B.A. COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY
ANAND 388 110

POST GRADUATE ODD SEMESTER END EXAMINATION DECEMBER-2014

AGM 505: Soil Water Balance Climatology (2+1)

Date: 24/12/2014  Time: 10.00 to 12.00 hrs.
Day: Wednesday  Marks: 50.00

Note: Draw the neat diagram and give equations wherever necessary.

Q. 1. Give short answers of the following (Any six) (12)

1. Sensible heat advection  
2. Stefan-Boltzman’s Law  
3. Solar constant  
4. Boundary Layer  
5. WUE  
6. Laminar layer  
7. Plank’s Law  
8. Lysimeter

Q. 2. Explain in brief radiation balance equation and its various components (08)

Q. 3. Explain in brief PAR measuring instruments (10)

OR

Q. 3. Explain in brief the radiation receipt on earth and factors affecting it (10)

Q. 4. Define PET and explain in brief the factors affecting PET. (10)

OR

Q. 4. Explain in brief wind speed profile over rough (Crop) surface (10)

Q. 5. Enlist different micrometeorological methods of estimation of ET and explain in brief Eddy correlation method (10)

OR

Q. 5. Enlist different climatological methods of estimation of PET and explain in brief any one of them (10)
B. A. COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY, ANAND
POST GRADUATE ODD SEMESTER END EXAMINATION (2014-15)
Course No. AGM. 604 (2+1)
Course Title: Weather, Climate and Livestock

DATE: 23-12-2014
DAY : Tuesday

MARKS : 50
TIME : 1000 to 1200 hrs

Answer any FIVE of the followings,

Q.1. Define Bioclimatology. Describe Bonsman’s concept of environment (the Wagon wheel) to depict human and animal interaction.

Q.2. Describe the housing management recommendations for animals. Write the ambient temperature and its ranges suitable for Housed Live stocks.

Q.3. Explain diagrammatically the radiation balance of animal. Write different components of radiant energy fluxes

Q.4. What do you mean by adaptability? What are the different thermal zones? Explain diagrammatically.

Q.5. Write different comfort indices for warm and cold seasons. Describe their advantages/limitations in terms of their applicability.

Q.6. What are the optimum temperature requirements of different animals? Describe the climate inside the animal shelter.

Q.7. What do you mean by climate space diagram? Draw and describe the same for sheep.
1. Define the followings
   a. Horse latitude
   b. Pressure gradient
   c. Coriolis force
   d. Hadley cell
   e. ITCZ
   5 marks

2. Describe in brief
   a) Thunderstorms
   b) Stefan Boltzman’s law
   c) Trade wind
   d) Artificial rain making
   e) Crop weather chart
   5 marks

3. Differentiate the followings
   a) El-Niño and La-Niña
   b) Lapse rate and Inversion
   c) Geostrophic and gradient wind
   d) Cyclone and Anticyclone
   e) Medium and long range forecasting
   10 marks

4. Answer any Six
   A. Describe the different laws of radiation and their use in meteorology.
   B. Describe the Charles’s and Boyle’s laws. Derive the Ideal gas equation.
   C. Describe diagrammatically the variation of temperature in atmosphere. Describe the importance of Troposphere.
   D. Explain diagrammatically the wind and pressure distribution over globe. Describe the various wind systems.
   E. Write the elements of weather. What are instruments used for measuring weather parameters.
   F. Describe the crop weather calendars diagrammatically and their importance in crop planning.
   G. Describe the different types of weather forecast and the techniques used in such forecasting.
   30 marks
B. A. College of Agriculture  
Anand Agricultural University, Anand  

Postgraduate Odd Semester End Examination-2014-15  
AGM. 603 : Air Pollution Meteorology (2+1)  
Date : 20-12-2014  
Day : Saturday  
Time : 1000 to 1200 hrs.  
Marks: 50  

Note: All questions carry equal marks.

Q.1 Define/Explain terms  
I. Air pollution  
II. Lapse rate  
III. Rainout  
IV. Acid rain  
V. Mixing height

Q.2 Fill in the blanks  
I. An inversion occurs when air temperature _________ with altitude.  
II. Dry adiabatic lapse rate of the atmosphere is _________ °C/km.  
III. _________ pollutants created by chemical reactions between two or more pollutants.  
IV. The bell-curve is known in statistics as the normal or _________ distribution.  
V. The concentration of CO₂ is rising at the rate of about _________ ppm/decade.  
VI. _________ combines with hemoglobin and forms a stable compound, which cause suffocation and may even lead to death.  
VII. The PAN is produced by the action of _________ and _________  
VIII. _________ particles are emitted by petrol run vehicle exhaust.  
IX. Author of the book ‘Boundary Layer Climates’ is _________

Q.3 Explain types of atmospheric inversion.

Q.4 Explain stability and plume behavior.

Q.5 Discuss atmospheric stability at different heights using thermal profile observations given below.

<table>
<thead>
<tr>
<th>z (m)</th>
<th>T (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>34.5</td>
</tr>
<tr>
<td>10</td>
<td>34.1</td>
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<tr>
<td>30</td>
<td>34.3</td>
</tr>
<tr>
<td>50</td>
<td>34.1</td>
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<td>70</td>
<td>33.9</td>
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<tr>
<td>90</td>
<td>33.2</td>
</tr>
<tr>
<td>110</td>
<td>32.6</td>
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<tr>
<td>130</td>
<td>31.7</td>
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<tr>
<td>150</td>
<td>32.0</td>
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<tr>
<td>170</td>
<td>32.3</td>
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<td>190</td>
<td>32.6</td>
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<td>210</td>
<td>32.4</td>
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<td>230</td>
<td>32.2</td>
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<tr>
<td>250</td>
<td>33.0</td>
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</table>
POST GRADUATE ODD SEMESTER END EXAMINATION-2014-15
AGM-508: Principles of Remote Sensing and its Application in Agriculture

Date: 18/12/2014
Thursday
Time: 10.00 to 12.00 hrs
Marks: 50

Q-1 [A] Fill in the blanks. [8]

1. When satellite travels from south to north is called ____________pass.
   a. ascending  b. descending  c. polar  d. None of the above

2. Geostationary satellites are often called ______________Satellite.

3. Spatial resolution depends on ____________
   a. swath  b.IFOV  c. both a and b  d. none of above

4. ____________is one of the space borne scatterometer.
   a. Sea SAT-A  b. GIS  c. IRS  d. NASA

5. Look angel is ____________.

6. NAVSTAR GPS was established in the year ____________.

7. The sensor which has its own source of energy is called ______________sensor.

8. GPS satellite has ____________no. of shift registers.

Q-1 [B] Match the following [4]

<table>
<thead>
<tr>
<th>[A]</th>
<th>[B]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. NRSC</td>
<td>a. Remote sensing satellite</td>
</tr>
<tr>
<td>2. IFOV</td>
<td>b. Solid Angle</td>
</tr>
<tr>
<td>3. Quick Bird</td>
<td>c. Electromagnetic wave</td>
</tr>
<tr>
<td>4. RADAR</td>
<td>d. Remote sensing Organization</td>
</tr>
<tr>
<td>5. IRS</td>
<td>e. Active sensor</td>
</tr>
<tr>
<td>6. NAVSTAR</td>
<td>f. Satellite Radar System</td>
</tr>
<tr>
<td>7. IR</td>
<td>g. High Resolution Satellite</td>
</tr>
<tr>
<td>8. SIR-A</td>
<td>h. GPS</td>
</tr>
</tbody>
</table>

(P.T.O.)
Q-1 [C] Explain the following terms in short

1. Remote sensing
2. GIS
3. Spatial Resolution
4. Depression Angle
5. Image Rectification
6. Swath
7. Atmospheric window
8. Map
9. Scattering

Q-2 [A] Answer the following questions

1. Give full form of NDVI with proper formula. Explain other indices.
2. Describe radiation–matter interaction.
3. Give some basic principles of image interpretation.

Q-2 [B] Answer the following in brief.

1. Describe the factors governing the quality of an image
2. Explain different parameters affecting in microwave remote sensing?
3. Describe imaging and non-imaging system.
4. What is supervised and unsupervised classification in image processing?

Q2 [C] Give the answers of following

1. What is GPS? Describe GPS working in detail.
2. Write a note about different applications of Remote sensing in different areas.
3. What is microwave remote sensing? Describe in detail.
B. A. COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY
ANAND-388 110

Post-Graduate Odd Semester End Examination-2014-15
Ag. Met. 509 : Applied Agricultural Climatology (1+2)

Date: 18/12/2014               Time: 1000 to 1200 hrs.
Thursday                          Marks: 50

- Give answer of the following questions in brief (Any Five)
Each question carries ten marks.

Q.1. Discuss the measures of central tendency and variability with appropriate examples.
Q.2. Discuss the role of congenial weather in outbreak of pest and disease.
Q.3. Discuss the climatic water budgeting components and its application in agriculture.
Q.5. Narrate important points to be considered in constructing new animal house in terms of
animal comfort.
Q.6. Define the following:
Crop calendar, Homogenity, Moving average, Cardinal temperature, Photothermal unit,
Phenology, Photoperiodism, Heliothermal unit, Dry spell, Evapotranspiration,
Skewness, Correlation, Length of growing period

X@X@X
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ANAND-388 110

Post-Graduate Odd Semester End Examination-2014-15
Ag. Met. 502 : Fundamentals of Agricultural Meteorology (2+1)

Date: 18/12/2014
Thursday

Time: 1000 to 1200 hrs.
Marks: 50

Give answer of the following questions in brief (Any Five)
Each question carries ten marks.

Q.1. What is Agricultural meteorology? Discuss in brief the aim, scope and role of Agro meteorologist. Enlist the important meteorological parameters affecting crop growth and development and discuss any one parameter in detail.

Q.2. Discuss the role of moisture and temperature in plant photosynthesis.

Q.3. Define air pollution. Write short note on air pollution and its impact on vegetation.

Q.4. Define the following terms: (Any ten)
Greenhouse effect, Photo period, PAR, Net photosynthesis, Air pollution, PET, Aridity index, Weather forecasting, Agricultural drought, Agricultural meteorology, Numerical method of weather forecasting, Global warming, Climatic classification

Q.5. Write short note on causes of climate change and its impacts on agriculture and suggest adaptation measures for sustainable agriculture.

Q.6. What is drought? Discuss different types of drought classification and describe drought proofing technology for agriculture.

X@X@X
Q.1 Fill in the blank

1) A fall in the price of 'X' resulted in a decrease in the demand of 'Y' is due to ________.
2) Welfare definition of economics of Alfred Marshall was criticized by ________.
3) At the point of inflection the MP & AP is ____________________________.
4) The elasticity of demand of electricity used for industrial purpose will be ________.
5) At shut down point of the firm the average variable cost is ____________________.

Q.2 Choose the correct answer from the following

1) A rise in price of an inferior good resulted increase in their demand is described by,
   a) Veblen effect
   b) Substitution effect
   c) Giffen paradox
   d) None of these

2) Zone-II is called rational, because in this zone the resources are
   a) Over utilized
   b) Optimum utilized
   c) Under utilized
   d) None of these

3) Change in the price of a product on an iso-revenue line will result in
   a) Change in the slope of curve
   b) Shift in curve
   c) Both
   d) None of these

4) Breakeven point refers to, when
   a) Total income is greater than total cost
   b) Total income is equal to total fixed cost
   c) Total income is equal to total cost
   d) Total income is equal to total variable cost

5) The two iso-quants do not intersect each other, because
   a) Both of them are negatively sloped
   b) Both of them represent different level of output
   c) Both of them are convex to the origin
   d) None of these

(PFO)
Q.3 True/False (5.0)

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Particulars</th>
<th>T/F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>When TP increases, MP is Negative &amp; increasing.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>When two goods x &amp; y are substitutes, the cross elasticity is positive.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Demand is more elastic in the short run.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>When the MC is higher than the AC, the AC is rising.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>In the monopolistic competition the products are homogenous.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Cost to be paid whether or not any units are produced is variable cost.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>The slope of transformation curve is given by $MRT_{xy}$.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>The scarcity definition of economics is given by Keynes</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>The next best alternative forgone is implicit cost.</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>In the pure completion the demand of individual firm is perfectly elastic.</td>
<td></td>
</tr>
</tbody>
</table>

Q.4 Define the following terms: (Any Five) (5.0)

1) Budget line.
2) General welfare function.
3) Elasticity of production.
4) Marginal cost.
5) Substitution effect.
6) Expansion path.
7) Pareto optimality.

Q.5 Short notes: (Any Five) (10.0)

1) Market equilibrium.
2) Perfect competition of market.
3) Measurement of price elasticity.
4) Welfare economics.
5) Factor-product relationship.
6) Cournot Model.
7) Law of demand.

Q.6 Descriptive type questions: (Any Four) (20.0)

1) Define the price elasticity of demand and describe in detail about the various methods of measurement of price elasticity.
2) Profit maximization and cost minimization under perfect market situation.
3) Explain the different types of cost with suitable diagrams.
4) What is Isoquant? Explain the various characteristics of isoquant.
5) Define Production function and explain the laws of returns with diagrams.

**********
Q: 1. Explain how Keynes links money market with good market. What are its policy implications?  

Or

Q: 2. Explain Keynes' psychological law of consumption. Explain its importance in determination of income and employment in the economy.

Q: 2. Explain with the aid of IS-LM curves role of monetary policy for stabilization of the economy.  

Or

Q: 2. Explain with the aid of IS-LM curves model role of fiscal policy in overcoming recession in the economy.

Q: 3. What is the Phillip Curve? What kind of trade-off between unemployment rate and inflation rate does it imply?

Q: 4. Write down short note on the following topics. (Any Two Only)
   i. Major issues and concerns of macroeconomics
   ii. Stagflation and supply-side Economics
   iii. Foreign Exchange Policy

Q: 5. Answer the following questions to the point (Any five Only).
   i. Distinguish between dear money and cheap money.
   ii. What does Ratchet effect mean?
   iii. Mention the names of national income series in India.
   iv. Give the formula for Multiplier
   v. Give the example of a country that experienced hyperinflation
   vi. What is devaluation?

Q: 6. Answer the following question in brief (Any Five Only)
   i. Describe the saving function with its importance.
   ii. What are the assumptions of Keynes’ Simple Income Determination?
   iii. What are the instrument of quantitative credit control?
   iv. How important is the deficit budget?
   v. What are the objectives and limitations of fiscal policy?
   vi. Distinguish between balance of trade and balance of payments.

Q: 7. Define/explain the following terms (Any Five Only)
   i. Social Accounting Matrix
   ii. Stagflation
   iii. Multiplier
   iv. Stochastic Macroeconomics
   v. Effective Demand
   vi. Agreement on Agriculture of WTO

**************
Q.1 Fill in the blank (5.0)

1. Taylor have extended the 'stock-adjustment principle' to non-durables, giving it the name ______
2. The indifference map of a LES would appear as ____________, implying the ______ of groups of commodities.
3. A fall in the price of 'X' resulted decrease in the demand of 'Y' is due to ______
4. The distinctive feature of an oligopoly market is ______
5. The Cournot model was developed in the year ______ by the French economist ______
6. Asymmetric information means the market situation when the buyers and sellers have a __________ while making a transaction.
7. The concept of new welfare economics is given by ______
8. Market failure means failure to achieve ______

Q.2 True/False (5.0)

<table>
<thead>
<tr>
<th>S. No</th>
<th>Particulars</th>
<th>T/F</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>AIDS was developed by Deaton and Muell-bauer (1990).</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>When two goods x &amp; y are substitutes, the cross elasticity is positive.</td>
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</tr>
<tr>
<td>3.</td>
<td>Partial equilibrium is not study of the behavior of individual decision-making units.</td>
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<tr>
<td>4.</td>
<td>The slope of transformation curve is given by MRSxy.</td>
<td></td>
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<tr>
<td>5.</td>
<td>Dual to the utility maximization problem is the cost minimization problem.</td>
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<tr>
<td>6.</td>
<td>Overt collusion occurs when there is attempt to hide agreements</td>
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<tr>
<td>7.</td>
<td>In third degree price discrimination the MR from each market is not same.</td>
<td></td>
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<tr>
<td>8.</td>
<td>Kinked demand curve is also known as Sweezy model.</td>
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<tr>
<td>9.</td>
<td>The point of maximum social welfare is attained at grand utility possibility curve tangent to general welfare curve.</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>When the demand curve has infinite slope its elasticity is more than zero.</td>
<td></td>
</tr>
</tbody>
</table>
Q. 3 Define the following terms: (Any Five) (5.0)
1) Private Costs
2) Incomplete Markets
3) Price Rigidity
4) Duality
5) Linear Expenditure System
6) Maximum social welfare
7) Production contract curve

Q. 4 Short notes: (Any Five) (15.0)
1) Existence, uniqueness and stability of general competitive equilibrium.
2) Principal agent problem, adverse selection and moral hazard.
3) Edgeworth Box Analysis.
4) Utility possibility curve.
5) Collusive and Non collusive oligopoly.
6) Price effect and consumer surplus.

Q. 5 Descriptive type questions: (Any Four) (20.0)
1) Differentiate between perfect and imperfect competition of market, enlist the theories of factor market and explain the Stackelberg solution with example.
2) Discuss the various criteria for social welfare and also discuss the limitations and benefits of SWF.
3) Can an economy ever reach general equilibrium in the real world explain in detail.
4) Describe in detail about the Distributed-lag models of demand and Nerlove's stock-adjustment principle.
5) Discuss in detail the applications of Almost Ideal Demand System (AIDS) in Agricultural economics.
Q.1 Define the concept of Agricultural Marketing with its characteristics, importance and problems 5.0

OR

Q.1 Define the word Price. List out its characteristics and Functions. How Agricultural Price are differ than industrial price.

Q.2 a List out the Inadequacies of present Indian Marketing System 4.0
b Work out price spread & marketing efficiency in marketing of 1 qtl. Potato. 4.0

<table>
<thead>
<tr>
<th>Producers sale price Rs./qtl</th>
<th>Marketing Cost (Rs./qtl)</th>
<th>Margin (Rs./qtl)</th>
<th>Retailer Sale Price Rs./qtl</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Farmer</td>
<td>W.S.</td>
<td>Retailer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>370.07</td>
<td>29.22</td>
<td>78.43</td>
<td>80.54</td>
</tr>
</tbody>
</table>

Q.3 Discuss Marketing Research with its importance, types and different steps 3.0

Q.4 Write short note (any four) 4.0

1 Administred price
2 Concept of Marketing Equilibrium
3 Modern Concept Of Regulated Market
4 Contract Farming (Modern View)
5 Supply chain Management
6 Future Trading
7 IT in Agricultural Marketing

Q.5 Do as directed (any ten) 10.0

1 Enlist advantage and disadvantages of future trading
2 List out components of a market.
3 Suggestions to improve of Agril. Marketing System
4 Highlight the factors which influence on Market Price
5 Work out price Elasticity of Demand & interpret the result.

<table>
<thead>
<tr>
<th>Price of X (Rs./Kg.)</th>
<th>Quantity of X demanded</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>10</td>
</tr>
<tr>
<td>200</td>
<td>15</td>
</tr>
</tbody>
</table>

(PTO)
Enlist the principles of co-operation
Draw well labeled diagram of change in inward shifts and outward shifts in Market demand & equilibrium price.
Enlist the effect of integration
Components of Market structure.
Show effect of increase or decrease of Govt. taxes and subsidies on supply.
Forecast the demand using the given data adopting trend projection method.
Value of a=12.08  b = 1.097 and  T = 14
Enlist the methods of forecasting

Q.6 Differentiate the basic term (any two)
1. Place utility & Time utility
2. Supply & Demand
3. Market Information & Market Integration
4. Minimum support price & Selling price

Q.7 Interpret the result & give proper suggestions for both the seller & buyer (any eight)
1. Correlation co-efficient for monthly wholesale prices of potato was 0.6727** for the market pairs Nadiad - Petlad.
2. Agri firm combined the activities i.e. To produce 1 lack tissue culture banana plant for sell, Wholesaling, retailing and home delivery transport.
3. Convert paddy into rice.
4. Central Govt. declared 20% less minimum support price of paddy compared to last year.
5. Suppose PeS > 1, though the supply are contras.
6. PeS < 1
7. An increased the Govt. taxes in inputs,
8. In South Gujarat, setup co-operative marketing society, where more than 60% farmers are Marginal & Small.
9. Modified measures of efficiency of Market-A was 0.67 & Market B was 0.43
10. Market concentration Ratio range between 80 % to 100%.

Q.8 Define / Explain the terms (any eight)
1. Price volatility 2. Lagged Margin 3. Producer surplus
4. Inter-year variation 5. Hats, 6. intra-year

X@X@X
Q.1. Discuss the characteristics and usefulness of the following (2*5=10)

(i) Constant Elasticity of Substitution (CES) production function.
(ii) Cobb-Douglas production function.

Q.2. Discuss economic optima under following (2*5=10)

(i) Varying input prices
(ii) Varying output prices

Q.3. Precisely discuss the following (2*5=10)

(i) Derivation of factor demand and output supply functions from the profit function.
(ii) Cost Minimization subject to an output constraint.

Q.4. Answer the following (2*5=10)

(i) Given the following production function.

\[ Q = 10 + 20X_1 - 2X_1^2 + 30X_2 - 4X_2^2 \]

Where, \( X_1 \) price (\( P_1 \)) = 2, \( X_2 \) price (\( P_2 \)) = 5, Output price (\( P \)) = 50

How much output should the firm produce and what levels of inputs should it use to maximize profit.

(ii) Define elasticity of substitution. Also discuss the significance of elasticity of substitution.

(PTO)
Q.5. Given the following profit function 

\[ \Pi^* = 10P^3 - 2P_1 - 6P_2 + 0.1P_1^2 + 0.2P_2^2 - 2P_1P_2P \]

(P_1=2, P_2=4, P=5) 

a) What is the optimum level of output supply?  
b) What are the optimum levels of input use  
c) At the optimum level of input and output use that you found in part a and b, show how much this firm is earning.  
d) Are \( X_1 \) and \( X_2 \) substitutes of compliments? Why?

6. Write short notes on any four of the following  

1. Estimation problem,  
2. Specification of the economic model,  
3. Decomposition analysis,  
4. Technical change,  
5. Allocative efficiency.

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Anand Agricultural University
B. A. College of Agriculture, Anand
Post Graduate ODD Semester End Examination: December 2014
Course No. Ag. Econ. 511: Agricultural Development Policy Analysis (credit 2+0)

Date: 15-12-2014 Time: 10.00 to 12.00 hrs.
Day: Monday Marks: 50

Q: 1. Define/explain the following concepts/terms (Any five Only) 5.0
   i. Globalization
   ii. Environmental Degradation
   iii. PQLI
   iv. Green GDP
   v. Disguised Unemployment
   vi. MEW

Q: 2. Explain the nature, scope and importance of the development economics. 7.0

Q: 3. Explain in detail Harrold-Domar Models and state the limitation of these models. 7.0
   Or
   Q: 3. Explain in detail Kaldor’s Model of growth with its weaknesses 7.0

Q: 4. Why are some countries poor and others rich and why are there such divergences between growth rates? 7.0
   Or
   Q: 4. Explain the Human development Index in detail with its computation and criticisms

Q: 5. Differentiate the following (Any Two) 8.0
   i. Economic Growth v/s Economic Development
   ii. Free Trade v/s Protectionism
   iii. Endogenous Growth Theory v/s Exogenous Growth

Q: 6. Write down short note (Any Two Only). 8.0
   i. WTO and Agreements on Agriculture
   ii. Sustainable Agricultural Development
   iii. Role of Agriculture in Economics

Q: 7. Answer the following questions in brief (Any Four only) 8.0
   i. Mention the indicators of economic development,
   ii. Show the relation between population growth and economic development.
   iii. What are the obstacles in the way of economic development?
   iv. What are the policies the government may take to reduce poverty?
   v. Mention the five stages of economic growth shown in Rostow’s growth theory.

*****
Q: 1. Explain business cycle with diagram. State the causes of business cycle instability and also explain the counter cyclical stabilization policies

Explain IS and LM curves. What is the role of these two curves in simultaneous determination of equilibrium rate of interest and level of income?

Q: 2. What are economic indicators and why are they important? Explain economic indicators in relation to the business cycle/economy. What are the leading, lagged and coincident types of indicators?

Q: 3 Describe the simple theory of income determination with a suitable diagram (Basic Keynes Model).

Q: 4 Write down short notes on the following topics. (Any three only)
   i. Modern Theory of Exchange Rate Determination
   ii. Consumption Function
   iii. Importance and Scope of Macroeconomics
   iv. Components of money supply

Q: 5 Define/Explain the following terms. (Any Five)
   i. Seasonal Unemployment
   ii. New classical Economics
   iii. National Income
   iv. Say’s Law of Market
   v. Great Depression
   vi. Principal of Acceleration

Q: 6 Answer the following questions in brief. (Any Five)
   i. What does national income at constant prices mean?
   ii. Differentiate between recession and depression.
   iii. What are the criticisms of Say’s Law
   iv. What are the determinants of consumption other than income?
   v. What do the terms “Cost-Push Inflation” and “Demand-Pull Inflation” mean? What’s the difference between the two?
   vi. State the objectives and limitations of fiscal policy.

Q: 7 Answer the following questions to the point. (Any Five)
   i. Name the methods for measuring national income.
   ii. Define multiplier and give the formula for it.
   iii. What are the three motives for liquidity preference theory?
   iv. Name the factor of Production and their remuneration (or rewards)
   v. What are the goals and major problems of macroeconomics?
   vi. What are MPS and its importance in economy?
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**ANAND 388 110**  
**POST GRADUATE ODD SEMESTER END EXAMINATION—2014-15**  
**AG. STAT-561: STATISTICAL METHODS (2+1)**

<table>
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**Q. 1**  
Defi ne/Explain the following terms. 
1. Beta distribution of first kind  
2. Cauchy distribution  
3. Weibull distribution  
4. Probability  
5. Log normal distribution  
6. Sampling and Non-sampling error  

**Q. 2**  
Answer the followings (Any Three)  
1. Explicate poisson distribution and its properties.  
2. What is descriptive statistics? Explain different measures of dispersion.  
3. What is normal distribution? Give properties of the normal distribution.  
4. Give the concept of random vectors, moments and their distribution.  

**Q. 3**  
Answer the following  
1. What is chi-square distribution? Give its properties.  
2. Give properties of negative binomial and geometric distribution.  
3. Discuss student t-distribution.  

**Q. 4**  
Answer the following in brief (Any Seven)  
1. Explain rectangular and exponential distribution.  
2. What are the types of correlation?  
3. What do you understand by logistic distribution?  
4. Discuss the function of gamma distribution.  
5. What do you understand by order statistics and rank correlation?  
6. Give the formula of bivariate normal distribution.  
7. Explain binomial and bernoulli distribution.  
8. What is pareto distribution?  
9. Discuss the function of Z distribution.  
10. Enlist any three properties of F-distribution.
Q.1 (i) Write short note (Any three) (12.0)
   1. HW law
   2. Selection and selection index
   3. Discriminant function
   4. Heritability/co-heritability and factors affecting it

   (ii) Define/Explain followings (5.0)
   (i) Breeding value
   (ii) Correlated response
   (iii) Heterosis
   (iv) Dominance deviation
   (v) Selection differential
   (vi) Genotypic correlation
   (vii) Coupling & Repulsion
   (viii) PCV %
   (ix) SPRC
   (x) Path coefficient

Q.2 (i) Explain different models. Write EMS and df for following sources of variation (8.0)
in ANOVA. Replications=4, Genotypes=10 Years=4 (treatments effects are fixed and year random)

<table>
<thead>
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(ii) Derive the change in gene frequency due to selection for a single locus when (5.0)
(i) selection operates at gametic stage and (ii) at zygotic stage when A_2A_2 has
s+1

Q.3 (i) Give contribution of following scientist in statistical genetics (5.0)
   (i) Fisher  (ii) Hazel  (iii) Smith  (iv) Karl Pearson  (v) Sewall Wright

(ii) Narrated correlation and Path analysis. (8.0)

Q.4 (i) Explain procedure for estimation of gene and genotypic frequency, population mean, genetic, additive and dominance variances. (7.0)
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POST GRADUATE ODD SEMESTER END EXAMINATION–2014-15
AG. STAT-540: STATISTICAL GENETICS-II (2+1)

Date: 20–12-2014
Time: 10.00 to 12.00 hrs.
Marks: 50.00

Saturday

Q.1 Explain the following terms. (10.0)
   1. North Carolina design-I
   2. Partial diallel
   3. Genetic drift and genetic load
   4. Biparental cross
   5. Genotypic and phenotypic correlation

Q.2 Answer the followings (Any Two) (12.0)
   1. What is generation mean analysis? How will you estimate value of different scaling test? Give their test of significance and give components of six parameters model with its standard error and test of significance? Draw your conclusion.
   2. Explain line x tester programme with five lines, three tester and four replications. Give complete procedure for analysis.
   3. Define stability analysis. Enlist different models for stability analysis and explain Eberhart and Russell model with ANOVA.

Q.3 Answer the followings (12.0)
   1. Give ANOVA for NCD-II on plant basis with expected mean squares. Give formulae to estimate additive and non-additive variances.
   2. Discuss the Hayman’s approach and Griffing’s approach of diallel. Give assumption of diallel.

Q.4 Differentiate the followings (10.0)
   1. Generation mean analysis and diallel cross analysis.
   2. Three parameter and five parameter model.
   4. Additive x Additive and Additive x Dominance types of epistasis.

Q.5 Answer the following in brief (Any Six) (6.0)
   1. Define triallel and triple test cross.
   2. What are the assumptions of North Carolina Design?
   3. Explain linkage.
   4. Define adaptation and adaptability.
   5. Explain selection index and how it useful in plant breeding?
   6. Explain North Carolina design-III.
   7. How qualitative and quantitative characters are governed by gene?
Q.1(A) Define/ Explain the following (4)

(1) Experimental unit       (2) Experiment
(3) Experimental error      (4) Interaction effect

(B) Enlist the types of experiment and discuss any two. (4)

Q.2 (A) An experiment is to be conducted to study the effect of three different date of sowing on the yield and quality of Groundnut under middle Gujarat condition. Five different varieties are to be compared. Suggest appropriate design of experiment with due justification. Give statistical model of the design and layout plan of at least one replication with complete procedure of data analysis. (7)

(B) In the above experiment if data related seed weight, pest population, germination percentage, protein percentage and disease index are to be analyzed, suggest appropriate transformation. (5)

Q.3 (A) An experiment is to be planned to study the effect of five hormonal treatments on fruit production of Sapota. How will you select the experimental material to conduct the experiment? Suggest appropriate design. How many experimental units will be required? Discuss complete method of analysis. (7)

(B) What is missing plot technique? Give procedure to estimate effective number of replication in any one design. (5)

Q.4 From the following layout plan, identify the experimental design. Give statistical model with complete analysis of variance structure. (10)

<table>
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<th>Replication III</th>
<th>Replication IV</th>
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Q.5 Answer the following. (Any two) (8)

(1) Give important differences between lsd and DNMRT
(2) How uncontrolled variation can be minimized?
(3) List two important reference books with their author (s) related to this course
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**POST GRADUATE ODD SEMESTER END EXAMINATION : 2014-15**  
**AG. STAT-533 : STATISTICAL METHODS FOR CROP PROTECTION-I (2+1)**  

<table>
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<th>Time: 10.00 to 12.00 hrs.</th>
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**Q. 1**  
(A) Define/Explain the following terms.  
(i) Latin square design  
(ii) Multiple regression  
(iii) Treatment  
(iv) Probit analysis and LD$_{50}$  
(v) Experimental unit  

(B) Define the term correlation? Explain different types of correlation with examples.  

**Q. 2**  
(A) What is DNMRT? Discuss its procedure.  
(B) When transformation is required? Explain the different types of transformations.  

**Q. 3**  
(A) Plan an experiment to study the effect of ten different insecticides as seed treatment against cotton pest. Suggest appropriate design of experiment with its justification. Give its statistical model, layout plan of at least one replication and complete procedure of statistical analysis.  

(B) Explain the principles of experimentation and give their importance  

**Q. 4**  
(A) When pooled analysis is required? Give ANOVA structure for an experiment was repeated for four years in RBD with T=5 and R=3.  

(B) Answer the following  
(i) Give formula for efficiency of RBD over CRD.  
(ii) What is experimental error? How one can minimized it?  
(iii) Explain bias correction.  
(iv) Give the condition for the application of CRD design.  
(v) Give the formula of rank correlation when rank are repeated and not repeated.  

**Q. 5**  
Differentiate the following  
(i) Linear and non-linear regression.  
(ii) Correlation coefficient and regression coefficient.  
(iii) Preliminary and critical experiment.  
(iv) Direct assay and indirect assay.  
(v) Split plot and strip plot design.
Q.1 (a) Define/Explain following
1. Experimental error
2. Local control
3. ANOVA
4. Treatment
5. Path coefficient
6. Random effect model
7. Guard row
8. Incomplete Block design

(b) From below given ANCOVA, estimate genotypic, phenotypic and environment variance and correlation.

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Q.2 Answer as directed (Any seven)
1. Explain principles of experimental design
2. List different types of transformations. Under what circumstances they are used?
4. How will you estimate one missing value in RBD? How it will affect the analysis of data as compared to normal analysis of RBD?
5. In what way compact family block design and split plot design differ.
7. Explain different models.
8. Give uses of Covariance Analysis in Agricultural Research
9. What is factorial concept? Explain simple, main and interaction effect.
10. Explain path diagram

Q.3 Explain progeny row trial. Give its ANOVA skeleton.

Q.4 Explain compact family block design and give complete procedure of analysis of data.

Q.5 What is path analysis? Who developed it? Who used it first time in plant science? What is SPRC? How they are useful in plant breeding?

Q.6 Why Augmented design is required? Give layout plan for evaluation of 102 new selections with three checks.
Anand Agricultural University
B. A. College of Agriculture, Anand
Post Graduate Odd Semester End Examination, 2014-15
Course No: Stat. 616 : Statistical Modeling

Date : 18-12-2014 Time : 1000 to 1200 hrs.
Thursday Marks : 50

Q.1 Explain Empirical and Mechanistic models and its application in research. (10)
Q.2 Discuss application of Non linear statistical models in agricultural research. (10)
Q.3 What is Single Species Population Models? How it is useful in the study of population growth? (10)
Q.4 Discuss the application of Lotka-Vo;terra Predator-Pray Models in research. (10)
Q.5 Discuss the method of least squares for nonlinear models. (10)

***********************
Date: 27-12-2014
Day: Wednesday
Marks: 50

Q.1 Define or Explain in brief
1. Null Hypothesis
2. Non-parametric test
3. Sampling method
4. Test of significance
5. Frequency
6. Time series
7. Sampling error
8. Factor loading

Q.2 Answer the following:
1. What is statistics? What are the limitations of statistics?
2. What is sample? Enlist the methods of sampling with explanation under what circumstances they are used.
3. Give the important characteristics of non-parametric test and which non-parametric tests are used to compare two related and independent samples.
5. What is path coefficient? Give the formula for direct and indirect effects, if there are three independent variables and one dependent variable.
6. What is chi-square? Give its uses.

Q.3 (a) Write short note on the following (Any four).
1. Write procedure for frequency distribution.
2. Factor analysis
3. Rank correlation
4. Time series analysis
5. Index number

(b) Write the formula to calculate the following.
1. Arithmetic mean and standard deviation from grouped data.
2. \( b_x \) and \( b_y \)
3. Approximate number of classes, class interval
4. Standard error difference of mean for independent t test when \( n_1 \neq n_2 \).
5. Paasche's index number

Q.4 (a) Differentiate following.
1. Large sample and Small sample
2. Qualitative variable and Quantitative variable
3. Correlation and Regression
4. Real population and Hypothetical population
5. Stratified sampling and Cluster sampling

(b) Give the very specific use of the following.
1. Wilcoxon sign rank test
2. Coefficient of determination
3. Paired t test
4. Median test
5. Step wise Regression
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POST GRADUATE ODD SEMESTER END EXAMINATION 2014-15
AG. STAT. 512: EXPERIMENTAL DESIGNS (2+1)

Date : 27-12-2014 Time : 1000 to 1200 hrs.
Day: Saturday Marks : 50

Q.1 (A) Define /Explain
   (1) Degrees of freedom   (4) Null hypothesis
   (2) Level of significance   (5) F test
   (3) Efficiency of RBD over CRD   (6) Critical difference test
(B) Give your comments on the following statements.
   (1) Latin square design is very flexible design.
   (2) Main function of replication is to increase the precision for
treatment comparison.
   (3) When main effects are significant, interaction effects is bound to
be significant.
   (4) In green house or laboratory study CRD is employed.
   (5) Type II error is associated with level of significance.
   (6) Randomization provides a correct test of significance.

Q.2 (A) Define experimental error. Which are the major sources of it? How
to control it?
(B) Explain the basic principles of experimental design.

Q.3 (A) Define Latin Square Design. Give the randomization for 5x5 latin
square.
(B) Define correlation. Explain the types of correlation. Give the
formula to workout correlation coefficient.

Q.4 Write the complete procedure with ANOVA for a factorial experiment
conducted in RBD with two factors A and B each at three levels and 4
replications.

Q.5 Answer the following
   (1) Define test of significance.
   (2) In an experiment, which is conducted in LSD, the error d.f. are 30,
what are the number of treatments, rows and columns?
   (3) List the advantages CRD.
   (4) Illustrate to explain simple, average and interaction effects.
   (5) Define analysis of variance.
   (6) What do you understand by standard error of mean?

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POST GRADUATE ODD SEMESTER END EXAMINATION 2014-15
AG. STAT. 541: STATISTICAL METHODS FOR ANIMAL SCIENCES (2+1)

Date: 27-12-2014
Day: Saturday

Time: 1000 to 1200 hrs.
Marks: 50

Q. 1 (A) Define / Explain (6)

(1) Degrees of freedom
(2) Level of significance
(3) Efficiency of RBD over CRD
(B) Give your comments on the following statements. (6)

1. Latin square design is very flexible design.
2. Main function of replication is to increase the precision for treatment comparison.
3. When main effects are significant, interaction effects is bound to be significant.
4. In green house or laboratory study CRD is employed.
5. Type II error is associated with level of significance.
6. Randomization provides a correct test of significance.

Q. 2 (A) Define experimental error. Which are the major sources of it? How to control it? (6)

(B) Explain the basic principles of experimental design. (6)

Q. 3 (A) Define Latin Square Design. Give the randomization for 5x5 latin square. (6)

(B) Define correlation. Explain the types of correlation. Give the formula to workout correlation coefficient. (4)

Q. 4 Write the complete procedure with ANOVA for a factorial experiment conducted in RBD with two factors A and B each at three levels and 4 replications. (10)

Q. 5 Answer the following (6)

1. Define test of significance.
2. In an experiment, which is conducted in LSD, the error d.f. are 30, what are the number of treatments, rows and columns?
3. List the advantages CRD.
4. Illustrate to explain simple, average and interaction effects.
5. Define analysis of variance.
6. What do you understand by standard error of mean?

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Q-1 Answer the following questions

1. What is the need of sampling as compared to complete enumeration?
2. What do you understand by a population in statistical sense?
3. Name different types of populations or universe and give their description summarily
4. In what situations sampling is inevitable?
5. Expound sampling and non-sampling errors.

Q-2 Answer the following short questions

1. What do you understand by random sampling?
2. Mention in brief the objective of sampling
3. Distinguish between complete enumeration and sampling study
4. What is meant by sampling method?
5. What is meant by an estimator?
6. Which factors are responsible for the size of sample?
7. Give the formula for sample mean.
8. What formula is used to calculate the sample variance?
9. What is equal allocation?
10. What are the advantages of systematic sampling?

Q-3

A. Answer the following Fill in the Blanks

1. If the numbers of units in a population are limited, it is known as _________ population.
2. If all the units of a population are surveyed it is called _________
3. When the population size N is a multiple of sample size n, _________ systematic sampling is appropriate
4. When the population size N is not divisible by the sample size n, _________ systematic sampling is plausible.
5. A sampling procedure, in which the units are selected with chance of selection in proportion to some measure of their size, is known as _________ sampling.

B. Answer the following Multiple Choice

1. A sample consists of: (a) All units of the population (b) 50 per cent units of the population (c) 5 per cent units of the population (d) Any fraction of the population
2. The number of possible samples of size n from a population of N units with replacement is: (a) N^2 (b) n^2 (c) N (d) N!
3. Simple random sample can be drawn with the help of: (a) random number tables (b) chit method (3) roulette wheel (d) all the above
4. If the items are destroyed under investigation, we have to go for: (a) complete enumeration (b) sampling studies (c) both (a) and (b) (d) neither (a) nor (b)
5. If all observations in a set of observations are same, the variance of the set of values is: (1) zero (2) one (3) infinity (4) not possible to calculate

(P.T.O.)
Q-4 Prove the following theorem

1. In simple random sampling without replacement the sample mean is an unbiased estimator of population mean.
2. In simple random sampling without replacement,
   \[ S^2 = \frac{1}{n-1} \sum_{i=1}^{n} (y_i - \bar{y})^2 \]
   is an unbiased estimator of population variance

3. In a SRSWOR
   \[ S^2 = \frac{1}{n-1} \sum_{i=1}^{n} (y_i - \bar{y})^2 \]
   is an unbiased estimate of the population variance

4. \[ E(p) = p \]

Q-5 Answer the following questions

1. Lottery Method
2. Circular Systematic Sampling
3. PPS
4. Construction of Strata
5. Name different methods of sample size allocation and give their description summarily
Q-1: (A) Enlist major insect pests of citrus with their scientific name and describe nature of damage and management strategies of fruit sucking moth. (6.0)

(B) Describe life cycle of the following insect pests (Any Five) (5.0)
1. Mango hopper
2. Cabbage butterfly
3. Guava bark eating caterpillar
4. Lily caterpillar
5. Tomato fruit borer
6. Custard apple mealy bug

Q-2: (A) Enlist major insect pests of coconut with their scientific name and describe nature of damage and management strategies of black headed caterpillar. (6.0)

(B) Describe nature of damage caused by the following pests (8.0)
1. Mango stem borer
2. Cut worm of Aswagandha
3. Eriophyd mite of coconut
4. Anar butterfly
5. Rhizome or Corn weevil in Banana
6. Drumstick leaf eating caterpillar
7. Onion thrips
8. Rose thrips

Q-3: (A) Narrate marks of identification of the following pests (Any five) (5.0)
1. Lemon butterfly
2. Citrus psylla
3. Red palm weevil
4. Moringa bud worm
5. Aonla leaf roller
6. Potato cut worm

(B) Give scientific reason(s) for the following (5.0)
1. Smoking in citrus orchard during evening hours is suggested to citrus growers.
2. Mix cropping of okra and cotton should be avoided.
3. Any injury on coconut trunk should be plastered with clay or cement.
4. Application of persistent insecticides on mango trunk during off season is recommended.
5. Deep ploughing after harvesting is advocated in cucurbitaceous crops.

(P.T.O.)
Q-4: (A) Give IPM strategies for the following pests (Any five) (10.0)

1. DBM in cabbage
2. Mango fruit fly
3. Jasmine budworm
4. Aonla gall forming caterpillar
5. Brinjal shoot and fruit borer
6. Red palm weevil

(B) Answer in short for the following (5.0)

1. Explain methodology of root feeding techniques for the control of coconut eriophyid mite.
2. Write name of vector/ carrier with scientific name for the following diseases.
   (1) Tomato leaf curl virus
   (2) Brinjal little leaf
   (3) Cowpea mosaic
   (4) Okra yellow vein mosaic
3. Which diseases are transmitted by citrus psylla and banana aphid?
4. How will you differentiate the damage of chiku bud borer and chiku moth?
5. Enlist major insect-pests of greenhouse flowering crops with their scientific name.
Q.1. Define the following (any ten)

1. Ecosystem  
2. Species  
3. Community
4. Photoperiodism  
5. Saprophytes  
6. Flagship Species
7. Kairomones  
8. Amensalism  
9. Potential pest
10. Photo taxis  
11. Migration  
12. Co-evolution
13. Trophic interaction

Q.2. Answer following multiple choice questions (any ten)

(1) Which of the following is correct?
   (a) Energy cannot be cycled and reused - matter can.
   (b) Matter cannot be cycled and reused - energy can.
   (c) Both matter and energy can be cycled and reused.
   (d) Neither matter nor energy can be cycled and reused.

(2) Which is not a factor that affects density of organism?
   a. season  b. food supply  c. weather conditions  d. age of organism

(3) Which is the example of estimating absolute density?
   a. counting total no. of lions  b. sweeping of insect with hand net  c. trapping of insects  d. sticky trap for small insects

(4) Which is the least common form of distribution found in nature?

(5) Who, in 1735, devised an orderly system for naming the different sorts of organisms?
   a. Erasmus  b. Malthus  c. Volterra  d. Linnaeus

(6) The movement of individuals away from their area of origin or from centers of high population density is known as
   a. Species dispersal  b. Species distribution  c. Species range  d. Biogeography

(7) The visible light ranges from ....... to ....... wavelength.
   a. 0.01 to 0.4μm  b. 0.4 to 0.7μm  c. 1μm to 100μm  d. None of above

(PTO)
(8) The plants flower when days and nights are equal are called......
   a. Short day plant  b. Long day plant  c. Day neutral plant  d. None of above

(9) Which of the following pesticides is bioaccumulated in food chains?
   a. Atrazine  b. Glyphosate  c. DDT  d. 2,4-dichlorophenoxyacetic acid

(10) In life table notation, \( \lambda (\text{lambda}) < 1 \) is indicates....
   a. the population is declining  b. increasing population  c. stable population.
   d. All of above

(11) An endemic species is
   a. a species found uniquely in one place  b. a species carrying an epidemic disease.
   c. a species at an early phase of its evolution  d. a taxonomist's mistake.

(12) The inhibition of germination, growth or metabolism of one plant by another through the production of toxic chemical compounds that escape into the environment is called:
   a. mycotrophy  b. allelopathy  c. symbiosis  d. None of these

Q.3. Define 'Biodiversity', list out its ecological functions and enlist various threat categories. (6.0)

Q.4. Enlist basic characteristics of a population, Discuss the various age-structures and its significance in the insect population. (6.0)

Q.5. Discuss various mating system and reproductive strategies in insects. (6.0)

Q.6. Enlist major features of 'Optimal Foraging Theory'. (6.0)

Q.7. Compare various ecological attributes of natural and man-made ecosystem. (6.0)

*****
Q. 1 Define /Explain the following (Any five) (5.0)
1. Biomagnification
2. Biorational pesticides
3. Pesticide residue
4. Waiting period
5. MRL
6. ADI
7. Deposit
8. Persistence

Q. 2 Answer the following in short (Any twelve) (24.0)
1. What is a need to do pesticide residue analysis?
2. Acceptable Daily Intake (ADI) is 0.1 mg/kg/day, weight of contaminated food is 450 g and the weight of man is 60 kg. Calculate the MRL value.
3. Which steps are involved in pesticide residue analysis?
4. Explain phenomena of liquid liquid extraction with suitable example.
5. Explain soxhlet extraction method.
6. Explain QuEChERS method to analyze vegetable samples for pesticide residue
7. Give advantages of QuEChERS method
8. Which kind of molecules are analysed on gas and liquid chromatography
9. Which are the common confirmation techniques for pesticide residues?
10. Differentiate between GC and GC-MS
11. Which steps are needed to overcome pesticide residue problems?
12. What are the chronic and acute effects of pesticide poisoning?
13. How pesticides are useful in public health and household
14. Explain hazard and risk of pesticides with suitable example.
15. Give sampling size of potato, cumin and rice for pesticide residue analysis.

Q. 3 Describe in detail different factors affecting toxicity of insecticides. (8.0)

Q. 4 What is insecticidal resistance? Narrate different factors responsible for development of resistance in insects to insecticides. Describe resistance management strategies. (8.0)

Q. 5 Explain mechanism of penetration and distribution of insecticides in insect system. (5.0)
Q. 1 Define/Explain the following. (10.0)
1. Molecular biology
2. Cell theory
3. Cell culture
4. Transcription factories
5. Sub culturing
6. Continuous cell lines
7. Translation
8. DNA Barcoding
9. Cell toxicity
10. DNA fingerprinting

Q. 2 Answer the following (Any five) (15.0)
1. Differentiate between transgenic and non-transgenic plants
2. List out the different mechanisms involved in the development of insecticide resistance among insects.
3. Enlist characteristics of continuous cell lines
4. Give application of DNA fingerprinting.
5. What are the steps involved in DNA barcoding
6. Role of molecular techniques in the field of sericulture
7. What is possible risk of genetically modified insects into the environment?

Q. 3 What is transcription? Give stages of transcription. (5.0)

Q. 4 What are the advantages and disadvantages of DNA barcoding (5.0)

Q. 5 Explain the various factors conducive for rapid development of insecticide resistance in insect. (7.0)

Q. 6 What are the different resistance management strategies that can be adopted to delay the development of insecticide resistance in insects. (8.0)
B. A. COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY
ANAND 388 110

POST GRADUATE ODD SEMESTER END EXAMINATION-2014-15
Ag. Ent. - 517: Vertebrate pest management (1+1)

Date: 23-12-2014  Time: 10:00 to 12:00 hrs.
Day: Tuesday  Marks: 50

Q. 1. Biology and behavior of wild boar
Q. 2. Describe general biology and behavior of birds
Q. 3. Write note on any four
   i. Baits in control rodents
   ii. Bird Scaring techniques
   iii. Taste repellents
   iv. Principles of vertebrate pest management
   v. Biological methods of rodent control
Q. 4. Ecology and global distribution of Bandicota bengalensis
Q. 5. Explain the various signs (indicators) of rodent pest infestation
Q. 7. Describe Rodent proofing and exclusion methods in Godowns
Q. 8. Biology and behavior of Indian myna
Q. 9. Scaring techniques for Bird control

*****
Q.1. Define the following (any ten) (10.0)
1. Immigration
2. Photoperiodism
3. Species
4. Guild
5. Saprophytes
6. Hibernation
7. Kairomones
8. Commensalism
9. Potential Pest
10. Parasitoid
11. Ecology
12. Aposematic species
13. Hormones
14. Bio-geochemical cycle

Q.2. Answer following multiple choice questions (any ten) (10.0)
(1) Which of the following is correct?
(a) Energy cannot be cycled and reused - matter can.
(b) Matter cannot be cycled and reused - energy can.
(c) Both matter and energy can be cycled and reused.
(d) Neither matter nor energy can be cycled and reused.
(2) Many insect species in hot summer or higher temperature undergo summer sleep which is termed as
(3) Which is the example of estimating absolute density?
(a) counting of total no. of lions b. sweeping of insect with hand net c. trapping of insects d. sticky trap for small insects
(4) Which is the least common form of distribution found in nature?
(5) Who, in 1735, devised an orderly system for naming the different sorts of organisms?
a. Erasmus b. Malthus c. Volterra d. Linnaeus
(6) The instrument used for measurement of humidity level in a room is known as.
(7) The insects with high reproductive rate and low survival rate are called……
a. r-strategists b. k-strategists c. both (a) and (b) d. none of this

(PTO)
(8) The plants flower when days and nights are equal are called....
   a. Short day plant b. Long day plant c. Day neutral plant d. None of above

(9) Which of the following pesticides is bioaccumulated in food chains?
   a. Atrazine  b. Glyphosate c. DDT d. 2,4-dichlorophenoxyacetic acid

(10) In life table notation, $\lambda$ (lambda) <1 is indicates....
   a. the population is declining b. increasing population c. stable population.
   d. All of above

(11) An endemic species is
   a. a species found uniquely in one place b. a species carrying an epidemic disease.
   c. a species at an early phase of its evolution d. a taxonomist's mistake.

(12) The inhibition of germination, growth or metabolism of one plant by another
     through the production of toxic chemical compounds that escape into the
     environment is called:
     a. Mycotrophy b. Allelopathy c. Symbiosis d. None of these

Q.3 Define mutualism and explain association of fig (Ficus sp.) and fig wasps
    and enlist co-evolutionary features in both the species.  (6.0)

Q.4 Enlist major features of “Optimal Foraging Theory.”  (6.0)

Q.5 Enlist basic characteristics of a population. Discuss the various age-structures
    and its significance in the insect population. (6.0)

Q.6 What is life table of an insect? Explain various column heads used in the life table. (6.0)

Q.7 State the laws of thermodynamics and draw a diagram of energy flow in the eco-system. (6.0)
**POST GRADUATE ODD SEMESTER END EXAMINATION-2014-15**

**Ento.508 : Toxicology of Insecticides (2+1)**

**Date: 20/12/2014**  
**Saturday**  
**Time: 10:00 to 12:00 hrs**  
**Marks: 50**

<table>
<thead>
<tr>
<th>Q. 1</th>
<th>Define /Explain the following (Any Eight)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Biomagnification</td>
</tr>
<tr>
<td>2.</td>
<td>LD Nin</td>
</tr>
<tr>
<td>3.</td>
<td>Pesticide residue</td>
</tr>
<tr>
<td>4.</td>
<td>Waiting period</td>
</tr>
<tr>
<td>5.</td>
<td>MRL</td>
</tr>
<tr>
<td>6.</td>
<td>ADI</td>
</tr>
<tr>
<td>7.</td>
<td>Deposit</td>
</tr>
<tr>
<td>8.</td>
<td>Persistence</td>
</tr>
<tr>
<td>9.</td>
<td>Acaricide</td>
</tr>
<tr>
<td>10.</td>
<td>Rodenticide</td>
</tr>
<tr>
<td>11.</td>
<td>Pesticide</td>
</tr>
<tr>
<td>12.</td>
<td>Deposit</td>
</tr>
</tbody>
</table>

(8.0)

<table>
<thead>
<tr>
<th>Q. 2</th>
<th>Mention detail information of the following Insecticides (ANY EIGHT):</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Monocrotophos</td>
</tr>
<tr>
<td>2.</td>
<td>Thiometoxax</td>
</tr>
<tr>
<td>3.</td>
<td>Carbaryl</td>
</tr>
<tr>
<td>4.</td>
<td>Quinalphos</td>
</tr>
<tr>
<td>5.</td>
<td>Acephate</td>
</tr>
<tr>
<td>6.</td>
<td>Malathion</td>
</tr>
<tr>
<td>7.</td>
<td>Imidacloprid</td>
</tr>
<tr>
<td>8.</td>
<td>Chlorpyriphos</td>
</tr>
<tr>
<td>9.</td>
<td>Propoxur</td>
</tr>
<tr>
<td>10.</td>
<td>Carbofuran</td>
</tr>
</tbody>
</table>

(8.0)

| Q. 3 | Describe in detail different factors affecting toxicity of insecticides. |

(10.0)


(10.0)

| Q. 5 | What is the need of bio-assay? Describe different methods of bio-assay |

(8.0)

| Q. 6 | Describe points for safe use of pesticides |

(6.0)
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ANAND 388 110

POST GRADUATE ODD SEMESTER END EXAMINATION-2014-15
Ento.511: Pests of Field Crops (1 + 1)

Date: 16/12/2014  Time: 10:00 to 12:00 hrs  Marks: 50

Monday

Q. 1 A. Describe host plants, life history, marks of identification, nature of damage and control measures of *Amsecta moorei* Butler (5.0)

B. How biology of an insect is useful for its better control. (4.0)

Q. 2 Mention IPM strategies of the following pests (ANY FOUR): (10.0)

1. *Holotrichia consanguinea* B
2. *Spodoptera litura* Fb.
3. *Mythimna separata* W.
5. *Odonotermes abessus* (Rambur)

Q. 3 Enlist different insect pests of paddy, Mention marks of identification, nature of damage, life history and control measures of any one of them. (8.0)

Q. 4 A. Describe nature of damage of the following insect pests (ANY FOUR): (8.0)

1. Sugarcane top borer
2. Leaf hoppers
3. Pigeon pea pod borer
4. Sorghum stem borer
5. Mustard sawfly
6. Tobacco white fly

B. Mention marks of identification of the following insect pests (ANY FOUR): (8.0)

1. Blisters beetle
2. Thrips
3. Aphid
4. Tur plume moth
5. Mole cricket

Q. 5 Describe seasonal abundance of American boll worm in Gujarat (2.0)

Q. 6 Describe procedure for preparing 5% neem seed kernel suspension. (3.0)

Q. 7 Which care should be taken while preparing and spraying NPV suspension. (2.0)
Q.1. Define/Explain the following terms (Any Ten). (10.00)

(1) Systematics
(2) Species
(3) Genus
(4) Keys
(5) Identification
(6) Phylogenetics
(7) Classification
(8) Order
(9) Cladogram
(10) Insular species
(11) Sympatric
(12) Taxonomic Description

Q.2. Answer the following in short (Any Ten) (10.00)

(1) Who is considered as father of taxonomy? What is his contribution in the field of taxonomy?
(2) How alpha taxonomy is differ from beta taxonomy?
(3) How will you write the author(s) name in scientific name of insect?
(4) Name two text books along with its author(s) a referred for the Advanced Insect systematics.
(5) Write down the seven steps of Linnaeus hierarchy of Spodoptera litura Fabricius and Thrips tabaci Lindeman
(6) Enlist the important international rules/codes of zoological nomenclature.
(7) What is nomenclature? Name the three important pre-requisites of scientific nomenclature.
(8) What is systematics? Write its significance in the field of entomology.
(9) What is meant by numerical phenetics? Name the scientists who have first developed this concept.
(10) Discuss in brief about the criticisms of phenetics systematic.
(11) What is catalogue? How it differ from faunal volume.
Q.3. Answer the following in detail. (Any five) (10.00)

1. Explain the importance of taxonomic publication.
2. What are the different level of taxonomy and explain any one of them.
3. What is speciation? Name the four geographic modes of speciation occurring in nature and explain any one of them.
4. Discuss the various era/period of the insect systematics/taxonomy.
5. Explain the different ways of identification.
6. How will you differentiate between binominal and trinominal nomenclature?

Q.4. State whether the following statement are “True” or “False”. If “False” rewrite the correctly. (10.00)

1. Molecular systematics is nothing but it is an essential phenetics approaches.
2. DNA barcode is not used for classification but used to identify unknown species of animals.
3. In scientific name of insect, the first letter of specific name must be a capital letter.
4. In zoological nomenclature, the name of genus is often abbreviated to initial letter when the generic name is used earlier in same paragraph.
5. A catalogue of animals of a specific region or period considered as fauna.
6. The term nomenclature comes from the Latin language.
7. Full form of ICZN is International Cabi of Zoological Nomenclature.
8. A study of insects existing on earth is called paleoentomology.
9. Birds and bats are analogues as they have a common ancestor.
10. The concept of numerical taxonomy was first developed by Rober Sokal and Peter in 1963.

Q.5. Write short notes on following. (10.00)

1. Numerical taxonomy
2. Importance of biological classification
3. Biological species concept
4. Recent trends in insect systematics/taxonomy
5. Phenetics and cladisties
Q.1. Give nature of damage of following pest
   (1) Rice weevil
   (2) Pulse beetle
   (3) Rice moth
   (4) Lesser grain borer
   (5) Cigarette beetle

(10 marks)

Q.2. Give scientific name of the following pest
   (1) Cigarette beetle
   (2) Rice weevil
   (3) Indian meal moth
   (4) Red rust flour beetle
   (5) Khapra beetle

(5 marks)

Q.3. Write short notes on the following pertaining to storage pest control
   (1) Sun drying
   (2) Oil treatment
   (3) Turning and disturbance
   (4) Hermetic storage
   (5) Inert dusts

(10 marks)

Q.4. Give difference between following
   (1) Internal feeder and external feeder
   (2) Dry grain heating and wet grain heating

(6 marks)

Q.5. Describe on preventative measures for the management of stored grain insects

(5 marks)

Q.6. Explain briefly on following (Any five)
   (1) Fumigation
   (2) Factors affecting storage grain insect damage
   (3) Egg laying behavior of rice weevil
   (4) Hot spot
   (5) Arthropod parasites associated with stored grain pests
   (6) Rodent control during storage of grains
   (7) Mites attacking grains during storage

(10 marks)

Q.7. Enlist different storage structures

(4 marks)
B. A. College of Agriculture
Anand Agricultural University, Anand
Postgraduate Odd Semester End Examination-2014-15
ENTO. 602 : Immature Stages of Insects (1+1)

Date : 20-12-2014
Saturday
Time : 1000 to 1200 hrs.
Marks : 50.00

Q.1 (A) What are immature insects ?
     (B) Explain the various stages of immature stages with suitable examples.
     (C) Give brief importance of immature insects.

Q.2 Describe the followings with suitable diagram.
     (A) Different type of eggs
         (i) Flat and scalelike
         (ii) Conical
         (iii) With appendages
         (iv) Spherical
         (v) Elongate
     (B) Explain where the eggs laid of following insects (with suitable diagrams)
         (i) Boll weevil
         (ii) Grass hopper
         (iii) Chrysoperilla
         (iv) Cotton bollworms complex
         (v) Brinjal fruit and shoot borer

Q.3 (A) Differentiate the following (Any two)
     (i) Larvae and Nymphs
     (ii) Compodeform larvae and Apodus larvae
     (iii) Oktect type pupae and Exarate type pupae
     (B) Draw the structures of following immature stages.
         (i) Types of larva
             (a) Carabiform
             (b) Scarabaeiform
         (ii) Types of pupae
             (a) Coarctate
             (b) Exarate

Q.4 Enlist and explain the various types of collection of immature insects.

Q.5 Draw the following collecting apparatus (Any two).
     (i) Sweeping Net
     (ii) Sifter Net
     (iii) Water Net

X@X@X
Q. 1. Write functions of the following insect body parts. (05)
   (i) Integument
   (ii) Antennae
   (iii) Maxillae
   (iv) Wings
   (v) Cerci

Q. 2. Write short notes on the following. (10)
   (i) Tergite
   (ii) Wing venation
   (iii) Metamorphosis
   (iv) Post embryonic development
   (v) Photoreceptors

Q. 3. Draw labeled diagram of the following. (7.5)
   (i) Lateral view of insect head
   (ii) Labium
   (iii) Insect leg
   (iv) Insect antenna
   (v) Insect integument

Q. 4. Differentiate the following. (10)
   (i) Cuticular processes and cuticular appendages
   (ii) Thermo and Hygroreceptor
   (iii) Chemical and Physical colouration
   (iv) Exocuticle and endocuticle
   (v) Jugum and frenal wing coupling

Q. 5. Define / Explain the following. (7.5)
   (i) Tagmata
   (ii) Prognathous
   (iii) Pterothorax
   (iv) Suture
   (v) Tarsomere
   (vi) Prescutum
   (vii) Chaetotoxy
   (viii) Epimeron
   (ix) Microtrichia
   (x) Disatal cells

Q. 6. Briefly describe the modifications of the following insect body parts. (10)
   (i) Antennae
   (ii) Legs
   (iii) Abdomen
   (iv) Mouthparts
   (v) Wings

---@@@@---@@@@---
Q.1 Draw a neat and clean labelled diagrams (ANY TWO)
1) A route of haemolymph circulation in insects
2) Synaptical transmission of nerve impulses
3) Integument
4) Male Reproductive system

Q.2 Explain: Structure of typical neuron and describe the different types neuron based on structure and functions. (10)

Q.3 Describe the different types of haemocytes with diagram and give their functions. OR (10)

OR

Q.2 Explain: Digestion of Carbohydrates or Proteins

Q.3 Discuss the types of respiratory system based on number and arrangements of the functional spiracles.

Q.4 Write short notes of the following (ANY TWO)
1) Salivary glands
2) Johnston organ
3) Pairing and copulation in insects
4) Filter chamber in insects

Q.5 Answer in brief (ANY FIFTEEN)
1) Give the empirical formula or structural formula of chitin.
2) Explain: Axonal transmission of impulses
3) What do you mean by parthenogenesis and viviparity types of reproductions in insects?
4) How endoparasitic insects respire?
5) Explain: Excretion of urea acid through Malpighian tubules with no loss of water
6) Differentiate: Afferent and Efferent axon/neurons
7) Explain: Prostodel feeding of termites (tropholaxis)
8) Differentiate: Holocrine and Merocrine cells
9) How the mode of action of carbamate is differ from the chitin inhibitors?
10) Explain: Scope and importance of this course in Applied Entomology.
11) Differentiate: Holometabolous and Hemimetabolous
12) Explain: Snapping movement of proventriculus in honeybees
13) Give the functions of ‘air-sacs’ in aquatic insects
14) Write the major functions of peritrophic membrane in insects
15) Enlist the different type’s neurotransmitters.
16) Why haemolymph does not play any role in respiration of insect?
17) Which are the different types of neurotransmitter
18) Name the types of metamorphosis in grass hopper, spring tail, silver fish and Earias vittella
19) Give the function of peristigmatic gland in spiracle
20) How diapause is differ from quiescence?
Q-1, Give the Answer on following Questions. All carry equal marks. 20

1. What is biological control?
2. What are the major advantages if using biocontrol agent?
3. What is the mode of action of Bt?
4. What are the basic requirements for the selection of biological agents for introduction?
5. Which orders of class insect the predators usually belong?
6. What is the potential of *Trichogramma* in biological control?
7. Name of the Bt strain of insect available in the market.
8. How the plant viruses differ from insect viruses?
9. Name of natural hosts used for mass rearing of *Trichogramma* spp. and lady bird beetle.
10. When and with which trade name the commercial formulation of Bt was first produced?
11. Give one example of successful biological control in Gujarat.
12. How many types of inclusion or occluded virus are known?
13. What is PIB?
14. What is the larval equivalent (LE)?
15. Define the terms IPM.
16. Explain recommended biological control practices in cotton.
17. Enlist the projects which are ongoing in BCRL, AAU, Anand?
18. Which predator and parasitoids are reared in this laboratory?
19. Give the name of two reference book and journals related to this course.
20. What is Phoracy?

Q-2. What are the major techniques used in biological control programme? Described it? 5

Q-3. Give the difference between following terms 10

1. parasites and predators
2. Primary parasites and secondary parasites
3. Hyper parasites and Multiple parasites
4. Natural control and Biological control.

Q-4. Give the detail mass production techniques of *Corcyra*, *Trichogramma chilonis* and LBB 15

***************
Q-1 Define Agrostology and write the improved package of practices for forage Sorghum in detail.

Q-2 Write short notes:
   (1) Write scope and benefits of Agro forestry in detail.
   (2) Pasture management.
   (3) Importance socio cultural factors in Agro forestry.
   (4) Agro forestry for reclamation of problem soils.
   (5) Effects of alley cropping on soil properties and soil conservation.

Q-3 Explain / Justify the following:
   (1) Technology for year round forage production.
   (2) Toxic substance in fodder plants and their effect on animal health and production.
   (3) Government policies and agro-forestry implementation.
   (4) Problem and prospects of forage cultivation in the India.
   (5) Multipurpose trees.

Q-4 Abbreviations (Any five):
   (1) ICRISAT : At
   (2) ICRAF : At
   (3) CAZRI : At
   (4) UNESCO : At
   (5) AFRENA : At
   (6) IITA : At

Q-5 Define/explain (Any six):
   1. Biomass
   2. Grazing
   3. Herbage
   4. Erosion
   5. Ley farming
   6. Intercropping
   7. Evapotranspiration
   8. Cover crop

Q-6 Define Agro forestry and discuss in detail about classification of Agroforestry systems.

Q-7 Differentiate the following:
   1. Forage v/s Fodder
   2. Grass land v/s Pasture
   3. Silage v/s Soilage
   4. Agro-aquaculture v/s Agri sericulture
   5. Silvi pastoral v/s Horti pastoral

X@X@X
Q. 1 (A) Define/ Explain
(1) Cropping System
(2) Ley Farming
(3) Conservation Cropping
(4) Rainfed Farming
(5) Sericulture

(B) Explain spread and yield index of a crop. Calculate the same for Rice and Cotton crop for Gujarat state.

Q. 2 (A) What is annihilation? Discuss the practical use of annihilation in cropping system.

(B) Write short notes (Any Two)
(1) Goat Rearing
(2) Crop residue Management
(3) Crop rotation

Q. 3 (A) What is allelopathy? Discuss with reference to crop productivity.

(B) State the significance of PGR in crop production.

Q. 4 (A) Define IFS. Mention the component of IFS and give IFS model for humid hilly area.

(B) Differentiate the following
(1) Specialized Vs. Diversified Farming
(2) Row Vs. Strip intercropping
(3) Legume Vs. Sorghum Effect
(4) LER Vs. CEY
(5) Vertical Vs. Horizontal Farming
Q.5  (A) Calculate diversity index from below information and give your comments. (5.0)

<table>
<thead>
<tr>
<th>Crops</th>
<th>Shares of individual crops in different Farm</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Rice</td>
<td>0.2</td>
<td>0.1</td>
</tr>
<tr>
<td>Cotton</td>
<td>0.4</td>
<td>0.3</td>
</tr>
<tr>
<td>Maize (rabi)</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Potato</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>Red gram</td>
<td>0.2</td>
<td>0.1</td>
</tr>
</tbody>
</table>

(B) Enlist the non-monetary inputs and low cost technologies for cotton production. (3.0)

(C) Which physical properties of soil are altered by organic matter? (2.0)
B.A. College of Agriculture  
Anand Agricultural University, Anand  
Postgraduate Odd Semester End Examination-2014-15  
Agron 506 : Agronomy of Major Cereals and Pulses  (2+1)

Date : 24.12.2014  
Marks: 50  
Wednesday  

Time : 10.00 to 12.00

Q 1. As an agricultural expert, give advice to the farmer of Baroda district wish to grow the following crops on following aspects : (Any two) (10)

1) Winter maize  
2) Rice crop under SRI  
3) Pigeon pea  

1. Time of sowing.  
2. Seed rate.  
3. Spacing.  
4. Recommended varieties  
5. Fertilizer management.  
6. Number and time of irrigations.  
7. Weed management.  
8. After care operations.  
10. Marketing.

Q 2.1 Give the reason of the following. (10)

i) Wheat crop should be irrigated at 18 to 21 days.
ii) Productivity of summer pear millet is higher than kharif season.
iii) Pulse crops are most suited for multiple cropping and crop rotation.
iv) The productivity of pulse crops became stagnant since last three decades.
v) India import pulses.
vi) In poultry feed HQPM-1 maize should be preferred.
vii) Parboiled rice is better than milled rice.
viii) Timely nipping is very important in gram.
ix) Durum wheat is preferred for chapati making.

Q 2.2 Answer the following questions (Any two) (8)

i) What is Ratooning? Explain cultural practices in ratooning.
ii) What is intercropping? Enlist the benefits of intercropping in pulses.
iii) Control measures of White backed plant hopper and False smut diseases in paddy.

Q 3 Write down the short notes (Any four) (12)

i) Economic importance of black gram.
ii) Seed treatment and methods of raising nursery of paddy.
iii) Critical growth stages for irrigation.
iv) Classification of pigeon pea with suitable examples.
v) SIRA technique in rice.

(PTO)
Q.4 Give the difference of following (Any three) (6)

i) Aerobic rice Vs Transplanted rice
ii) Popcorn Vs Sweet corn
iii) Legumes Vs Pulses
iv) Mix cropping Vs Intercropping

Q.5 Match A with B (4)

<table>
<thead>
<tr>
<th>Sr. No.</th>
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<tr>
<td>1</td>
<td>Cob</td>
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<td>2</td>
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<td>Transplanting</td>
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<td>4</td>
<td>Amber</td>
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<td>Madhuri</td>
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<td>Popcorn</td>
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<td>6</td>
<td>Green gram</td>
<td>6</td>
<td>Preferable for patients</td>
</tr>
<tr>
<td>7</td>
<td>Pigeon pea</td>
<td>7</td>
<td>Most drought tolerant cereal</td>
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<tr>
<td>8</td>
<td>Sorghum</td>
<td>8</td>
<td>Maize</td>
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</table>
Q. 1. 
   a. Explain in detail agronomic requirements for successful harvesting of castor or summer groundnut. (6)
   b. Strategies for increasing oilseed production in India (3)
   c. Economic importance of soybean. (2)

Q. 2. 
   a. Give in detail the requirements of successful raising of sugarcane or sunhemp crop. (6)
   b. Explain the by-products of cotton. (3)
   c. Points to be considered for effective seed treatments. (2)

Q. 3. 
   a. Explain constraints in oilseed production. (6)
   b. How sugar beet are useful? (3)
   c. Explain by-product of sugarcane industries. (2)

Q. 4. Filling the blank/s (7)
   a. India ranks _________ in the world in area in groundnut.
   b. _________ portion of sugarcane is useful for planting.
   c. ___________ method of sowing is useful in high rainfall area having deep vertisol where drainage of excess water is a problem.
   d. Sugar beet contains ________ per cent sugar.
   e. Sunflower oil is a rich source of _________, which helps in washing out cholesterol deposition in the coronary arteries of the heart.
   f. Cotton is also known as _________.
   g. Generally _________ and ________ diseases observed in sesame.

(P.T.O.)
h. The yield of green material for green manuring crop of sannhemp is about ________ tons/ha with deposition of ________kg nitrogen, ________kg phosphorus and ________kg potash per hectare.

i. Prolonged cloudy weather with high temperature at the time of flowering resulted in poor seed setting, which is known as ________ in castor crop.

j. ________ crop seed and fiber are used for manufacture of linen and canvas.

Q. 5. Justify following
   (4)
   a. Soybean seeds should be inoculated with suitable strain before sowing.
   b. Soil temperature is important in groundnut.
   c. Nipping of auxiliary buds in castor is required.
   d. The castor cake is not suitable for cattle feed.

Q. 6. Answer as directed
   (6)
   a. Give cotton growing zone of Gujarat State.
   b. Advantages of ratoon crop of sugarcane.
   c. Economic important of safflower.
Q.1 Write short notes (ANY THREE):
   (1) Climatic factors
   (2) Component of watershed management programme.
   (3) Fertilizer management in dry farming areas.
   (4) Profitable recommendations for cropping system.

Q.2 Answer in details (ANY THREE):
   (1) Crop planning under normal onset of monsoon.
   (2) Soil constraints in dry farming areas.
   (3) In-situ water harvesting.
   (4) Relationship between plant population and crop yield.

Q.3 Answer in brief (ANY TEN):
   (1) Mention the classification of climate based on temperature.
   (2) Explain/Define effective rainfall.
   (3) Mention the importance of climatic data.
   (4) Which are the important aberrations in rainfall behavior in dry farming areas?
   (5) Mention the nutrient status of red soils in dryland areas.
   (6) Transpiration is a necessary evil for plant growth, justify it.
   (7) Explain/Define cropping system.
   (8) Enlist the parameters used for cropping system.
   (9) Mention the types of drought based on duration.
   (10) Give the suggestions for satisfactory late rains to overcome rainfall vagaries.
   (11) Explain the alternate land use system.
   (12) Which crops do afford less protection against the effect of rainfall on soil?

(PTO)
Q.4. Differentiate the following (ANY FOUR): \( (8.0) \)
   1. Climate V/s Weather
   2. Transpiration V/S Evaporation
   3. Dry spell V/S Wet spell
   4. Off season tillage V/s Primary tillage
   5. Crop rotation V/S Mixed cropping

Q.5 Fill up the blanks with appropriate word/s: \( (6.0) \)
   1. __________ is the only source of water for crop growth in __________ agriculture.
   2. Among various land shaping approaches, __________ comes first.
   3. Water __________ is an effective measure for stabilizing __________ in dry land areas.
   4. The protection offered by the shelter belts depends upon __________ of central tree row.
   5. Timely sowing has also another dimension to avoid __________.
   6. Soybean and __________ is popular intercropping in __________
   7. In dryland areas, __________ lands are not fit for cultivation of __________.
   8. __________ is the most popular tree species to serve as hedge row.

Q.6. Give full form of following abbreviations: \( (2.0) \)
   (i) NDPRA  (ii) GLDC  (iii) FUE  (iv) PET
   (v) IER  (vi) AICRPDA  (vii) ATER  (viii) MDI
   (ix) ICARDA  (x) NWDPRA
Q-1 Fill up the blanks with appropriate word/s

1. In contact farming _______ and _______ services are often supplied by the sponsor.
2. Devices used for remote sensing is soil and land survey detect _______ radiation.
3. Crop residues have high C:N ratios which favour _______ of soil N.
4. The first GPS satellite was launched in the year _______.
5. In GM crops, _______ of plant has been modified using genetic engineering techniques.
6. Pollen from genetically modified plants can spread and will infect other plants, creating _______ with insecticidal properties or herbicide-resistance.
7. Production of hybrid maize seed involves _______ and _______ steps.

Q-2 Answer the following (Any ten)

1. What is remote sensing? Enlist their applications.
2. Enlist the characteristic of HEISA.
3. Differentiate between selfers and crosser plants.
4. Differentiate between harvests refuse and process wastes.
5. Draw a schematic diagram of crop residue management system.
6. Enlist the different traits of good seeds.
7. Narrate the function of WTO.
8. How global warming affect livestock sector?
9. Write the objectives of organic farming.
10. Discuss about the classes of seeds.
11. Explain the different models identify for contract farming.

[PTO]
Q-3 Define/Explain following:


(5.0)

Q-4. Answer as directed (Any ten) (20.0)

1. Write about work initiated on precision agriculture in Indian institutes.
2. Define LEISA and explain their basic ecological principles.
3. Enlist the promising LEISA techniques and practices and explain any one.
4. Write the advantages of GIS technology in agriculture.
5. Define farming system approach and discuss about their needs.
6. Describe the benefits drawn from crop residues with their basic relationships.
7. Enlist the function of accreditation agencies.
8. Describe the certification process for organic products.
9. Discuss about the key conditions for successful contract
10. Highlights the limitations of contract farming.
11. Write the advantages of the WTO trading system.
12. Discuss about the positive impacts of GM crops.

Q-5. Discuss in length about general principles of seed production. (5.0)

X@X@X
Q. 1. Write short notes of the following (Any four) (12)
   1. Different branches of Agrometeorology
   2. Methods of weather forecasting
   3. Beer's law of radiation interception
   4. Role of nitrogen and oxygen in plants
   5. Agricultural practices to mitigate drought
   6. Trade Winds
   7. General circulation of atmosphere

Q. 2. What is air pollution? Enumerate effect of air pollution on human health OR (10)
Q. 2. What is cardinal temperature? Give effect of high temperature on crops (10)

Q. 3. Explain in brief the measurement of Atmospheric (air) temperature OR (7)
Q. 3. Explain in brief the measurement of relative humidity (RH) (7)

Q. 4. Explain in brief different components of water balance equation. OR (7)
Q. 4. Explain in brief the advantages of remote sensing (7)

Q. 5. Explain in brief major air pollutant OR (7)
Q. 5. Discuss in brief the medium range weather forecasting (7)

Q. 6. Discuss in brief the protection of crops against frost damage OR (7)
Q. 6. What is climate change? Discuss in brief greenhouse gases (7)

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B.A. COLLEGE OF AGRICULTURE  
ANAND AGRICULTURAL UNIVERSITY  
ANAND  
SEMESTER END POST GRADUATE EXAMINATION-2014  
Course No.: Agron 504  
Title: Principles and Practices of Water Management  
Date: 20-12-2014 (Saturday)  
Time: 10.00 to 12.00 hrs.  
Marks: 50

Q.1  
A Define / Explain (Any ten)  
1. Duty of water  
2. Soil moisture tension  
3. pF  
4. Infiltration  
5. Drainage  
6. Water conveyance efficiency  
7. Hygroscopic coefficient  
8. Seepage  
9. Delta  
10. Metric potential  
11. Leaching requirement  
B What is irrigation scheduling and what are the different approaches for scheduling irrigation? 05

Q.2  
A Write short notes (Any five)  
1. Soil Moisture Constants  
2. Biological classification of soil moisture  
3. Surface drainage  
4. Ill effect of irrigation  
5. Moisture sensitive periods of crops  
6. Salinity hazard  
7. Border irrigation

Q.3  
A Differentiate (Any five)  
1. Field capacity v/s Permanent Wilting Point  
2. Capillary Water v/s Hygroscopic Water  
3. Water Requirement v/s Irrigation requirement  
4. Check flooding v/s furrow flooding  
5. Bicarbonate v/s Boron Hazard  
6. Surface v/s subsurface drainage  
B What are different methods of irrigation? Give merits and limitations of sprinkler system over other methods of irrigation. 05

Q.4  
A Give reasons (Any five)  
1. More frequent irrigations are necessary for sandy soils than clay soils.  
2. Check basin method is recommended for undulating land.  
3. PET is considered desirable for optimum crop yield.  
4. Transpiration is an essential evil.  
5. In sugarcane, formative phase is most sensitive to soil moisture stress.  
6. The movement of water is faster in moist soil than in dry soil.  
B What is drip irrigation and what are its advantages and limitations? Enlist different components of drip. 05

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Q.1 Define / explain the followings (Any six).
1. Alternate land use system
2. Contour farming
3. Silvi-pasture
4. Watershed
5. Broad bed and furrow
6. Hydraulic action
7. Ley farming

Q.2 Define soil erosion and enlist cultivation techniques to reduce soil erosion.
1. Explain gully erosion and write measures to stabilize active gullies.

Q.3 Fill up the blanks with appropriate words.
1. _______ and _______ are stomatal closing type anti-transpirants.
2. Series of gullies openings or joining in each other is called as _______ and it affected the largest area in _______ state.
3. Micro watershed covers area of _______ hectares, while Macro watershed covers area of _______ hectares.
4. Reflecting type anti-transpirant increase _______ and thereby reduce _______

Q.4 Differentiate the followings.
1. Cover cropping V/S Strip cropping
2. Sheet erosion V/S Rill erosion
3. Contour bunds V/S Graded bunds

Q.5 Give scientific reasons.
1. Soil character affects soil erosion
2. Improvement of catchment area control gully erosion
3. Tillage influence the receptivity of soil moisture
4. Economy of resources can be achieved by mixed cropping
5. Organic matter addition increased rain water conservation

Q.6 Explain in detail about Alley cropping and write important advantages of Alley Cropping.

Q.7 Write short notes.
1. Strategies for sustainable water management
2. Land use according to its capability classes
3. Tree farming
4. Objectives of watershed management

Q.8 Write as directed (Any two).
1. Define drainage and write advantages of drainage
2. Explain the process and causes of gully formation and gully development
3. Define runoff and mention different ways of rain water losses.

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Q.1 (A) Define / Explain the following. (8.0)
1. Diversified farming
2. LER
3. Companion cropping
4. Cropping system
5. Pairs cropping
6. Alley cropping
7. Cropping intensity
8. FSR

(B) Differentiate the following (10.0)
1. Crop rotation v/s Land rotation
2. Mix cropping v/s Mix farming
3. Additive series v/s Replacement series of intercropping
4. Peasant farming v/s Tenant farming

Q.2 (A) What is allelopathy? Discuss the types of allelopathy. (4.0)
(B) Give reasons (6.0)
1. Choice of component is more in upland irrigated farming system.
2. Farming system as foot stone of sustainability.
3. IFS are a boon for small and marginal farmers.
4. Agro-forestry is the most suitable component in dry land ecosystem

Q.3 Answer as directed (10.0)
1. Prepare an IFS model for farmer having one ha. land near Anand city.
2. Write down the good practices for better yield under dry farming conditions.
3. State the points are to be considered, while choosing appropriate enterprise in IFS.
4. State the principles of cropping scheme.

Q.4 Short notes (12.0)
1. Scope of farming system
2. Biogas plant
3. Bee keeping
4. Shifting cultivation
B. A. College of Agriculture  
Anand Agricultural University, Anand  
Post Graduate Odd Semester End Examination-2014-15  
AHE 610 : Human Resource Management in Animal Husbandry Sector (2+1)

Date: 22-12-2013  
Day : Monday  
Time: 1000 to 1200 hrs  
Marks: 50

Q. 1 (A) Define/explain the following terms (any six).  

1. Motivation  
2. Communication  
3. Group dynamics  
4. Selection  
5. Performance appraisal  
6. Decision-making  
7. Stress  
8. Recruitment

(B) Fill in the gaps with appropriate word/s.  

1. Performance is the function of __________, __________ and __________ .  
2. __________ is the most important asset in the organization.  
3. In __________ type of leadership, decision is in the hand of one man.  
4. The purpose of __________ is to make message clear, understandable and realistic to the audience.  
5. The position in which we hold our body while standing or sitting is called __________.  
6. __________ is a set of behaviors or tasks that a person is expected to perform by virtue of holding a position in a group.  
7. __________ and __________ are described as the eyes and ears of a training programme.  
8. __________ is an important subset of HRM.  
9. Improvement in job performance is assessed by __________ evaluation.

Q. 2 Answer any two of the following.  

1. What do you understand by conflict? Discuss in brief various views of conflict and conflict handling approaches.  
2. Discuss buzz group and brain storming methods of training.  
3. Discuss various functions of management in brief.
Q. 3 Write short notes on following (any four).
1. Management by objectives
2. Consequences of stress
3. Stages of group formation
4. Managerial grid
5. Soft skills required for animal husbandry extension
6. 360 degree performance appraisal

Q. 4 (A) Do as directed (any four).
1. Enlist the factors affecting selection of training methods.
2. State the characteristics of poor motivators.
3. Differentiate impact evaluation and terminal evaluation
4. Enlist any four characteristics of task oriented leader.
5. What points will you consider while writing for farmers?

(B) Answer the following (any six)
1. How trait theory of leadership differs from great man theory?
2. What are the ways to increase group cohesiveness?
3. Name the major four functions of HRM.
4. State any four barriers in communication.
5. Give difference between role taking and role making.
6. Differentiate between halo effect and horn effect.
7. What do you mean by social loafing?
8. Enlist various roles of a professional manager.
B. A. College of Agriculture
Anand Agricultural University
Anand

Post Graduate Odd Semester End Examination 2014 - 15

Course No.: AHE-. 601
Course Title: Fundamentals of Veterinary and Animal Husbandry Extension(2+1)=3
Date: 22- 12 - 2014 Marks: .50
Monday Time: 10.00 – 12.00 hrs.

Que-1 (A) Fill in the blank/s with appropriate word/s. (5.00)
1 Elements of extension education are __________________________ and __________________________
2 __________________________ is the process of bringing desirable change in human behaviour.
3 __________________________ is the apex body working for the development of agriculture in the country.
4 Skill is the ________________ in using knowledge efficacy.
5 The aim of ________________ education is to bring about all round development of human being.
6 ________________ is fundamental truth or law one has to follow as the basis of some action.
7 ________________ is an intensive and systematic learning experiences carried out in a community.
8 National extension service was launched in the year ________________.

(B) Enumerate the programmes implemented by the Government for poverty alleviation of cattle owners. Discuss any two in brief. (5.00)

Que-2 (A) List out the principles of veterinary extension. Discuss any two principles in detail. (6.00)
(B) What is the role of veterinary extension in veterinary university? (4.00)

Que-3 (A) Discuss the linkages between Researcher- extension worker- livestock farmer and industry in generation, transfer and utilization of animal husbandry practices in rural area. (5.00)

(B) Define/ Explain the following terms. (Any five) (5.00)

1 a. Objectives b. Communication
c. Education d. Attitude
e. Informal education f. Skill
g. Knowledge

P.T.O
Que-4  (A)  Give the full form of the following. 
1  FSBE: __________________________________________ (5.00)
2  FSR: __________________________________________
3  ICDS: __________________________________________
4  MNREGA: ______________________________________
5  NABARD: _______________________________________
6  ICDP: __________________________________________
7  IDDB: __________________________________________
8  KCC: __________________________________________
9  RMK: __________________________________________
10 BuP: __________________________________________

(B)  Explain the components of veterinary extension. (5.00)

Que-5  (A)  Write the short note on the following. (Any three) (6.00)
1  MNREGA
2  ICDP
3  Distance education.
4  Kissan Call Centre

(B)  Answer the following.(Any two) (4.00)
1  Write the scope of veterinary extension in animal husbandry.
2  Discuss the elements of veterinary extension.
3  Role of SAUs in development of rural cattle owners.
4  Enlist some common Indigenous technical know-how about animal husbandry.
Q. 1 Fill in the blank using most appropriate word/s.

1. The word psychology comes from the two Greek words viz. ___________ means ______________ and ___________ means ____________. It is known as father of psychology.

2. ___________ is desirable change in human behaviour in terms of ___________ and ___________.

3. According to Daniel, Psychology is the scientific study of the ___________ of an individual.

4. Guilford defined Psychology as the science of ___________ activity of an organism.

5. Psychology is a science of human ___________.

6. Murthy described psychology as the science that studies the ___________ which living individuals make to their ___________.

7. Psychology is the science of ___________ and ___________.

8. ___________ is known as understood information possessed by an individual.

9. How person behaves is known as ___________.

10. ___________ is feeling of an individual towards or against any object.

11. ___________ is the ability to perceive future events.

12. ___________ is the basis of certain assumptions made about the behavior of the group to which they belong is called.

13. Internal forces or external forces that make person active to achieve predetermined goal is known as ___________.

14. Three laws of learning are ___________, ___________, and ___________.

15. Three main categories of learning theory are ___________, ___________, and ___________.

16. Psychologist named ___________ created the theory of introverts and extroverts.

17. ___________ is perception that does not require stimulation of a sense organ.

18. ___________ refers to the way we try to understand the world around us.

19. ___________ is a way to measure how a person recognizes emotions in himself or herself and others, and manages these emotional states to work better as a group or team.

20. ___________ is a value that indicates a person's ability to learn, understand, and apply information and skills in a meaningful way.

21. ___________ is the ability of people to communicate effectively with one another.

Q. 2 Define social psychology and explain scopes of social psychology with its importance in 10.00

Q. 3 Answer any two of the following.

1. Write in detail principles of perception.
2. Write in detail factors influencing perception.
3. Explain on theories of attitude and factors influencing attitudinal change.

Q. 4 Answer any two of the following.

1. Explain in detail theories of motivation.
2. List out any 10 examples of emotions and explain theories of emotions.
3. Explain principles of learning in detail.

Q. 5 Answer any two of the following.

1. Explain determinants of personality in detail.
2. Explain nature and theories of intelligence.
3. Factors affecting group and individual behaviour.
Q-1 Explain following terms (Any Five)
1) Organic Animal Husbandry
2) ATIC
3) PVK
4) Video conferencing
5) Wide Area Network
6) Co-operation

Q-2 Give the full form of following
I) PPP
II) PVK
III) DVK
IV) IIVRI
V) ATMA
VI) ICDP
VII) IVLP
VIII) FFS
IX) RKVY
IX) AGB

Q-3 Write short note on following (Any Five)
I) Problems in development of organic animal husbandry
II) Organic vs Traditional livestock system
III) Krishi Vigyan Kendra
IV) Agri. Technology Management Agency (ATMA)
V) Live stock health programmes
VI) Challenges in Agricultural Information Technology
B. A. College of Agriculture  
Anand Agricultural University, Anand-388 110  
POST GRADUATE ODD SEMESTER END EXAMINATION-2014-15

AHE 606 : RESEARCH METHODOLOGY IN VETERINARY AND ANIMAL HUSBANDRY EXTENSION

Date: 23-12-2014  
Time: 1000 to 1200 hrs.  
Marks: 50

Tuesday

Q.1 (A) Give the definition of the following  
Reliability, Sample, Sample frame error and Variable  

04

Q.1 (B) Answer the following as required  

06

A. How many units will be selected by systematical sampling method if, N=85 and n=17, starting with 2nd unit (Draw the figure and indicate each unit)

B. Select the sample of 120 farmers from three villages having 160,145, 130 and farmers respectively by propositional random sampling method.

Q.2 Write the answer of the following  

04

A. Select any one research problem based on live stock owner and frame out three objectives of the problem.

B. Describe different types of Variables

06

Q.3 Which design and statistical tools will be selected to study the following  

04

A. To find out the association between the variables in which independent variables are already acted upon.

B. To study the impact of mass media on the knowledge of improved dairy farming.

C. Discuss any three types of data collection methods

06

Q.4 Give the difference between the following  

10

A. Test retest and split half techniques of reliability  
B. Type I error and Type II error  
C. Primary data and secondary data  
D. Personal Interview and Questionnaire types of Data collection  
E. Fundamental research and applied research

(PTO)
Q.5 Interpret and discuss the result from the following Relationship between profile of Dairy farmers and their knowledge regarding improved dairy farming.

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<th>Sr. No.</th>
<th>Independent Variables</th>
<th>Correlation Coefficient ('r' value)</th>
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<tbody>
<tr>
<td>1.</td>
<td>Age</td>
<td>(-) 0.151 NS</td>
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<tr>
<td>2.</td>
<td>Education</td>
<td>0.160 NS</td>
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<tr>
<td>3.</td>
<td>Experience</td>
<td>(-) 0.176*</td>
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<tr>
<td>4.</td>
<td>Herd size</td>
<td>0.397**</td>
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<tr>
<td>5.</td>
<td>Annual income</td>
<td>0.487**</td>
</tr>
<tr>
<td>6.</td>
<td>Mass media exposure</td>
<td>0.527**</td>
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<tr>
<td>7.</td>
<td>Innovation proneness</td>
<td>0.626**</td>
</tr>
<tr>
<td>8.</td>
<td>Scientific orientation</td>
<td>0.617**</td>
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Give the meaning of significant at 5% level of probability and significant at 1% level of probability.

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B.A. College of Agriculture  
Anand Agriculture University,  
Anand – 388 110  
Post Graduate Odd Semester End Examination 2014-15

Sub:- AHE 611 Gender and Livestock Development (1+0)  
Date:- 20/12/2014  
Time:- 10:00 to 12:00  
Marks :- 50

Q-1 Explain following terms (Any Five)  

1) Gender  
2) Gender equality  
3) Gender discrimination  
4) Gender budgeting  
5) Gender Analysis  
6) Women empowerment

Q-2 Fill in the blanks with appropriate option

1) The term that refers to the social and psychological dimensions of being female or male is:  
a. Gender specificity  b. Gender  c. Gender role  d. Gender typing

2) The psychoanalytic theory of gender explains gender development in terms of:  
a. Imitation  b. Rewards and punishments  
c. Sexual attraction to opposite-sex parent  d. Peer relations

3) Which gender development theory stresses that individuals actively construct their gender world:  
a. Psychoanalytic theory  b. Gender schema theory  
c. Social role theory  d. Social cognitive theory

4) International Women’s day celebrated on:  
a. 8 March  b. 18 March  c. 15 September  d. 8 December

5) From 2 Aug 2011, ____________ is the Chairperson of “National Commission for Women”  
a. Smt. Mamata Sharma  b. Mrs. Vandana Rai  
c. Smt. Sonia Gandhi  d. Ela Bhatt

6) The barrier to female education is:  
a. Inadequate facilities of schooling for girls  
b. A large number of dropouts in case of girls enrolled in the school  
c. Parents are not willing to send their daughter to school  
d. Both a & b  
e. Both b & c
7) Women are not willing to work in rural area because of_________
   a. Nuisance by ruling peoples in villages
   b. Increasing trend of rowdiness
   c. Unfavourable attitude of rural society towards working women
   d. All of the above

8) AWID stands for_________
   a. Association for Women’s Rights in Development
   b. Agriculture Women’s in Development
   c. Approaches to Women for Development
   d. None of the above

9) CEDPA stands for_________
   a. Centre for Development and Population Actions
   b. Centre for Development and Population Activities
   c. Centre for Economic Development and Population Activities
   d. None of the above

10) Centre for Development and Population Activities founded in_________
    a. 1975  b. 1980  c. 1985  1090

11) IWWMF stands for_________
    a. International Women’s Media Foundation
    b. International Women’s Media Forum
    c. Indian Women’s Media Foundation
    d. Indonesian Women’s Media Foundation

12) International Women’s Media Foundation was launched in_________

13) WILPF stands for_________
    a. Woman International League for Peace and Freedom
    b. Women’s International League for Poverty and Freedom
    c. Women’s International League for Peace and Freedom
    d. None of the above

14) Women’s International League for Peace and Freedom was established in_________
    a. 1915  b. 1925  c. 1940  d. 1950

15) World Rural Women’s Day_________
    a. 15 October  b. 20 September  c. 30 December  d. 16 December

16) CEDAW stands for_________
    a. Convention on the Elimination of All Forms of Discrimination against Women
    b. Commission on the Elimination of All Forms of Discrimination against Women
    c. Consortium on the Elimination of All Forms of Discrimination against Women
    d. Committee on the Elimination of All Forms of Discrimination against Women
17) Convention on the Elimination of All Forms of Discrimination against Women adopted by the UN General Assembly in the year

18) CEDAW provides the basis for
a. Realizing equality between women and men
b. Realizing equity between women and men
c. Reforming equality between women and men
d. None of the above

19) Fourth world conference on women held in

20) First Global Conference on Women in Agriculture (GCWA) held at New Delhi on
a. 13 to 15 March 2012    b. 13 to 15 September 2009
b. 23 to 25 December 2012    d. 5 to 7 January 2012

Q-3 Give the full form of following
I) RMK
II) DWCRA
III) SEWA
IV) SWOT
V) WTO
VI) IRDP
VII) NRCWA
VIII) FAO
IX) NGO
X) ATMA

Q-4 Write short note on following (Any Four)
I) Role of livestock sectors in Indian economy and poverty alleviation
II) Explain the problems due to lack of women empowerment
III) SEWA
IV) Role of women in Agriculture
V) Important extension projects for women farmers
VI) Different areas of gender discrimination in India
Q.1. Explain characteristics of Eukaryotic genome organization. (6.0)
Q.2. How histone proteins are involved for molecular evolutions in living organisms? (6.0)
Q.3. Enlist the merits of human genome project. (6.0)
Q.4. Discuss the different types of genome mapping, its association to molecular evolution. (6.0)
Q.5. Write short note on (ANY TWO): (12.0)
1. CRISPR-CAS Technology  3. RNA Editing
2. Gene regulation in virus  4. Advances in transformations
Q.6. Discuss the advances gene isolation techniques and its application in agriculture. (6.0)
Q.7. Discuss the merits of IPR with respect to bioethics and biosafety. (6.0)
Q.8. Explain the following terms: (2.0)
   i. Gene expression therapy
   ii. Site directed mutagenesis

X@X@X
Q.1 Answer the following (ANY FIFTEEN):

1. Enlist different types of plant protoplasts with their distinct function.
2. Enlist factors affecting photosynthesis.
3. Biochemical changes during fruit ripening with enzymes.
4. Write components/factors responsible for ethylene synthesis regulation.
5. Explain citogenesis.
6. What is subgenic?
7. Enlist nitrogen fixing organisms.
8. Role of rhizohydrase in nitrogen fixation.
9. Name of pathways exist in the biosynthesis of IAA.
11. Enlist biochemical functions of cell wall.
12. Enlist major types of plant phenolics.
13. Functions of sulfur in plants.
15. Seed storage proteins in legumes.
16. Steps of methionine synthesis from cysteine.
17. Discuss chloroplast genome structure.

Q.2 Discuss/Explain the following (ANY FIVE):

1. Write characteristics of C3, C4 and CAM pathway of photosynthesis.
2. Explain signal transduction in plants.
4. Discuss peroxisomes biochemical functions.
5. Write steps of fatty acid conversion to sucrose in germinating seeds.
6. Explain nitrogen cycle.
Q.1 Write the principles of following biochemical techniques (Any Four) (10)
   (i) Centrifugation
   (ii) Electrophoresis
   (iii) Gel permeation chromatography
   (iv) Spectrophotometry
   (v) Fluorometry

Q.2 Write the differences between (Any Eight) (10)
   (i) SDS PAGE and Native PAGE
   (ii) Preparative and Analytical centrifuge
   (iii) True proteins and Crude proteins
   (iv) Molar solution and Normal solution
   (v) Micro kjeldahl and Macro kjeldahl
   (vi) HPLC and HPTLC
   (vii) Mobile phase and Stationary phase
   (viii) Spectrophotometer and Colorimeter
   (ix) Spectroscopy and Specphotometry
   (x) Rf and Rm value

Q.3 Write the applications of following in agriculture field (Any two) (10)
   (i) Isotops
   (ii) DNA molecular markers
   (iii) NMR
   (iv) Atomic absorption spectrophotometer

Q.4 Answer briefly. (10)
   (i) Calculate the pH of 0.1 N NaOH.
   (ii) How 0.1 M Na2HPO4 solution is prepared?
   (iii) Mention the criteria of good buffer.
   (iv) Draw a schematic diagram of cell fractionation.
   (v) Write the functions of photomultiplier tube.
   (vi) Why quartz cuvette is preferred for UV visible spectrophotometry?
   (vii) Write full name of TEMED and GC – MS.
   (viii) Write the functions of digestion mixture in nitrogen assay.
   (ix) Write the functions of indicator in titrimetric assay.
   (x) Significance of moisture content in biochemical assay.

Q.5 Write the principles of following assay (Any five) (10)
   (i) Estimation of soluble sugar by phěnol - sulfuric acid method.
   (ii) Estimation of free amino acids by ninhydrin method.
   (iii) Estimation of tannin by Denis method.
   (iv) Titrimetric assay of ascorbic acid.
   (v) Estimation of ‘N’ by Microkjeldahl method.
   (vi) Estimation of chlorophyll by DMSO methods.
B.A.ColleGE OF AGRICulture
ANAND AGRICULTURAL UNIVERSITY, ANAND-388 110
Post Graduate Odd Semester End Examination 2014-15
Biochem 606 : Biomembrane (2+0)

Date: 24.12.2014                Time: 10.00 to 12.00 hrs.
Day : Wednesday                Marks: 50.

Q.1. A. Define (Any five) 5.0
      (1) Osmosis (2) Passive transport (3) Phagocytosis (4) endocytosis
      (5) Membrane fluidity (6) Integral protein

Q.2 State True or False, if false, correct it 2.5
   1 The integral membrane proteins remove by inorganic solvent
   2 Transport proteins allows substances to diffuse through the membrane
   3 Marker proteins also known as identification of proteins
   4 The molecule which can not attach to receptor is known as ligand
   5 Opening and closing stomata of ion channels are controlled by neurotransmitters.

Q.2 Fill in the gaps 2.5
   1 “Trilamellar model” of cell membrane was proposed by ............
   2 Continuous layer of plasma membrane was made up by ............
   3 Plasma membrane the functional as well as structural role is played by .......
   4 ...........is an essential component of mammalian membrane
   5 ...........Lipids are working as detergents.

Q.3 Explain in brief 10.0
   1. Proteins in membrane
   2. Simple and facilitated diffusion
   3. Cell-cell recognition
   4. Plasma membrane
   5. Fluid mosaic model of membrane

Q.4. Do as directed 20.0
   1 Explain. Ions, glucose, amino acids are impermeable to membrane, while
gaseous molecules are permeable.
   2 What do you mean by endocrine and paracrine signaling?
   3 Write in short : Cell surface receptor and intracellular receptor
   4 What is the role of cholesterol in plasma membrane
   5 Enlist the single lipid layered and double lipid layered membrane
   6 Enlist the signal molecules and write the function of any one molecule.
   7 What do you mean by lipid raft?
   8 Artificial membrane means ..........
   9 Intracellular junctions means ....
   10 Explain in short signal transduction

Q.6 Write short note (Any two) 10.0
   Cell communication
   Various Models of biomembrane
   Lipids and Membrane Proteins in Biological Membranes
   -x-x-x-x-
Q. 1 Enlist the factors involved in plant interaction with environmental factors. How fungal infection alters the physiological parameters in plants? (6)

Q. 2 Discuss the signal transduction of R gene expression in view of plant tolerance to abiotic stress. (6)

Q. 3 Differentiate the following (Any two) (6)
   (i) Vertical and Horizontal resistance
   (ii) Hyper and Hypo sensitive resistance
   (iii) Osmoprotectants and Osmoregulators

Q. 4 Write the functions of (Any three) (6)
   (i) Phytoalexins
   (ii) Glycine betaine
   (iii) Sugar alcohol
   (iv) IAA oxidase
   (v) Proline

Q. 5 Write short note on (Any one) (6)
   (i) Antioxidants
   (ii) Cell wall degrading enzymes

Q. 6 How free radicals are neutralized during ROS generation? (6)

Q. 7 How molecular strategies of transformation is useful for tolerance against various stresses? (6)

Q. 8 Discuss the role of defensin-proteins during abiotic stress tolerance in plant. (6)

Q. 9 Enlist the biochemical alterations during biotic stress. (2)

X@X@X
B.A. COLLEGE OF AGRICULTURE  
ANAND AGRICULTURAL UNIVERSITY  
ANAND 388 110  
POST GRADUATE ODD SEMESTER END EXAMINATION-2014-15  
Biochem 501 : Basic Biochemistry (3+1)  
Date: 15-12-2014  
Day: Monday  
Time: 10.00 to 12.00 hrs.  
Marks: 50.00

Q-1 Define (Any Five)  
(1) Carbohydrate  
(3) Nucleotide  
(5) Biochemistry  
(2) Protein  
(4) Bioenergetics  
(6) Iodine Value

Q-2 Describe the Carbohydrate metabolism or Explain recombinant DNA technology? How it useful in agriculture.

Q-3 Do as Directed (Any ten)  
1. Enlist Water soluble Vitamins.  
2. On oxidation of Fats release more energy than carbohydrate. Give your comment.  
3. Difference between C3 and C4 plant  
4. Write down the Bond involve in protein structure.  
5. What is enthalpy, entropy and Gibbs free energy.  
6. Write the sequence of the mRNA molecules synthesized from DNA template stand having the sequence 5'ATCGTACCGTAA3'.  
7. What is Striating codon in eukaryote transcription?  
8. Sucrose is invert sugar Give your comment.  
9. Why Amino acids are Aminolyces in nature?  
10. Difference between DNA and RNA.  
11. Induce fit model of enzyme.  
12. Enlist Essential Fatty Acids.

Q-4 Write a short notes on (Any four)  
1. Enzyme Classification with suitable example  
2. Explain protein on their structure levels  
3. Importance of Biochemistry  
4. Watson and crick model of DNA.  
5. Replication in Eukaryotes  
6. Outline of Amino acids Anabolism

Q-5 Write down step of Glycolysis? Give answer of following question in brief  
(1) Irreversible steps with Enzymes?  
(2) Give name of high energy compound?

*********
Q.1 (A) Explain following (Any five) 05.0

1. Enzyme unit 2. Catalyst 3. Immobilized Enzyme 4. Turnover number

Q.2 Write short answers 15.0

1. What is an enzyme?
2. The importance of enzymes in living systems.
3. Enzymes are specific. Why?
4. What is co-factor?
5. Do some Enzymes contain vitamin derivatives
6. How enzymes are classified according to IUB system?
7. According to IUB system which enzymes are included in group 3?
8. What is the main difference between non competitive and uncompetitive inhibitors
9. Enlist the factors affecting the enzyme
10. What is a Biosensor?

Q.3 Write true or false, if false make it true 05.0

1. Apoenzyme is a sum of Holoenzyme and Coenzyme
2. Generally all the enzymes are colourless solid and globular
3. The activity of enzyme is greatly affected by pH of the medium
4. The enzymes where catalysis involves transfer of electrons are named as Ligase
5. The role of an enzyme in a chemical reaction is to prevent denaturation
6. The active site of an enzyme is altered by heavy metals
7. The molecule that fits into the enzyme's active site is the coenzyme
8. The site on the enzyme wherein the substrate is bound and is converted into products is known as catalytic site
9. A substance that speeds up reactions without changing the produced substances is known as product
10. Ribozymes means Ribonucleic acid with enzyme activity

Q.4 Explain in detail (Any five) 15.0

1. Enzyme classification
2. Factors affecting Enzyme activity
3. Various types of specificity in enzymes
4. The Lock and Key Hypothesis
5. Induced-fit theory of enzyme
6. Classification of Carriers

Q.5 Write short note (Any two) 10.0

1. Enzyme inhibition
2. Role of Enzymes in Agriculture
3. Enzyme immobilization

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B.A. COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY
ANAND
Postgraduate Odd Semester End Examination·2014-15
Ext 605 : Advanced Instructional Technology (2+1)

Date: 23/12/2014
Time: 10.00 to 12.00 hrs
Marks: 50.00

Q-1(A) Define or explain the following terms (Any five) 5.00

1. Instructional Technology
2. Learning
3. Teaching
4. Comprehension
5. Educational planning
6. Distance education

(B) Describe the steps of instructional technology cycle 5.00

Q-2 (A) Write about need and objectives of educational planning 5.00

(B) Write about need and objectives of educational technology 5.00

Q-3 (A) Describe the role of instructional technology for enhancing education 5.00

(B) Enlist the theories of learning and describe any two in detail 5.00

Q-4 (A) What do you mean by lesson plan? Write step prepare lesson plan 5.00

(B) Write about the canals of education system 5.00

Q-5 (A) Write about the Honey and Mumford's model of learning 5.00

(B) State ways and means to motive student for better learning 5.00

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B. A. College of Agriculture  
Anand Agricultural University, Anand  
Post-Graduate Odd Semester End Examination-2014-15  
Ext. 507 : Human Resource Development (2+1)

Date: 22-12-2014  Time: 1000 to 1200 hrs  Marks:50
Monday

Q. 1 (A) Define/explain the following terms (any six).  (06)
1. Motivation  
2. Communication  
3. Group dynamics  
4. Selection  
5. Performance appraisal  
6. Decision-making  
7. Stress  
8. Recruitment

(B) Fill in the gaps with appropriate words.  (06)
1. Performance is the function of __________, __________ and __________.  
2. __________ is the most important asset in the organization.  
3. In __________ type of leadership, decision is in the hand of one man.  
4. The purpose of __________ is to make message clear, understandable and realistic to the audience.  
5. The position in which we hold our body while standing or sitting is called __________.  
6. __________ is a set of behaviors or tasks that a person is expected to perform by virtue of holding a position in a group.  
7. __________ and __________ are described as the eyes and ears of a training programme.  
8. __________ is an important subset of HRM.  
9. Improvement in job performance is assessed by __________ evaluation.

Q. 2 Answer any two of the following.  (12)
1. What do you understand by conflict? Discuss in brief various views of conflict and conflict handling approaches  
2. Discuss buzz group and brain storming methods of training.  
3. Discuss equity theory of motivation.

(PTO)
Q. 3 Write short notes on following (any four). (12)
1. HRA and its benefits
2. Stages of group formation
3. Organizational commitment
4. Consequences of stress
5. Managerial grid
6. 360 degree performance appraisal

Q. 4 (A) Do as directed (any four). (08)
1. Enlist various potential sources of stress.
2. State the characteristics of poor motivators.
3. Differentiate impact evaluation and terminal evaluation.
4. Enlist any four characteristics of task oriented leader.
5. What soft skills are required to be good extension worker?

(B) Answer any six of the following. (06)
1. How trait theory of leadership differs from great man theory?
2. What are the ways to increase group cohesiveness?
3. Name the major four functions of HRM.
4. State any four barriers in communication.
5. Give difference between role taking and role making.
6. Differentiate between halo effect and horn effect.
7. What do you mean by social loafing?
8. Enlist various roles of a professional manager.

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BA COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY
ANAND - 388110
POSTGRADUATE ODD SEMESTER END EXAMINATION - 2014-2015
Ag.Extn. 504 : RESEARCH METHODS IN BEHAVIORAL SCIENCES (2+1)

Date: 26-12-2014
Time: 1000-1200 hrs.
Friday

Marks: 50

Q.1A. Fill in the blank

1) For gaining knowledge by collecting new or fresh observations under controlled conditions, research design used is _____________.

2) There is always an absolute zero that is meaningful in ____________ scale.

3) ____________ variable has only two values.

4) ____________ variable is the presumed effect

5) A variable whose attributes form a steady progression ____________

6) ____________ variable has an impact on the relationship between the independent and dependent variables.

7) Unstructured data can be produced by ____________ questions.

8) Attributes of objects, events, things and being, which vary and can be measured is called as ____________

9) ____________ is a series of written questions a researcher supplies to subjects, requesting their response.

10) If Population (N) is 3000 and sampling list is 1800, the sample frame error will be ____________ %.

B. Do as directed

1. Select the sample size of 120 respondents proportionately, if Population N = 400 and Strata n₁ = 160, n₂ = 100, and n₃ = 140

2. A scale has thirteen statements with a scoring of 5,4,3,2 and 1 in five continuum. What will be the maximum and minimum score one can get? Categorize the score arbitrary into favourable, Neutral and Unfavourable categories.
Q.2 (B) Write only salient features of the following (10)
1. Fundamental research
2. Ex post facto research design
3. Personal Interview schedule
4. Split half method of reliability
5. Stratified method of sampling

Q.3 (A) Define the following (4)
1. Operationalization
2. Level of significance
3. Ratio scale and
4. Validity

(B) Write the difference between the following (4)
1. Primary data and Secondary Data,
2. Types of error I and error II.

(C) Describe the mail survey method of Data collection (2)

Q.4 A Calculate the scale value and Quartile value from the following and state whether the statement will be selected or not? (7)
No. of Judges=50

<table>
<thead>
<tr>
<th>Statement Frequency</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>06</td>
<td>12</td>
<td>09</td>
<td>14</td>
<td>09</td>
</tr>
</tbody>
</table>

B Which types of statistical tools will be used for the following (3)
1. To study association between the independent and dependent variables
2. To find out impact of training on adoption level of the respondents.
3. To categorize the data in three levels i.e. Low, Medium and High.

Q.5 Describe the format of thesis work (10)

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B. A. College of Agriculture
Anand Agricultural University
Anand

Post Graduate Odd Semester End Examination 2014 - 15

Course No.: Ext.501
Course Title: Development Perspectives of Extension Education
Date: 18- 12 - 2014
Marks: 50
Thursday

Time: 10.00 – 12.00 hrs.

Que-1 (A) Fill in the blank/s with appropriate word/s. (5.00)
1. Elements of extension education are ________________
   and ____________________.
2. ____________________ is the process of bringing desirable change in
   human behaviour.
3. ____________________ is the apex body working for the
   development of agriculture in the country.
4. Skill is the ________________ in using knowledge efficacy.
5. The aim of ________________ education is to bring about all round
   development of human being.
6. ________________ is fundamental truth or law one has to follow as the
   basis of some action.
7. Knowledge means ________________ behaviour.
8. National extension service was launched in the year ____________.

(B) Enumerate the programmes implemented by the Government for poverty
   alleviation of cattle owners. Discuss any two in brief. (5.00)

Que-2 (A) List out the principles of extension education. Discuss any two principles
   in detail. (6.00)

(B) What is the role of extension education in agriculture? (4.00)

Que-3 (A) Discuss the linkages between Researcher- extension worker- livestock
   farmer and industry in generation, transfer and utilization of animal
   husbandry practices in rural area. (5.00)

(B) Define/ Explain the following terms. (Any five) (5.00)

1. a. Objectives
   b. Communication
   c. Education
   d. Attitude
   e. Informal education
   f. Skill
   g. Knowledge

P.T.O
Que-4  (A) Give the full form of the following.
1  FSBE: ...................................................... (5.00)
2  FSR: ......................................................
3  SGSY: ......................................................
4  MNREGA: ......................................................
5  NABARD: ......................................................
6  MLE: ......................................................
7  DPAP: ......................................................
8  KCC: ......................................................
9  RMK: ......................................................
10 BuP: ......................................................

(B) Explain the components of extension education. (5.00)

Que-5  (A) Write the short note on the following. (Any three) (6.00)
1  Farmer Field School
2  Adult education
3  Distance education.
4  Kissan Call Centre

(B) Answer the following. (Any two) (4.00)
1  Write the scope of extension education in agriculture.
2  Discuss the elements of agricultural extension.
3  Role of SAUs in development of farmers.
4  Write the functions of extension education.

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B. A. College of Agriculture,
Anand Agricultural University, Anand-388 110
POST GRADUATE ODD SEMESTER END EXAMINATION-2014-15
Ext.505: E-EXTENSION (2+1)

Date: 18-12-2014 Time: 1000 to 1200 hrs.
Thursday Marks: 50

Q.1 Define the following terms (Any Six) (6)

(1) SMS    (2) E-Commerce   (3) Community Radio

(4) Cyber    (5) e-Learning  (6) IT    (7) AgrIDS  (8) Blended learning

Q.2 Give Six names of Websites related to Agri. marketing. Specify their activities. Give some names of books and Journals related to E-Extension. (3)

Q.3 Describe in brief Advantages, Limitations and opportunities in using ICT. Successful application of IT in villages is cyber cafe-Explain. (4)

Q.4 What is e-commerce? What is e-agriculture and E-Agribusiness and how does it relate to E-Business? (2)

Q.5 What is community Radio and Information Kiosks? Describe in brief their importance in rural development. (3)

Q.6 Specify business model—Choupal. How it helps to enhance farm productivity and price realisation for farm produce? Enlist some name of working Information Kiosks. (4)

Q.7 What is open and distance learning? What is e-learning and blended learning? List out the institutes engage in this type of activities. (4)

Q.8 Give the name of different models-approaches of ICTs. Describe in brief. (Any three). (5)

Q.9 What is Cyber? Enlist the elements of Cyber Extension. Give the full form as stated below. (5)

(A) GSWAN    (B) PDA’s   (3) SIN   (4) CRM   (5) FDMA

(PTO)
Q.10 What is “V KVK”? Explain in brief. (3)

Q.11 Explain about e-Governance and narrate different programmes run through e-Governance (2)

Q.12 Answer in brief. (Any ten) (5)
   A. Give full form of SWDF and KNA.
   B. Give Five name of websites related to Agriculture / market oriented
   C. What is open and distance learning?
   D. List out the institutes engage in distance education programmes
   E. Enlist the ICT tools.
   F. Enlist the Net work of e-agriculture / business in India.
   G. Elements of e-agriculture/ business- List out.
   H. Which type of certificates provided under-E-Gram Vishwa Gram Project.
   I. Give Full form of AMCS and SHC.
   J. Which one Major difference is - between M-Learning & e- Learning
   K. List out three agricultural programmes broadcasted on television.
   L. What is video-conferencing?

Q.13 What is a-Aaqua? Who answers a-Aaqua questions? (2)

Q.14 Describe the function of cell phone. Enlist the code of cell phone. Give the name of common technologies used by 2G/3G cell phone NET work. (2)

*****all the best-do the best*****
Q-1 Explain following terms (Any Five)  
I) Farmer led extension  
II) Market led Extension  
III) Cyber extension  
IV) Gender mainstreaming  
V) Gender budgeting  
VI) Agril knowledge and information System  
VII) Decentralized Planning

Q-2 Give the full form of following  
I) SAMETI  
II) MANAGE  
III) NAES  
IV) TAR  
V) IVLP  
VI) NMAET  
VII) ABAC  
VIII) PGDA’M  
IX) DAESI  
X) C-DAP

Q-3 Write short note on following (Any Four)  
I) Potential areas of public private partnership in Agril. Extension management  
II) Advantages and weakness of N G Os  
III) Agril. Technology Management Agency (ATMA)  
IV) Process and methods of ITK analysis  
V) Challenges in Agril Information Technology

Q-4 A progressive farmer of Boravi Village of Anand Taluka is interested to run Farmers Field School (FFS) on girjert. Explain in brief the steps/process to be followed to run FFS
POST GRADUATE ODD SEMESTER END EXAMINATION-2014-15
EXT 603 : Advances in Training Technology (2+1)

Date: 20-12-2014
Day: Saturday
Time: 10.00 to 12.00 hrs.
Marks: 50.00

Note: (i) Attempt all the questions.
(ii) Figures at the right indicate full marks.

Q-1: Answer any five of the following questions. (10)

i) Define the term monitoring and evaluation.

ii) Differentiate between the training and education.

iii) Enlist the factors for selecting training method.

iv) What do you mean by micro lab exercise?

v) Describe the term brainstorming.

vi) Give the full form of "SMART" and "ABCD".

vii) What do you mean by simulation game?

Q-2: Enlist the participatory training techniques and describe any one technique in detail. (10)

Q-3: Define the term extension talk. Describe in detailed the considerations for planning and effective delivery of extension talk. (10)

Q-4: What do you by mean training objectives? Describe in detailed the levels of training objectives and criteria for judging the training objectives. (10)

OR

Q-4: What is conflict? Discuss in detailed the types, potential sources, consequences and resolution approaches of conflict. (10)

Q-5: Write short notes on two of the following. (10)

i) Evaluation methods of training.

ii) Techniques to motivate farmers.

iii) 7-step design model of ELC.

iv) Training need assessment.
**B. A. COLLEGE OF AGRICULTURE**  
**ANAND AGRICULTURAL UNIVERSITY**  
**ANAND - 388 110**

**Post Graduate Odd Semester End Examination - 2014-15**  
**FSC 504: Canopy Management in Fruit Crops (1+1)**

| Q.1 | Explain the meaning of canopy and write groups of plants on the basis of canopy. Explain the basic principle of canopy management. | (10.00) |
| Q.2 | Explain the different tools of canopy management in fruit crops. | (5.00) |
| Q.3 | Write the objectives and importance of canopy management in fruit crops. | (5.00) |
| Q.4 | What is plant growth regulator? Write the name of plant growth regulators used in mango, sapota and guava fruit crops. | (5.00) |
| Q.5 | What is pruning? Write the effect of pruning on canopy management of fruit crops. | (5.00) |
| Q.6 | Explain about root stock. Write importance of rootstock in canopy management | (5.00) |
| Q.7 | What is high density planting? Write the advantages and disadvantages of high density planting in fruit crops. | (5.00) |
| Q.8 | What is training? Explain the different methods of training for canopy management in fruit crops. | (5.00) |
| Q.9 | Explain the crop regulation in Pomegranate & Guava particular for farmers of Gujarat. | (5.00) |

---
Date: 22/12/2014

Q. 1 Define/Explain the following terms:
   (1) Net Assimilation rate
   (2) Crop Growth Rate
   (3) Phytohormones
   (4) Growth Retardants
   (5) Photosynthesis

Q. 2 What do you understand by photoperiodism and vernalisation? Describe their significance.

Q. 3 Write the role of water and nutrients in plant growth and development in brief.

Q. 4 Define seed dormancy. Describe physiological changes occur during germination.

Q. 5 Write short notes:
   1. Impact of pruning and training on reproductive phase of fruit crop.
   2. List out the process associated with fruit ripening and factors affecting climacteric fruit ripening.
   4. Deficiency symptoms of micro nutrients.

Q. 6 What is seed? Describe the seed structure with figure.

Q. 7 What is seed dormancy? Which are the different types of seed dormancy and describe the methods for breaking of seed dormancy.

Q. 8 What is PGR? Classification of the PGR’s. Which are the growth phases of plant.
Q.1 Give two examples of the followings (ANY TEN):
1. Pink fleshed guava varieties: __________ and __________.
2. Sapota varieties cultivated in Gujarat: __________ and __________.
3. Guava hybrids released from Hisar: __________ and __________.
4. Varieties of mandarine orange: __________ and __________.
5. Banana varieties under AAA group: __________ and __________.
6. Sub tropical fruit crops: __________ and __________.
7. Highly drought tolerant fruit crops: __________ and __________.
8. Fruit plants having 100-300 years of life span: ________ and ________.
9. Very heavy fruits (>5 kg): __________ and __________.
10. Fruits which are rich source of vit-C: __________ and __________.
11. Fruit crops belongs to Monocot family: __________ and __________.
12. Leading cultivated varieties of guava in India: __________ and __________.

Q.2 Give difference between the following (ANY FIVE):
- Desert banana x Cooking banana
- Sweet orange x Mandarine Orange
- Raisins x Manakka
- Pumelo x Grape fruit
- Climacteric fruits x Non-climacteric fruits
- Aggregate fruits x Multiple fruits
- Long day x Short day fruit crops

Q.3 Give parentage of the following hybrids (ANY FIVE):
- DSH - 1: __________ x __________
  - Safed Jam: __________ x __________
  - Arkavati: __________ x __________
  - Ratna: __________ x __________
  - Kinnow mandarin: __________ x __________
  - Edible banana cultivar: __________ x __________
  - Pusa Navrang: __________ x __________

(P.T.O.)
Q.4 Define the followings (ANY FIVE) : 
1. Systematic Pomology  
2. Nomenclature  
3. Systematist  
4. Classification  
5. Taxonomy  
6. Manaka  

Q.5 Explain the following questions (ANY TEN) : 
1. How fruit crops are classified based on photoperiodic response. Explain with suitable example?  
2. Explain different related species of guava (Psidium spp.)?  
3. How varieties of sapota are classified in to different groups?  
4. Explain the classification based on ‘Specificity to Soil Texture’?  
5. What is raisin and explain the characteristics of raisin grapes?  
6. What are the different groups of sweet orange varieties? Explain with examples.  
7. How banana varieties are classified under different groups. Explain with example.  
8. List different improved varieties / hybrids of sapota released from different institutes?  
10. What are the criteria’s for citrus classification? Explain any one of them?  
11. Explain how grape varieties are classified in to different groups with example?  
12. List few inter-generic and intra-generic hybrids of citrus.

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POST GRADUATE SEMESTER END EXAMINATION (Odd Semester 2014-15)
Course & Title: FSC-511 Protected Fruit Culture  (2+1)

Date : 17-12-2014  Time : 10.00 to 12.00
Day : Wednesday  Marks : 50

Q.1. (A) Write the following sentences are true (✓) or false (✗).  (5.00)
(i)  Ridge is the highest horizontal section in the roof.
(ii)  In Hi-tech greenhouse semi-automatic systems are used.
(iii)  The invisible light of the solar radiation is a source of energy of plants.
(iv)  Methane is a primary greenhouse gas.
(v)  The main motto of greenhouse cultivation is to increase the yield per unit area.
(vi)  Naturally ventilated poly house is in environmental controlled
(vii)  In constant feed fertilizer application methods fertilizers are given monthly interval.
(viii) Plastic pot containers are reusable.
(ix)  Green house construction is considered as a fixed cost.
(x)  Strawberry is generally propagated by seed.

Q.1 (B) Give the classification of greenhouse based on suitability and cost and explain about any one.  (5.00)

Q.2 Write short notes  (Any Four)  (10.00)
1. Fumigation in greenhouse
2. Role of temperature in greenhouse
3. Components of net house
4. Walk-in-tunnel type greenhouse
5. Advantages of greenhouse

Q.3 Define/explain  (Any Ten).  (10.00)
(1) Cladding material
(2) Column
(3) Disbudding
(4) Gravel filter
(5) Bending
(6) Media
(7) Roof
(8) Gutter
(9) Micro-irrigation
(10) Span width
(11) Gable
(12) Defoliation
Q-4 Give the answer as per demand. (Any Four) (10.00)

1. Give the classification of greenhouse based on type of glazing materials.
2. Give the different methods of strawberry cultivation in greenhouse.
3. Give the different types of media used in greenhouse.
4. Enlist different agro climatic zones of Gujarat.
5. Enlist special horticultural practices in greenhouse production.

Q-5 Differentiate (Any Four) (10.00)

1. Clay pot V/s Plastic pot
2. Active heating greenhouse V/s Active cooling greenhouse
3. Self life V/s Vise life
4. Chlorosis V/s Necrosis
5. Dead load V/s Live load
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POST GRADUATE ODD SEMESTER END EXAMINATION 2014-15
FSC 506 BREEDING OF FRUIT CROPS (2+1)

Date: 20.12.2014
Marks: 50

Saturday

Q. I A

B Define or Explain following (ANY EIGHT) [8]

1 Self pollination
2 Multiple fruit
3 Pollination
4 Asexual propagation
5 Triploid

6 Andromonoecious
7 Biotic stress
8 Mutation breeding
9 Abiotic stress
10 Tissue culture

Q. II A
Describe breeding methodologies for improvement of mango crop and narrate constrains faced in mango hybridization programme. [6]

B What is interspecific hybridization? Give breeding methodologies for papaya. [6]

Q. III A
Breeding methodologies and breeding objective for following crops (ANY FOUR) [8]

1 Avocado
2 Mangosteen
3 Pineapple

4 Custard apple
5 Guava

B What is mutation breeding? How it is useful in fruit crop breeding? [3]

Q. IV A
Why rough lemon use as root stock? Give name of varieties use as rootstock and Schion. [3]

B Answer the following questions (ANY FIVE) [10]

1 What is colchicines? What is use of colchicines.
2 What is Micro propagation? Give steps for Micro propagation
3 Give floral biology of Mango, Sapota, Guava and Papaya.
4 What is biotic stress resistance? How to develop biotic stress resistance variety.
5 How to develop triploid banana?
6 What do you understand by tissue culture? Give its importance in fruit crops.
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POST GRADUATE ODD SEMESTER END EXAMINATION-2014-15
FSC 501 – Tropical and Dry land Fruit Production (2+1)

Date : 15/12/2014
Day : Monday

Time : 10.00 to 12.00 hrs
Marks : 50.00

Q-1 Describe the scientific cultivation practices of Banana crops in following heads (10)
   (a) Climate and soil requirement
   (b) Selection of planting materials
   (c) Commercial varieties with their characters
   (d) Nutrient and Water Management
   (e) Harvesting and yield

Q-2 Write short note on following (Any four) (12)
   (1) Annual pruning in Ber crop
   (2) Fruit cracking in pomegranate
   (3) Citrus canker – cause and control measures
   (4) Propagation in Sapota
   (5) Physiological disorder in Avocado

Q-3 National and International importance of Mango (4)

Q-4 Discuss types, causes and control measures of fruit drops in Mango (4)

Q-5 Discuss medicinal values and commercial uses of Aonla (4)

Q-6 Discuss planting, nutrient and water management in papaya crop (4)

Q-7 What is bahar treatment? Discuss crop regulation in guava crop (4)

Q-8 Discuss flowering, fruit development, harvesting & yield of custard apple (4)

Q-9 Discuss propagation in pineapple (2)

Q-10 Discuss flowering and fruit development in jack fruit (2)

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POST GRADUATE ODD SEMESTER END EXAMINATION 2014-15
FSC 503: Biodiversity and Conservation of Fruit Crops (2+1)

Date: 19-12-2014 Time: 10.00 to 12.00 hrs.
Day: Friday Marks: 50.00

Q1 (a) Geographical indication of banana, citrus, grape and guava. (4.0)
(b) Give conventional methods of Ex-situ conservation and explain any one. (6.0)

Q2 (a) Role of IPRs in biodiversity? (4.0)
(b) Germplasm conservation of custard apple and banana. (6.0)

Q3 (a) Give some famous International and National Botanic Gardens/Research centers/Institutes for germplasm conservation. (6.0)
(b) Describe brief history of IPRs and biodiversity. (4.0)

Q4 (a) Define/explain.
(i) Conservation (ii) Climacteric fruit
(ii) Orthodox seed (iv) Biodiversity
(b) Short note (6.0)
(i) Gene-bank (ii) IPRs
(ii) Centre of origin (iv) Ex-situ conservation

Q5 Give direct answers (10.0)
(i) Different species of banana and custard apple.
(ii) Different maturity stages of date palm.
(iii) Full name of NBPGR and PPVFR
(iv) Extinction species of mango.
(v) Different methods of seed conservation.
(vi) Different fruit research station of India.
(vii) Enlist varieties of mango and papaya.
(viii) List out some possible benefits accruing from on-farm conservation (adapted from Jarvis 1999).
(ix) List out world centers of origin of cultivated plants.
(x) Storage behavior of papaya seed.
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POST GRADUATE ODD SEMESTER END EXAMINATION (2014)
SUBJECT: G518  TITLE: GENETIC CONTROL OF PLANT REPRODUCTION(2+0)
DATE: 22-12-14   MARKS: 50.0
DAY: MONDAY   TIME: 10.00-12.00hrs

Q.1. (A) Define the following: (Any six) (6.0)
   a) Triple fusion
   b) Meiotic restitution
   c) Lethality
   d) Unilateral incompatibility
   e) "S" genes
   f) Pseudo compatibility
   g) "Ph" gene

Q.1. (B) Describe the process of double fertilization, embryo and endosperm development in monocots and dicots. (6.0)

OR

How are pre and post fertilization barriers in inter-specific and inter-generic crosses can be overcome? Discuss citing examples.

Q.2. (A) Differentiate between the following (Any Four) (6.0)
   a) Gametophytic apomixis and Adventitious polyembryony
   b) Sporogenous male sterility and Functional male sterility
   c) PGMS and TGMS
   d) Microspore and Anther culture
   e) Hybrids and Cybrids
   f) Micro sporogenesis and Mega sporogenesis

Q.2. (B) If there are four self incompatible genotypes in population i.e. S1S2 S1S3 and S1S4 and S1S4, what will be the cross compatible offsprings and their frequencies in the first and second generation of inter mating? (Note: S1> S2> S3> S4) (4.0)

Q.3. Give reasons for the following: (Any Six) (12.0)
   a) The male sterility is more common than female sterility.
   b) Gene action is meiotic or post-meiotic in gametophytic incompatibility.
   c) Alloploidous flowers are usually non-attractive.
   d) Hydrophilous flowers are characterized by aerenchymatous tissues.
   e) Survival rate of male sterile genotypes are more in gynodioecious populations.
   f) Male sterility is more commonly reported in dicots than in monocots.
   g) Male sterility rather than self-incompatibility is generally used in hybrid seed production.

Q.4. Answer the following (Any Eight) (16.0)
   a) How self incompatibility breaks down in nature?
   b) "The pollination mechanisms existing in nature, depend on the adaptive radiation of floral organs": Explain the statement in detail.
   c) What is apomixis? Give its classification and significance to crop plants?
   d) What is Somatic hybridization? Elucidate its applications and utility to plant breeders.
   e) Describe the structure of a typical dicot seed and a monocot seed with suitable diagram.
   f) "Gene flow influences pollination mechanisms." Justify the statement in the context of GM crops.
   i) Describe the factors which make magnolia flowers cross pollinated?
   j) Describe various factors involved in the pollination efficiency of foraging insects.
   m) Describe various mechanisms involved in self-incompatibility. How sporophytic and gametophytic systems differ in this aspect?

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POST GRADUATE ODD SEMESTER END EXAMINATION 2014-15
GP-602 ADVANCED BIOMETRICAL AND QUANTITATIVE GENETICS (2+1)

Date: 26.12.2014
Friday

Time: 10:00 to 12:00 Noon
Mark: 50

<table>
<thead>
<tr>
<th>Q.I(A) Define or Explain following (ANY FIVE)</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Weighing Coefficients</td>
<td>5 Euclidean distance</td>
</tr>
<tr>
<td>2 Convergent improvement</td>
<td>6 Population hybrid</td>
</tr>
<tr>
<td>3 Selection index</td>
<td>7 Eigen Value</td>
</tr>
<tr>
<td>4 Adaptability</td>
<td>[5]</td>
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</tbody>
</table>

(B) What is stability? Give different model use for estimation of stable genotype and describe about widely use model for stability.  [5]

<table>
<thead>
<tr>
<th>Q.II(A) Definition or Explain following (ANY THREE)</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 First Degree V/s Second Degree</td>
<td>3 Additive V/s Epistatic Variance Statistics</td>
</tr>
<tr>
<td>2 Meteorogly Analysis V/s D^2 Statistics</td>
<td>4 Macro V/s Micro environment</td>
</tr>
</tbody>
</table>

(B) What is Pattern analysis? Give main feature of pattern analysis.  [5]

<table>
<thead>
<tr>
<th>Q.III(A) Answer the following question (ANY FOUR)</th>
<th>10</th>
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</thead>
<tbody>
<tr>
<td>1 What do you understand by Biometrical genetics? Give principles of it.</td>
<td>[10]</td>
</tr>
<tr>
<td>2 What is PCA? Give properties of its.</td>
<td></td>
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<tr>
<td>3 What is QTL mapping? Why it is?</td>
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<tr>
<td>4 What do you understand by first, second &amp; third degree statistics? Which statistics gave robust result?</td>
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<tr>
<td>5 What is Path coefficient analysis? Draw a path diagramme.</td>
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<tr>
<td>6 What do you understand by molecular marker? Give name of molecular marker.</td>
<td></td>
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<thead>
<tr>
<th>Q. IV Give reasons for following (ANY FIVE)</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 How linkage disequilibrium cause in population?</td>
<td></td>
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<tr>
<td>2 Why additive genetic variance does not mean additive genetic effect?</td>
<td></td>
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<tr>
<td>3 Why practically dominance variance cannot be predicted?</td>
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<tr>
<td>4 Justify statement “selection is effective in F_2 generation rather than F_1 generation”</td>
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<tr>
<td>5 Why knowledge of genetic variance require to plant breeder?</td>
<td></td>
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<tr>
<td>6 Why narrow sense heritability more important than broad sense heritability for plant breeder?</td>
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</tbody>
</table>

*******
Q. 1 (A) Define/Explain the following terms (4.0)
1. Disease
2. Gene pyramiding
3. Pathotype
4. Halophytes
5. Virulent
6. Drought
7. Osmoregulation
8. Vertifolia effect

(B) Differentiate the vertical and horizontal resistance (4.0)

(C) Explain the biochemical and anatomical mechanisms of disease resistance (4.0)

Q. 2 (A) Enlist the problems associated with the breeding of the following stresses. (8.0)
1. Insect resistance
2. Mineral toxicity
3. Drought resistance
4. Freezing tolerance

(B) Explain the physiological effects of heat stress. (3.0)

(C) Explain signal transduction in abiotic stress. (2.0)

Q. 3 Write short notes on the following (Any four) (12.0)
1. SAR
2. Gene-for-gene relationship
3. Transgenic management for abiotic stress resistance
4. Mechanisms of drought avoidance
5. MAS for biotic stress

Q. 4 (A) Answer the following in brief (10.0)
1. Explain the generation of variability in pathogens.
2. How does disease development take place?
3. Enlist the sources of resistance for disease resistance.
4. Explain briefly the selection criteria for chilling tolerance.
5. Explain in brief different plant stress proteins.

(B) Give the screening or testing techniques of the disease resistance of the following disease: (3.0)
1. Leaf blight
2. Wheat bunt
3. Damping off

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Odd Semester End Post Graduate Examination-2014-15
BREEDING FOR CEREALS, FORAGES AND SUGARCANE (2 + 1)

Course No. : GP-511                         Marks: 50
Date       : 16/12/2014                     Time : 1000 to 1200 hrs.

Attempt All Questions

Q.1   (A)  Explain origin of tetraploid and hexaploid Wheat. (5.0)
(B)  Give procedure for maintenance of A, B and R lines in Pearl millet. (5.0)

Q.2   (A)  What are the breeding methods used to develop improved cultivars of Maize. (5.0)
(B)  Give characteristics of ideotype plant of wheat. (5.0)

Q.3   (A)  Breeding forage crops is more difficult than breeding other cultivated crops. Why? (5.0)
(B)  Explain species of sugarcane with its chromosome number and characteristics. (5.0)

Q.4   (A)  Describe polycross method in Lucerne crop. (5.0)
(B)  Explain genetic male sterility in Rice. (5.0)

Q.5   (A)  Describe procedure for development of Hybrid Napier APBN-1. (5.0)
(B)  Explain major constraint of Lucerne breeding. (5.0)

*****
Q. 1 Define/Explain (Any Seven)  
1. RNA Editing  
2. Isochromosome  
3. Metagenomics  
4. Sex linked trait  
5. Plasmid  
6. Inducer  
7. Gene pool  
8. Antigens  
9. Probe  
10. Polymorphism  
11. Onco genes  
12. Reconst  

Q. 2 Explain in brief: (Any Ten)  
1. Why Mendel got success in his garden pea experiment?  
2. DNA replication is semiconservative type.  
3. Properties of Genetic Code  
4. The genic balance theory of sex determination in Drosophila  
5. Inhibitory gene action  
6. Characteristics of mitochondrial DNA  
7. Explain different types of mutation  
8. Function of Following Enzyme (Any Five)  
   a. Taq polymerase  
   b. DNA Polymerase II  
   c. Ligase  
   d. RNA Polymerase I  
   e. Helicase  
   f. Topoisomerase  
9. Classification of plasmid  
10. Function of following Chemicals in DNA Isolation (Any Five)  
   a. Phenol  
   b. NaCl  
   c. CTAB  
   d. β mercaptoetanol  
   e. Mg+  
   f. SDS  
11. Enlist the significance of RNA interference  
12. Why is this packaging of DNA necessary  
14. Important features of a polyacrylamide gel, an agarose gel and the technique of pulsed-field agarose gel electrophoresis  
15. Lac operon model in E. coli  

Q. 3 Difference the following: (Any Four)  
1. cDNA library vs genomic library  
2. Negative vs positive control of transcription  
3. Allopolyploidy vs Autopolyploidy  
4. Purines vs Pyrimidine  
5. Mit DNA vs Nuclear DNA  

(P.T.O.)
Q.4 Write short note (Any six)
   1. Overlapping genes
   2. Hardy Weinberg law
   3. Sanger method of DNA sequencing
   4. Law of independent assortment
   5. tRNA
   6. Transformation (Griffith experiment)
   7. DNA replication in prokaryotes
   8. Protein synthesis
   9. RNA processing
   10. Extra nuclear (cytoplasmic) inheritance

Q.5 Write the significant contribution of following Scientist (Any five)
   1. W. Gilbert
   2. Philip A. Sharp and Richard J. Roberts
   3. Barbara McClintock
   4. Joshua Lederberg
   5. Hershey-Chase
   6. T.H. Morgan
   7. Friedrich Miescher
Q-1 (A) Define or Explain the following terms. (4.0)
(1) Distant hybridization
(2) Tolerance
(3) Adventive Embryony
(4) Plant Breeder’s Right

(B) Differentiate the following. (6.0)
1) Synthetic variety and Composite variety
2) Traditional breeding and Ideotype breeding
3) Recurrent selection for GCA and Recurrent selection for SCA

Q-2 (A) Answer the following questions. (Any three) (6.0)
1) Give the limitations of mutation breeding.
2) Write the applications of backcross breeding method.
3) Give the importance and limitations of self incompatibility in plant breeding.
4) What do you mean by chemical hybridizing agent? Write down the features of an ideal chemical hybridizing agent.

(B) Justify the following statements. (4.0)
1) The recurrent parent in the backcross breeding programme must be most popular variety of the area.
2) Parents selected for hybridization should be diverse and homozygous.
3) Hybrid varieties are more common in cross pollinated than in self pollinated crops.
4) Resistant breeding is a continuous work.

Q-3 Write short notes. (Any Two) (10.0)
1) Gene for gene hypothesis
2) Clonal selection
3) Multiline

Q-4 Explain diagrammatically the procedure to develop new cytoplasmic male sterile line. Give the importance and limitations of cytoplasmic male sterility in plant breeding. (10.0)

Q-5 Describe pedigree method of breeding with suitable diagram. Give the merits and demerits of it. (10.0)

xxxxxxxxx
Q.1 Fill in the blank with appropriate answer (Any ten) (10)

(1) ___________ mutations are of great evolutionary significance because of they can be perpetuated and maintained in heterozygous condition.

(2) In case of ___________ mutation, proteins are non-functional hence such mutations are much more deleterious than those produced by base substitutions.

(3) Screening of the irradiated material is also started in _____ generation rather than _____ generation even for the dominant mutant.

(4) Highly mutable site within gene is called ___________.

(5) Beta particles (electrons) such as those from _____ and _____ produce effects in tissue similar to those of x or gamma rays, although the penetrating ability of beta particles is lower than that of x or gamma rays.

(6) Mutagenic doses, close to ___________ dose, are generally recommended.

(7) Multiplication of the mutant somatic cells results into a ________ of mutant and non-mutant tissues.

(8) Application of TILLING and Eco-TILLING as ___________ genetic approaches to elucidate the function of genes in plants and animals.

(9) The largest numbers of mutant cultivars (nearly 119 varieties) have been produced in ___________, followed closely by legumes and cereals.

(10) The world's very first mutant variety of cotton, ________ induced by x-rays, endowed with drought tolerance and it was released in 1948 by India.

(11) Total _______ mutant varieties released in India.

(12) ___________ approach can be effectively used for developing multi-lines in a much shorter time compared with the conventional back cross procedure.

Q.2 Match the 'X' and 'Y' Group (5)

<table>
<thead>
<tr>
<th>Group- 'X'</th>
<th>Group- 'Y'</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Fine structure of gene in bacteriophage</td>
<td>(1) Mendel</td>
</tr>
<tr>
<td>(b) Mutagenic effect of ultraviolet (UV)</td>
<td>(2) Darwin</td>
</tr>
<tr>
<td>(c) Gave birth to mutation breeding</td>
<td>(3) Bridge C.B.</td>
</tr>
<tr>
<td>(d) Mutation Theory</td>
<td>(4) Benzer</td>
</tr>
<tr>
<td>(e) Theory of Evolution</td>
<td>(5) Altenburg</td>
</tr>
<tr>
<td></td>
<td>(6) Hugo-de Vries</td>
</tr>
<tr>
<td></td>
<td>(7) Muller and Stadler</td>
</tr>
</tbody>
</table>

(P.T.O.)
Q.3 Give the differences (Any five)
1. TILLING
2. BARC
3. RBE
4. LET
5. BU
6. EMS

Q.4 Answer / Define the following (Any ten)
1. Mutator gene
2. Gamma garden
3. LD 50
4. Allele mining
5. Base analogues
6. Radiobiology
7. Alpha rays
8. Transposition
9. Effects of mutations on survival
10. Enlist two reference books with author
11. Plasmagene mutation
12. Enlist two major research center actively engaged in mutation breeding

Q.5 Give the differences (Any four)
(1) Hybridization breeding and Mutation breeding
(2) Oligogenic mutations and Polygenic mutations
(3) Periclinal chimera and Sectorial chimera
(4) Eco Tilling and Sequencing based allele mining
(5) Base substitution and Base addition

Q.6 Discuss in detail (Any four)
(1) Give stepwise procedure operated in mutation breeding for development of variety?
(2) Procedure for handling $M_2$ and later generations for improvement of polygenic traits?
(3) Describe the achievements of mutation breeding and limitation of this approach?
(4) Factors influencing radiation effects.
(5) Approaches in Allele mining.
(6) Describe the procedure of mutation breeding in vegetatively propagated species.

======x======
Q 1. Define/Explain the following terms in short (Any Five). 
   1. Polysome
   2. Gap genes
   3. Nuclear pore complex
   4. Enthalpy
   5. Frameshift mutation
   6. Nuclear pore
   7. Transduction
   8. Homeotic genes

Q 2. Differentiate between following (Any Five) 
   1. mtDNA and cpDNA
   2. Enthalpy and Entropy
   3. Mitosis and Meiosis
   4. Prokaryotic and Eukaryotic cell
   5. Genomics and proteomics
   6. Prokaryotic and Eukaryotic transcription

Q 3. Enlist the following (Any Five) 
   1. Laws of thermodynamics
   2. Biological membrane system in cell
   3. Characteristics of genetic code
   4. Structures of chloroplast
   5. Different steps in translation
   6. Types of cell signalling system

Q 4. Answer the following questions in detail. (Any Three) 
   1. Describe an experiment which proved that DNA is the genetic material
   2. Explain wobble hypothesis.
   3. Explain with diagram translation in prokaryotes.
   4. Explain the experiment which proved DNA as genetic material

Q 5. Give brief account genes in development in any one organism. 

Q 6. What is cell cycle and explain its regulation in eukaryotes.
Q. 1 Define / Explain the following terms (ANY FIVE) : (10.0)

1. *In situ* conservation
2. Gene bank
3. Genetic erosion
4. Biosphere reserve
5. Cryopreservation
6. Natural Selection
7. Quarantine

Q. 2 Write Short notes (ANY FIVE) : (15.0)

1. Bio - diversity
2. Advantages of *in vitro* gene bank
3. Seed exchange network
4. Participatory Plant Breeding
5. Community gene bank
6. Diversity fair
7. NBPGR

Q. 3 Answer the following questions (ANY FIVE) : (20.0)

1. What is the limitations of field gene bank and DNA gene bank ?
2. National strategies for conservation of plant genetic resources (PGR) ?
3. Role of economic analysis in on farm conservation.
4. What is the importance of conservation of Plant Genetic Resources (PGR) ?
5. What is the role of environmental and Biological factors for conservation of genetic resources?
6. How *in situ* conservation is more useful than cryopreservation?
7. What is the benefit for farmers from local crop diversity?

Q. 4 What is the significance of *Ex situ* conservation ? (5.0)

X@X@X
Q1. Define the following terms (10)

1. Palindromic sequence
2. Enhancer
3. Star Activity
4. Constitutive Promoter
5. Probe
6. Relaxed plasmid
7. Shuttle vector
8. Tissue Culture
9. Cis-genes.
10. Cosmid

Q2. Enlist the following (5)

1. Probe Labeling methods
2. Nucleic acid hybridization methods
3. DNA modifying enzymes
4. Direct gene transformation methods
5. Tissue culture methods

Q3. Match the pair (5)

1) Ampicillin  a) Northern blotting
2) Terminal transferase  b) Selectable Marker
3) Karry Mullis  c) Southern blotting
4) DMB paper  d) PCR
5) Nitrocellulose paper  e) Addition of 3’OH group

Q4. Write short notes on (ANY TWO) (10)

1. Genomic library
2. Probe labeling and detection methods
3. Southern blotting

Q5. What is gene cloning and discuss different gene cloning strategies? (10)

Q6. What is Ti plasmid? Discuss the biology of infection of Agrobacterium tumefaciens for development of transgenic.

X@X@X
B. A COLLEGE OF AGRICULTURE  
ANAND AGRICULTURAL UNIVERSITY, ANAND 388110  
Postgraduate Odd Semester End Examination-2014-15  
MBB 513 : NANOBIOENGINEERING (3+0)  

Date: 26-12-2014  
Day: Friday  
Time: 1000-1200 hrs  
Marks: 50

Note: Draw labeled figures/diagrams wherever necessary

Q1. Define (Any Eight):  
   a. Lotus effect  
   b. Quantum dots  
   c. Biosensors  
   d. Moore’s first law  
   e. Nano science  
   f. Zeta potential  
   g. Contact angle  
   h. Smartdust  
   i. Nanocide  
   j. Hydrophobicity  
   k. CPA  
   l. Precision farming

Q2. Explain/brief account of the following (Any Two):  
   a. “One nanometer (1 nm) is a magical point on the dimensional scale” Why?  
   b. Give the names various instruments used in characterization of nanoparticles  
   c. Advantages of super hydrophobicity.

Q3. What do you about carbon fullerenes? Describe their properties, synthesis methods and possible applications?  

   OR  
   Give a detailed account of various applications of nanotechnology in agriculture?

Q4. What are surfactants? How does it differ from detergents? Describe the application of surfactants in agriculture?  

   OR  
   What is nanotechnology? What are the reasons for the change in physical as well as chemical properties at nano scale? Give few appropriate examples.

Q5. Which are the types of electron microscopy used for characterization of nanomaterials and nanostructures? Give a brief description about each of them.  

   OR  
   Describe separately about Biosensors and Nanofluidics and its applications.

Q6. What are the methods for synthesis of nanoparticles and describe various top down and bottom up approaches in detail.  

   OR  
   What is surface science? Give a detailed account of applications of surface science in agriculture.

Q7. Write short notes: (Any Two)  

   1. Biomolecules  
   2. Significance of Contact angle measurement  
   3. Characterization related tools for nanoparticles

***
Q. 1  Multiple Choice Questions : (5.0)

1. Construction of molecular genome map involves following number of major steps
   A) Five
   B) Three
   C) Seven
   D) Four

2. The standardization of D makes D-values range between:
   A) 0 to 1
   B) 0 and ∞
   C) -1 and +1
   D) -1 and ∞

3. Which one of the following is an immortal population.
   A) F2
   B) RIL
   C) NIL
   D) BIL

4. Non-random association of alleles can be exploited for
   A) QTL analysis
   B) Gene identification
   C) SNP Detection
   D) All above

Q. 2  Fill in the blanks : (5.0)

1. RAPD gives .................................. ratio for backcross population with dominant homozygous gene.
2. Tanksley and Nelson (1996) suggested the .................................. method with simultaneous backcrossing in tomato crop for QTL analysis.
3. Random association of alleles at different loci is known as..............................................
4. Segregation distortion level is high during linkage analysis in ..................................pollinated crops.

Q. 3  True or False : (5.0)

1. D' is the coefficient of linkage disequilibrium first proposed by Lewontin & Kojma.  
   ( )
2. Simple t-test can be used to evaluate presence of a QTL through statistical differences between three marker genotypes.  
   ( )
3. GxE is good for MABC.  
   ( )
4. Tissue culture is not essential for development of DH population.  
   ( )
   (P.T.O.)
Q. 4. Define (not more than 3 sentences) (10.0)
1. Segregation distortion
2. Allele mining
3. Single marker approach of QTL mapping
4. Mapping population

Q. 5. Short note (not more than 5 sentences) (10.0)
1. Foreground selection
2. Bulk segregant analysis
3. Gene stacking
4. Quantitative trait loci

Q. 6. What is mapping population? Enlist the types of mapping population and explain any two in brief. (5.0)

Q. 7. What is MAS? Brief the advantages and limitations of MAS. Explain the prerequisites of MAS program (10.0)
B.A. COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY, ANAND
Postgraduate Odd Semester End Examination-2014-15
MBB 602 Title: Advances in Genetic Engineering (3+0)

DATE: 24-12-2014
DAY: WEDNESDAY
TIME: 10.00-12.00 hrs.
MARKS: 50

Q1 Define / Explain the following terms (10.0)

1. Codon bias
2. TALEN
3. Antisense RNA
4. Phonemics
5. RISC
6. Refugia
7. Dicer
8. Molecular farming
9. Glycosylation
10. IRES

Q2 Discuss the development of male sterility citing an example of silencing of BCP 1 gene of Arabidopsis. (5.0)

Q3 Give an account of generation of selectable marker free transgenic tomato resistant to drought, cold and oxidation stress using Cre / Lox P DNA exclusion system. (5.0)

Q4 Differentiate the following (10.0)

1. Transposon based SMG removal method Vs MAT vector system
2. Drosha Vs Pasha
3. Chloroplast transformation Vs Nuclear transformation
4. Selectable marker Vs Scorable marker

Q5 Write short notes on the following (10.0)

(a) Subcellular targeting of foreign protein
(b) Gene stacking using mini-chromosome
(c) Zinc finger nuclease technology for SMG’s removal
(d) High throughput phenotyping in crop plants

Q6 Do as directed (ANY TEN) (10.0)

1. Enlist the different types of expression system for heterologous protein and discuss in brief about plant expression system.
2. Enlist the important recombinant proteins produced in plants with pathology and clinical status phases.
3. Enlist the key issues related to selectable marker genes.
5. Give an outline of the biosafety framework for GMO’s in India.
6. Give a flow chart of metabolic engineering for Vitamin A in rice.
7. Elucidate molecular mechanism of T DNA transfer with the help of a schematic diagram.
8. Discuss the mechanism for CRISPR interference in brief.
9. Enlist the application of transgenic male sterility in crop improvement.
10. Enlist the factors influencing the heterologous protein production in plants.
12. There was a controversy about Bt brinjal in India. Comment.
B. A COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY, ANAND 388110

Postgraduate ODD Semester End Examination -2014-15

MBB-606 : COMMERCIAL PLANT TISSUE CULTURE (2+0)

Date: 23-12-2014 Time: 1000-1200 hrs
Day: Tuesday Marks: 50

Note: Draw labeled figures / diagrams wherever necessary

Q.1. Which are the requirements/parameters considered while starting any new commercial tissue culture laboratory project? Describe business formulation for successful operations of commercial units.

Q.2. Explain protocol for micropropagation of Banana on commercial scale?

Q.3. Write short note on following: (Any Three)
   i. Cryopreservation
   ii. National Certification System for Tissue Culture Raised Plants (NCS-TCP)
   iii. Acclimatization of tissue culture plants.
   iv. Hairy root culture

Q.4. Enlist the following (Any Five)
   i. Applications of plant tissue culture.
   ii. Criteria for assessment of commercial tissue culture unit
   iii. SOP for cleaning of tissue culture laboratory
   iv. NSC-TCP accredited laboratories in Gujarat
   v. Different types of bioreactors used in Micropropagation.
   vi. Classification of clean rooms

Q.5. i. Explain the set up of a commercial tissue culture unit with appropriate diagram.

ii. Explain Standard Guidelines/Parameters for Production of Tissue Culture Raised Banana Plants

******
B. A. COLLEGE OF AGRICULTURE  
ANAND AGRICULTURAL UNIVERSITY  
ANAND 388 110

POST GRADUATE ODD SEMESTER END EXAMINATION-2014-15  
MBB 503 : Molecular Cell Biology (250)

Date: 23-12-2014  
Day: Tuesday  
Time: 10.00 to 12.00 hrs.  
Marks: 50.00

Q. 1 Multiple Choice Questions :  

1. Term cell was coined by  
   A) Robert Hooke  
   B) Robert Brown  
   C) Schwann  
   D) De Bary

2. The membrane around the vacuole is called  
   A) Cytoplasm  
   B) Tonoplast  
   C) Amyloplast  
   D) Elaioplast

3. Microfilaments are composed mainly of  
   A) Actin  
   B) Chitin  
   C) Myosin  
   D) Tubulin

4. Smooth ER is the site of  
   A) Protein synthesis  
   B) Lipid synthesis  
   C) Amino acid synthesis  
   D) All above

5. Main function of centrosome is  
   A) Secretion  
   B) Protein synthesis  
   C) Osmoregulation  
   D) Spindle fibre formation

6. PIP₂ is hydrolyzed to IP₃ and DAG by the enzyme  
   A) Phospholipase C  
   B) Cyclase  
   C) Kinase  
   D) Phosphatase

Q. 2. Fill in the blanks :  

1. NO activates __________, ultimately leading to smooth muscle relaxation in blood vessels.
2. Cytoskeleton -microtubule is made of __________
3. NUMTS stands for __________
4. __________ is function of nucleolus.

(P.T.O.)
Q. 3. Define/Comments (not more than 3 sentences) (10.0)
1. Treadmilling
2. Mitochondria
3. Checkpoint in cell cycle
4. Nuclear Envelope
5. CDKs

Q. 4. Short note (not more than 5 sentences) (10.0)
1. Three parents baby
2. Nuclear pore with diagram
3. Extracellular genes
4. Protein targeting

Q. 5. What are intermediate filaments? How are intermediate filaments assembled? What are some examples of intermediate filaments? What regulates the assembly and disassembly of intermediate filaments? (8.0)

Q. 6. What is signal transduction? Explain general Principles of Signal Transduction. What is secondary messenger and signal amplification? Draw the figure on G protein activation of effectors. (11.0)
Q-1 Write down step of Glycolysis? Give answer of following question in brief
(1) Irreversible steps with Enzymes?
(2) Give name of high energy compound?
(3) How many ATP produce when glucose breakdown during aerobic condition

Q-2 Define (Any five)
(1) Enzyme
(2) Protein
(3) Nucleotide
(4) Bioenergetics
(5) Biochemistry
(6) Saponification Value

Q-3 Write a short notes on (Any four)
1. Watson and crick model of DNA.
2. Explain protein on their structure levels
3. Importance of Biochemistry
4. Enzyme Inhibitors.
5. Replication in Eukaryotes
6. Classify carbohydrate with suitable examples

Q-4 Do as Directed (Any ten)
(1) Enlist Water soluble Vitamins.
(2) On oxidation of Fats release more energy than carbohydrate. Give your comment.
(3) Difference between C3 and C4 plant
(4) Write down the terminating codon in translation.
(5) What is enthalpy, entropy and Gibbs free energy.
(6) Write the sequence of the mRNA molecules synthesized from DNA template stand having the sequence 5'ATCGTACCGTTA3'.
(7) Complete oxidation of one Palmitic acid molecules (C-16) through β Oxidation and TCA cycle result how many ATP gains?
(8) Sucrose is invert sugar Give your comment.
(9) Why Amino acids are Ampolytes in nature?
(10) Difference between DNA and RNA.
(11) Lock and Key Model of enzyme.
(12) Enlist Essential Fatty Acids.
(13) Difference and Similarity of Replication.

Q-5 Describe the Lipid metabolism or Enzyme Classification with example.
B A COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY, ANAND
POST GRADUATE ODD SEMESTER END EXAMINATION (2014)

SUBJECT: MBB 601  TITLE: ADVANCES IN PLANT MOLECULAR BIOLOGY (3-0)
DATE: 27-12-2014  MARKS: 50.0
DAY : SATURDAY  TIME: 10.00-12.00hrs

Q.1. (A) Write short notes on the following: (Any Six): (7.5)
1) SAGE
2) AB-QTLs
3) Gibberellin signaling
4) Real Time PCR
5) HSPs
6) Nod genes.
7) Physical maps

Q.1. (B) Describe the molecular biology of flower development in plants. What are the
different pathways involved in flow flowering. (2.5)

Q.2. (A) Define (Any Ten): (10.0)
1) Intersitial mutagenesis
2) ETR
3) DaT
4) CaM
5) BRI
6) SSCP
7) BLAST
8) ROS
9) SCAR
10) Enhancer trapping
11) DNA Foot printing

Q.2. (B) Discuss the molecular tools available for gene expression studies in plants. (2.5)

Q.3. (A) Differentiate (Any Five): (10.0)
1) Apoptosis and Necrosis
2) SNP and EST
3) Genome Imprinting & DNA methylation
4) TAIL PCR and inverse PCR
5) Inducible & Tissue specific promoters
6) SAG & SARK

Q.3. (B) What are the mechanisms involved in race specific resistance? Explain,
using any one model you have studied. (2.5)

Q.4. Write as directed: (Any Five): (15.0)
1) Describe the significance of Arabidopsis in plant biotechnology. Briefly discuss its
genome constitution.
2) Describe the signaling pathway of resistance towards any one abiotic stress affecting
plants.
3) What is self incompatibility? Describe the molecular mechanisms involved in different
types of incompatibility observed in plants.
4) Briefly describe the molecular mechanism involved in symbiotic nitrogen fixation.
5) What is RNAi? What is its role in Post transcriptional gene silencing? What are its
applications in agriculture?
6) Describe the molecular biology of agrobacterium infection and organization of T-DNA
region.

XXXXXXXX
Q. 1(A) Explain the following terms (ANY FOUR) (4.0)

(i) Molecular Cytogenetics (iv) Ideogram
(ii) B-chromosome (v) Point Mutation
(iii) C-value paradox (vi) Polyploidy

Q. 1(B) What is chromosome banding? Explain various techniques of chromosome banding used in plants. (8.0)

Q. 2(A) Differentiate (ANY FOUR) (6.0)

(i) Chloroplast vs Mitochondrial Genome
(ii) Euchromatin vs Heterochromatin
(iii) FISH vs GISH
(iv) Introns Vs Exons

Q. 2(B) Explain; chloroplasts and mitochondria genome organization in higher plants (7.0)

Q. 3(A) What is artificial chromosome? Explain it by giving suitable example. (6.0)

Q. 3(B) What do you mean by centromere and telomere? Explain the nature of telomere repeats. How the replication of telomere is useful in chromosome healing? (7.0)

Q. 4 Write short notes on (ANY THREE) (12.0)

(i) Sympatric Speciation
(ii) Southern Hybridization
(iii) Cell Cycle
(iv) Flow Cytometry
(v) Micro-dissection
B. A. COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY
ANAND - 388 110
POST GRADUATE ODD SEMESTER END EXAMINATION 2014-15
MICRO 511 : BIOFERTILIZER TECHNOLOGY (1+1)
Date : 16-12-2014 Time : 1000 to 1200 hrs.
Day : Tuesday Marks : 50.00

Answer following questions. Draw neat diagram wherever necessary

Q.1 Fill in the blanks : (5.0)
1. *Rhizobium* forms ............. in ............... plants.
2. Nitrogen fixing bacteria convert atmospheric Nitrogen to ........... by enzyme ..............
3. *Azolla pinnata* is an aquatic fern which harbors BGA named ........... inside its fronds.
4. As per FCO shelf life of carrier based biofertilizer is ........... year
5. .................. is well known aerobic symbiotic Nitrogen fixer
6. Active nitrogen fixing nodules are red in color due to presence of ............... .
7. Biological decomposition or breakdown of organic material by microbes is known as ................

Q.2 Discuss role of Mycorrhizae in agriculture. (5.0)

Q.3 Answer briefly (Any five) : (25.0)
1. Enlist nitrogen fixing microbes with their nitrogen contributions in agricultural crops.
3. Quality control criteria for *Azospirillum* liquid formulation as per FCO.
4. Describe Frankia and its significance in agriculture
5. Composting microbes and their significance in agriculture.
6. Significance of PGPR in present day agriculture
7. Various methods used for Bioremediation of contaminated soil

Q.4 Write short-note (Any three) : (15.0)
1. Enlist various steps in Mass production of PSB.
2. Limitations of carrier based Biofertilizers and advantages of Liquid formulations
4. Importance of *Acetobacter* in Agriculture.
B. A. COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY
ANAND - 388 110
POST GRADUATE ODD SEMESTER END EXAMINATION 2014-15
MICRO 501 : Principles of Microbiology (3+1)
Date : 16-12-2014  Time : 1000 to 1200 hrs.
Day : Tuesday  Marks : 50.00

Answer following questions. Draw neat diagram wherever necessary

Q.1  Give important contribution of following scientists in historical envelopment of microbiology  8
   1. Louis Pasteur
   2. John Tyndall
   3. Robert Koch
   4. Joseph Lister

Q.2  Differentiate structure and function of prokaryotic and eukaryotic cell  8

Q.3  Write on basic principles and techniques used in bacterial classification with use of r-RNA sequencing in classifications  10

Q.4  Write short notes on  10
   1. Graecilicutes
   2. Firmicutes
   3. Tenericutes
   4. Mendoicutes

Q.5  What are viruses? Describe general morphology and structure of phage  7

Q.6  Differentiate flagella from pilli, write on structure and type of flagella  7

-----------------------------XXXXX-----------------------------
Answer following questions. Draw neat diagram wherever necessary

Q.1 Define following plant microbe interaction with examples

   i. Antagonistic ........................................
   ii. Neutralism ........................................
   iii. Symbiotic ...........................................
   iv. Commensalism ......................................
   v. Mutualism ...........................................
   vi. Biosencer ...........................................
   vii. Proteomix.........................................

Q.2 Differentiate endophytic mycorrhizae and bacteria with their role in agriculture

Q.3 Draw and label food chain in soil

Q.4 List different energy flow in ecosystem with role of a biotic factors

Q.5 Use of TGGGE, T-RFLP and DGGE in soil microbial community studies

Q.6 Quorum-sensing in bacteria, flow of signals in response to carbon

Q.7 Impact of transgenic plants on soil biodiversity of microbes

-----------------XXXXXXXXXXXXXXXX-------------------
B. A. COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY
ANAND – 388110

POST GRADUATE SEMESTER (ODD) END EXAMINATION 2014-15
MICRO 510: INDUSTRIAL MICROBIOLOGY (2+1)

Date: 19/12/2014
Day: Friday
Time: 1000 to 1200 hrs.
Marks: 50.00

(Q-1) Define / Explain the following (Any Five):
(1) Industrial Microbiology (3) Biosensors (5) Bioreaching
(2) Upstream processing (4) Antifoam (6) Fermenter

(Q-2) Answer the following with suitable option (Write answers in
answer sheet).

(1) Which of the following organism have NOT been used in various
bioconversions:
(A) Unicellular bacteria (B) Yeasts (C) Actinomycetes (D) Viruses.

(2) Industrial alcohol will be produced by using starter culture:
(A) Top yeast (B) Middle yeast (C) Bottom yeast (D) Feeder yeast

(3) Vitamin B12 can be estimated and determined by using organism:
(A) Lactobacillus sp (B) Bacillus subtilis (C) Lactobacillus leichmanni
(D) E. coli

(4) Batch fermentation is also called:
(A) Closed system (B) Fed-Batch system (C) Open system (D) Sub-merger
system.

(5) A vessel containing all the parts and condition necessary for the
growth of desired microorganisms is called:
(A) Bio reactor (B) Auto reactor (C) Fermenter (D) None of these.

(6) Basic principle in industrial microbiology is / are:
(A) Suitable growth (B) Aseptic conditions (C) Fermentation (D) All of
these.

(7) Raw-material used for the production of alcohol is:
(A) Molasses (B) Starch (C) Sulphite waste water (D) All of these.

(8) The best medium for the production of Streptomycin is:
(A) Nutrient agar (B) Corn steep liquor (C) Sulfite waste liquor (D) Whey.

(9) In the industrial production of streptomycin, the secondary
metabolite or byproducts is:
(A) Vitamin – B12 (B) Vitamin – C (C) Vitamin – B6 (D) Ethanol.

(10) The fungus used in the industrial production of citric acid:
(A) Rhizopus oryzae (B) Fusarium moniliformae (C) Rhizopus nigricans
(D) Aspergillus nigericans.

(P.T.O.)
(11) Industrial Production of Vitamin-B₁₂ is from:
(A) Propionibacterium sp. (B) Pseudomonas sp. (C) Both A and B (D) None of these.

(12) The outstanding example of traditional microbial fermentation product is:
(A) Vinegar (B) Penicillin (C) Citric acid (D) Tetracycline

(13) Vinegar fermentation involves:
(A) Yeasts only (B) Yeasts with lactic bacteria (C) Yeasts with acetic acid bacteria (D) Yeasts with butyric acid bacteria.

(14) The purification and recovery of the production after fermentation is called:
(A) Upstream process (B) Downstream process (C) Surface fermentation (D) None of these.

(15) In the citric acid production, pH to be maintained in the fermenter is:
(A) 7.0 (B) 5.0 to 6.0 (C) 8.0 to 9.0 (D) 1.0 to 6.0.

Q - 3: Write short note on following (Any Four).
1. Basic Steps of SCP production.
2. MEOR.
3. Functions of Vitamin B₁₂.
4. Steps in the mass multiplication of Biofertilizers.
5. Applications of Biosensor.
6. Mode of action of Bacillus thuringiensis.

Q - 4: Explain in detail (Any Two).
1. Fermentation protocol: Penicillin.
2. Fermentation protocol: Citric acid.
4. Schematic & labeled diagram of fermenter with function (importance) of each part.
Answer following questions with diagrams

Q.1 Define following terms: (Any ten) (10.0)
1. ATP
2. Halophiles
3. Osmosis
4. m-RNA
5. t-RNA
6. codons and anticodons
7. transcription
8. ribosomes
9. coenzyme
10. pyrimidines
11. photoautotroph
12. Generation time

Q.2 Write short note on: (Any five) (25.0)
1. Bacterial Growth curve
2. Electron transport chain (ETC)
3. Nutrients requirement of bacteria
4. Bacterial cell structures
5. TCA cycle
6. Glycolysis (EMP)
7. Binary fission
8. Biosynthesis of starch

Q.3 Differentiate between following: (Any five) (10.0)
1. Respiration and fermentation
2. Anabolism and catabolism
3. Spread and streak plate methods
4. Plasmolysis and Plasmopathy
5. Aerobes and Anaerobes
6. Active and passive transport

Q.4 Enlist various environmental factors and describe effect of Temperature affecting bacterial growth. (5.0)
Q. 1. Define “Survey” and Surveillance”, give principles, kinds, objectives and methods of survey.

Q. 2. Enlist different methods of nematode extraction form plant tissue and give detail for Senhorst’s funnel spray technique.

Q. 3. Discuss technique for culturing Pratylenchus spp. on carrot discs method.

Q. 4. Write correct answer for following

(1) Migratory endoparasitic nematodes from roots are extracted by
   (a) Mistifier  (b) Sieving  (c) Elutriator  (d) Two flask

(2) Percent concentration of Phloxin B used for staining is
   (a) 1.5  (b) 0.015  (c) 0.15  (d) 0.20

(3) Percent concentration of Methyl p-hydroxibenzoate used for inhibition of bacterial growth is
   (a) 0.05  (b) 0.5  (c) 0.15  (d) 0.10

(4) All stages of nematodes from soil can be extracted by
   (a) Baermann funnel method  (b) Cobb’s sieving and decanting method
   (c) Senhorst mistifier method  (d) Fenwick can method

(5) The specific gravity of nematodes is
   (a) Equal to specific gravity of water  (b) More than specific gravity of water
   (c) Less than specific gravity of water  (d) Nematode has no gravity

(6) Acid fuchsin is used for
   (a) Staining egg masses of nematodes  (b) Separation of eggs from egg masses
   (c) Staining nematodes in plant tissues  (d) Inactivation of nematodes

(PTO)
B.A. College of Agriculture  
Anand Agricultural University, Anand-388 110  
Post Graduate Odd Semester End Examination-2014-15  
Nema 504: Classification of Nematodes (2+1)  
Date: 20-12-2014  
Saturday  
Time:1000 -1200 hrs  
Marks: 50  

Q. 1. Define the following.  

<table>
<thead>
<tr>
<th>No.</th>
<th>Term</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ecdysis</td>
<td>11. Gubernaculum</td>
</tr>
<tr>
<td>2</td>
<td>Ambifenestrate</td>
<td>12. Spermatheca</td>
</tr>
<tr>
<td>3</td>
<td>Muco</td>
<td>13. Oesophagus</td>
</tr>
<tr>
<td>4</td>
<td>Annules</td>
<td>14. Hemizonid</td>
</tr>
<tr>
<td>5</td>
<td>Basal bulb</td>
<td>15. Diochic</td>
</tr>
<tr>
<td>6</td>
<td>Sexual dimorphism</td>
<td>16. Nerve ring</td>
</tr>
<tr>
<td>7</td>
<td>Bursa</td>
<td>17. Lumen</td>
</tr>
<tr>
<td>8</td>
<td>Cephalic framework</td>
<td>18. Monodelphic</td>
</tr>
<tr>
<td>9</td>
<td>Cyst</td>
<td>19. Epidermis</td>
</tr>
<tr>
<td>10</td>
<td>Molting</td>
<td>20. Cardia</td>
</tr>
</tbody>
</table>

Q. 2. Fill in the blanks

1. The present classification of nematodes is based on ______ and _______ characters.
2. Naming of nematodes is governed by __________ nomenclature.
3. A Taxon described under more than one name is known as _______.
4. Plant parasitic nematodes belongs to the phylum ___________________.
5. Nematode body is covered with _______ secreted by __________.
6. The excretory system of nematodes is without _______ cells.
7. Male sex organs in nematodes are called ____________.
8. Nematodes have _______ juvenile stages.
9. _______ part of nematodes shed at each larval moult.
10. Opening of sub-ventral gland in nematode is in ____________.
11. Location of excretory pore in nematodes is in _______ region.
12. Anguina belongs to the family ____________.
13. The shape of Anguina female body is ____________.
14. Plant parasitic nematodes usually have _______ parts of oesophagus.

(FTO)
Q.1. Answer any Four of the following questions. (10)
1. What do you mean by tolerant variety?
2. How do soil chemicals influence the nematodes?
3. How do inimical plants manage the nematodes?
4. Enlist various parasites of nematodes.
5. How do nematodes spread?

Q.2. Match ‘A’ with appropriate ‘B’ (10)

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barber</td>
<td>Father of American Nematology</td>
</tr>
<tr>
<td>Berkeley</td>
<td>Father of Indian Nematology</td>
</tr>
<tr>
<td>N. A. Cobb</td>
<td>Root-knot on Tea</td>
</tr>
<tr>
<td>Kuhn</td>
<td>Root-knot on Vegetables</td>
</tr>
<tr>
<td>Needham</td>
<td>Ear cockle on wheat</td>
</tr>
<tr>
<td>A. M. Khan</td>
<td>Used CS₂ for nematode control</td>
</tr>
<tr>
<td>Giant cells</td>
<td>Citrus nematode</td>
</tr>
<tr>
<td>Nurse cell</td>
<td>Cyst nematode</td>
</tr>
<tr>
<td>Syncytium</td>
<td>Root-knot nematodes</td>
</tr>
<tr>
<td>Nema wool</td>
<td>Bulb and stem nematode</td>
</tr>
</tbody>
</table>

Q.3. Mention the role of any Four of the followings in nematode management. (10)

1. Sunnhemp
2. Crop rotation
3. Flooding
4. Bacteria
5. Rabbing

Q.4. (A) How does planting time help ecologically in nematode management? (5)
(B) Discuss the role of bulky manures in nematodes management. (5)

Q.5. (A) Classify the nematodes on ecological bases. (5)
(B) What do you know about followings? (5)

1. Senescene
2. Periwinkle
3. Anoxybiosis
4. Tannins
5. Terthiyony

---x---
ANAND AGRICULTURAL UNIVERSITY
B. A. COLLEGE OF AGRICULTURE
ANAND
PG Odd Semester End Exam 2014-15

Course No: Nema. 602
Course Title: Current Topics in Nematode Disease Development and Host Resistance (2+1)

Date: 19/12/2014 Time: 10 to 12 hrs
Friday Marks: 50

Q.1. Answer any Four of the following questions.

1. How do nematodes play roles in nematode-fungi pathogenesis?
2. Mention the role of nematodes enzyme in pathogenesis.
3. What do you know about molecular mechanism of resistance?
4. What is passive resistance?
5. Mention different types of reaction of host plants to nematodes.

Q.2. What do you know about followings? (Answer any Five).


Q.3. Answer any Two of followings questions.

1. What will be the requirements to start breeding for nematode resistance?
2. Enlist various mechanisms of resistance exist in plants against nematodes.
3. Mention the role of nematodes in disease complexes.

Q.4. Differentiate followings. (Answer any Four)

1. Nurse cell and Syncytium
2. Resistant and Immune variety
3. Pre and Post infectional resistance
4. Endo and Ecto-parasite
5. Biocide and Nematicide

Q.5. Answer any Four of followings questions in short.

1. What do you know about hybrid and transgenic plants?
2. How do nematodes affect the physiological activities of the plants?
3. Enlist different types of associations between nematodes and other microbes.
4. Which variety/varieties of bidi tobacco and tomato are resistant to root-knot?
5. What do you know about nematode and arthropod aggravation?
6. How molecular approaches will be helpful in nematode management?
B. A. COLLEGE OF AGRICULTURE  
ANAND AGRICULTURAL UNIVERSITY, ANAND-388 110  

POST GRADUATE ODD SEMESTER END EXAMINATION: 2014-15  
PL. PATH 602: Advanced Virology (2+1)  

Date: 26.12.2014  
Day: Friday  
Time: 1000-1200 hrs.  
Marks: 50

Note: 1. Figures to the right indicate marks.  
2. Give suitable figures and examples wherever necessary.

Q. 1. (A). Define/ explain any ten of the following:  
   i). Virus  
   ii). Prions  
   iii). Genomics  
   iv). Antibodies  
   v). Proteomics  
   vi). Viroids  
   vii). PCR  
   viii). Vector  
   ix). Nucleotides  
   x). mRNA  
   xi). SDS PAGE  
   xii). Transgenic plants

(B). Define immunodiagnostics. Discuss the use of monoclonal antibodies in identification of viruses and their strains.  

Q. 2. (A). Discuss briefly the protein and nucleic acid based techniques of detection of plant viruses. Discuss any one in detail.  

(B). Write short notes on any three of the following:  
   i). Replication and multiplication of plant viruses  
   ii). Satellite viruses and satellite RNA  
   iii). Genome organization of viruses  
   iv). Hybridoma technology

Q. 3. (A). Discuss the plant virus and insect vector relationship and transmission of the viruses by vectors.  

(B). Discuss Immunoglobulin structure and its functions.  

(C). Give the importance of transgenic plants. Discuss briefly genetically engineered resistance in plants for virus resistance.
Q. 1. Write briefly on the important contribution of following scientists. (10.0)
   i. Beadle and Tatum
   ii. P.A. Micheli
   iii. E.M. Fries
   iv. L.R. Tulasne
   v. A.F. Blakeslee
   vi. P.A. Saccaro
   vii. S.D. Garrett
   viii. C.H. Persoon
   ix. Fuckel
   x. Van Sterbeeck

Q. 2. Give an outline classification of fungi upto phyla. (3.0)

Q. 3. What are the main characteristics of fungi? Describe nutrition, thallus and cellwall of fungi. (4.0)

Q. 4. Write short notes on following (Any five). (10.0)
   1). Characteristic features of Saccharomyeota
   2). Aspergillosis
   3). Genera Erysipheae and Podosphaera
   4). Planogametic copulation
   5). Parasexual cycle
   6). 9 + 2 structure of flagellum
   7). Somatogamy

Q. 5. Describe the morphological characters of following phylum. (9.0)
   i. Chytridionyeota
   ii. Ascomycota
   iii. Basidiomyeota

Q. 6. Name four sex hormones and their producer organisms. Describe hormonal regulation of sexual reproduction in any two of them. (6.0)

Q. 7. What are the distinguishing features of phylum Zygosomyeota? Give its classification into subphyla and orders. (3.0)

Q. 8. What is heterokaryosis? Describe its establishment (formation) and significance. (5.0)
B. A. College of Agriculture  
Anand Agricultural University, Anand  
Post Graduate ODD Semester End Examination: 2014-15  
Pl.Path. 501: Mycology (2+1)

Date: 16.12.2014  
Time: 10.00 to 12.00 hrs.  
Marks: 50

Note: 1. Figures to the right indicate marks.  
2. Draw neat, clean and labeled diagrams/figures wherever necessary.

Q.1  (A) Define / Explain the following terms (Any FIVE). [5]

(i) Dolipore septum  (v) Mycorrhizae  
(ii) Anamorph  (vi) Stromata  
(iii) Dicyospore  (vii) Mycelia sterilia.  
(iv) Sterigmata

(B) Write the important contributions of the following scientists in the field of Mycology (Any FIVE). [5]

(i) CJ Alexopoulos  (v) JH Craigie  
(ii) EM Fries  (vi) Pontecorvo and Roper  
(iii) MS Woronin  (vii) Anton de Bary.  
(iv) AF Blakesle


(i) Draw and labeled different stages in ascus formation.  
(ii) Name three poisonous species of Amanita.  
(iii) Draw and labeled different stages in development of basidium.  
(iv) Name the four types of zoospores, based on nature and location of flagella.  
(v) Distinguish between three types of ascomata.  
(vi) Enlist the types of life cycles in rust with examples.

(B) Characterize the following (Any THREE). [6]

(i) Family Taphrinaceae  (iv) Genus Saccharomyces  
(ii) Genus Albugo  (v) Phylum Glomeromycota.  
(iii) Genus Rhizopus

Q.3  (A) Differentiate the following (Any THREE). [6]

(i) Holocarpic thallus and Eucarpic thallus  
(ii) Unitunicate ascus and Bitunicate ascus  
(iii) Aspergillus and Penicillium  
(iv) Pythium and Phytophthora  
(v) Sexual cycle and Parasexual cycle.

(B) Describe the diagnostic features of downy mildew genera. [4]

OR

What are the characteristic features of conidia of powdery mildews? Give key to classify family Erysiphaceae into genera. [P.T.O.]
Q.4 (A) Answer of the following (Any FIVE).

(i) Why are Phytophthora and other Oomycota not true fungi?
(ii) Write about Saccardon system of spore group.
(iii) What are the three sections of Alternaria species?
(iv) Give the diagnostic features:
   (1) Rhizoctonia (2) Phomopsis (3) Bipolaris.
(v) Write taxonomic position up to family:
   (1) Glomus (2) Tuber (3) Pilobolus.
(vi) Mention the teleomorph:
   (1) Pyricularia (2) Ascochyta (3) Nigrospora.
(vii) State the causal organism and mention their classification (class and order only):
   (1) Karnal bunt of wheat (2) Flag smut of wheat
   (3) Smut of bajra.

(B) Fill in the blanks.

(i) __________ genus of fungi is a vector of virus and it belongs to Phylum __________.
(ii) Cell wall of Oomycetes fungi is made up of __________.
(iii) The first book on mycology, Theatrum Fungorum was written by __________ in 1675.
(iv) In fungal pathogen nomenclature, the 'class and 'subclass' ends with a suffix __________ and __________ respectively.
(v) Pleurotus sajor-caju is commonly known as __________ mushroom.
(vi) __________ is a cellulose-degrading fungus, growing on wet paper, fabrics and other cellulose-rich materials.
(vii) The fungus __________ is known as nematode trapping fungi or nematophageous fungi.
(viii) Plasmodiophora brassicae causes __________ disease of crucifers.

X-X-X-X-X
Q.1 Describe the symptoms and causal organism of the following diseases (Any Seven) (21)

(i) Antracose of grapes
(ii) Apple scab
(iii) Citrus "gummosis"
(iv) Mango malformation
(v) Black spot of rose
(vi) Sigatoka disease of banana
(vii) "Fusarium yellows" disease of gladiolus
(viii) Alternaria blight of marigold

Q.2 Discuss measures that may be adopted in minimizing following diseases (Any Seven) (14)

(i) Marigold Damping-off
(ii) Rust of pear
(iii) Botrytis blight of gladiolus
(iv) Powdery mildew of grapes
(v) Antracose of mango
(vi) Root rot of papaya
(vii) Botrytis blight of rose
(viii) Peach scab
(ix) "Yellows" disease of gladiolus

Q.3 Answer the following in short (8)

(i) Describe the disease cycle of apple rust.
(ii) Why basal stem rot of coconut is also known by "Thanjavur wilt".
(iii) Give the favourable conditions for apple scab.
(iv) Differentiate powdery and downy mildew of grapes.
(v) Why pre-harvest spray of fungicides is applied for the management of post-harvest disease.
(vi) Give the favourable conditions for Peach brown rot Blossom.
(vii) Describe the disease cycle of powdery mildew of grapes.
(viii) Suggest effective fungicides (with concentration) for "Botrytis Blight" of rose.

(P.T.O.)
Q.4 Fill up the blank

(i) Fusarium yellow disease of gladiolus is also known as ______________ and ______________.

(ii) Antracnose of grape is also known as ______________.

(iii) The lesions on the mango fruit surface as ______________ patterns are common in antracnose disease.

(iv) Black rot disease of pear is also called ______________.

(v) Downy mildew of grapes can effectively manage by spraying with ______________ fungicide.

(vi) ______________ is the alternate host of apple rust.
Q. 1. (A). Define/ explain any ten of the following:
   i). Virus  
   ii). Viroid
   iii). Prion  
   iv). Phytoplasma
   v). Purin base 
   vi). Pyrimidine base
   vii). Antibodies  
   viii). Cell inclusion bodies
   ix). Nucleotides  
   x). Genomics
   xi). mRNA  
   xii). RNA silencing

   (B). Give the historical development and contributions of scientists in the field of Plant Virology. (6.0)

Q. 2 (A). Give the different protein and nucleic acid based methods of detection of plant viruses. Describe any one in detail. (6.0)

   (B). Write short notes on any two of the following: (6.0)
   i). Mechanical inoculation of plant viruses
   ii). Physiological changes in virus infected plants
   iii). Economic importance of plant viruses.

Q. 3 (A). Give a detailed account of infection of viruses in the plants. Describe the locations of seed borne viruses in the seeds. (6.0)

   (B). Discuss plant viruses and insect vectors relationships. Give a critical account of transmission of plant viruses through insect vectors. (7.0)

Q. 4 (A). Give the significance of symptoms in identification of plant diseases. Describe critically the symptoms i.e. changes in colour and morphology of plants due to viral diseases. (7.0)

   (B). Give different methods of management of viral diseases of crop plants. (6.0)

XXXXX
Post-Graduate Odd Semester End Examination-2014-15
Pl. Path. 509 : Diseases of Vegetables and Spices Crops (2+1)

Date: 17-12-2014  Time: 1000 to 1200 hrs.
Day: Wednesday     Marks: 50.00

Note: 1. Draw neat, clean and labeled diagrams/figures wherever necessary.
2. Figures to the right indicated marks.

Q.1. State the name of causal organism and describe the characteristic symptoms of below mentioned diseases (Any Five).
   1. Anthracnose of chilli
   2. Purple blotch of onion
   3. Damping off of vegetables
   4. Little leaf of brinjal
   5. Black rot of cabbage
   6. Yellow vein mosaic of okra

Q.2. State the name of causal organism and mention effective management strategies for control of below mentioned diseases (Any Five).
   1. Powdery mildew of cucurbits
   2. Rhizome rot of ginger
   3. Cumin blight
   4. Downy mildew of crucifers
   5. Brown rot of potato
   6. Damping off of fennel

Q.3. (A) Draw systemic, labeled diagram of disease cycle of late blight of potato and describe it in detail with history behind Irish famine. (10.0)

   (B) State the four steps of predication model for outbreak of late blight of potato. (3.0)

Q.4. State the favorable climatic conditions, primary source of inoculum and secondary spread of following diseases under field condition. (Any Five).
   1. Phomopsis fruit rot of brinjal
   2. Downy mildew of onion
   3. Colletotrichum leaf spot of turmeric
   4. Wilt of cumin
   5. Neck rot of garlic
   6. Sclerotium rot of potato

Q.5. (A) Differentiate between following.
   1. Smudge AND Black mold of onion
   2. Black leg AND Club root of cabbage

   (B) State the name of causal organism of following diseases. (5.0)
   1. Foot rot of black pepper
   2. Stem rot of fennel
   3. Downy mildew of fenugreek
   4. Powdery scab of potato
   5. Ring spot of cabbage
   6. Rust of bean
   7. Neck rot of garlic
   8. Leaf blight of carrot
   9. Leaf blotch of potato
   10. Leaf spot of fenugreek

@@
Q. 1. (A). Define/ explain any ten of the following: (6.0)

i). Biocontrol
ii). Cellulases
iii). Ecological Niche
iv). Hyperparasitism
v). Biotic stresses
vi). Glucanases
vii). Antagonism
viii). Mycorrhiza
ix). Rhizosphere
x). Antibiosis
xi). Soil inhabitants
xii). Chitinases

(B). Discuss different types of biological interactions existing in an agro-ecosystems. Mention the interactions used in developing biological control of soil borne plant pathogens/ diseases. (6.0)

Q. 2. (A). Write short notes on any two of the following: (6.0)

i). Factors governing the success and failure of biological control of plant pathogens
ii). Systemic Resistance in plants due to bioagents
iii). Biological control in IDM, IPM and organic farming system.

(B). Give the methods of evaluation of antagonists for biocontrol of fungal pathogens. Discuss any one method in detail. (7.0)

Q. 3 (A). Give mode of action of *Trichoderma* spp. in management of plant pathogens/ diseases. (7.0)

(B). Discuss mass multiplication and commercial production of fungal and bacterial bioagents. Discuss commercial production of *Trichoderma* spp. in detail. (6.0)

Q. 4. (A). Give delivery system of bioagents for disease management in crops. Mention commercial biopesticides used in IPM. (6.0)

(B). Give the importance and principles of plant disease management with bioagents citing the suitable examples. (6.0)
Q.1 Explain the following terms. (9.00)

(I) Antagonism  (II) IDM  (III) Biological control  (IV) Phytotoxicity
(V) Antisporulant  (VI) Inoculum  (VII) Antagonist  (VIII) Immune
(IX) Fungistate

Q.2 Explain the following. (6.00)

(1) Role of field and plant sanitation in IDM
(2) Mode of action of *Trichoderma* spp.
(3) Method of preparation for NSKE
(4) Mycoherbicides

Q.3 Plant disease management is required because. (8.00)

Q.4 Write integrated disease management for the following diseases. (Any four). (8.00)

(A) Damping-off in vegetable nursery
(B) Tomato leaf curl virus disease (TLCV)
(C) Little leaf of Brinjal
(D) Loose smut of Wheat
(E) Anthracnose of chilli

Q.5 Write classification of fungicides based on their mode of action with suitable example. (5.00)

Q.6 Write the role of (1) Exclusion of inoculum (2) Eradication of inoculum in IDM. (8.00)

Q.7 Write short note. (6.00)

(1) Mass production technology of fungal bio-control agent.
(2) Compound interest disease and simple interest disease.
(3) Disease triangle.
<table>
<thead>
<tr>
<th>Q.1</th>
<th>Define the following terms (Any Six) (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Plant Physiology</td>
</tr>
<tr>
<td>2.</td>
<td>Bioregulent</td>
</tr>
<tr>
<td>3.</td>
<td>Plant hormone</td>
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<tr>
<td>4.</td>
<td>Vitamins</td>
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<tr>
<td>5.</td>
<td>Parthenocarpy</td>
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<tr>
<td>6.</td>
<td>Florigen</td>
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<tr>
<td>7.</td>
<td>Apical dominance</td>
</tr>
<tr>
<td>8.</td>
<td>Parthenocarpy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q.2</th>
<th>Answer in details (Any three) (12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Write the history and biosynthetic pathways of gibberellins.</td>
</tr>
<tr>
<td>2.</td>
<td>Describe the Acid growth theory of auxins.</td>
</tr>
<tr>
<td>3.</td>
<td>Described the Physiological role of ethylene in growth and development.</td>
</tr>
<tr>
<td>4.</td>
<td>What are the role of gibberellins in plant growth and development and its distribution in plant?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q.3 (A)</th>
<th>Answer the following (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Describes the types of vitamins with their occurrence in plants.</td>
</tr>
<tr>
<td>2.</td>
<td>What is bioassay? What are the bioassays of ABA?</td>
</tr>
<tr>
<td>3.</td>
<td>List out the commercial plant growth regulators available in the market</td>
</tr>
<tr>
<td>4.</td>
<td>How does cytokines play roles in senescence?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(B) state the molecular/chemical formula of the followings (Any four) (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. NAA</td>
</tr>
<tr>
<td>2. 2,4-D</td>
</tr>
<tr>
<td>3. GA3</td>
</tr>
<tr>
<td>4. Zeatine</td>
</tr>
<tr>
<td>5. IBA</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Q.4</th>
<th>Answer the following in brief (10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Enlist synthetic ethylene available in market.</td>
</tr>
<tr>
<td>2.</td>
<td>Write the major precursor of Auxins and its biosynthetic path way.</td>
</tr>
<tr>
<td>3.</td>
<td>Role of ethylene in fruit ripening.</td>
</tr>
<tr>
<td>4.</td>
<td>Write the name of anti gibberellins.</td>
</tr>
<tr>
<td>5.</td>
<td>How does ABA play a role under water stress condition?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q.5 A</th>
<th>Answer in one words (Any six) (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Rooting hormone</td>
</tr>
<tr>
<td>2.</td>
<td>de-novo synthesis of α amylase activity</td>
</tr>
<tr>
<td>3.</td>
<td>Flowering in pineapple</td>
</tr>
<tr>
<td>4.</td>
<td>Ripening hormone</td>
</tr>
<tr>
<td>5.</td>
<td>Chlorophyll retaining hormone</td>
</tr>
<tr>
<td>6.</td>
<td>Foolish seedling of rice</td>
</tr>
<tr>
<td>7.</td>
<td>Precursor of ethylene biosynthesis.</td>
</tr>
</tbody>
</table>

| B     | Write the importance of PGR's in horticultural crops. (4) | *** |
Q1. Define (Any Eight):
   i. Stroma  vi. Apposition
   ii. Osmosis  vii. Apical dominance
   iii. Matric potential  viii. Phytohormones
   iv. Field capacity of soil  ix. Ageing
   v. Cytoplasmic streaming  x. Night break phenomenon

Q2. Enlist the following (Any Two)
   a. Major processes involved in flowering in plants
   b. Critical stages of the life cycle of annual flowering plants
   c. Classification of plants based on photoperiod requirement.

Q3. What are plant growth hormones? Name the major categories and briefly describe each of the groups with its commercial applications

OR

Describe the process of photosynthesis in detail.

Q4. Differentiate (Any Four)
   i. Prokaryotes and Eukaryotes
   ii. Photoperiodism and Vernalization in plants
   iii. Drought and Physiological drought
   iv. Differentiation and Development
   v. Transpiration & Guttaion

Q5. Give reasons: (Any Four)
   a. If a straight growing seedling is kept on a wet block and illuminate from up, shoot will bend towards light source.
   b. Tender leaves if cut and kept for some times show severe symptoms of wilting.
   c. Glycophytes if grown under saline conditions cannot absorb water from its environment.
   d. Chloroplasts and mitochondria are considered as microcells within the cells.
   e. Clipping of the tip portion of the plant is a regular practice in tobacco cultivation

Q6. Describe the most accepted structure of plasma membrane of plant cells

OR

Give a detailed account of the process of respiration in plants.

Q7. Write short notes: (Any Two)
   1. Growth curve
   2. Anti-transpirants
   3. Dormancy

****
B.A. COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY
ANAND-388 110

Post Graduate Odd Semester End Examination-2014-15
Pl. Phy. 506 : Physiology of Growth and Yield and Modeling (1+1)

Date : 16-12-2014
Time : 1000 to 1200 hrs.
Marks : 50

Tuesday

Q.1 (A) Define the following terms (Any Seven). (7.0)

(1) Crop physiology (6) Photosynthetic partitioning
(2) Radiation use efficiency (7) Plant ideotype
(3) Harvest index (8) Ripeness to flower
(4) Determinate plant (9) Plant growth analysis
(5) Empirical models

(B) Write full form and give the formula with their unit of measurement for the following growth indices. (8.0)

(1) LAI (3) LAD (5) LAR (7) AGR
(2) RGR (4) CGR (6) NAR (8) BMD

Q.2 (A) Differentiate between the following. (8.0)

(1) Growth and Development
(2) Photoperiodism and Vernalization
(3) Short day plant and long day plant
(4) Symplast and Apoplasm

(B) Write short note on (Any Four) (12.0)

(1) Sigmoid growth curve
(2) Crop stimulation models
(3) Significance of photoperiodism
(4) Measurement of biomass production
(5) Phloem loading and unloading

Q.3 Answer the following in brief (Any Six). (15.0)

(1) Enlist the principle events of reproductive differentiation.
(2) Enlist the factors affecting the plant growth and productivity.
(3) Explain the photosynthetic partitioning during grain filling.
(4) Give the types of plant ideotype and characteristics of ideotypes.
(5) What is an Empirical model?
(6) Enlist the significances of crop growth models.
(7) Explain in brief the different models applied in agriculture.
B. A COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY, ANAND 388110

POST GRADUATE ODD SEMESTER END EXAMINATION-2014-15
Pl. Phy. 507 : GENOME ORGANIZATION IN HIGHER PLANTS (2+1)

Date: 16-12-2014 Time: 1000-1200 hrs
Day: TUESDAY Marks: 50

Note: Draw labeled figures / diagrams wherever necessary

Q1. Define (Any Eight):
   i. Polyploids
   ii. Gene
   iii. tRNAs
   iv. Genome
   v. Frameshift mutation
   vi. Operon
   vii. TATA box
   viii. Attenuation
   ix. Insertion sequences
   x. Suppressor tRNAs

8.0

Q2. i. Mechanism of transposition
    ii. Structure, function and role of RNA polymerases.

4.0

6.0

Q3. Explain the process of translation with emphasis on initiation and termination.

8.0

OR

Q4. Differentiate (Any Four)
   i. Prokaryotes and Eukaryotes
   ii. Tetraploids and Autoptetraploids
   iii. Promoters and Terminators
   iv. mRNA and tRNA
   v. Replicative and Non-replicative transposition

8.0

Q5. Describe the genome organization and regulation of gene expression in mitochondria and chloroplast.

OR

What is genetic code? Enlist its characteristics and describe the degenerative property with example.

Q6. Write short notes: (Any Two)
   i. Transcription factors
   ii. Structure and function of transposable elements
   iii. Replication of DNA

8.0

***
Q.1 Define/Explain (ANY FIVE) :

1. Halophytes
2. Acid soil
3. Phytochelatins
4. Transpiration
5. Salinity
6. Chilling stress

Q.2 Write short notes (ANY THREE) :

1. Chilling injury
2. Water potential in Soil-Plant-Atmosphere Continuum (SPAC)
3. Basic principles of a crop improvement programme under stress
4. Reactive Oxygen Species (ROS)

Q.3 Explain the following (ANY THREE) :

1. Effect of high temperature stress on photosynthetic apparatus
2. Role of ABA under water stress conditions
3. Salt tolerance in Glycophytes and Halophytes
4. Effect of chilling stress on physiological processes

Q.4 What is stress? Enlist the types of abiotic stresses and discuss any one which you consider the most important.

Q.5 What is drought? Describe the effects of drought on plants.
B.A. COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY
ANAND 388 110

POST GRADUATE ODD SEMESTER END EXAMINATION-2014-15
Pl. Phy. 606 : Post Harvest Physiology (2+0)

Date: 23-12-2014
Day: Tuesday
Time: 10.00 to 12.00 hrs.
Marks: 50.00

Q.1 Define / Explain (Any five)

1. Ageing
2. Active packing
3. Vase life
4. Physiological maturity
5. Senescence
6. Nano composites

Q.2 Write short notes (Any three)

1. GM crops
2. Controlled Atmosphere Storage
3. Modified Atmosphere Packing (MAP)
4. Biochemical changes during seed development

Q.3 What is ethylene? Describe the physiological effect of ethylene in post harvest life of fruits and vegetables.

Q.4 Explain the environmental factors influencing post harvest life of flowers, vegetables and seeds.

Q.5 Explain the following

1. Photosynthesis and senescence
2. Biodegradable packing
3. Role of preservatives in post harvest life of flowers

Q.6 Write alternate post harvest methodology and quality attributes for rose.
### B. A. College of Agriculture
Anand Agricultural University, Anand

**Postgraduate Odd Semester End Examination-2014-15**
**SOILS 513: Management of Problematic Soils and Water (2+1)**

**Date:** 23/12/2014  
**Time:** 10.00 to 12.00 hrs  
**Marks:** 50

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Attempt any five Questions from the following  

\[ (10 \times 5 = 50 \text{ Marks}) \]

Q. 1  
\[ (2+3+5 = 10) \]

a. What are the theories to describe the structure of atom?

b. Briefly describe the term: Isotopes, Isobars and Isotones in respect to nuclear structure of atoms

c. Describe the principals and rules of nuclear stability

Q. 2  
\[ (2+5+3 = 10) \]

a. What is radioactivity?

b. Establish the equation \( (\tau = 0.693/\lambda) \) through principle of radioactive decay rate and half lives.

c. What are the units of radioactivity and state the relationship among them

Q. 3  
\[ (2+5+3 = 10) \]

a. What is the oldest and simplest detector for measuring nuclear radiation? Give its principle of working.

b. Describe the principle of scintillation counter and mention consecutive events occurs during the radioactive measurement in scintillation counter

c. Mention what are chief advantages of scintillation counter

Q. 4  
\[ (2+3+5 = 10) \]

a. Give some important example of stable isotopes used in tracer techniques with importance of its application.

b. Mention the advantages of stable isotopes over radioactive isotopes

c. For which radioactive particle, liquid scintillation counter is generally preferred? Describe components and working principle of liquid scintillation counter.
Q. 5
a. Define RAD (Radiation Absorption Doses) and give its importance.
b. What are the factors which determine relative danger of radioactivity?
c. Describe safe working or handling methods with nuclear radiation

Q. 6
a. Which instrument is used for analyzing stable isotope in tracer studies? Why GM counter cannot be used?
b. Describe the principle of Isotope dilution techniques
c. How nuclear techniques can be used for pest control?

Q. 7 Describe following Concepts
a. Mass Defect
b. Autoradiography
c. Isotopic trace
d. Photomultiplier tube

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B. A. COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY, ANAND - 388 110
POST GRADUATE ODD SEMESTER END EXAMINATION 2014-15
SOILS 601 - Advances in Soil Physics (2+0)
Date : 24-12-2014 Time : 1000-1200 hrs.
Day : WEDNESDAY Marks : 50.00

Q-1 A Define the following terms : (10.0)
1. Soil water potentials
2. Water holding capacity
3. Entropy
4. Tortuosity
5. Hydraulic gradient
6. Hydraulic Conductivity
7. Infiltrability
8. Specific heat
9. Soil conditioner
10. Albedo

Q-2 Do as directed (Any six) (12.0)
1. Enlist the different method for measurement of soil water content
2. Factors affecting permeability or hydraulic conductivity of a saturated soil
3. Enlist the factor affecting the infiltration rate.
4. Enlist the practices reducing the development of soil crusts or minimizing their negative impacts.
5. Enlist the physical limitation of puddle soil
6. Give the classification of Soil Pores
7. Important features of remote sensing techniques
8. Utility of Soil Water Potential Concept:

Q-3 Write down the following short notes (Any four) (12.0)
1. Describe the Darcy’s law and its limitation
2. Describe the Zone of the typical moisture profile during infiltration.
3. Describe theory of the movement of salts/nutrient from soil to root
4. Describe the Soil-Plant-Atmosphere Continuum (SPAC)
5. Describe the law of thermodynamics
6. Describe the nutrient mobility within the plant and soil

Q-4 Differentiate the followings (Any two) (6.0)
1. Kinetic energy and potential energy
2. Active transport and Passive transport
3. Comparison of water flow in saturated soil and that in unsaturated

Q-5 A Calculate the mass water content, volume water content and determine the amount of water in mm using following observations. (1) Soil depth 30 cm, (2) Bulk density = 1.4 Mg m\(^{-3}\) (3) Weight of wet soil sample + container = 110 gm (4) Weight of oven dry soil sample + container = 95 gm (5) Weight of empty container = 35 gm

B Calculate the volume of water content in meter cube present in the root zone (1 m depth) of one hectare (10000 m\(^2\)) soil having 20 % mass water content and 1.4 Mg m\(^{-3}\) BD.
Q.1 (A): Fill in the blanks ................................................................. (5.0)

1. Biological functions in soil depends on _________ and _________ condition of soil.
2. _________ analysis is rapid; while, _________ analysis is expensive methods of soil fertility evaluation.
3. Generally, samples are collected from _________ layer of the soil.
4. Walkley and Black method can be used to determine _________ in soil.
5. _________ extractant can be used to evaluate available Ca from soil.
6. Critical limit for exchangeable K in soil is _________
7. Deficiency of _________ showing interveinal chlorosis in plant.
8. Mesophilic composting carried out at _________°C
9. _________ is a highly decomposed organic matter.
10. Potassium required (absorbed) up to harvesting stage by the crop, like _________ (N or P)

Q.1 (B): Choose the most correct answer ................................................................. (5.0)

1. The most deficient nutrient in Indian children is
   (A) N    (B) K    (C) S    (D) Zn
2. The most deficient secondary nutrient in Gujarat soils is
   (A) S    (B) Zn    (C) Fe    (D) Ca
3. In relation to heavy texture soil, light texture soil is _________ in weight
   (A) Light    (B) Heavy    (C) Equal    (D) None
4. Extractant for evaluation of micronutrient from soil is
   (A) 0.05M DTPA (pH 7.3)    (B) 0.005M DTPA (pH 3.7)    (C) Any one    (D) None
5. Interverinal chlorosis in plant
   (A) N deficiency in lower leaves    (B) Zn deficiency in middle leaves
   (C) S deficiency in upper leaves    (D) None
6. Biological function of soil depends on
   (A) Physical condition of Soil    (B) Chemical condition of Soil
   (C) Both (A)&(B)    (D) None
7. Concept of Soil property is/ are
   (A) Soil Fertility    (B) Soil Productivity    (C) Both (A) & (B)    (D) None
8. Inherent fertility
   (A) Permanent fertility    (B) Temporary fertility
   (C) Permanent productivity    (D) Temporary productivity
9. Mobile nutrient in plant is/ are
   (A) N    (B) P    (C) Both (A) & (B)    (D) None
10. Five ppm Zn means
    (A) 0.05% Zn    (B) 0.005% Zn    (C) 0.0005% Zn    (D) None

(PTO)
Q.2: Justify the statement .......................................................... (10.0)
1. The Ca deficiency symptom shows on younger leaves (top of plant).
2. Use of basic slag is not advisable in Gujarat.
4. The manure of young animals is not so rich like old ones.
5. The entire quantities of P fertilizer should be preferred as basal application.
6. Green manure crop should have a deep root system.
7. Fertile soil may or may not be productive soil.
8. The manures from bullocks (generally) contain more nutrients as compared to milch cow.
9. Green manuring reduces the soil loss caused by runoff and erosion.
10. The application of Murrate of Potash is advisable along with organic matter in alkaline soil.

Q.3: Define / Explain .............................................................. (6.0)
1. Balanced fertilization
2. Complex fertilizers
3. Intercellular chlorosis
4. Bio fertilizer
5. Agronomic efficiency
6. INM

Q.4: Answer the following (Any Four) ......................................... (8.0)
1. List the factors affecting mineralization and discuss any one
2. List the factors responsible for decline in productivity and discuss any one
3. Short note on C:N ratio of the organic material
4. Discuss SSNM approach
5. Advantages of foliar application

Q.5: Discuss the following (Any Two)........................................ (6.0)
1. Discuss nitrification in soil
2. Discuss concept of STCR approach and its limitations
3. Precaution for the use of bio fertilizers

Q.6: Calculate the following ........................................................ (10.0)
1. How much DAP (18-46-0), Urea (46% N), Gypsum (15% S) and Potassium Sulphate (50% K & 17% S) required supplying 60-60-30-20 N-P2O5-K2O-S kg ha⁻¹ as basal dose to wheat cropping.

2. Give the procedure / steps for estimation of micronutrients from soil sample and calculate the Zn content (ppm) in a given sample of light textured soil. The reading of sample on AAS was 0.72 ppm with 0.27 ppm blank value.

... X ...


Q. 1 Define the following:  
(1) Sewage Sickness  
(2) Heavy metals  
(3) Pollution  
(4) Eutrophication  
(5) Phytoremediation  
(6) Bioremediation  

Q. 2 Fill in the blanks with most suitable answer:  
(1) Phosphetic fertilizers add _______ and _______ (heavy metals) to soil.  
(2) The acid rain is a cocktail of _______ and _______ acid.  
(3) Itai-itai and mina mata disease in human beings is due to _______ and _______ heavy metals respectively.  
(4) EPA phytotoxic limit for Cd and Zn in plant are _______ and _______ respectively.  
(5) In wet oxidation employs oxidizing acids _______ tri-acid mixture or _______ di-acid for heavy metals analysis of plant.  
(6) Sulphate and Boron from water samples are determine by _______ and _______ method respectively.  

Q. 3 Differentiate the following (Any three):  
(1) Geogenic and Anthropogenic pollution  
(2) Microbiological decomposition and chemical decomposition  
(3) Advantages and limitation of phytoremediation  
(4) Advantage and disadvantage of bioremediation  

(P.T.O.)
Q.4 Write short notes (Any three):

(1) Nitrate toxicity
(2) Use of sewage water for irrigation
(3) Fertilizer related pollution management
(4) Global pools and Fluxes of Green house Gases

Q.5 Answer the following as directed (Any Five):

(1) What is soil pollution? Discuss sources of soil pollution and its control.
(2) Explain effect of air pollution and control of air pollution in details.
(3) Enlist reaction of pesticides in soil and explain any three reactions in details.
(4) Explain environmental pollution due to heavy metals.
(5) Write detail method for analysis of micronutrients/heavy metals from soil OR Plant samples.
(6) Write detail method for determination of BOD OR COD from effluent or sewage water sample.
(7) What is water pollution? Explain management of water pollution.
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Post Graduate Odd Semester End Examination: 2014-15
Soils 512: System Approaches in Soils and Crop Studies (2+1)

Date : 19/12/2014  Time : 1000 to 1200hrs
Day : Friday  Marks : 50

Q-1(A): Fills up the blanks  (5)

1) ____________ explain not only the relationship between weather parameters and yield but also the mechanism of the model.
2) ____________ is a set of interacting or interdependent components forming an integrated whole.
3) ____________ concerned with building the model right, while ____________ concerned with building the right model.
4) ____________ are maps or graphical representations of a process which are uses special shapes to represent different types of actions or steps in a process.

Q-1 (B): Write the full form of the following  (5)

1) DBMS  2) SWAT  3) ERM  4) DSS  5) IBSNAT

Q-2: Write short note (Any Three)  (15)

1) The role of crop systems simulation in agriculture
2) Mathematical model and its classification
3) Enlist types of model and discuss in details
4) Decision support system for agro technology transfer (DSSAT)

Q-3: Answer the following  (15)

1) Flow chart, symbols and their usage
2) Application of science system thinking
3) Enlist of crop simulation models for important crops
4) Verification of Simulation Model
5) Benefit of simulation modeling and analysis

Q-5: Define/Explain the following  (10)

1) Uses of WEEP model  4) Pseudo code
2) Data modeling  5) System thinking
3) GIS implementation

X@X@X
Q.1 Define / Explain following terms (Any Five)  

(1) Soil  
(2) Salinization  
(3) Ammonification  
(4) Humans  
(5) milli - equivalent  
(6) CEC  
(7) Buffering capacity of soil  

Q.2 (A) Calculate % base saturation, % base unsaturation, amount of Ca in kg/ha and lime requirement of the soil, which has  

(1) CEC=30 meq/100g  
(2) Exch. Ca=14 meq/100g  
(3) Exch. Mg=8 meq/100g  
(4) Exch. K=1 meq /100 g  
(5) Exch. Na=3 meq/100 g  

(B) A soil possess CEC=30 meq/100g and ESP=30, we want to reduce this ESP to 10. So how much gypsum is required to be added?  

Q.3 (A) Fill in the blanks  

(1) According to salinity hazard of irrigation water C2 and C3 class values are________ and________, respectively.  
(2) According to sodium hazard of irrigation water S1 and S3 class values are________ and________, respectively.  
(3) For sodium hazard of classification of irrigation water,________ values are taken in to consideration.  
(4) RSC means________ and its formula is RSC =________.  
(5) 1 meq H =________ t/ha lime.  
(6) 1 meq Na =________ t/ha gypsum.  
(7) Saline soil is also called________.

(PTO)
Q.3 (B) Write whether the following statements are true or false. (5)

(1) ( ) All clays are colloids but all colloids are not clays.
(2) ( ) In soil, nutrients in soil solution and on exchange complex are available to plants.
(3) ( ) Nutrients in soil solution are only available to plants.
(4) ( ) mg /kg = mg/lit = ppm
(5) ( ) ppm / 10000 = percent
(6) ( ) In octahedral sheet Al is replaced by Si.
(7) ( ) In tetrahedral Si is replaced by Al.
(8) ( ) Sandy soil CEC is more than clayey soil.
(9) ( ) pH of alkaline soil could be more than 7.0.
(10) ( ) Reserve acidity is less than active acidity.

Q.4 (A) Answer the following (Any Five) (15)

(1) What is mineralization? Explain with reactions.
(2) How C/N ratio affects decomposition rate of soil organic matter? Explain with diagram.
(3) How do the -ve charges are developed on silicate clay minerals.
(4) Give criteria of saline, saline – alkali and alkali soil. Explain their amelioration methods.
(5) What are the forms of phosphorus in soil? Describe the factors affecting its availability.
(6) Give classification of soil micro-organisms with examples of each class.

(B) Give scientific reasons for the following statements (Any Five) (5)

(1) Montmorillonite can expand but kaolinite can not.
(2) Though H^+ is monovalent it acts as polyvalent on clay.
(3) Available nutrients are always more in clayey soil as compared to sandy soil.
(4) In illite soil, K-application does not respond.
(5) Addition of organic matter improved CEC of soil.
(6) There is no permanent -ve charge in Kaolinite.

X@X@X