Note: 1. Write Legibly
2. Draw figures where ever necessary

Q: 1 List the theories of crossing over. How will you demonstrate that crossing over is associated with exchange of chromosomal segments, with an example. (10)

Q: 2 Explain a compound microscope with principles involved for studying a chromosome critically. (10)

Q: 3 List the systems of male sterility in plants. Explain two systems of cytogenetic nature of male sterility with their merits and demerits. (10)

Q: 4 Write an extended note on :- (10)
   a) Spindle
   b) Inversions

Q: 5 Write a short note on :- (10)
   a. Cytokinesis
   b. Fluorescence
   c. Centrosome
   d. Cochineal
   e. Muller
Q-1 Write the commercial and export potential of horticultural crops. (3.00)

Q-2 Give the soil, climate, propagation methods and harvesting of following crops (9.00)
   (i) Guava  (ii) Citrus  (iii) Banana

Q-3 Define / explain the following (Any six) (6.00)
   (i) Training  (ii) Fertigation  (iii) Earthing up
   (iv) Propping  (v) Polyembryonic  (vii) Descuckering
   (vi) Inter cropping

Q-4 Furnish the information in the tabular form (4.00)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the crops</th>
<th>B. N.</th>
<th>Family</th>
<th>Propagation methods</th>
<th>Planting distance (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Papaya</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Pineapple</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Mango</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Jack fruit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q-5 Give the manure and fertilizer dose of the following crops (Any four) (4.00)
   (i) Grape  (ii) Guava  (iii) Mango
   (iv) Sapota  (v) Papaya

Q-6 Write short note on the following (Any four) (8.00)
   (i) Training in grape
   (ii) Horticulture crops and human nutrition
   (iii) Canopy management
   (iv) Mrugbahar in guava
   (v) Alternate bearing in mango

Q-7 Give the maturity symptoms for harvesting of following fruit crops (Any four) (4.00)
   (i) Papaya  (ii) Sapota  (iii) Banana
   (iv) Pineapple  (v) Grape

Q-8 Give the reasons of the following (Any four) (4.00)
   (i) Papaya crop require high fertilization
   (ii) Guava crop require light pruning
   (iii) Mulching is necessary in Banana crop
   (iv) Rainfall during flowering period adversely affect in mango crops
   (v) Pineapple crop require slightly acidic and light soil.

Q-9 The farmers face the following problems in fruit crops. (4.00)
   Give your valuable suggestions.
   (i) Mango malformation
   (ii) Yellowing of lime
   (iii) Fruit dropping in mango
   (iv) Bunchy top in banana

Q-10 Write the different varieties of the following (Any four) (4.00)
   (i) Cashewnut  (ii) Mango  (iii) Litchi
   (iv) Banana  (v) Grape
Q.1 Define/Explain terms (any ten)  

I. Zero plane displacement  
II. Albedo  
III. Free convection  
IV. Momentum flux  
V. Reynold’s analogy  
VI. Micrometeorology  
VII. Thermal conductivity of soil  
VIII. Ground heat flux  
IX. Bowen Ratio  
X. Planetary boundary layer  
XI. Potential temperature  
XII. Clothesline effect  

Q.2 Fill in the blanks  

I. Soil heat flux measured with the _________ placed at different depths in soil.  
II. The solar constant is a true constant, but fluctuates by as much as _____% about its mean value.  
III. In first 2-3 m above the ground vertical gradient of potential temperature can be approximated by_____________________.  
IV. In desert area magnitude of the _________ heat flux is negligible.  
V. To transform one gram of water to vapour, nearly__________of heat is required.  
VI. Bowen ratio of _________region will be less than 1.  
VII. Ri is negative in _________condition.  
VIII. The dry air is_______dense than moist air.  
IX. Makkink proposed regression type formula for estimation of PET from measurements of__________parameter.  
X. During night, the level of CO₂ is distinctly__________in dense crop canopy.
Q.3a. Derive equation of Net Radiation with all components (consider atmospheric properties like cloud, water vapour etc. and empirical approach).

Q.3b. Describe briefly: Factors governing amount of insolation on any date and any place on the earth surface.

Q.4a. Write short note on energy fluxes, list the methods of evaluation of convective fluxes and explain one method (any one).

Q.4b. Describe logarithmic wind speed profile.


Q.5b. Draw canopy profiles for Water vapour concentration and CO2 concentration in grass, conifer and tropical rain-forest canopy types.

**********
Q.1. Define / Explain: (Any ten) [10]
   i. Molecular Biology
   ii. Linking number of cccDNA
   iii. Chargaff's rules
   iv. Hypochromicity
   v. Aminoacyl tRNA synthetases
   vi. Ribozymes
   vii. Melting Temperature (Tm) of DNA
   viii. Electrophoresis
   ix. Allosteric Enzymes
   x. Molecular Chaperons
   xi. Wobble hypothesis
   xii. Codon degeneracy

Q.2. Differentiate: (Any Six) [12]
   i. Exonuclease and Endonuclease enzymes
   ii. Proteinase K and Protonase
   iii. Sanger Sequencing and Maxam Gilbert sequencing
   iv. Purines and Pyrimidines
   v. Uracil and Thymine
   vi. Phosphodiester bond and glycosidic bond (in nucleotides)
   vii. Prokaryotic genome and Eukaryotic genome
   viii. “Second Genetic Code” and “second half of genetic code”
   ix. Probe and Primer

Q.3. Write short notes on the following: (Any Seven) [14]
   i. Primary structure of nucleic acids
   ii. Griffiths Experiment
   iii. Levels of gene regulation
   iv. Effect of Acids/ Alkali on Nucleic acids
   v. Structure of B-DNA
   vi. Translation
   vii. Lac operon
   viii. Restriction Enzymes
   ix. DNA Topoisomerases

Q.4. How was the genetic code deciphered? [4]
Q.5. Answer the following:

i. If the percentage of cytosine in a double-stranded DNA molecule is 21%. What is the percentage of thymine?

ii. The DNA is negatively charged at neutral pH. Why?

iii. RNA is less stable than DNA. Why?

iv. RNA is hyper-chromic to ds DNA. Why?

v. What is the role of "Ribonucleotide reductase enzyme"?

vi. Which of the following has the maximum absorption per unit mass at a wavelength of 260 nm?
   a. dsDNA  
   b. mononucleotides  
   c. RNA  
   d. Protein

vii. DNA that is located between genes and is not used to specify a product is known as
   a. Intron DNA  
   b. Exon DNA  
   c. Spacer DNA  
   d. Regulatory DNA

viii. In prokaryotes, the lagging strand primers are removed by
   a. 3' to 5' exonuclease  
   b. DNA ligase
   c. DNA polymerase I
   d. DNA polymerase III

ix. Who primarily worked out the detailed pathway of purine biosynthesis in the 1950s?

x. Explain the "RNA world hypothesis".

xi. pUC18 plasmid DNA after treatment with 2, 4, 6, and 8 units of topoisomerase I (for 45 minutes at 37°C) is separated by agarose gel (electrophoresis) in lane 1, 2, 3, and 4, respectively. Migration of DNA will be slowest in which lane and why?

xii. Which enzyme is required for the inter-conversion of nucleotides dTMP and dUMP?

xiii. How many (number of) aminoacyl tRNA synthetases are required for translation in eukaryotes?

xiv. The term "Polypeptide polymerase enzyme" refers to which cell organelle?

xv. The term "RNA dependent DNA polymerase" refers to which enzyme?

xvi. Venkatraman Ramakrishnan, Thomas A. Steitz, Ada E. Yonath were awarded nobel prize in the year 2009 for their work on ____________.

xvii. Genetic code could be a triplet only. Why?

xviii. Incorporation of ddNTPs in a PCR reaction causes termination of extension while incorporation of dNTPs does not. Why?

xix. Enlist the factors that impart stability to a dsDNA.

xx. Name two intercalating agents. What is the effect of intercalation on DNA?

xxi. The sequence 5'-AGTCTGACT-3' in DNA is equivalent to which sequence in RNA?
   a. 5'-AGUCUGACU-3'
   b. 5'-UCAGUCUGA-3'
   c. 5'-UGTCTGUTC-3'
   d. 5'-AGUCAGACU-3'
Q.1 List out models of communication given by various social scientists and draw diagrams of any three of them with all the elements. (08.00)

Q.2. Write any **four** definitions of "Communication" and give your comments on any **four** of the following statements. (08.00)
1. Communication involves interdependence.
2. Communication is a process.
3. Communication occupies many means.
4. Communication process comprises number of distinguishable parts.
5. Communication takes places at many levels.

Q.3 Write in detail on any **two** of the following. (06.00)
1. Factors determining audience response
2. Key communicators
3. Relationship in communication
4. Types of Audience responses

Q.4. Discuss in detail on any **three** of the following features of "Message". (10.50)
1. Characteristics of Ideal message
2. Distortion of message
3. Models of flow of Message
4. Treatment of Message

Q.5 Explain factors influencing communication effectiveness of communicators. (10.00)

Q.6 Fill in the blanks using most appropriate word/s. Write only number wise correct word/s of blanks in your answer book. (07.50)
1. (1) ____________, (2) ____________, (3) ____________, (4) ____________ and (5) ____________ are the important communication skills of audience.
2. (1) ____________, (2) ____________, (3) ____________, (4) ____________ and (5) ____________ are the examples of encoding skills of communication.
3. ____________ Book is written by A.S.Sandhu.
4. To formulate 0.2 % of solution of chemical, _____ ml of chemical is needed to mix with 1 liter of water.
5. From the ten bags, each containing 50 Kg. of Urea, ____________ Kg. of Nitrogen is available.
6. ____________ Model of Communication contains only three elements of communication.
7. In the S-R theory of communication, S stands for ____________ and R stands for ____________.
8. (1) ____________, (2) ____________, (3) ____________ and (4) ____________ are the Four-Person types of social net-works among the people, while (1) ____________, (2) ____________, (3) ____________, (4) ____________, and (5) ____________ are Five-Person types of social net-works among the people.
9. Knowledge means ____________ information possessed by an individual.
10. ____________ is known as trustworthiness and expertise accorded by audience to the source of information.
11. Any obstacles entered in channels are known as ____________.
12. ____________ and ____________ are the popular theories about basis of empathy.
Date 06-07-2010

Q.1 Draw neat and clean diagram of the following
   1. Meteorological observatory layout plan
   2. Measurement of Wind direction
   3. Sunshine recorder

Q.2 Write the Installation height of the following
   1. Self recording rain gauge
   2. Simple rain gauge
   3. Stevension Screen
   4. Sunshine recorder
   5. Pan Evaporimeter
   6. Wind vane
   7. Anemometer
   8. Grass minimum Thermometer
   9. Lysimeter
   10. Net radio meter

Q.3 Write the unit of Measurement of the following Parameters
   1. Maximum temperature
   2. Dew point temperature
   3. Wind direction
   4. Wind speed
   5. Evapotranspiration
   6. Evaporation
   7. Rainfall
   8. Relative Humidity
   9. Radiation
   10. Vapour pressure

Q.4 Write the different parts of the following instruments
   1. Sunshine recorder
   2. Self recording rain gauge
   3. Ordinary raingauge
   4. Anemometer
   5. Pan evaporimeter
   6. Wind vane
   7. Lysimeter
   8. Pyrano radio meter
   9. Automatic Weather Station
   10. Assman Psychorometer

Q.5 Write the working Principal of the following instruments
   1. Sunshine recorder
   2. Self recording rain gauge
   3. Anemometer
   4. Wind vane
Q.-1 (A) 1. What are selectivity, resistance and persistence of herbicides in the soil?
2. Give the classification of weeds.

(B) 1. Do you support the use of GMOs with special reference to herbicide
tolerance crops (HTCs) in agriculture? Why or why not?
2. Describe at least three approaches to controlling weeds.

Q.-2 (A) 1. Discuss herbicide formulations.
2. Discuss lack of herbicide performance.

(B) 1. What is bio-control? Enlist the category of bio-control and explain about
classical bio-control approach.
2. Weed management programme, success means maximum crop yield not
just dead weeds-discuss.

Q.-3 (A) Write short note
1. GPS
2. Zero tillage
3. Impact of herbicide use
4. Herbicide drift and volatility
5. Weed management in turf

Q.-4 Answer the following
1. How can growers slow the evaluation of herbicide resistance in weed
population?
2. Which one of the herbicide is cheaper to apply in 10 hectare of Maize
crop, how much?
   (a) Pendimethalin @ 0.50 kg/ha
   (b) Atrazine @ 0.50 kg/ha
   The cost of formulated/labeled product of pendimethalin Rs. 400/lit and
   that of atrazine is Rs. 400/kg.
3. Enlist steps to proper sprayer cleanout.
4. Why are soil microbes often a source of herbicide resistance gene?
5. What are some traits of weeds that make them effective competitors with
crops?
6. What is an issue with the repeated application of the same herbicide to a
specific field?
7. How dose tillage works in controlling weeds?
8. Why should the dose of post emergent isoproturon in wheat changes with
soil type when usually it is true only for the pre emergence herbicides?
9. Differentiate contact and translocate herbicide.
10. Of the varied choices of herbicides available for a crop as given in
literature, how one should arrive at the best choice? Enlist factors
controlling this choice.
Q.-5 Fill in the blanks

1. Weeds which produce seeds that is difficult to separate once mixed with crop seeds are called ___________ weeds.
2. Dormancy of weeds induced due to its genetic nature is called ________.
3. Vascular plants, produce most of their vegetative growth beneath water surface are called as ___________ weeds.
4. Any direct or indirect harmful effect by one plant or another through the production of chemicals is called ______________.
5. Weeds thrive well under alkali are called ______________.
6. Spraying fungal spore or its fermentation products to control the target weed. The preparations are called ____________
7. Chemical directly responsible for herbicidal effect in any herbicide is called ____________.
8. ___________ mechanism in plants is the most accepted theory of herbicide selectivity in the world.
9. Triazines and urease group of herbicides kill the weeds due to inhibiting __________ reaction.
10. Quantity of herbicide that remains in soil after its mission is accomplished is called as __________.
11. Aquatic weeds are botanically called as ____________.
12. ___________ name of the herbicide is given to the formulation of an herbicide by its manufacture.
13. First herbicide proved to improve the yield at sub-lethal dose is ________.
15. Herbicides absorbed by roots are translocated to the shoots through __________ vessels.
16. Non polar herbicides moves to plant system by ____________. 
17. Successful bio-agent for Parthenium hysterophorus is__________.
18. 100 ppm = ______ g/lit
19. Herbicides are ___________ harmful to mammals than insecticides.
20. Chemigation means ________________________.
B.A. College of Agriculture  
Anand Agricultural University  
Anand  
Even Semester End Post Graduate Examination-June-July 2010  
Course No: Pl.Path. 602  
Course Title: Introductory Bacteriology  
Date: 06-07-2010  
Time 10:00 to 12:00HR  
Marks: 50

Q. 1. Define/Explain any eight
1. Generation time of bacteria
2. Slant culture
3. Bacterial transformation
4. Peptidoglycan
5. Bacterial systematics
6. Bacterial chemotaxis
7. Working distance in microscopy
8. Serovars
9. Acid fast bacteria

Q. 2. Answer briefly of any five
1. Characterize the genus *Pseudomonas*
2. Explain hanging drop method
3. Differentiate bacterial flagella and fimbriae
4. Mention chemical properties and function of bacterial capsule
5. Explain resolving power of a microscope
6. Are bacteria prokaryotes? Justify

Q. 3. Write short notes on any three
1. Plate count method
2. Bergey’s manual of determinative bacteriology
3. Bacterial flagella
4. Bacterial pathovars

Q. 4. (A). Fill in the blanks
1. Genus _______ and _______ is known to have maximum pathovars.
2. _______ stain is used for negative staining.
3. _______ reported fire blight of apple first.
4. Abbreviation CFU stands for _______.
5. At the end of Gram staining, Gram +ve bacteria appear _______.
6. Second phase of bacterial growth curve is known as _______.
7. _______ and _______ are Gram +ve genera
8. Bacteria divide by _______ method

(B). Mention primary source of inoculum
1. Citrus canker
2. Black arm of cotton
3. Moko of banana

(C). Mention causal organism and diagnostic symptoms of any two
1. Bacterial blight of paddy
2. Black arm of cotton
3. Ring rot of potato
B. A. College of Agriculture
Anand Agricultural University
Anand- 388 110

Post Graduate Even Semester End Examination-2010
Hort. 602 : Principles of Vegetable Production (2+1)

Date : 06-07-2010
Time : 10-00 to 12-00 hrs
Tuesday
Marks : 50

Q-1 (A) What is drip irrigation? Draw a diagram of drip irrigation system with functions of each components. (7.00)

(B) Explain role of temperature in vegetable production. (6.00)

Q-2 Write short note on following (Any six). (12.00)
   (i) Hardening of tomato seedlings
   (ii) Truck gardening
   (iii) Classification of vegetable crops on the basis of cultural practices
   (iv) Liquid bio fertilizers
   (v) Role of humidity in diseases of vegetable crops
   (vi) Kitchen gardening
   (vii) Light intensity

Q-3 Differentiate following. (10.00)
   (i) Hot bed V/s Cold frame
   (ii) Heat stress V/s Chilling injury
   (iii) Inter cropping V/s Mix cropping
   (iv) Fruit V/s Vegetable
   (v) Long day plant V/s Short day plant

Q-4 (A) Give answer in short (Any five). (10.00)
   (i) Give important characters of Sugar Baby and Pusa Chikni varieties
   (ii) Factors associated with water requirement of vegetable crops
   (iii) Principle of organic farming
   (iv) How efficiency of fertilizers increase in vegetable crops?
   (v) When pre and post emergent herbicides are applied?
   (vi) Value added products of potato and tomato

(B) What is Green house? Discuss on type, function and advantages of green house (5.00)

@@@@@@@@@@@@
1. What is exponential distribution? Derive the moment generating function of exponential distribution. (10)

2. What is Gamma distribution? State and prove the additive property of the Gamma distribution. (10)

3. What is quadratic form?. Explain classifications of quadratic forms. List out any three important properties of quadratic forms. (10)

4. What is Chi-square distribution?. State the additive property of Chi-square variates. List out application of Chi-square distribution. (10)

5. What is residual analyses ?. Explain different tools for model adequacy checking. (10)
ANAND AGRICULTURAL UNIVERSITY
B.A. College of Agriculture, Anand
Post-Graduate Even Semester End Examination: 2009-10

Course No: Ag Micro-602 (2+1)
Course Title: Morphology, Cytology and Classification of Microorganisms

Date: 06/07/2010
Time 1000 to 1200
Marks: 50

Q.1 Existence of microorganisms in nature, where are they found and what is unusual about their growth and metabolism requirement. (6)

Q.2 Write general principles of classification and methods of classification. (10)

Q.3 Describe shapes and sizes with body coverings and skeletons of protozoa giving examples. (4)

Q.4 Differentiate:
1. Bacterial cell wall and cell membrane.
3. Plant viruses and bacteriophages.
4. Asexual fungi.
5. DNA and RNA constituents. (10)

Q.5 Briefly write on followings (Any ten). (20)

1. Obligate anaerobes
2. Alkalophile
3. Archaea bacteria
4. Chemostat
5. Mycoplasma
7. Evaluations of microorganisms
8. Techniques for interna organelles examinassions.
9. Capsule staining
10. Endospore staining
11. Molecular techniques in classification of microorganisms
B.A. COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY
ANAND-388110
Post-Graduate Even Semester End Examination-2009-10
Course No. NEM 604 : Economic Nematology (2+2)

Date: 6-7-2010 Time: 1000 to 1200 hrs.

Q. 1. Describe the following (any five) (35)

1. Economic importance of nematodes in agriculture.
2. History of development of nematology.
4. Integrated management of root-knot nematodes in tobacco.
5. White tip disease of paddy and its management.
6. Seed gall nematode of wheat and its management.

Q. 2. Differentiate between the following. (15)

1. Lesion nematode and burrowing nematode.
2. Cyst nematode and reniform nematode.
3. Root knots and root nodules.
4. Rice root nematode and rice stem nematode.
5. Paring and Prelinage.
Q.1 A "Tillage is manure"- Discuss. 5.00

B Differentiate the followings 5.00

1. Geoponic V/s Hydroponics
2. Subsistence Farming V/s Diversified Farming
3. Evaporation V/s Transpiration
4. Alley Cropping V/s Multistory Cropping
5. Water Requirement V/s Irrigation Requirement

Q.2 A Describe the different factors influencing crop responses to fertilizers. 5.00

B Justify the following (Any five) 5.00

1. Plant population is a key factor that decides crop yield.
2. Bulk density is an important physical property of soil for crop production.
3. Nitrogen should be applied in installments.
4. Tillage should be carried out at vaspa condition.
5. Mix cropping serves the purpose of alternate crop rotation.
6. Organic matter in the soil enhances soil microbial activities.

Q.3 A What are the remedial measures to reclaim saline soil? 5.00

B Calculate cumulative evaporation required for scheduling irrigation at 0.4, 0.6, 0.8 and 1.0 IW/CPE ratio with 60 mm water depth. 5.00

Q.4 A Discuss different methods of irrigation scheduling in details. 5.00

B Write short notes (Any two) 5.00

1. Classification of salt affected soils.
2. Yield attributes.

Q.5 A Define / Explain (Any five) 5.00

1. Cropping intensity 2. LER 3. Companion cropping
4. Synergetic cropping 5. CGR 6. Parallel cropping

B Answer as directed. 5.00

1. Enlist the name of two books, research journals and magazines each used for this course.
2. Classify the Nitrogenous fertilizers with examples.
3. Mention essential factors for success of relay intercropping.
4. Give the advantages of multiple cropping.
5. Enlist the yield attributes for pigeonpea and wheat.
B. A College of Agriculture
Anand Agricultural University, Anand-388110

Post Graduate Semester End Examination-2010-11
Course no & Title: Crop Phy-602 (2+1)
Principles of Plant Physiology II - Metabolic Process and growth regulation

Date: 05/07/2010 Time: 10.00 to 12.00 Day: Monday Marks : 50

ATTEMPT ALL QUESTIONS

1. Describe the ultra-Structure and function of Chloroplast. (10)

2. Give the Major classes of Plant Product and their functions. (10)

3. Write notes on:
   (a) TCA cycles
   (b) glycolysis
(10)

4. Explain in Brief:
   (a) Estimation of Chlorophyll
   (b) Harvest Index
   (c) Vigour index
   (d) Respiratory ratio
   (e) C/N Ratio
(05)

5. Difference between:
   (a) Heat injury & Heat resistance
   (b) Cold injury & Cold resistance
   (c) C₃ & C₄ Plants
   (d) Apparent and Net photosynthesis
   (e) Orthodox Seeds and Recalcitrant seeds
(05)

6. Describe the Phenomenon of Photoperiodism in plants
(05)

7. Explain the mechanism & Condition necessary for Vernalization
(05)
Q.1 Explain the complete procedure of partitioning the genotypic variance through orthogonal polynomial coefficients.

Q.2 Explain selection and its effects, selection differential and response due to selection. Derive the formulae to calculate change in gene frequency after selection at gametic and zygotic level.

Q.3 (A) Define/ Explain
(i) Genetic advance
(ii) Phenotypic coefficient of variation
(iii) Correlated response
(iv) Coupling and repulsion phase
(v) Coheritability

(B) Explain discriminant function

Q.4 Give procedure to detect linkage from F₂ and backcross data. Give different methods to estimate linkage intensity from F₂ data along with their confidence limits.

Q.5 (A) Give HW law and prove it taking an example of single gene pair

(B) What statistical method is used when plant stand in an experiment is varying? Give details of the method for it.

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**B. A. COLLEGE OF AGRICULTURE**  
**ANAND AGRICULTURAL UNIVERSITY**  
**ANAND-388110**

**Post Graduate Semester End Examination**  
**Sub: Ag. Extn. 604**  
**Methods of Social Research (2+1)**

**Date: 5-7-2010**  
**Time: 10.00 to 12.00 hrs.**  
**Marks: 50**

<table>
<thead>
<tr>
<th>Q.1 Define/explain the following terms.</th>
<th>5</th>
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<tbody>
<tr>
<td>1. Hypothesis</td>
<td>2. Observation</td>
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<tr>
<td>3. Variable</td>
<td>4. Research</td>
</tr>
<tr>
<td>5. Data</td>
<td></td>
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</tbody>
</table>

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<thead>
<tr>
<th>Q.2 (A) Enlist types of variables with their measurement.</th>
<th>6</th>
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<tbody>
<tr>
<td>(B) Discuss the use of computer in social science research.</td>
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<tr>
<th>Q.3 Differentiate the following terms.</th>
<th>5</th>
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<tbody>
<tr>
<td>(A) Laboratory v/s field experiment</td>
<td></td>
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<tr>
<td>(B) Interview v/s questionnaire</td>
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<tr>
<th>Q.4 (A) Enlist qualities of a workable hypothesis.</th>
<th>5</th>
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<tbody>
<tr>
<td>(B) How will you differentiate case study from success story?</td>
<td>6</td>
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<tr>
<th>Q.5 (A) Enlist elements of scientific methods.</th>
<th>5</th>
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<tbody>
<tr>
<td>(B) Discuss format of research problem.</td>
<td>8</td>
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</table>
Q.1  Describe/ Explain (Any Ten) (15.0)

a) Additivity and multiplicative effects of genes
b) Average effect of gene
c) Transgressive segregants
d) COARSER Test
e) Bi-parental mating
f) Continuous Variation
g) Probability
h) Random Genetic drift
i) First degree statistics
j) Population Genetics
k) Breeding value
l) Coefficient of confidence
m) Reference population
n) Cov AD = 0
o) Heritability

Q.2  Answer as suggested (Any Eight) (20.0)

a) Why Golton could not bring out effective laws of inheritance as Mendel ?
b) What is the significance of \( V_{BC1} \) and \( V_{BC2} \) in Biometrical Genetics ?
c) Why additive genetic variance does not confirm additivity of genes ?
d) Why genetic parameters estimated in the absence of back cross generations have less validity ?
e) What is importance of mid parental value, average effect of gene and population mean in Biometrical Genetics ?
f) How gene frequency and degree of dominance influence the magnitude of components of genetic variance ?
g) When breeding values based on average effect of genes and progeny performance have varied estimates, what does it suggest ?
h) Why variance due to intra allelic interaction is non-fixable though it is heritable? How it can be fixed and/or utilized?

i) How will you estimate $V_E$ with a single testing data of 15 $F_3$ plant progenies?

j) Why diallel mating design considered as factorial mating design?

k) What is the limitation of Cov.F.S.?

l) Cov F.S. = 2 Cov H.S. = $\frac{1}{4} V_D$ explain theoretically.

m) Though breeding value is absolute unit, more conveniently it is considered as relative unit, Why?

Q.3 Answer (Any Three) (15.0)

a) What is significance of ‘M’ parameter in Generation Mean Analysis? and why it is estimated from $F_2$ population in six parameters model of Hayman (1958)?

b) How will you evaluate six generations of each four families in field?

c) Why interallelic interactions above digenic interactions are neglected, while estimating components of genetice variance?

d) Why dominance deviation is not simply measure of degree of dominance?

e) Why additive-dominance model generally fails with polygenic inheritance?

f) The observed values for different genotypes are as:

\[ A_1A_1 = 36 \]
\[ A_1A_2 = 24 \]
\[ A_2A_2 = 10, \text{ and} \]

gene frequency of allele $A_2 = 0.4$, work out total genotypic variance, partitioned it in to different components. Also work out breeding value and dominance deviation for each genotype.

************
Q.1 Derive the Michalis Menten equation. How you can estimate $V_{\text{max}}$ and $K_m$. Give its Merits and demerits. (10.0)

Q.2 Give the nomenclature and classification of enzymes. (10.0)

Q.3 Mention the properties on which isolation of enzymes the based. (5.0)

Q.4 Describe the substrate concentration and temperature on enzyme activity. (5.0)

Q.5 Define the following (ANY TEN): (10.0)

1. King-Altman patterns
2. Briggs-Haldane steady state approach
3. Ping – pong mechanism
4. Hill Plot
5. Scatchard plot
6. Symmetry / Sequential models
7. Bi-substrate reactions
8. Arrhenius equation
9. Restriction endonucleases
10. Allosteric enzyme
11. Isozymes
12. Specific activity

Q.6 Write short notes (ANY FIVE): (10.0)

1. Ribozyme
2. Ordered mechanism
3. Enzyme inhibition
4. Regulation of enzyme activity
5. Herbicide intolerance
6. Immobilized enzymes
7. Application of enzymes in food and chemical industries
Q.1 (a) What is interval estimation? Why interval estimate is superior over (4) point estimate?
(b) Obtain $100(1-\alpha)\%$ confidence limits for parameter $\mu$ under the (6) assumption that variance is to be estimated.
(c) Find 95% confidence interval of mean for sample of four (5) observations 61, 69, 64, 66 and $\sigma^2 = 81$. Also find length of interval.

Q.2 What is statistical hypothesis? Explain different types of hypotheses. (6)

Q.3 (a) Explain the principle of maximum likelihood. Work out Maximum (6) likelihood estimator of $m$ for poission distribution.
(b) Obtain the minimum attainable variance for distribution (6)

$$f(x;\theta) = \frac{e^{-\theta} \theta^x}{x!}; \quad x=0, 1, 2, \ldots, \infty$$

Q.4 (a) What do you understand by point estimation? What are the (7) characteristics of good estimator? Discuss any one in detail.
(b) Work out Maximum likelihood estimator for normal distribution. (6)

Q.5 Write short notes (4)
(1) Type I and Type II errors
(2) Power of test
(3) Statistical inference
(4) Levels of significance.
B.A. COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY
ANAND
Post- Graduate Even Semester End Examination – 2010
Soil Science 604: Soil Physics (2+1)

Date: 03.07.2010
Saturday

Marks: 50
Time: 10.00 to 12.00 hrs

Q.1 A) Define the following.

B) What is infiltration? Explain the factors affecting on infiltration rate.

C) Define the puddling and explain its effect.

(Q.2 A) Differentiate the following (Any Three)
1. Dry condition of soil and Wet condition of soil
2. Soil structure and Soil texture
3. Field capacity and wilting co-efficient
4. Primary particle and secondary particle

B) Explain Fourier’s law.

C) Write short notes on the following (Any Two)
1. Soil water balance
2. Physical problems of heavy soil
3. Management of soil temperature

Q.3 A) Graphically represents the following.
1. Oxygen diffusion rate in relation to depth
2. Moisture – density curve with a constant compactive effect
3. Atterberg’s limits and constants
4. Soil moisture characteristics of compacted and aggregated soil
5. Infiltration rate and cumulative infiltration

B) What are the contributions of the following?

C) What do you mean by genesis of soil structure? Explain the effect of anions on aggregate formation.

B) Enlist the different instruments used for measuring the soil temperature and soil aeration.

C) **Give scientific reasons for the following.**
   1. Application of FYM has significant effect on soil structure.
   2. Water is universal solvent.
   3. Carbon dioxide is greater in soil than in atmosphere.
   4. Excess neutral sodium salts have good flocculation effect.
   5. Loamy textures is ideal for crop production.
Q.1 (a) Define regression. How will you estimate $\beta_0$, $\beta_1$ and $\beta_2$ in case of multiple regression model? (7)

Q.2 (b) What are the assumptions for linear regression model? (3)

Q.3 Illustrate to explain the concept of dummy variables. Give at least two examples where you could use the model with dummy variables. (7)

Q.4 What do you understand by multicolinearity? What are its consequences? Enlist the tests for detecting multicolinearity. (6)

Q.5 Define Heteroscedasticity. How it on least square estimates and their standard errors? (6)

Q.6 Prove that the least square estimate of simple regression coefficient is unbiased. Derive the variance of this estimate. (6)

Q.7 (a) What is autocorrelation. What are the sources of autocorrelation in errors? (6)

(b) What do you understand by stochastic and non stochastic models? (3)

Q.8 Write notes on (Any Two) (6)

(1) Durbin Watson test
(2) Lagged variables
(3) Econometrics

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X - X - X - X - X
Q.1 How plant pathogen's actively liberate from the point of infection? (8.0)
Q.2 Describe the invasion of plant viruses into plant host & process of disease induction. (8.0)
Q.3 State the principles of management of plant diseases & describe two management methods with suitable examples. (8.0)
Q.4 Differentiate:
1. Sporadic diseases and Epidemic diseases
2. Monogenic resistance and Polygenic resistance
3. Elicitors and Phytoalexine
4. Pathogenesis and Pathogenecity
5. Root-Knot and Root nodules
Q.5 Define:
1. Hypersensitive reaction
2. Plant disease
3. Quarantine
4. Transgenic plant
5. IDPM
6. Infection chain
Q.6 Answer in brief:
1. State the biotic factors influencing disease condition.
2. Justify- Seed act as vehicle of Plant Pathogens.
3. State the methods of fungal invasion in host.
4. How plant defend against attacks of plant pathogens?
5. State the importance & objectives of Plant Pathology.
6. What are the pre-requisites for induction of disease?
Q.7 State contributions of the following:
1. Prevost
2. Beijerinck
3. Anton de Bary
4. T.J. Burrill
5. Needham
6. Tillet

X X X X X X X
## B. A. COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY, ANAND
POST GRADUATE SEMESTER END EXAMINATION
Course No.: CROP.PHY.604
Course Title: Morphogenesis, Tissue Culture & Plant Transformation (2+1)

**Date:** 01.07.2010
**Time:** 1000-1200 hrs
**Marks:** 50.0

**Thursday**

<table>
<thead>
<tr>
<th>Q1.</th>
<th>Define (Any EIGHT):</th>
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<tbody>
<tr>
<td></td>
<td>i. Auxin autotroph</td>
<td>vi. Acclimatization</td>
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<td>ii. Explant</td>
<td>vii. Surfactant</td>
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<td>iii. Ovulo-embryo culture</td>
<td>viii. Cybrid</td>
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<td>iv. Filter sterilization</td>
<td>ix. Fusogen</td>
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<td>v. Callus</td>
<td>x. Vitrification</td>
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<th>Q2.</th>
<th>Give scientific reasons:</th>
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<th>Differentiate (Any FOUR):</th>
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<tr>
<td></td>
<td>A. EC &amp; IEC</td>
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<td>B. Auxins &amp; Cytokinins</td>
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<td>C. Primary &amp; Secondary hardening</td>
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<td>D. Phytohormone &amp; Plant Growth Regulator</td>
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<td>E. Sexual hybridization &amp; Somatic hybridization</td>
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<tr>
<th>Q4.</th>
<th>What is artificial tissue culture medium? Give the details of the ingredients of the medium giving details about the role of each of them.</th>
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<th>Q5.</th>
<th>Answer the following (Any FOUR):</th>
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<tbody>
<tr>
<td>1</td>
<td>Applications of protoplast culture and fusion</td>
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<tr>
<td>2</td>
<td>Give applications of cryopreservation</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>What is synthetic seed? How can it be produced?</td>
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<td>4</td>
<td>Synthetic auxins are usually preferred over natural ones. Why?</td>
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<td>5</td>
<td>Methods for surface sterilization of plant material for tissue culture</td>
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<th>Q6.</th>
<th>Describe the steps involved in the production of transgenic plant using <em>Agrobacterium</em> mediated transformation preferably with a diagram. What is the role of tissue culture in this process?</th>
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[Signature: P.T.O.]
| Q7. | Enlist the tissue culture methods used for crop improvement. Briefly describe any one method. | 5.0 |
| Q8. | Describe the processes involved in embryo culture of any crop you have studied. | 4.0 |
| Q9. | What is somatic hybridization? Discuss different methods of isolation of protoplast and their fusion technique. | 5.0 |
B. A. COLLEGE OF AGRICULTURE
ANANAD AGRICULTURAL UNIVERSITY
ANAND

Post-Graduate Even Semester End Examination - 2010
Course No. AGBT 605 / FBT 105 / ANBT 105
Course Title: Bioinformatics

Date: 01-07-2010
Day: Thursday
Time: 10:00 – 12:00 Hrs
Marks: 50

Q.1 Define / Explain following terms –
1. PAM
2. Multiple Sequence Alignment (MSA)
3. Similarity
4. Identity
5. Orthologs
6. Ktuples or Ktups
7. Scaled Tree
8. Annotation
9. Bioinformatics
10. Comparative modelling

Q.2 Write Short note on following –
1. Homology Modelling
2. FASTA – a search tool
3. Dayhoff Amino Acid Substitution
4. BLAST
5. Progressive Alignment

Q.3 Enlist different tools / software available for MSA. Explain in detail about MSA, its applications, rules and criteria for selection of sequences.

Q.4 Choose the appropriate / correct option to answer following questions.

1. EMBOSS Align, is a tool used for ________________?
a. Local Alignment  b. Global Alignment  c. Pattern Search  d. Signature Search

2. In MSA, if short sequences collected through sequencing projects are to be used, then which one of the following programs should be used?

3. The correct FASTA format is best explained by which of the following statements –
a. Use one letter amino acid code, all capital letters, spaces separating each letter, and headings are put in quotation marks.
b. Use one letter amino acid code, no spaces between letters and heading are put in all capital letters.
c. Use one-letter amino acid code, no spaces between letters and heading lines are marked with a ‘>’.
d. Use one letter amino acid code, put spaces every ten amino acids and put numbering above each line

4. In Bioinformatics, analysis of primary structure involves ________________.
a. Hydrophobic cluster analysis
b. De novo repeat detection
c. Computation of pI
d. All of above

5. In which year Yeast genome was completely sequenced?

6. In PAM matrix, as the PAM number increases sequence identity ________________.
a. Increases  b. Decreases  c. Remains constant  d. Increases with corresponding PAM number
7. What would be the Z-score in FASTA, if result is referred as 'probable' homologs?
   a. 0.5    b. 5.15    c. >15    d. <0

8. Which one of the following is a tool used to visualize protein structure in 3D?
   a. RasMol   b. RasTop   c. SwissPDBViewer   d. All

9. Which one of the following is not a computing language generally used by biologists?
   a. PERL     b. BIO-PERL   c. PYTHON   d. AJAX

10. In PHYLIP, which program is used to generate / obtain bootstrap value?
    a. DNAML   b. Consense   c. Seqboot   d. Retree

11. In PHYLIP, which program should be used in order to obtain rooted tree?

12. What would be output of following perl program?
    ```perl
    print "Welcome \n";
    a. Welcome   b. Welcome to Perl   c. Welcome to Perl   d. "Welcome"
    Perl "to" "Perl"
    ```

13. When GenBank 3.0 was made available to public?

14. Which web based tool or resource provides valuation contents on protein structure prediction?
    a. EVA   b. PredictProtein   c. CASP   d. Rosetta

15. Which one of the following is not a method for predicting protein tertiary structure?
    a. Threading   b. Fold Recognition   c. Ab-initio   d. EVA
Q.1 Answer in brief (Any five) (10)

1. What is ‘GEOSMIN’? Give its structural formula.
2. How soil amendment controls plant disease?
3. What is Biotic Limitations?
4. Classify soil organisms with examples.
5. What is Soil Biology? Give importance of soil organisms.
6. How soil is a good habitat for organism?
7. What is the role of soil algae in agriculture?

Q.2 Write short-note (Any five) (20)

1. Mycorrhizal fungi
2. Soil enzyme
3. Earthworm and soil fertility
4. Soil protozoa
5. Nitrogen cycle
6. Soil actinomycetes
7. Biological nitrogen fixation

Q.3 What is Root Soil Interface (RSI)? Describe different aspects of RSI and their influence on plant nutrition. (10)

or

Classify soil bacteria. Describe the priming effect of bacteria in the decomposition of soil humus.

Q.4 What is Mycorrhizae? Explain different types of mycorrhizal association with respect to nutrient uptake. (10)

or

Classify soil enzymes. Discuss different types of soil enzymes and their activity in soil.
### Q1. Define (Any EIGHT):

- Auxin autotroph
- Explant
- Ovulo-embryo culture
- Filter sterilization
- Callus
- vi. Acclimatization
- vii. Surfactant
- viii. Cybrid
- ix. Fusogen
- x. Vitrification

**Marks:** 8.0

### Q2. Give scientific reasons:

- a. Sucrose is not considered as a phytohormone
- b. Low temperature pretreatment is given to anthers during anther culture
- c. Cryoprotectants are required for cryopreservation
- d. Activated charcoal is sometimes added in tissue culture medium
- e. Aseptic manipulations can be done safely on a laminar flow hood

**Marks:** 5.0

### Q3. Differentiate (Any FOUR):

- A. EC & IEC
- B. Auxins & Cytokinins
- C. Primary & Secondary hardening
- D. Phytohormone & Plant Growth Regulator
- E. Sexual hybridization & Somatic hybridization

**Marks:** 6.0

### Q4. What is artificial tissue culture medium? Give the details of the ingredients of the medium giving details about the role of each of them.

**Marks:** 6.0

### Q5. Answer the following (Any FOUR):

1. Applications of protoplast culture and fusion
2. Give applications of cryopreservation
3. What is synthetic seed? How can it be produced?
4. Synthetic auxins are usually preferred over natural ones. Why?
5. Methods for surface sterilization of plant material for tissue culture

**Marks:** 5.0

### Q6. Describe the steps involved in the production of transgenic plant using *Agrobacterium* mediated transformation preferably with a diagram. What is the role of tissue culture in this process?

**Marks:** 6.0
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Q-1: Answer the following. (10.00)

1. Give an account of different methods/ways used for insect identification and explain any one of them.

2. What is hierarchy? Name the various taxa used by Linneaus in hierarchy.

3. What is nomenclature? Discuss its importance in insect systematics.

4. Write important international codes/rules of zoological nomenclature.

5. Enlist the important pre-requisites for zoological nomenclature.

6. Why dictyoptera and phasmida order get separated from orthoptera order?

7. What do you know about the telephonic and telegraphic style of insect description? Explain with suitable examples.

8. Enlist the different ways (means) of insect classification and explain one of them.

9. What is mean by lower and higher taxa?

10. Name the various primary and secondary wingless insects.

Q-2: (A) Write short-note on following (Any five) (5.00)

1. Trinomial nomenclature
2. Level of insect taxonomy
3. Biological species concept
4. Common name of insects
5. Recent trend in insect systematics
6. Taxonomic publication

(B) Write the contribution of following in the field of insect taxonomy (3.00)

1. Aristotle
2. Carolus Linnaeus
3. Brauer
4. Haeckel
5. Sharp
6. Pickard

(C) Name the two reference books along with its author used for "Insect Systematics" course. (2.00)
Q-3: (A) Classify the following insects into their respective order, sub-order and family. (5.00)
1. Preying mantid
2. Onion thrips
3. Fruit fly
4. Mustard sawfly
5. Locust

(B) Name the insect(s) included in the following families. (5.00)
1. Coccinellidae
2. Tettigoniidae
3. Tephritidae
4. Plutellidae
5. Braconidae
6. Gelechidae
7. Pentatomidae
8. Pseudococcidae
9. Acrídidae
10. Tenthredinidae

Q-4: (A) Define following terms (Any six) (6.00)
1. Phenetics
2. Sibling species
3. Hamuli
4. Paleoptera
5. Anamorphosis
6. Holotype
7. Monotypic species

(B) Write outstanding morphological differences between the following. (4.00)
1. Grasshopper and cockroach
2. Dragonfly and damselfly
3. Leaf insect and stick insect
4. *Trichogramma* and mustard sawfly

Q-5: (A) Write most important features for the following. (5.00)
1. Mouth-parts in thysanoptera
2. Antennae in lepidoptera
3. Legs in orthoptera
4. Wings in diptera
5. Abdominal appendages in collembola

(B) State whether the following statements are “True” or “False” (5.00)
1. Phylopoda is a synonym of thysanoptera.
2. Hemiptera order is also known as rhynchota.
3. Adults of dragonfly live for short period.
4. Insects of plecoptera are known for its protective resemblance to the foliage on which it occur and feed.
5. Ovipositor of predatory thrips is modified into tubular structure.
Q.1 Write Notes on (Any three) (9)

1. Long term experiments
2. Direct, Residual and cumulative effect
3. Pooled Analysis
4. Balanced confounding

Q.2 (a) What is the meaning of confounding? Why in general higher order interactions are confounded? In which circumstances partial confounding is resorted. (4)

(b) In a $2^5$ experiment, A, B, C, D, E and F are the factors. Prepare a plan for one replication, when ABC and ABDEF are confounded. (3)

(c) In a $3^2$ experiment, $AB^2$ effect is to be confounded. Prepare the layout for one replication (3)

Q.3 (a) What are the advantages of factorial experiment? Illustrate to explain simple effect, main effect and interaction. (4)

(b) Illustrate to explain the procedure for analysis the data from $2^4$ experiment conducted with two replications in RCBD. (6)

Q.4 Explain analysis of covariance. Under which circumstances covariance analysis could be used for improving the precision of treatment comparisons. (6)

Q.5 What is response curve? Explain the procedure for finding economic optimum dose of fertilizer from a quadratic function. (6)

Q.6 Identify the effect(s) confounded from the given layout of a block and complete the replication (9)

(PTO)
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Anand Agricultural University  
B. A. College of Agriculture, Anand  
Post Graduate Even Semester End Examination- 2010

Course No: Ag.Stat.711 (Statistical Methods for Crop Protection II)

Date: 07.07.2010  
Day: Wednesday  
Time: 1000 to 1200 hrs.  
Marks: 50

Q.1 Discuss the uses of the following (10)
   (1) Regression coefficient
   (2) R²
   (3) Partial F test
   (4) LC₅₀
   (5) Partial correlation

Q.2 Explain the term “Multiple linear regression” and enlist the objectives of studying regression analysis. List different methods of fitting linear multiple regression model and discuss any one method with appropriate example. (10)

Q.3 What do you understand by non-linear regression? Discuss the uses of non-linear regression analysis in agricultural research. (10)

Q.4 What is Bio assay? Discuss different types of assay and the application of bio assay in research. (10)

Q.5 Fit a multiple regression equation using following information. (10)

\[ \sum x₁^2 = 5.6906 \quad \sum x₂^2 = 4.1967 \quad \sum x₃^2 = 21.8291 \]
\[ \sum x₁.x₂ = 0.9775 \quad \sum x₂.x₃ = 1.6316 \quad \sum x₁.y = 0.5541 \]
\[ \sum x₂.y = -0.2563 \quad \sum x₃.y = -0.3948 \]
B. A. COLLEGE OF AGRICULTURE  
ANAND AGRICULTURAL UNIVERSITY  
ANAND-388110  
Post Graduate Semester End Examination  
Sub: Ag. Extn. 715  
Administration in Extension Education (2+0)

Date: 7-7-2010  
Time: 10.00 to 12.00 hrs.  
Marks: 50

Q. 1 (A) Define/ explain the following terms (any five).  
1. Administration  
2. Performance appraisal  
3. Co-ordination  
4. Break-even analysis  
5. Planning  
6. Authority

(B) Fill in the blanks with appropriate word(s).  
1. The formal rights rested officially to a person in the organization is called  
   _______________ type of authority.  
2. _______________ principle of management says that a person should receive  
   orders from one superior only.  
3. The horizontal dimension of the formal organizational structure is also known  
   as _______________ structure.  
4. Authority flows ____________ and responsibility flows ____________ .  
5. ____________ is a blend of top-down and bottom up approach of planning.

Q.2 (A) How will you differentiate administration from management?  
(B) Describe the functions of administration in detail.

Q.3 Write short notes on any three of the following.  
1. Qualities of a good administrator  
2. Types of budget  
3. Principles of co-ordination  
4. Principles of extension administration

Q.4 Answer the following questions (any four).  
1. Enlist various steps in the process of planning.  
2. What do you understand by span of management?  
3. “Management is the science and art both”- justify this statement.  
4. State various characteristics of management.  
5. What are the objectives of training?

Q.5 Discuss in brief various principles of organization.
Q. 1 Discuss about the role of theories of work motivation in group dynamic (8)

Q. 2 Describe the social groups and its classification in extension work (8)

Q. 3 Discuss about Performance Appraisal (4)

OR

Q. 3 Discuss about Rural Resources Development (4)

Q. 4 Write short notes (Any five) (15)

1. Advantages of small group
2. Sociometry
3. Group dynamic
4. Group cohesiveness
5. Ways of teacher-group interaction
6. Selection and indication of training development
7. Reasons for small informal group formation

Q. 5 Describe the methods and conditions for learning process skill (5)

OR

Q. 5 Describe about a hierarchy of learning? (5)

(P.T.O.)
Q. 6  Match the following Group A with Group B

<table>
<thead>
<tr>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sociogram</td>
<td>physical proximity</td>
</tr>
<tr>
<td>2. Aggregation</td>
<td>who chooses whom</td>
</tr>
<tr>
<td>3. Secondary social group</td>
<td>life vs theater</td>
</tr>
<tr>
<td>4. Primary social group</td>
<td>demonstrations</td>
</tr>
<tr>
<td>5. Shakespeare</td>
<td>little intimacy</td>
</tr>
<tr>
<td>6. SOAR</td>
<td>one follow up activity</td>
</tr>
<tr>
<td>7. LIFE</td>
<td>we feeling</td>
</tr>
<tr>
<td>8. Involuntary group</td>
<td>common goal</td>
</tr>
<tr>
<td>9. Job satisfaction</td>
<td>by birth</td>
</tr>
<tr>
<td>10. Cohesive group</td>
<td>management expectations</td>
</tr>
<tr>
<td>11. S.R Theory</td>
<td>feeling</td>
</tr>
<tr>
<td>12. McDougall's theory</td>
<td>kurt lenen</td>
</tr>
<tr>
<td>13. Biological drive</td>
<td>conditionism</td>
</tr>
<tr>
<td>14. Thorndike</td>
<td>micro finance</td>
</tr>
<tr>
<td>15. Alfred adler</td>
<td>merit rating</td>
</tr>
<tr>
<td>16. Abraham Maslow</td>
<td>self actualization</td>
</tr>
<tr>
<td>17. Performance appraisal</td>
<td>security drive</td>
</tr>
<tr>
<td>18. SHG</td>
<td>stimulus response mechanism</td>
</tr>
<tr>
<td>19. Group dynamic</td>
<td>thrust</td>
</tr>
<tr>
<td>20. Companionship</td>
<td>instinct</td>
</tr>
</tbody>
</table>
B.A.COLLEGE OF AGRICULTURE  
ANAND AGRICULTURAL UNIVERSITY  
ANAND 388 110 

POST GRADUATE EVEN SEMESTER END EXAMINATION – 2009-10  

Subject : Biochem. - 711 (2+0) : Immunochemistry  

Date : 07-07-2010  

Time : 10.00 to 12.00 hrs.  

Wednesday  

Marks : 50  

<table>
<thead>
<tr>
<th>Q-1</th>
<th>Explain (Any Five)</th>
<th>5.0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) Hybridoma (2) Acquired immunity (3) Vaccination (4) Antibody</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5) Hapten (6) Abzymes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q-2</th>
<th>State True or False</th>
<th>5.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mild illness is a reason to withhold vaccination</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Galactosidase enzyme is involved in ELISA technique</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Abzymes are monoclonal antibodies</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Immunogenicity is restricted to ant particular molecular charge.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Monoclonal antibodies derived from single clone</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q-3</th>
<th>Write short answers (Any five)</th>
<th>15.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Write the name of innate immune system's and adaptive immune system's cells and molecules</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Enlist the types of immune system</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>What are the factors influencing immunogenicity?</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Differentiate T-lymphocytes and B-lymphocytes</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>What do you mean by allergy and allergen?</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Give the characteristics of IgG, IgH, and IgE</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q-4</th>
<th>Fill in the gaps</th>
<th>5.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Abzymes play a dual role as __________ and __________</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>A disease consisting organism is known as __________</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>________________ is induced by natural exposure to the pathogen</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>The location of monocytes cells is __________</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q-5</th>
<th>Write short note (Any two)</th>
<th>20.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Scope of Immunology</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Vaccines</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Antigen</td>
<td></td>
</tr>
</tbody>
</table>
B. A. College of Agriculture  
Anand Agricultural University, Anand

Post Graduate Even Semester End Examination- June-July-2010  
Course No. Ag. Micro. 711  
Course Title: Biology and Cultivation of Edible Fungi (1+1)

Date: 6/7/2010  
Time: 1000 to 1200  
Day: Tuesday  
Total Marks: 50

Note: All Questions Carry Equal Marks

1. List different edible fungi with their characteristics.  
2. Give classification of edible fungi.  
3. Discuss nutritional aspects of mushrooms  
4. Give the protocol for commercial production of any one edible fungus.  
5. Explain how you proceed for identification of edible fungi.
Q.1 (A) Explain in brief the working principles, construction feature, working method, advantages and disadvantages of continuous knapsack sprayer

(B) State whether following statements are True or False, Rewrite the falls statement correctly.

(1) Foot sprayer is most suitable for applying pesticides in cotton field
(2) Pressure gauge is useful to maintain pressure
(3) Triple action nozzle is specially designed for foot sprayer
(4) Booms are useful for spraying the cotton
(5) Knapsack sprayer is most suitable for orchards

Q.2 (A) Define/Explain the following terms

1) Ultra low volume
2) Drift
3) Fog and smok
4) Emulsion
5) Solution

(B) Match the following

(1) Bird scarer (2) Gator sprayer (3) Soil injection (4) Plunger duster (5) Knapsack sprayer (6) Hand compression sprayer (7) Sprayer (8) Hand rotary duster (9) Domestic sprayer (10) Arial sprayer (11) Scare the birds (12) 7.14 to 18 kg/cm² (13) Useful for orchard (14) Useful for dry farming (15) Mechanical Agitator (16) ULV (17) Nematicide (18) Domestic duster (19) 14 to 17 kg/cm²
Q. 2 (C) Differentiate the followings (4.0)
(1) Backpack sprayer and knapsack sprayer
(2) Pressure gauge and pressure chamber
(3) High volume and Low volume
(4) Air pump and hydraulic pump

Q. 3 (A) Write short notes (6.0)
(1) Plunger duster
(2) Atomizer

(B) Answer the following in brief (5.0)
(1) What should be the proportion of oil and petrol in motorized knapsack mist blower cum duster?
(2) What the importance of pressure regulation in spraying?
(3) What care should be taken during operating a CDA sprayer?
(4) Which are the miscellaneous plant protection equipments other than sprayer and duster?
(5) How rocking sprayer differs from foot sprayer?

Q. 4 (A) Why aerial spraying is not useful for controlling the pest in India? (8.0)
Explain demerits in details.

(B) Explain the importance of plant protection equipments in pest management (5.0)
B.A. College of Agriculture  
ANAND AGRICULTURAL UNIVERSITY  
ANAND – 388 110

POST GRADUATE EVEN SEMESTER END EXAMINATION 2009-10

Subject: Ag. Ento. 716 (2+1): Pests of vegetables, tuber, spices, condiments, medicinal and aromatic plants

Date: 06/07/2010 Time: 1000 to 1200 hrs Marks: 50

Tuesday

Q. 1. Enlist the pests of okra with scientific name and describe the complete IPM strategies for management of okra pest complex. (8)

Q. 2 (a) Give the marks of identification of the following pests (Any four) (6)

1. Shoot borer of Ginger  
2. Epilachna beetle  
3. Shield backed bugs of Jatropha  
4. Pod fly of pigeon pea  
5. Parwar vine borer

Q. 2 (b) Describe the nature of damage of following pests in crop (Any four) (8)

1. Chilli thrips  
2. Potato tuber moth  
3. Ginger rhizome scale  
4. Red and black pumpkin beetle in cucurbits  
5. Leaf footed plant bug in bitter gourd

Q. 3 Write the IPM strategies for following pests (Any four) (12)

1. Cabbage diamond back moth  
2. Potato cut worm  
3. Fruit fly in cucurbits  
4. Onion thrips  
5. Tomato fruit borer

Q. 4 (a) Write two recommended insecticides for the following pests (5)

1. Brinjal mites  
2. Okra jassid  
3. Tomato leaf miner  
4. Cowpea pod borer  
5. Pigeon pea podfly

CP T 3

1
Q. 4 (b)  Mention two natural enemies with its scientific name of following pests
   1. Brinjal shoot and fruit borer
   2. Cucumber leaf miner
   3. Chilli fruit borer
   4. Cabbage aphids

Q. 4 (c)  Write the vector/carrier with scientific name for following diseases
   1. Pigeon pea sterility mosaic virus
   2. Brinjal little leaf disease
   3. Cowpea mosaic
   4. Chilli leaf curl
   5. Okra Yellow Vein Mosaic Virus
   6. Onion purple blotch

Q. 5 (a)  Name the insect pests which can be monitored through sex pheromone traps.

Q. 5 (b)  Mention any two reference books for this course along with title and authors.
Q. 1 Explain the following terms in short. (10.0)

1. Somatic recombination
2. Embryo rescue
3. Suspension culture
4. Packed-cell volume
5. Satellite RNA
6. LD50 Dose
7. Segmental Chimera
8. Epistasis
9. Antisense RNA
10. Photorespiration

Q.2 Differentiate between the following (10.0)

1. Dedifferentiation and Redifferentiation
2. Mid Parent heterosis and Better Parent heterosis
3. Heterologous and Homologous protein
4. Avr and R genes
5. C3 and C4 plants

Q.3 Answer the following in short (14.0)

1. List out various parameters on the basis of which effects of mutagens are evaluated in plants.
2. Describe what is stated by Dominance and over dominance hypothesis of heterosis.
3. Mention the role of following enzymes in plant metabolism
   i) Polygalacturonase
   ii) ACC synthase
   iii) Phytoene synthase
   iv) Rubisco
4. List out some of the important genes from different sources which have been used to develop transgenic in plants for biotic stress resistance.
5. List out and define various classes of promoters used in plant genetic engineering
6. Give mutation breeding scheme for seed propagated and vegetative propagated crops. How they differ from each other?
7. Describe Flor's gene for gene model for disease resistance in plants with suitable diagrams.

Q.4 List out some of the traits which are normally targeted for quality enhancement through genetic engineering techniques. Describe any one of them in details giving suitable example. (6.0)

Q.5. Write short notes on the following (ANY TWO) (10.0)

i) Genetic engineering for crop productivity
ii) Production of haploids and their use in crop improvement
iii) Heterosis breeding

***************
Anand Agricultural University  
B.A. College of Agriculture  
Anand  
Post Graduate Even Semester End Examination 2009-10  
Ag. Stat. 715: Statistical Methods for Social Sciences – I (2+1)  
Date: 05-07-2010  
Monday  
Time: 1000-1200hrs  
Marks: 50

Q.1  
(A) Define the following  
(i) Regression coefficient  
(ii) Type –I error  
(iii) Level of significance  
(iv) Discrete variable  
(v) Coefficient of determination  
(B) What is dispersion? Enlist its measures and give formulae to estimate them from grouped and ungrouped data.

Q.2  
(A) Give conditions for application of small sample test of significance and complete procedure for analysis of data for two independent small samples.

Q.3  
(A) Give the uses of chi-square test and complete procedure for test of independence in social sciences.

Q.4  
(A) Give complete procedure to fit $Y = a + bX$ equation  
(B) Differentiate parametric and nonparametric test  
(C) Define central tendency and enlist its measure. Give formulae to estimate the ideal measure of central tendency from grouped and ungrouped data.  
(D) Explain different types of correlations you have studied
B. A. College of Agriculture
Anand Agricultural University, Anand
Post Graduate Even Semester End Examination-2010
Course No. : Pl. Path. 720
Course Title : Plant Disease Management (2+1)

Date : 03.07.2010 Time : 10.00 to 12.00 hrs.
Day : Saturday Marks : 50

Note : (1) Figures to the right indicate marks.
(2) Support your answer with suitable figures and examples wherever necessary.

(Q-1) (A) Define biological management of plant diseases. State various mechanism involved in biological management of plant diseases with merits and demerits. (5.0)

(B) Discuss the significance of plant disease management. (4.0)

(Q-2) (A) Define/Explain the following (Any eight). (6.0)
(i) Adjuvants (vii) Hyperparasitism
(ii) Tenacity (vii) Antibiotics
(iii) Plant disease (viii) Pathogenicity
(iv) Antagonist (ix) Cross protection
(v) Epidemiology (x) Seed treatment.

(B) Write short notes on the following (Any six). (12.0)
(i) Soil solarization
(ii) Boom and bust cycle
(iii) Plant quarantine
(iv) Role of multilines in plant disease management
(v) Bordeaux mixture
(vi) Characteristics of an ideal fungicides
(vii) Plant disease forecasting
(viii) Crop rotation in plant disease management.

(Q-3) (A) Give the trade name of the following fungicides. (4.0)
(i) Chlorothalonil (v) Metalaxyl MZ
(ii) Difenconazole (vi) Dinocap
(iii) Copper oxychloride (vii) Mancozeb
(iv) Iprobenfos (viii) Thiophanate methyl.

(B) Differentiate the following (Any four). (10.0)
(i) Vertical resistance and Horizontal resistance
(ii) Soil invaders and Soil inhabitants
(iii) Systemic and Non-systemic fungicides
(iv) Disease control and Disease management
(v) Simple interest disease and Compound interest disease.

(P.T.O.)
(Q-4) (A) Enlist various principles of plant disease management. Discuss the principle “Avoidance of the pathogen” in detail with suitable examples. (4.0)

(B) Fill in the blanks. (5.0)

(i) Plant quarantine does not work, when the pathogen is ________ in nature.

(ii) The alternate host of black rust of wheat is ________.

(iii) The dosage that kills 50% of the spore population is called ________.

(iv) Full form of MEMC is ________.

(v) ________ is an antifungal antibiotic.

(vi) Sterility mosaic of pigeonpea is transmitted by ________ vector.

(vii) Horsfall’s celebrated book on fungicides is entitled “__________”.

(viii) Flor, in 1955, proposed the ‘gene for gene’ hypothesis for host-parasite interaction in rust of ________, caused by ________.

(ix) The fungicide ________ is also known as Kittleson’s Killer.

###xxx###
B. A. COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY, ANAND

POST GRADUATE EVEN SEMESTER END EXAMINATION-2010
SUBJECT: AGRON-714
TITLE : STRESS CROP PRODUCTION

Date: 03/07/2010
Day : Saturday

Time : 10:00 to 12:00 hrs.
Marks: 50

Q.1 Answer in details (ANY THREE) (12.0)
(1) Mention the all climatic factors affecting crop growth in details.
(2) Define chlorosis, mention its types, causes and remedial majors.
(3) Mention the alkaline appraisal, its causes and measures to reduce alkalinity in soil.
(4) Mention the air pollution, its effects on plants and its remedial measures.

Q.2 Write short notes (ANY THREE) (9.0)
(1) Characteristics of Xerophytes plants.
(2) Reclamation of saline/sodic soils
(3) Redox potential
(4) Low temperature effects and remedial measures.

Q.3 Fill up the blanks with appropriate word/s (6.0)
(1) Stress due to pesticides, nutrient reduction etc. is called ____________ stress.
(2) _______ tolerate excess sodium and grown in ______ season.
(3) One atmosphere bar = _________ cm. height of water column.
(4) NO₃ ion develops ______ spots in saline soils.
(5) _______ chemical compound is the best for the reclamation of sodic soils.

Q.4. Differentiate the following (ANY FOUR) (8.0)
(1) Stress V/s strain
(2) Acute injure V/S chronic injure
(3) PAN V/s O₃
(4) Mesophytes V/s Halrophytes
(5) Active acidity V/s Potential acidity.

Q.5 Answer in brief (ANY TEN) (10.0)
(1) Mention different types of phyto-remediation.
(2) Enlist different sources of water pollution.
(3) Define SAR and ESP, give their formulae.
(4) Enlist the radionuclides in soil, give its sources.
(5) Enlist organic and chemical amendments of soil.
(6) Mention the advantages of sewage water and sludge.
(7) Enlist the heavy metals.
(8) Enlist different types of stresses.
(9) Mention the organic and inorganic waste.
(10) Mention the selection of trees for safe environment.
(11) Mention the remedial measures to overcome high temperature stress.
(12) Mention the three categories with examples of plants for Ozone pollutant.
(13) Enlist the name of salt tolerant crops.

PTO
Q.6 A. Match pair A with pair B

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Foreign perturbations</td>
<td>1. Pre-ripening of banana</td>
</tr>
<tr>
<td>2. Tobacco</td>
<td>2. CEE</td>
</tr>
<tr>
<td>3. Suffocation</td>
<td>3. 100 %</td>
</tr>
<tr>
<td>4. Dandi</td>
<td>4. Bar</td>
</tr>
<tr>
<td>5. Press mud</td>
<td>5. BOD</td>
</tr>
<tr>
<td>7. Ethylene</td>
<td>7. Frost</td>
</tr>
<tr>
<td>8. Refrigeration</td>
<td>8. CFS</td>
</tr>
<tr>
<td>12. Chemical transformation</td>
<td>12. Low temperature injure</td>
</tr>
<tr>
<td></td>
<td>13. Denitrification</td>
</tr>
<tr>
<td></td>
<td>14. Reversible</td>
</tr>
</tbody>
</table>

Q.6 B. Give full form of following abbreviations

(i) NEERI   (ii) CAM   (iii) COD   (iv) PAN
(v) EPCB   (vi) CSSRI (vii) CEE   (viii) WWI

xxxxxxxxx
Date: 2/7/2010
Day: Friday

Time: 1000 to 1200
Total Marks: 50

Note: All Questions Carry Equal Marks

1. Define the term 'Microbial Control' and discuss the pros and cons of using microbial biopesticides.
2. Explain how you will proceed for isolation of a microbial control agent from a dead insect.
3. Define the term 'stain' and explain the mechanism of Grams' staining.
4. List different biotechnological tools used in microbial control and discuss any one of them.
5. Discuss occurrence, spread, entry and mode of action of baculoviruses in insects.
Q.1. Write short notes:
   (1) Advantages of vermi-compost
   (2) Biological weed control
   (3) Scope of organic farming in Gujarat State.
   (4) Organic crop rotation.
   (5) Requirements for exporting organic products.

Q.2. Give scientific reasons (Any Four):
   (1) Agricultural activity affects the biodiversity.
   (2) Organic foods are healthier than conventional foods.
   (3) Major section of farmers have never accessed to green revolution.
   (4) Consumers are not paying much for organic food.
   (5) India is uniquely suitable for organic cultivation

Q.3. Define the followings:
   (1) Bio-fertilizers.
   (2) Allelopathy
   (3) Bio dynamic farming
   (4) Green manuring in situ
   (5) Mixed farming


Q.6. Write as directed:
   (1) Enlist principles of organic farming within ecological frame work.
   (2) Write full form of OFPA, IFOAM, APEDA and NSOP.
   (3) Enlist important crops used for green manuring.
   (4) Enlist different methods of composting.

Q.7. Define composting and write factors affecting composting.

Q.8. Write about mechanical composting and enrichment of compost in detail.

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Post Graduate Even Semester End Examination 2010-11
Hort. 712. Advances in Commercial Floriculture (2+1)

Date: 02-07-2010
Day: Friday

Time: 1000 to 1200
Marks: 50.00

Q.1 (A) What is Floriculture? Why it is known as a Dynamic Industry
(B) Define Hydroponics. Enlist propagating medias with their
characters.

Q.2 (A) Write on the uses of bio-fertilizers in flowering plants with their
(B) What is fertigation? Enlist the water soluble fertilizers.
chemical action.

Q.3 (A) Write on organic farming in Floriculture
(B) Write the points on advanced cultivation of Rose in Green
House condition.

Q.4 (A) Narrate the reasons and remedies of carnation flower splitting.
(B) Write on special practices adopted for chrysanthemum
cultivation.

Q.5 (A) What is value addition? How you can add the value of flower?
(B) An advanced flower producer want to take seed production
programme. Guide him

Q.6 (A) How can you manage photoperiod, Co2 level and temperature in
(B) Narrate and describe the different Green House.
Green House?

Q.7 (A) Write on production technology of pot and foliage plants.
(B) Give the methods of packaging.

Q.8 (A) Write on flower arrangement and drying of flowers.
(B) Enlist the advanced varieties of Gerbera, Carnation, Lily and
Chrysanthemum.

@@@@@@@@
Q-1 Write IPM strategy for Rose crop pest management. (3.00)

Q-2 An enlist type of aphid found in ornamental plants and describe their nature of damage and control measures. (4.00)

Q-3 Write nature of damage and control measures for following pests in ornamental crops. (10.00)
- Thrips
- Leaf miner
- Scale insects
- Termite
- Mealy bug
- *Spodoptera litura*
- *Whitefly*
- Castor semi looper
- Jasmine bud worm
- Beetles and weevils

Q-4 An enlist the type of mites found in ornamental plants and give their nature of damage and control measures. (4.00)

Q-5 Explain pest management strategy in ornamental plants. (4.00)

Q-6 Write the nature of damage of following pests. (6.00)
- Mango leaf webber
- Leaf gall midge
- Citrus psylla
- Citrus leaf miner
- Chiku moth
- Aonla hairy caterpillar

Q-7 Explain in brief the marks of identification of following pests. (3.00)
- Fruitfly
- Termite
- Aonla leaf roller
- Aonla gall forming black caterpillar
- Anar butterfly
- Thrips

Q-8 Write the various species of Mango hopper with their specific host plants. Explain in brief its IPM strategy for mango orchard. (6.00)

Q-9 Write the most effective chemical insecticides for the management of following pests. (6.00)
- *Drosicha mangiferae* Green
- *Papilio demoleus* Linnaeus
- *Anarsia achrassella* Bradley
- *Indarbella tetraonitis* Moore

Q-10 Write the two recommendations for fruit crops recommended by the Department of Entomology, BACA, Anand for the following crops. (4.00)
- Aonla
- Mango
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ANAND

POST GRADUATE SEMESTER END EXAMINATION 2010-11

Course No.: Ag. Extn.-712 Rural Community Organizations (2+0) =2
Date: 02 / 07 / 2010 Time: 10.00 to 12.00 hrs. Marks: 50

Q-1 (a) List out the steps of process of community organizations and discuss any three in detail. (6.00)
(b) Enlist the objectives of rural community organizations. (4.00)

Q-2 (a) What is the role of Rural community organization in the development of rural areas? (5.00)
(b) Define / Explain the following. (Any five) (5.00)
1. Community
2. Voluntary organizations
3. Youth club
4. Gram Panchayat
5. Social institution
6. Mahila mandal

Q-3 (a) Enumerate the stages of community organization. Discuss first two in details. (5.00)
(b) Write the organizational structure of Seva Mandir. A Voluntary organization (5.00)

Q-4 (a) Enlist out the principles of rural community organization. Discuss any three in detail. (6.00)
(b) Spell out the following. (4.00)
1 NREGA:
2 BAIF:
3 RCO:
4 AKRSP:
5 ATIC:
6 ICCW:
7 SWM:
8 GVT:

Q-5 (a) List out the problems affect the rural development. Discuss any three in detail. (5.00)
(b) Fill in the blank/s with appropriate word/s. (5.00)
1 Rural community organization is a __________ of rural people who live in a common__________________________.
2 There is a natural bondage between the school and the __________.
3 ____________________________ are institutional bridges across a multifaceted society.
4 Village __________ are mostly illiterate.
*************
B.A. COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY
ANAND-388 110

Post Graduate Even Semester End Examination-2010

Course No. Crop Phy. 712 : Post Harvest Physiology (1+1)

Date : 01-07-2010
Thursday

Time : 10:00 to 12:00 hrs.

Marks : 50

Q-1 Define / Explain (any four) (8.0)
(1) Chilling injury
(2) Transgenic technology
(3) Molecular biology
(4) Anti ethylene concept
(5) Macrobiotic seeds

Q-2 Differentiate the following (any four) (8.0)
(1) Climacteric Vs non climacteric fruits.
(2) Physiological Vs commercial maturity.
(3) Seed viability Vs seed longevity.
(4) Senescence Vs aging of fruits.
(5) Maturity Vs ripening of fruits.

Q-3 Write methods to estimate (10.0)
(1) Chlorophyll from green leaves.
(2) Respiration rate from fruits and vegetables.

Q-4 Physiological and biochemical changes during ripening of fruits. (8.0)

Q-5 Explain fruit maturity and enlist the different indices for fruit maturity and give maturity indices for banana and mango fruits. (6.0)

Q-6 What is post harvest management? Write important steps involved for the management of cut flowers and fruits after harvest. (10.0)

***********************************************************************************
ANAND AGRICULTURAL UNIVERSITY
B A COLLEGE OF AGRICULTURE
ANAND-388110
P G Even Semester End Exam: 2010
Course: Ag. Met. 711/Ag Econ 802
Mathematics in Agriculture and Biology/Mathematical Methods (2+1)
Date: 1/7/2010
Thursday
Max Marks: 50
Time: 1000 to 1200 hr

Q.1
(a) Explain the following terms with giving examples.(Any Two) (4.0)
   i) Vectors and scalars  ii) Union of two sets and iii) Maxium and Minimum

(b) Answer the following questions.
   i) Write the events of Meteorology/Economics where probability is directly involved. (4.0)
   ii) What is the necessary and sufficient conditions to have maxima and minima either for two variables or one variables?

(c) Write the properties of Vector. (2.0)

Q.2 (a) Do as directed (8.0)
   i) \[ z = \exp(\cos y + \sin x) \] find first order Partial derivatives..
   ii) Find \( g'(5) \) if \( g(x) = (2x+1)^2 \)

(b) Attempt Any One (2.0)
   i) How to solve the linear differential equation \( \frac{dy}{dt} = ky \) ?
   ii) What is the order and degree of the differential equation

Q.3 (a) Do as directed. (4.0)
   i) What is the order and degree of the differential equation
   \[
   \left( \frac{d^2 y}{dt^2} \right)^3 + \left( \frac{dy}{dt} \right)^5 + y = 100 . \text{ Is this linear?}
   \]
   ii) The distance traveled by a insect at the time t is \( 2t^3 - t^{1/2} \). Find the instantaneous velocity at time t and at time t=2.

(b) Attempt Any Two (6.0)
   i) Solve: \( (D^2 + 4) y = e^x \)

   ii) Find the rank of the Matrix
   \[
   \begin{bmatrix}
   1 & 8 & 9 \\
   5 & 6 & 0 \\
   7 & 2 & 4
   \end{bmatrix}
   \] (P.T.O.)
Q1. Explain in detail the following. (10)
   a. Population, Sample
   b. Sampling, Sampling Unit
   c. Parameter, Statistic
   d. Standard error
   e. Purposive Sampling

Q2. a. Distinguish between complete enumeration and sampling study. (03)
   b. What is random sampling? (03)
   c. Explain sampling and non-sampling errors. (04)

Q3. Explain the following by giving suitable example from your field of study. (10)
   a. Cluster Sampling
   b. Stratified Random Sampling
   c. Systematic Sampling

Q4. Explain the following by giving suitable example from your field of study. (03)
   a. Correlation
   b. Rank Correlation
   c. Linear and Multiple Regression

Q5. What is residual. List out important assumptions of the residuals. Explain in detail the tools for "Model Adequacy". (10)
Q.1 Write in detail about Natural system of plant classification? Explain Bentham & Hookers system of classification, its merits and demerits in detail.

Q.2 Explain Global Plan of action. What are the priority activities of Global Plan of action for conservation and sustainable utilization of plant genetic resources?

Q.3 What is centre of origin and centre of diversity? what are different centres of origin of cereal and pulse crops? Explain in detail.

Q.4 What are the chief objectives of plant introduction? Explain important achievements along with its merits and demerits.

Q.5 What are the important issues related to plant genetic resources management?

Q.6 Define the following (Any five)
   1. Land races
   2. Obsolete varieties
   3. Species
   4. Primary gene Pool
   5. Propagules
   6. Base collections
   7. Patent

Q.7 Write short notes on the following (Any Five)
   1. Biodiversity repositories identified for different genetic resources
   2. Why Plant Genetic resources matter
   3. Types of Biodiversity
   4. Types of Plant introductions
   5. Thatiophyta
   6. NBPGR
   7. Intellectual property Rights
<table>
<thead>
<tr>
<th>Question</th>
<th>Part</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q.1</td>
<td>(a)</td>
<td>Define the terms- &quot;Leader&quot; and &quot;Leadership&quot;. (5)</td>
</tr>
<tr>
<td></td>
<td>(b)</td>
<td>State the difference between &quot;Leadership&quot; and &quot;Management.&quot; (5)</td>
</tr>
<tr>
<td>Q.2</td>
<td>(a)</td>
<td>Discuss the following: (5)</td>
</tr>
<tr>
<td></td>
<td>(i)</td>
<td>&quot;Leaders are gift of God to mankind&quot;.</td>
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<td></td>
<td>(ii)</td>
<td>&quot;Leadership creates confidence&quot;.</td>
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<td></td>
<td>(b)</td>
<td>Discuss most significant types of leaders with characteristics. (5)</td>
</tr>
<tr>
<td>Q.3</td>
<td>(a)</td>
<td>State and explain various methods of identifying the leaders (5)</td>
</tr>
<tr>
<td></td>
<td>(b)</td>
<td>Draw a figure for personality dynamics of a leader and explain it. (5)</td>
</tr>
<tr>
<td>Q.4</td>
<td>(a)</td>
<td>State &quot;A9 &quot;characteristics of an effective leadership. (5)</td>
</tr>
<tr>
<td></td>
<td>(b)</td>
<td>What is Sociometry? Discuss where to apply sociometry. (5)</td>
</tr>
<tr>
<td>Q.5</td>
<td>(a)</td>
<td>Discuss the methods useful in getting local leaders to accept new ideas. (5)</td>
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<td></td>
<td>(b)</td>
<td>Enumerate the advantages and disadvantages of using leaders in extension. (5)</td>
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</tbody>
</table>

***************
B. A. College of Agriculture  
Anand Agricultural University  
Anand - 388 110  
Post-Graduate Even Semester End Examination - 2010  
Course No. Hort. 713  
Course title: Plant Material for Landscaping (2+1)  
Date: 30/06/2010  
Day: Wednesday  
Time: 10.00 to 12.00 hrs  
Marks: 50

Q-1  
(A) What are the key for identification of various species of hibiscus? (5.00)  
(B) Differentiate the following (5.00)  
(1) Hedge and Edge  
(2) Cactus and Succulents

Q-2  
(A) What is garden plant material? Classify the garden plant material according to growth habit and utility. (5.00)  
(B) List out the annual flowering plants (5.00)  
(1) Useful for bedding  
(2) Useful as a edging  
(3) Useful for handing baskets  
(4) Useful for border  
(5) Useful for pot culture

Q-3  
(A) Discuss in detail about different species of jasmine (5.00)  
(B) Enlist for the following (5.00)  
(1) Species of cassia  
(2) Fruit trees for avenue planting  
(3) Species of crotons  
(4) Double bracted cultivars of bougainvillia  
(5) Species of erentheme

Q-4  
(A) Write the utility and importance of shrubs in the garden. (5.00)  
Classify the shrubs with suitable examples.  
(B) Reply as demanded (5.00)  
(1) Important facors affecting the growth of plant.  
(2) Name of foliage plants for edging.  
(3) Name of Fragnant flowering plants.  
(4) Name of scarlet flower species of Ixora.  
(5) Name of house plants suitable for interior decoration.

Q-5  
(A) Describe the planting methods of lawn and their maintenance in a garden. (5.00)  
(B) Furnished the information in the tabular form. (5.00)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name</th>
<th>Botanical name</th>
<th>Flowering season</th>
<th>Flower colour</th>
<th>Propagation method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Garmalo</td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>Tuberose</td>
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<tr>
<td>3</td>
<td>African Marigold</td>
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<tr>
<td>4</td>
<td>Kamini</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5</td>
<td>Annual Chrysanthemum</td>
<td></td>
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</tr>
</tbody>
</table>
Date: 30-06-2010

Date: Wednesday

Time: 10.00 to 12.00 hrs.

Marks: 50

Q.1 Which insect has developed high level of resistance against insecticides in Gujarat? Why? How can we overcome this problem.

Q.2 Differentiate the nature of damage of the following pests

1. Sorghum shoot fly and stem borer
2. Termite and white grub
3. Whitefly and aphid

Q.3 Give life history, nature of damage, marks of identification, host plants and control measures of one univoltine pest of Groundnut

Q.4 Mention IPM strategies of the following pests

1. *Amsacta moorei* Butler
2. *Mythimna separata* W.

Q.5 Describe procedure for preparing neem seed kernel suspension 5%

Q.6 How can we increase the efficacy of NPV

Q.7 Enlist pests of paddy and describe nature of damage of sucking pests of it

Q.8 Mention pests of transplanted tobacco. Give nature of damage, life history and control measures of one stem boring insect.

Q.9 Describe seasonal abundance of *Helicoverpa* in Gujarat

Q.10 Which are different pests of pearl millet. Describe marks of identification, nature of damage and control measures of insect damaging to earhead.

Q.11 Name most damaging insect of cotton at present in Gujarat. Give its nature of damage and control measure.

***************
POST GRADUATE EVEN SEMESTER END EXAMINATION – 2010
Subject : BIOCHEM - 709 (3+2 ) : Fundamentals of Molecular Biology
Date : 01–07- 2010
Thursday

Time : 1000 to 1200 hrs.

Marks : 50

Answer to the points.
Explain with diagram where necessary

Q. 1 Give significance of following :
1) DNA organization
3) SOS response
5) Transposons
7) Exonucleases
9) Telomerase

2) Tm Value
4) Sigma Factor
6) Processivity rate
8) Ribozyme
10) Stringent Response

Q. 2 Describe with schematic diagram me about pyrimidine biosynthesis and its catabolism

Q. 3 Give a comparative account of the DNA polymerases of E.coli

Q. 4 What is operon ? Explain the catabolic gene regulation for lac operon

Q. 5 Explain the homologous DNA recombination

Q. 6 Answer briefly the following questions (ANY TWO)
   i) Applications of reverse transcriptase
   ii) Benefits of genetically modified seeds
   iii) Applications of RAPD markers

Q. 7 Explain in detail preparation of cell DNA. Write down the steps for PCR analysis

Q. 8 Write your comment on :
   i) Error in DNA replication is more fatal than error in transcription of mRNA
   ii) Post transcriptional modification is an essential process
   iii) Two strands of DNA are anti parallel
   iv) There are more introns in eukaryotic cells
   v) There is degeneracy in genetic code

Q. 9 Write Short note on : (ANY ONE)
   a) Wobble hypothesis
   b) Group I splicing mechanism

Q. 10 Differentiate the following (ANY TWO)
   i) Eukaryotic promoters Vs Prokaryotic promoters
   ii) Genomic library Vs cDNA library
   iii) mRNA processing in Prokaryotes Vs Eukaryotes

******************************************************************************
B. A. College of Agriculture
Anand Agricultural University
Anand- 388 110
Post Graduate Semester End Examination-2010

Subject: Agron-708 Medicinal and Aromatic Crops
Time: 10:00 to 12:00
Marks: 50

Date: 07-07-10

Q.1 Give the detail agrotechnique for the following crops for middle Gujarat (10)

Q.2 Give the botanical name (5)
   I. Dodi
   IV. Vinca

   II. Senna
   V. Guggal

   III. Satavari

Q.3 Give released varieties of following cropś (5)
   1. Safed musli
   4. Isabgol

   2. Senna
   5. Asalio

   3. Kalmegh

Q.4 Which part is used for medicinal purpose (10)
   (1) Gymnema
   (3) Isabgol
   (4) Kalmegh

   (5) Guggal
   (6) Palmarosa
   (8) Aswagandha

   (9) Brähmi
   (7) Vinca

   (10) Shankhpushpi

Q.5 Which active ingredient is present in the following plants (5)
   1. Safed musli
   3. Kalmegh
   5. Gymnema

   2. Aswagandha
   4. Aloe

Q.6 Write short note on “Importance of Medicinal and Aromatic Plants in national economics”. (5)

Q.7 Give the name of five machines for processing of the medicinal plants. (5)

Q.8 Give the name of three reference books with author for Agron-708. (5)

**********
Date: 7-07-2010 Time: 10.00 to 12.00 hrs.
Day: Wednesday Marks: 50

Q: 1 Explain the commandments of scientific marketing. (5.0)

Q: 2 Discuss the Cobweb theory with diagrams. (6.0)

Q: 3 Discuss in detail market forces with factors affecting demand and supply of farm products along with simple market model and price determination. (7.0)

Q: 4 Write down short notes (Any Three). (9.0)
   i. Agricultural Price Policy in India
   ii. Marketing Functions
   iii. Role of Government in Promoting Agricultural Marketing
   iv. Price Integration Between Domestic and International Marketing

Q: 5 Differentiate the following (6.0)
   i. Horizontal Integration v/s Vertical Integration
   ii. Speculation v/s Hedging
   iii. Market information v/s Market Intelligence

Q: 6 Define/Explain the following terms (Any Five) (5.0)
   (a) Value Addition
   (b) Market Structure
   (c) Parity Price
   (d) Market Risk
   (e) Future Trading
   (f) Market Intelligence Cell

Q: 7 Answer the following questions in brief (Any Six) (12.0)
   i. Explain the seasonal price behaviors of agricultural commodities with diagram.
   ii. How does future market benefit farmers?
   iii. Explain Rajkrishna and Behrman Models.
   iv. Explain the measurements of price instability through quantitative approach.
   v. Mention the factors affecting the magnitude of inter-year fluctuation in prices of agricultural commodities.
   vi. Explain the relationship between marketed surplus and marketable surplus.
   vii. Which are the national commodity exchanges in India?

***********************
Q.1  (A) Define/Explain the following terms.  
(i)  Exon  
(ii)  cDNA  
(iii) Genetic map  
(iv)  PAC  
(v)  Reporter gene  
(vi) Shuttle vector  
(vii) Cos ends  
(viii) Blunt end  

(B) Enlist the methods of breeding self pollinated crops. Explain in detail the backcross method for transfer of a dominant gene.  

Q.2  (A) Define vector. What are the features of good vector? How do you differentiate a cloning vector and an expression vector.  

(B) Write short note (Any Two)  
(i)  BAC  
(ii)  YAC  
(iii)  Cosmids  

Q.3  (A) Define molecular markers. Explain in brief one dominant and one co-dominant molecular marker.  

(B) Describe briefly the Marker Assisted Selection (MAS) with suitable example.  

Q.4  Describe in detail the following (Any Two)  
(i)  Transgenic for insect resistance  
(ii)  Transgenic for abiotic stress resistance  
(iii)  Molecular farming.  

X@X@X
Post Graduate Even Semester End Examination, 2009-10
Course No. : Ag.Ento.-709 : Insect of Industrial Importance (2+1)
Date : 03/07/2010
Time : 10.00 to 12.00
Saturday
Marks : 50.00

Q-1 An enlist different domestic species of honey bee and explain the details of economic importance of one species which is most commonly used for apiculture. (4.00)

Q-2 Explain the role of honey bee in crop production. (4.00)

Q-3 Discuss the Pre-requisites for establishment of apiary (4.00)

Q-4 Write short notes on enemies of honey bees and their management. (4.00)

Q-5 Write the importance of disinfection in sericulture and enlist the rearing equipments required for rearing of silkworm. (7.00)

Q-6 Write the cultivation practices of mulberry crop and various types of silk worm used in sericulture. (8.00)

Q-7 Write the various products of lac insect and their uses. (4.00)

Q-8 An enlist the pests of lac insects and give their management strategy. (5.00)

Q-9 An enlist the host plants of lac insect and write their management practices. (5.00)

Q-10 Write the importance of lac insects, distribution and life cycle of lac insects in brief. (5.00)
Q.1 State the following statements are "True" or "false" (5)

1. Serial entrepreneur starts a new business after having already started and exited a previous business.
2. India has been a traditional importer of raw agricultural products like spices.
3. HRM covers those ethical issues arising around the employer-employee relationship.
4. Trade secret may be a word, symbol, designs, or some combination, or a slogan or sound.
5. GAIC is also declared as Nodal Agency by Ministry of Food Processing Industries.
6. Team skill is a normal and natural part of human interaction.
7. ISI has more than 18,000 International Standards.
8. Agro processing are the industrial estates specifically for setting up of food processing industries.
9. CPM is the time difference between the finish time of a task and the earliest start time of its successors.
10. The main objective of AEZ is to provide higher returns to the farmers.

Q.2 Define the following terms (5)

1. Task successors
2. Conflict
3. Ethics
4. IPR
5. Intrapreneurship
### Q.3 Write full form of the following:

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>SIDO:</td>
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<td>2</td>
<td>SEWA:</td>
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<td>3</td>
<td>PERT:</td>
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<td>DMI:</td>
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<td>7</td>
<td>GAIC:</td>
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<td>8</td>
<td>APMC:</td>
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<td>9</td>
<td>ATMA:</td>
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<td>10</td>
<td>FAO:</td>
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</table>

### Q.4 Fill in the blanks

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>__________ is designated as the statutory authority for regulation of MFOs.</td>
</tr>
<tr>
<td>2</td>
<td>__________ Development Research Foundation, Pune, is an NGO active in Rural Poverty Alleviation since 1967.</td>
</tr>
<tr>
<td>3</td>
<td>__________ works under the administrative control of the Ministry of Agro and rural Industries.</td>
</tr>
<tr>
<td>4</td>
<td>__________ could be defined as set of techno economic activities carried out for conservation and handling of agricultural produce.</td>
</tr>
<tr>
<td>5</td>
<td>__________ bring the purchasers (clients or agencies) and the sellers together.</td>
</tr>
<tr>
<td>6</td>
<td>__________ is given by BIS.</td>
</tr>
<tr>
<td>7</td>
<td>__________ is a NICNET based Agricultural Marketing Information System Network.</td>
</tr>
<tr>
<td>8</td>
<td>__________ is generally a list of all planned expenses and revenues.</td>
</tr>
<tr>
<td>9</td>
<td>__________ brings all the functions under control of a single entity.</td>
</tr>
<tr>
<td>10</td>
<td>__________ is important in selecting the right kind of extension personnel.</td>
</tr>
</tbody>
</table>

### PART-II (Subjective)

| Q-1 | A. How functions of MIS can be classified? (3) |
|     | B. Write the steps of the project planning in serial. (3) |
| Q-2 | Define the different types of budget. (6) |
| Q-3 | A. Explain the role APMC in contract farming? (3) |
|     | B. Which are the managerial traits of Entrepreneurship? (3) |
| Q-4 | Write the short notes on (Any three) (6) |
|     | 1. WTO |
|     | 2. PERT |
|     | 3. Agri Export Zone |
|     | 4. KVIC |
| Q-5 | A. State the power of NABARD. (3) |
|     | B. Describe the different Qualities of entrepreneur. (3) |
Q.1 Write the improved package of practices of hybrid napier grass in detail. (7)

Q.2 Fill up the blanks:
1. Forage of Lucerne and Hybrid napier grass contains ________ and ________ harmful substance, respectively.
2. The origin place of Maize and Berseem are ________ and ________, respectively.
3. The crude protein content in forages of Cowpea and Sorghum is ________ and ________, respectively.
4. ________ is the a parasitic weed of Lucerne, which is effectively controlled by ________ herbicide.
5. The best quality silage has a pH ________ and it is ________ in colour.

Q.3 Give the scientific reasons (Any Five) (10)
1. Stage of crop growth affects the nutritive value of forages.
2. Mixed cropping is advantageous in forage crop production.
3. The silage is a good substitute for green fodder.
4. Drying is important operation in hay making.
5. Forage sorghum are harvested at 50 % flowering stage.
6. Water management is important for forage seed production.

Q.4 Explain / Justify the followings:
1. Discuss the role of dry matter and crude protein in quality of forage crops.
2. Write importance of forage in agriculture.
3. Write important features for oat and Lucerne seed production.
4. Cropping and crop rotation reduces the weed in forage crops.
5. Cutting management in Hybrid Napier and Oat.

Q.5 Write steps for quality hay making. (5)

Q.6 Complete the following table with appropriate information. (8)

<table>
<thead>
<tr>
<th>Crop</th>
<th>Seed rate</th>
<th>Spacing</th>
<th>Fertilizer</th>
<th>Varieties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cowpea</td>
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</tr>
<tr>
<td>Lucerne</td>
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<tr>
<td>Maize</td>
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<tr>
<td>Oat</td>
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</tbody>
</table>

*****
Q.1  (a) Define regression. How will you estimate $\beta_0$, $\beta_1$ and $\beta_2$ in case of multiple regression model?  

Q.2  (b) What are the assumptions for linear regression model?  

Q.3  Illustrate to explain the concept of dummy variables. Give at least two examples where you could use the model with dummy variables.  

Q.4  What do you understand by multicollinearity? What are its consequences? Enlist the tests for detecting multicollinearity.  

Q.5  Define Heteroscedasticity. How it on least square estimates and their standard errors?  

Q.6  Prove that the least square estimate of simple regression coefficient is unbiased. Derive the variance of this estimate.  

Q.7  (a) What is autocorrelation. What are the sources of autocorrelation in errors?  

(b) What do you understand by stochastic and non stochastic models?  

Q.8  Write notes on (Any Two)  

(1) Durbin Watson test  

(2) Lagged variables  

(3) Econometrics  

x - x - x - x - x
B. A. Collage of Agriculture
Anand Agricultural University, Anand
Post Graduate Even Semester End Examination-2010

Course No.: SST-708
Course Title: Seed Production in Vegetable, Flower and Medicinal plants (2+1)

Date: 1/7/2010 Time: 1000 to 1200 Marks: 50

Q-1. Explain /describe the following terms (Any five) (10.0)
1. Isolation
2. Rouging
3. Emasculation
4. Self-pollination
5. Male sterility
6. Cleaning and grading
7. Self-incompatibility

Q-2. Write short notes (Any five) (10.0)
1. Quality seed production in cucurbits
2. Soil, climate and isolation requirements for Senna seed production
3. Plant protection measures in Rossella (Indian Sorrel)
4. Characteristics of good quality seeds
5. Gaps and constrains for seed production in vegetable crops
6. Seed extraction and post harvest care in tomato
7. Field inspection for annual chrysanthemum

Q-3. Fill up the following Table (10.0)

<table>
<thead>
<tr>
<th>Particulars/Crops</th>
<th>Chilli</th>
<th>Okra</th>
<th>Senna</th>
<th>Rossella</th>
<th>Gladiolus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time of sowing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isolation distance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seed/tuber yield kg/ha</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name of variety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q-4. Answer the following question (Any five) (20.0)
1. History of vegetable seed industries in India
2. Hybrid seed production in brinjal
3. Seed production technology for Isabgul
4. Field and seed standard requirement for seed certification of chrysanthemum spp.
5. Classification of vegetable crops based on pollination behaviors
6. General standard required for hybrid seed production of merigold
7. Describe the seed production technique for Solanum khasianum
Q.1. Fill in the blanks
1. Gas chromatography technique was first suggested by ________________.
2. The molecular formula of Florisil is ________________.
3. UV/VIS spectrophotometer works on ________________ law.
4. The i. d. of narrow bore capillary column is ____ mm.
5. The concentration of 10 mg of a pesticide in 100 mL solvent is ____ ppm.

Q.2. Indicate True or False
1. D₂O is heavy water.
2. 5 ppm = 5 mg/kg.
3. In FPD, 526 nm wavelength is used for S.
4. In GLC, FID is a selective detector.
5. Chromatography was first reported by Tswett.

Q.3. Answer in brief (Any four)
1. Principle of GLC.
2. Co-extractives extracted along with pesticides.
3. Glass adaptors used in GLC.
5. Classification of analytical techniques.

Q.4. Write short note (Any two)
1. PDA detector in HPLC.
3. Guard columns of GLC.

Q.5. Explain procedure for the estimation of pesticide residues from capsicum.

Q.6. Explain principle, application area and structure of UV/VIS spectrophotometer.

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POST GRADUATE EVEN SEMESTER END EXAMINATION 2009-10

Course No: Ag.Extn. 709  Course title : Training Methodology (1+1)

Date : 30-6-2010  Time   10.00 to 12.00  Total marks: 50.

Q.1  What is training? Discuss the benefits of training.  (5.0)

Q.2. Write the types of In-service training. Discuss any one of them in details  (5.0)

Q.3  Discuss the basic training approaches.  (5.0)

Q.4  Classify the training methods according to the involvement of trainees. Discuss any two of them in detail  (10.0)

Q.5  Write short note on (Any four).  (10.0)

   (A) Buzz group       (B) Panel discussion
   (C) Symposium        (D) Seminar
   (E) Brain storming

Q.6  Discuss the advantages of role Play  (5.0)

Q.7  Discuss the four Phases of method demonstration in detail.  (10.0)

-@@@@@@@@-
B A COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY, ANAND
POST GRADUATE EVEN SEMESTER END EXAMINATION (2010)
Course No: AGBT705/PBG 709.
DATE:30-06-10
DAY :WEDNESDAY
MARKS: 50.0
TIME: 10.00-12.00HRS

TITLE: GENE REGULATION (2+0)

Q.1. Define/ Explain the following (Any Twenty)
1. G-Proteins
2. Retro-transposons
3. Apo-inducers
4. Anti-terminators
5. Multi-gene families
6. Transcription factors
7. Synteny
8. Promiscuous DNA
9. Poly cistronic mRNA
10. DNA methylation
11. Dispersed repeat sequences
12. Operon
13. Transcription factors
14. Ribo switches
15. Overlapping genes
16. Merozygotes
17. Smart genes
18. Histones
19. Telomeres
20. Lrp regulon
21. CGA Proteins
22. Cistrons

Q.2. Differentiate between the following : (Any Ten)
1) Imprinting and Permutation
2) Promoters and Regulators
3) Ribosomes and Ribozymes
4) Repression and Induction
5) Split genes and Pseudo genes
6) Recons and Mutons
7) Solenoids and Nucleosomes
8) mRNA and sRNA
9) Constitutive and Regulated gene expression
10) Prokaryotic and Eukaryotic genomes
11) Repetitive and Selfish DNA
12) Homeo-box and Pribnow-box

Q.3. Answer the following (Any Ten)
1. “Chloroplast and mitochondria have prokaryotic origin.” Justify the statement.
2. What are cis-acting elements? How do they influence gene expression?
3. What is chromatin remodeling? What is its significance in eukaryotic gene regulation?
4. Explain the term “Functional genomics in plants” with suitable examples.
5. What are transposons? Describe their role in eukaryotic gene expression and utility to molecular breeding.
6. Explain positive and negative control of gene regulation with examples.
7. Tryptophan operon is a post transcriptional gene regulation. Explain.
8. What is meant by signal transduction? Explain with one pathway involved in signal transduction.
10. Compare chloroplast and mitochondrial genomes and their organization in plants.
11. Arabinose operon is an example of both positive and negative control of gene expression. Justify.

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Post Graduate Even Semester End Examination-2010

Course No. Crop Phy. 707 : Physiological aspects of crops-II (2+0)

Date : 30-06-2010 Time : 10:00 to 12:00 hrs.
Wednesday Marks : 50

Q-1 Define / Explain (10.0)

(1) Germination & Dormancy
(2) Photosynthesis
(3) Source sink relationship
(4) Transpiration & Evaporation
(5) Growth & Development
(6) Mineral nutrition
(7) Adaptation
(8) Photoperiod
(9) Vernalization
(10) Seed maturation

Q-2 Write physiological aspects of cotton crop in brief (10.0)

Q-3 Give mineral nutrition requirement of following crops (10.0)

(1) Cow pea
(2) Chick pea

Q-4 Explain the growth and development of groundnut crop (5.0)

Q-5 Photosynthesis, transpiration and water use efficiency of mustard crop (5.0)

Q-6 Write physiological aspects of tobacco crop in brief (10.0)

**************************************************************************
B. A. College of Agriculture  
Anand Agricultural University  
Anand – 388 110  
Post-graduate Even Semester End Examination Jnne-July-2010  
Course: Fungal Diseases of Field crops.  
Course No. Pl.Path. 706 (2+1)  

<table>
<thead>
<tr>
<th>Date: 05-07-2010</th>
<th>Time: 1000 to 1200</th>
<th>Marks: 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day : Monday</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:**  
1. Draw neat, clean and labeled diagrams wherever necessary.  
2. Figures to the right indicate marks.  

**Q.1.** Draw labeled diagram of disease cycle of downy mildew of bajara and describe it in detail.  

**Q.2.** State the name of causal organism and describe the characteristics of below mentioned diseases.  

1. Blast of paddy  
2. Ascochyta blight of chickpea  
3. Wilt of cotton  
4. Smut of bajara  
5. Charcoal rot of maize  
6. Sunflower rust  

**Q.3.** State the name of causal organism and mention the effective management strategies for control of below mentioned diseases.  

1. Brown spot of paddy  
2. Red rot of sugarcane  
3. Whip smut of sugarcane  
4. Rust of groundnut  
5. Pigeon pea wilt  
6. Powdery mildew of barley  

**Q.4.** State the favorable climatic conditions, primary source of inoculum and secondary spread of following diseases under field condition.  

1. Wilt of cotton  
2. Sorghum downy mildew  
3. Leaf blight of wheat  
4. Ascochyta blight of chickpea  
5. Powdery mildew of pea  

**Q.5.** Differentiate following  

1. Grain Smut **AND** Head Smut of sorghum  
2. Castor Wilt **AND** Root rot  
3. Stem rot **AND** Wilt of pigeon pea  

**Q.6.** Describe the *Puccinia* path way of black stem rust of wheat in India.  

xxxxx...

xxxxx...

xxxxx...

xxxxx...
Q.1 Derive the Michalis Menten equation. How you can estimate $V_{\text{max}}$ and $K_m$. Give its Merits and demerits.

Q.2 Write short notes on (ANY FIVE):

1. Enzyme inhibition
2. Random mechanism
3. Regulation of enzyme activities
4. Immobilized enzymes
5. Multizyme complexes
6. Application of enzymes in food and clinics

Q.3 Give the nomenclature and classification of enzymes.

Q.4 Explain the transient and steady state kinetics.

OR

Q.5 (A) Define the following (ANY SIX):

1. Briggs-Haldane steady approach
2. King patterns
3. Arrhenius equation
4. Isozymes
5. Restriction endonucleases
6. Hill Plot
7. Scatchard plot

(B) Write the structure of following (ANY TWO):

1. NADP
2. ATP
3. FOLIC ACID

OR

Q.5 (A) Discuss the factors affecting the enzyme actions.
(B) Explain the enzyme specificity.
Q-1: Answer the following in detail. (10.00)

1. What is mean by "Biological control"? How it differ from "Natural control"?
2. Explain the scope of biological control in Integrated Pest Management programme.
3. What is conservation? Discuss various methods of conservation recommended by AAU, Anand.
4. Write common and scientific names of parasitic and predatory insects that you have come across during your field visit (Five names for each category).
5. Explain the mode of action of NPV in lepidopteran larvae.

Q-2: Differentiate between following. (10.00)

1. Parasite and predator
2. Spore former and non-spore former bacteria
3. Terrestrial weed and aquatic weed
4. Granulosis virus and NPV
5. Inoculative release and Inundative release

Q-3: Define following terms. (5.00)

1. Solitary parasitism
2. Oligophagous
3. Artificial diet
4. Parasitoid
5. Multi-parasitism

(PTO)
Q-4 : Write the points to be considered for effectiveness of following bio-agents used in bio-control.  
1. *Trichogramma*  
2. *Chrysoperla*  
3. NPV  
4. *Bt* formulations  
5. Entomopathogenic fungi  

(5.00)  

Q-5 : Write short-note on following.  
1. Predatory bugs  
2. Granulosis Viruses  
3. Minor predators  
4. Biological Suppression of weeds  
5. Entomopathogenic nematodes  

(5.00)  

Q-6 : Write True or False for following statements and justify your answer in case of false statements.  
1. Parasitpes are always beneficial.  
2. NPV is applied during morning hours for the control of larvae.  
3. *Bt* can also infect human being.  
4. *Trichogramma* is recommended in chickpea crop against pod-borer.  
5. An entomopathogenic fungus is effective in summer only.  

(5.00)  

Q-7 : Name the recommended biocontrol agents for insect pests with its doses used in different crops.  
1. Cotton  
2. Sugarcane  
3. Cabbage  
4. Paddy  
5. Brinjal  

(5.00)  

Q-8 : Write the name of commercial formulations of following bio-pesticides available in India.  
1. *Bacillus thuringiensis*  
2. NPV  
3. *Verticillium lecanii*  
4. *Beauveria bassiana*  
5. *Steinernema corpocapsae*  

(5.00)
Post Graduate Semester End Examination 2010-11

Course No. Ag. Chem. 706
Course Title : Soil Water Pollution 2 + 1
Date : 27/1/2010
Time : 10.00 to 12.00
Marks : 50

Q. 1. Fill in the blanks
1. Acid precipitation is mainly the end results of conversion of oxides of and ________ and ________ in their respective acids.
2. Phosphatic fertilizers contain ________ radio active compound which absorbs by the root and responsible for lung cancer.
3. Earth crust contains ________ percent sulphur.
4. ________ group of herbicide is highly persistent in nature.
5. ________ is occurs in new born baby due to nitrate pollution.
6. Salinity of irrigation water is measured in ________ as total salt concentrations.
7. Poultry and pig manures content higher amount of ________ element.
8. Phosphatic fertilizers are the source of ________ contamination.
9. Eutrophication of lakes is due to ________ and ________ nutrients.
10. ________ and ________ are the main minerals of mental parts of earth.
11. The water with high salt concentrations is known as ________ water.
12. ________ rating is used to evaluate carbonate concentrations in water.
13. WHO fixed the ________ ppm limit of nitrate nitrogen for drinking water.
14. ________ is the least soluble and more stable in organic compound in soil.
15. ________ is related to sulphur.
16. ________ and ________ elements responsible for corrosion.

Q.2 Explain the following terms (any five)
1. Acidification 2. Methaemoglobin
3. Laughing gas 4. Eutrophication
5. NIFE 6. CFCs
7. CCA

Q.3 Write short note (any five)
1. Green house effects 2. Pesticide contaminations
3. Nitrate pollution 4. Lead pollution
5. Acid rain 6. Potash corrosion

Q.4 Answer the following (any five)
1. What are the problems arising due to pesticide uses?
2. How nitrate pollution occurs in soil?
3. Explain the demerits of sludge application to soil
4. How potassium application is safe for soil pollution?
5. How we contaminate ground water?
6. State your view on "Economic development VS Pollution"
7. How urea pollutes the environment?
Q.1. Explain the sequential process of wheat growth. (10.0)

Q.2. How food reserve is accumulated in sugarcane during the course of its development. (5.0)

Q.3. (A) What are the crop physiological factors influencing on rice productivity? (B) Describe the effect of moisture stress on rice germination. (10.0)

Q.4. Which are the plant types for dry land wheat? (5.0)

Q.5. Write the canopy classification and types of leaves in a canopy. (6.0)

Q.6. Explain the yield attributed characteristics in maize and sorghum. (8.0)

Q.7. Write full form and give the formula with their unit of measurement for the following growth indices. (6.0)

(1) LAI (2) NAR (3) BMD (4) CGR (5) HI (6) LAD

&;&;&;******&&&&&
Q.1. Define / Explain : (Any eight)
   i. Seed
   ii. Dockage
   iii. Seed Testing
   iv. Cultivar purity testing
   v. Real value of seed (Utility %)
   vi. Electrophoresis
   vii. Iso-Electric Focusing
   viii. Isozymes
   ix. Chromatography
   x. Tetrazolium Test

Q.2. Write a short notes on the following : (Any four)
   i) Importance of Cultivar purity Testing
   ii) Characteristics of good seed
   iii) Causes of contamination of cultivar purity
   iv) Phenol Test for wheat cultivar purity testing
   v) Registration of new varieties
   vi) Machine based vision for seed testing

Q.3. Describe the following techniques : (Any four)
   i) RAPD
   ii) SSR
   iii) AFLP
   iv) RFLP
   v) ELISA

Q.4. Differentiate between the following :
   i) PAGE and SDS-PAGE
   ii) Dominant and co-dominant markers

Q.5. Describe in detail different Methods for Cultivar Purity Testing

Q.6. Explain the advantages of using DNA based markers over morphological and other biochemical markers in cultivar purity testing.

Q.7. Describe discontinuous electrophoresis. Explain the importance of stacking and resolving gel in discontinuous gel electrophoresis.

Q.8. Enlist various chemicals used in PAGE or SDS-PAGE. Give the importance / role of each of the chemicals.

Q.9. Enlist the characters to be observed during Grow Out Test in the following crops (Any Two) :
   i) Rice
   ii) Cotton
   iii) Castor

Q.10. Enlist different parameters of seed that may be observed / studied for distinguishing different cultivars.
ANAND AGRICULTURAL UNIVERSITY
B.A.COLLEGE OF AGRICULTURE, ANAND
DEPARTMENT OF AGRIL. ECONOMICS

P.G. Even Semester End Examination-2010

Ag. Econ. 705 : Agricultural Project Analysis
Date : 03/07/2010
Time : 10.00 to 12.00
Marks : 50

Q.1 Define agricultural project and give its types and phases in project cycle

Q.2 Write short notes on (any four)
   1. Payback Period
   2. Sensitivity Analysis
   3. Intangible benefits of agriculture projects.
   4. Shadow price
   5. Valuation of farm assets

Q.3 Define/Explain (any eight)
   1. Internal rate of return
   2. Efficiency of labour
   3. Taxes
   4. Margin of safety
   5. Angle of incidence
   6. Appraisal
   7. Marginal social benefit
   8. Sunk costs
   9. Direct transfer payment

Q.4 (a) Calculate the profitability Index for data given below and select the projects

<table>
<thead>
<tr>
<th></th>
<th>Project – A</th>
<th>Project – B</th>
<th>Discount rate factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial out lay – 12,000</td>
<td>14,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year cash flow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>6000</td>
<td>8,000</td>
<td>0.909</td>
</tr>
<tr>
<td>2</td>
<td>4000</td>
<td>2,000</td>
<td>0.826</td>
</tr>
<tr>
<td>3</td>
<td>3000</td>
<td>2,000</td>
<td>0.751</td>
</tr>
</tbody>
</table>

Q.4 (b) Do as directed
   1. Purchase price of tractor is Rs.3,00,000/- useful life is 12 years and junk value is Rs.25,000/-. Workout the value of tractor at the end of 5 years.
   2. Suppose the income over infinite years will Rs.30,000/- per ha. and rate of interest is 10%. Workout the value of land in rupees.
   3. Bank even output value is Rs.22,358.98 in total revenue Rs.45,817.50 workout % of Margin of safety and interpret year result.
   4. Suppose total operating expenses is Rs.25,400/- and gross income is Rs.74,000/-, workout operating ratio and interpret year result.
   5. Value of assets Rs. 9,75,500/- and owners equity 7,19,500/-, workout equity value ratio and interpret the result.

(P.T.O.)
Q.5 (a) Answer the following in brief (any two)
   1. Meaning of "Time value of money"
   2. Financial aspects of project analysis.
   3. Explain the concept 'with' and 'without' project.

Q.5 (b) Write the merits of Net present value method.

Q.6 (a) What is planning? Characteristic of planning and importance of planning discuss in details.

Q.6 (b). Give formula/explain the following
   1. NPW
   2. Amortization of establishment cost : a =
   3. I < B R
Q.1 Give the definition
   1. Stress
   2. Drought
   3. Disease
   4. Chilling
   5. Freezing
   6. Elastic Resistance
   7. Helophyte
   8. Agrav. Drought

Q.2 Give the classification of Environmental stresses.

Q.3 Explain the following
   1. Problems in Breeding for salinity Resistance
   2. Selection Criteria for Chilling Resistance
   3. Types of Disease Resistance
   4. Losses due to insects

Q.4 Describe following
   1. Difficulties in Breeding for drought Resistance
   2. problems in Breeding for Freezing Tolerance
   3. Horizontal and Vertical Resistance
   4. Breeding methods for Insect Resistance

Q.5 Explain the breeding Approach to develop variety suitable for range of Environments

Q.6 Diagram for Transfer of Recessive gene for Disease Resistance

Q.7 State the problems in breeding for insect Resistance

Q.8 Sources of Insect Resistance
Date: 7-07-2010  Time: 1000 to 1200 hrs.
Wednesday  Marks: 50

Answer to the points.
Explain with diagramme where necessary.

Q. 1 Discuss the characteristics of genome organization in plants (5)

Q. 2 Discuss about the cytoplasmic DNA applications in agriculture. (5)

Q. 3 Enlist the functions of chloroplast genome. How the expression of genes is affected? (5)

Q. 4 Write short note on: (ANY TWO) (10)
a) Catabolic gene regulations in plants
b) Hormones and their role in gene regulation
c) R genes

Q. 5 Describe the expression of starch synthesizing genes in plants during light and dark reaction (5)

Q. 6 Describe the role of nitrogen fixing genes in plants (5)

Q. 7 Discuss the use of DNA makers in development of agriculture (5)

Q. 8 Describe the applications of gene silencing in quality improvement in fruits and vegetables (5)

Q. 9 Explain with an example using mitochondrial gene transformation technique (5)
B. A. COLLEGE OF AGRICULTURE
ANAND AGRICULTURAL UNIVERSITY, ANAND
POST GRADUATE EVAN SEMESTER END EXAMINATION-2010

CROP PHYSIOLOGY – 704 (2 + 1)

Course: Mineral Nutrition, Physiological and Molecular Aspects

Date: 06/07/2010

Time: 1000 to 1200 hrs

Total marks: 50

Q. 1 Answer the following
   a. Describe the role of K⁺ (Potassium) in physiological processes occurs in plant level.
   b. What do meant by essentiality of nutrient for plant and how its works?

Q. 2
   A. Define the following terms (Any four)
      1. Osmotic Pressure
      2. Diffusion Pressure Deficit
      3. Diffusion
      4. Absorption
      5. Imbibition
   B. Fill up the gaps
      1. Whip tail disease of cauliflower is due to the deficiency of ________.
      2. In a plant permeable, impermeable and semi permeable members are ________, ________ and ________, respectively.
      3. Water will move from lower to higher concentration called as ________.
      4. Phosphetic fertilizers are absorbed by the plant as ________ ions.
      5. ______ & ________ elements are necessary in plant as buffer systems.

Q. 3
   A. Describe the mechanism of absorption of nutrients in plants.
   B. What is meant by deficiency? Which elements are most likely to be essential for plants growth and development

Q. 4
   Write the short notes of following (Any Two)
   1. Ion exchange and Donnan effects
   2. Active transport system
   3. Carrier exchange of nutrient

Q. 5
   Give the details of classification and essentiality criteria for nutrients in plant.

Q. 6
   A. Describe the importance of mineral nutrient in plant growth and development
   B. Write the concept of nutrient use efficiency under adverse soil situation, viz., salinity and drought.
B.A. College of Agriculture
Anand Agricultural University
Post graduate Even Semester End examination 2009-10

Course No. AG Micro 704    Title: Biofertilizers (1+1)

Date:  3-7-10  (Saturday)
Time:  1000 to 1200 hrs

Note: Answer the questions very precisely and draw diagrams neatly wherever required

Q.1: Describe importance of Azolla – Rice dual cropping  (5)

Q.2: How Azotobacter is useful in improving crop yield?  (5)

Q.3: Enlist Genus of Blue Green Algae and how it is useful in paddy?  (5)

Q.4: How Rhizobium enter host plant and fix nitrogen?  (5)

Q.5: Why biofertilizers are the need of present agriculture?  (5)

Q.6: What is FCO? Describe FCO / ISI standards for PSB.  (5)

Q.7: Justify advantages of liquid biofertilizer formulation over carrier based in today’s agriculture?  (5)

Q.8: Draw diagram of VAM and how it is useful in agriculture?  (5)

Q.9: write about importance of Gluconoacetobacter diazotrophicus endophyte.  (5)

Q.10: What is role of Azospirillum in crop improvement?  (5)
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ANAND – 388 110

POST GRADUATE EVEN SEMESTER END EXAMINATION 2009-10

Subject: SST. 704 (1+1): Seed Entomology

Date: 02/07/2010     Time: 1000 to 1200 hrs
Friday           Marks: 50

Q. 1. A. Enlist the pests of brinjal and describe the nature of damage done by shoot and fruit borer and sucking pests in brief. Mention the IPM strategies for brinjal pest complex. (8)

B. Give the IPM strategies for following pests (Any four) (6)
   a. Pink bollworm in cotton
   b. Cucumber leaf miner
   c. Sorghum shoot fly
   d. Spotted boll worm in cotton
   e. Maize stem borer

Q. 2. A. Give the nature of damage for a given pests in brief (Any four) (4)
   a. Red and black pumpkin beetle
   b. Paddy brown plant hopper
   c. Okra semi looper
   d. Mealybugs in cotton
   e. Sorghum stem borer

B. Write two recommended insecticides for following pests (3)
   a. Aphids
   b. Okra shoot and fruit borer
   c. Jassids
   d. Whitefly
   e. Mealy bugs
   f. Mites

Q. 3. A. Define IPM and mention the different methods involved in IPM. Describe the methods of biological control in details. (5)

B. What is insecticides formulation? List the different formulations of insecticides with example. (4)

(P.T.O.)
C. Give the classification of insecticides based on chemical nature with example. (3)

D. Define fumigants. Give the characteristics of ideal fumigants. Enlist the different fumigants with its dose for control of store grain pests. (4)

Q. 4.  A. Enlist the major pests damaging to store grains. Describe the control measures for the insect pests of store grains. (5)

B. Name the different pollinating agencies. Describe the biological attributes of insect pollinators. (4)

C. What are the precautions to be taken in handling the pesticides?
B. A. College of Agriculture
Anand Agricultural University
Anand- 388 110

Post Graduate Even Semester End Examination-2010
Hort. 704 : Canopy Management (1+1)

Date : 30-6-2010 Time : 10-00 to 12-00 hrs
Wednesday Marks : 50

Q-1 (a) What is canopy management ? How canopy management done in mango orchard. ? (8.00)
   (b) Explain importance of canopy management. (5.00)

Q-2 (a) Enlist different basic principles of canopy management and Discuss on any two principles in details. (8.00)
   (b) Explain role of PGRs in canopy management in different fruit crops. (5.00)

Q-3 Write short note on following. (Any Six) (12.00)
   (i) Constraints of HDP
   (ii) Role of dwarf root stock in canopy management
   (iii) Columnor canopy
   (iv) Pruning is an idea tool for canopy management
   (v) Canopy management of new vineyard (grape)
   (vi) Diagonal planting system
   (vii) Multi-row and Bed system

Q-4 (a) Enlist as per demand. (7.00)
   (i) Characters of an ideal root-stock.
   (ii) Main canopy management issues.
   (iii) Essential features of an ideal canopy.
   (iv) Methods of canopy management.
   (v) Dwarf root stock for (i) Guava (ii) Ber (iii) Apple fruit crops.

Q-4 (b) A farmer of middle Gujarat is interested to plant mango grafts under HDP in one hectare area with 5 x 5 m distance. Furnish following information to the farmer (5.00)
   (i) Suitable varieties.
   (ii) No. of grafts required and it source.
   (iii) Time of digging pits and its size.
   (iv) Care require for selection of grafts.
   (v) Care require at planting time.

xxxx-xx-x-x-x-x
| Q.1 | [A] Give the classification of soil water in details. | Marks: 5.0 |
|     | [B] Define/explain the following. |          |
|     | i) Diffusion | (5.0) |
|     | ii) Soil solution |          |
|     | iii) Soil Water Potential |          |
|     | iv) Field capacity |          |
|     | v) Hysteresis |          |

| Q.2 | [A] Enlist the processes require to develop model for water use in terms of water availability and explain any one in detail. | (4.0) |
|     | [B] Differentiate the following. | (6.0) |
|     | i) Active uptake and passive uptake |          |
|     | ii) Structure and Texture |          |
|     | iii) Infiltration and Seepage coefficient |          |
|     | iv) Osmotic potential and metric potential |          |

| Q.3 | [A] Explain ET measurement using various components of the soil water balance of the root zone. | (5.0) |
|     | [B] Answer the following in brief. | (5.0) |
|     | i) Give the functions of stomata in transpiration. |          |
|     | ii) Enlist the factor affecting concentration and composition of soil solution. |          |
|     | iii) Give the different soil moisture determination methods. |          |
|     | iv) Enlist the factors affecting saturated flow of water in soil. |          |
|     | v) Give reason for “Plant cannot use hygroscopic water”. |          |

| Q.4 | [A] State the relationship between soil water content and potential with figure. | (5.0) |
|     | [B] Enlist the different water uptake mechanism models and explain any one in brief. | (5.0) |

| Q.5 | Write short notes on the following (ANY TWO) | (10.0) |
|     | i) Ascent of sap |          |
|     | ii) Mechanism for nutrient uptake |          |
|     | iii) Osmotic absorption of water by plants |          |
|     | iv) Solute translocation in plants. |          |
Q.1 Fill up the blanks.

i. _____ and _____ are the popular insecticides used as seed treatment for the control of sucking pests in cotton RCH-2 (BG II).

ii. Deficiency of nitrogenous fertilizer increases the incidence of _____ in sugarcane while excess use increases the incidence of _____ in paddy crop.

iii. Upward and downward curling of cotton leaves indicate the infestation of _____ and ____, respectively.

iv. Ladybird beetles and Chrysoperla belong to _____ and _____ order, respectively.

v. Water logged condition encouraging incidence of _____ in sugarcane while that of in paddy encouraging the incidence of _____.

vi. Accumulation of frass near the base of mango tree indicates the incidence of _____ while that of on the ground surface indicates the incidence of _____.

vii. _____ and _____ species of plant hopper are transmitting ____ and ____ viral diseases in paddy, respectively.

viii. Deformed leaves indicate the ovipositional injury of ____ while deformed fruits indicate the injury of ____ in little guard.

ix. Tobacco bugs feed on ____ insects while Neochetina feeds on _____.

x. _____ and _____ are the non-insect pests damaging to paddy crop.

Q.2 Describe the IPM strategies for the following crop pests (ANY THREE).

i. Pectinophora gossypiella  
   ii. Achaea janata
   iii. Amritodus atkinsoni
   iv. Melanagromyza obtusa
   v. Meloidogyne incognita and M. javanica

Q.3 Answer in brief.

i. Enlist the concepts/principles of IPM.

ii. Write the mode of action of delta endotoxin in Helicoverpa armigera.

iii. Name two chemical insecticides available in the market work on endocrine system.

iv. Mention the vector-less gene transfer methods used for transporting the foreign gene into plant cell.

v. Give the name of genes involve in the Bollgard and Bollgard II.

vi. What do you mean by “Bio-rational control”?

vii. Enlist the constraints in implementation of IPM.

viii. Write the equation for calculating the En.EIL.

ix. Mention the limitation of EIL and ETI.

x. What is impact of market value (V) and management cost (C) on EIL?

Q.4 What is HPR? Discuss the principle of HPR.

Q.5 Give the definition of IPM synthesises by Kogan, 1998 and give the complete classification of tools/components of pest management.

Q.6 Mention the integration of various tools for the management of the following pests (ANY TWO).

i. DBM in cabbage (trap crop + bio-control + botanicals)

ii. Bollworms in cotton (trap crop + cultural + microbial + bio-control + synthetic insecticides)

iii. BPH in paddy var. IR-60 (HPR + fertilizers)
Q.7 Describe the principles of plant diseases management

Q.8 Enlist various methods for application of insecticides and describe the Electrostatic spraying system.

Q.9 Give the scientific reasons for the following.
   i. Trash-burning in sugarcane is not advisable in South Gujarat.
   ii. Neem and ber trees should be sprayed with carbaryl within 3-4 days of first satisfactory monsoon rain.
   iii. The heaps of potato should not be kept exposed condition after harvest in the field.
   iv. Off-seasonal spray of carbaryl on mango trunk is advisable.
   v. White grub is known as hidden pest in groundnut crop.
   vi. Chlorinated hydrocarbon insecticides should not be sprayed in tobacco crop.
   vii. Hairiness' variety of cotton is generally less susceptible to Anagasta kuehniella.
   viii. Variety developed based on horizontal gene resistant is more preferable than vertical gene resistant.
   ix. Spray of quinalphos should be avoided in okra crop as far as possible.

Q.10 Categorize following pests into sporadic, potential, seasonal and migrating pests.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the pests</th>
<th>Category of pest</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.</td>
<td>Amsacta moorei</td>
<td>vi. Locusta migratoria</td>
</tr>
<tr>
<td>ii.</td>
<td>Mythimna separata</td>
<td>vii. Eriosoma lanigera</td>
</tr>
<tr>
<td>iii.</td>
<td>Plutella xylostella</td>
<td>viii. Dichocrocis punctiferalis</td>
</tr>
<tr>
<td>iv.</td>
<td>Achea janata</td>
<td>ix. Agrotis ipsilon</td>
</tr>
<tr>
<td>v.</td>
<td>Leucinodes orbonalis</td>
<td>x. Holotrichia consanguineau</td>
</tr>
</tbody>
</table>

Q.11 Match the following

<table>
<thead>
<tr>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Parasitic nematode</td>
<td>Bactrocera cucurbitae</td>
</tr>
<tr>
<td>2 Fish meal trap</td>
<td>Snail &amp; slug</td>
</tr>
<tr>
<td>3 Carbasulfan</td>
<td>Synergist</td>
</tr>
<tr>
<td>4 Whorl application of insecticides</td>
<td>Trichogramma resistant to Endosulfan</td>
</tr>
<tr>
<td>5 Methyl eugenol</td>
<td>Chilo partellus</td>
</tr>
<tr>
<td>6 Cue lure</td>
<td>Manduca sexta</td>
</tr>
<tr>
<td>7 Root feeding of insecticides</td>
<td>Coconut insect pests</td>
</tr>
<tr>
<td>8 Tobacco dust</td>
<td>Monitoring storage insect pests</td>
</tr>
<tr>
<td>9 Sesame oil</td>
<td>Virus</td>
</tr>
<tr>
<td>10 Probe trap</td>
<td>Sternonema</td>
</tr>
<tr>
<td>11 NPV</td>
<td>First resistant variety of wheat</td>
</tr>
<tr>
<td>12 Feign death</td>
<td>Pro-insecticide</td>
</tr>
<tr>
<td>13 DIMBOA</td>
<td>Bactrocera dorsalis</td>
</tr>
<tr>
<td>14 COS</td>
<td>Sorghum shoot fly</td>
</tr>
<tr>
<td>15 Pyrethrum</td>
<td>Chrysanthemum</td>
</tr>
<tr>
<td>16 Underhill</td>
<td>Stern et al.</td>
</tr>
<tr>
<td>17 Endogram</td>
<td>Rachel carson</td>
</tr>
<tr>
<td>18 Ist IPM definition</td>
<td>Mustard sawfly</td>
</tr>
<tr>
<td>19 Ist transgenic plant</td>
<td>AMBOA</td>
</tr>
<tr>
<td>20 Silent spring</td>
<td>Phytocid mite</td>
</tr>
</tbody>
</table>
Q.1 Draw T4 phage and describe its life cycle. (10)

Q.2 Describe different plasmids with their structure, size and economic importance. (10)

Q.3 Differentiate transformation and transduction with role of phage and plasmid giving examples. (10)

Q.5 Short questions (14)

1. Name few prokaryotic viruses.
2. List coliphages.
3. Lysogenic cycle.
4. Define bacteriophage.
5. Ti Plasmid.
6. R plasmids.
7. Plasmid vectors.
8. Differentiate RNA & DNA phages.
10. Demonstrate HFR conjugation using figures and who explain HFR strain nature in which year.
11. Applications of conjugation in GE.
12. Role of coupling protein in conjugation.
13. Phage mediated transduction.
14. Name three-parasexual process in bacteria and which one is sensitive to DNase.

Q.5 Fill in the blanks: (6)

1. ____________ in __________ yr showed recombination in E coli
2. Physical contacts of cells through U tube experiment device by ________ & ________ on oxotrophic bacteria.
3. Episome is also known as ____________.
4. HFR strain nature is proved by ____________ in yr ____________.
5. Conjugation in one direction F+ to F- concept given by ____________ in yr ____________.
6. ____________ appendages of bacterial is useful in conjugation.
B.A. College of Agriculture
Anand Agricultural University

Anand

Even Semester End Post Graduate Examination-June-July 2010
Course No: SST.703
Course Title: Seed Pathology

Date: 06-07-2010
Time 10:00 to 12:00hr
Marks: 50

Tuesday

Q.1. Define/Explain any eight
   1. Primary seed sample
   2. Plant quarantine
   3. Isolation distance
   4. Seed
   5. Seed vigour
   6. Certified seed
   7. Seed germination
   8. Seed embryo
   9. Inoculum threshold of seed borne pathogen
   10. Working seed sample

(12)

Q.2. Write critical note on any three
   1. Aflatoxin
   2. Polymer seed coating
   3. Seed certification standards
   4. Seed abnormalities

(12)

Q.3. Answer briefly any six
   1. What is mycotoxin? Name any three mycotoxins along with fungi producing it.
   2. Define biopriming. Explain with suitable example in relation to seed pathology.
   3. Name commonly used four fungicides for seed treatment. Enlist the factors affecting outcome of seed treatment.
   4. Enlist detection methods of seed-borne pathogens.
   5. What is DGISP? Where is it situated?
   6. What do the abbreviations MSCS and NSC stand for?
   7. Enlist at least five seed-borne viruses.

(12)

Q.4.(A). Answer the following
   1. Explain briefly the “Roll towel method” step-wise.
   2. Enlist objectives of seed health tests.
   3. What is seed treatment? Mention its benefits.
   4. Enlist management practices to minimize mycotoxin in food grains.

(B). Mention contribution of any four of the following in seed pathology
   1. Lucie C. Doyer
   2. Mary Noble
   3. Paul Neergaard
   4. V.K. Agarwal
   5. S.B. Mathur

(8)

(6)
Q-1. Give the contribution of following scientist (Any four) (4.0)

1. Thomas Fairchild (1717)
2. Rimpau (1890)
3. Bruce (1910)
6. Athwal (1965)

Q-2. Describe/explain the following terms (Any five) (10.0)

1. Top cross test
2. Molecular marker
3. Somatic hybridization
4. G x E interaction
5. Chemically hybridizing agent (CHA)
6. Use of tester
7. Heterotic pool
8. Homozygous balance

Q-3. Give the reasons of the following (Any six) (12.0)

1. Cucurbit crops have no effect of inbreeding depression after continuous selfing
2. Synthetic and composite varieties are utilized for partial heterosis
3. Three line hybrid breeding have more commercial value than two line hybrid breeding
4. SSR is the mother of all molecular marker
5. Cytoplasmic male sterile line is useful in ornamental plants
6. Koelreuter (1761-1766) was failed and Mendal after 100 years (1857-1866) was successes to explain the genetics of plant
7. In groundnut crop, hybrids are yet not commercialized

Q-4. Discuss the following in details (Any six) (24.0)

1. Enlist the Indian plant breeder and write the contribution of your favorite Indian plant breeder
2. Discuss the different mechanisms responsible for promoting cross pollination
3. Explain the dominance hypothesis of heterosis and its assumption
4. Current status and future prospects of hybrid breeding in maize
5. Which breeding methods you will prefer for yield improvement in cucurbits crops
6. Importance of CGMS system in hybrid seed production
7. How you will maintain the male sterile plant of tomato which you will suddenly observed in the field

:- πχ€£¥μΨΩβγδεηλ:-
Date: 05-07-2010  
Day: Monday  
Time: 1000 to 1200  
Marks: 50

Note: 1. Draw neat, clean and labeled diagrams wherever necessary.  
2. Figures to the right indicate marks.

Q.1. What is PCR, describe its advantages and disadvantages along with suitable examples. (8.0)

Q.2. Define/describe following  
1. Dilution End Point  
2. Persistent virus transmission  
3. Virus  
4. Mechanical transmission  
5. Thermal Death Point (5.0)

Q.3. Describe the role of fungi and nematodes in transmission of viral diseases. (8.0)

Q.4. How the pulse production is adversely affected by viral diseases, describe the integrated approach for management of viral diseases in pulses with suitable examples (4.0)

Q.5. Answer the following.  
(A) Describe and illustrate with figure the piercing and sucking type of mouth parts.  
(B) Explain the steps to transmit the virus by aphid in glass house  
(C) Enlist the some aphid borne viruses with vector species (15.0)

Q.6. Describe the transmission of circulative plant viruses by whitefly along with figures. (10.0)
Anand Agricultural University  
B. A. College of Agriculture, Anand  
Post Graduate Even Semester End Examination- June-July 2010

Course No. Ag. Met. 703  
Title: Crop weather models (1+2)

Date: 02/07/2010  
Day: Friday  
Time: 1000 to 1200 hrs.  
Marks: 50

Q.1 Answer the following in brief.  

(A) Define the following. (Any five)  
   a) Dynamic crop growth simulation model  
   b) Deterministic model  
   c) Crop growth simulation model  
   d) Crop weather model  
   e) Agrometeorological model  
   f) Mathematical model  
   g) Regression models

(B) Answer the following questions. (Any one)  
   I. Role of the Agrometeorological models in agriculture.  
   II. Discuss the various dynamic crop simulation model levels and groups.

Q.2 Answer the following questions.  

I. Discuss InfoCrop crop model in detail.  
II. Discuss the applications of dynamic crop simulation models in agriculture.  
III. Differentiate empirical/statistical and crop simulation models.  
IV. Write short note on DSSAT crop model.  
V. Describe the input and output files of DSSAT model.
Q.1 Answer in details (ANY THREE) (9.0)
   (1) Mention the Agro-climate zones of India.
   (2) Define drought and Alley cropping.
   (3) Mention the use of climatic data in agriculture.
   (4) Mention two or three reference books with authors used for your assignment.

Q.2 Write short notes (ANY THREE) (15.0)
   (1) Mention the different ways to improve WUE in dry land areas.
   (2) Characteristic of monsoon rain
   (3) Temperature effect in dry farming areas
   (4) Water harvesting techniques.

Q.3 Fill up the blanks with appropriate word/s (3.0)
   (1) _____ and _____ bajra and groundnut varieties are suited for dry land areas.
   (2) _____ % clay content are there in black soils
   (3) The active and dominant factor in dry land areas is ________
   (4) In heavy rains ____ N moves downwards in the soil profile.
   (5) ________ crop is recommended as a Ratoon crop.

Q.4. Differentiate the following (ANY FOUR) (8.0)
   (1) Dry spell V/s Wet spell
   (2) Surface crushing V/S Soil cracking
   (3) Climate V/S Weather
   (4) South west monsoon V/s North west monsoon
   (5) Mulches V/s Antitranspirants.

Q.5 Answer in brief (ANY TEN) (10.0)
   (1) Mention different types of climate in India.
   (2) Enlist dry farming research stations in Gujarat.
   (3) Define dry farming and rainfed farming.
   (4) Enlist the different soil types in dry land areas.
   (5) Give importance of interculturing in dry farming areas.
   (6) Mention the types of tillage.
   (7) Enlist the components of watershed management.
   (8) Explain the broad bed furrow.
   (9) Define water use efficiency.
   (10) Mention the characteristics of ideotype.
   (11) Mention the NPK status of the soil in dry land areas.
   (12) Mention the types of droughts based on duration.
   (13) Enlist the measures to increase fertilizer use efficiency in dry farming (PTO)
Q.6 A. Match pair A with pair B

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. N fertilizer</td>
<td>1. 23.5 $^\circ$N</td>
</tr>
<tr>
<td>2. Acidic fertilizers</td>
<td>2. Sorghum</td>
</tr>
<tr>
<td>3. Drought tolerant</td>
<td>3. Rice</td>
</tr>
<tr>
<td>4. Dry spell</td>
<td>4. Alkali soils</td>
</tr>
<tr>
<td>5. Acid soils</td>
<td>5. Not &lt; 2 weeks rainless</td>
</tr>
<tr>
<td>7. Capricorn</td>
<td>7. Jowar</td>
</tr>
<tr>
<td>8. Wet spell</td>
<td>8. Basic fertilizer</td>
</tr>
<tr>
<td>9. CEC</td>
<td>9. NH$_4$-N</td>
</tr>
<tr>
<td>10. Urea</td>
<td>10. 50% efficiency</td>
</tr>
<tr>
<td>11. Ammonium sulphate</td>
<td>11. &gt; 2 weeks rain</td>
</tr>
<tr>
<td>12. GSH-1</td>
<td>12. 23.5 $^\circ$S</td>
</tr>
<tr>
<td></td>
<td>13. NO$_3$-N</td>
</tr>
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<td></td>
<td>14. Problematic soils</td>
</tr>
</tbody>
</table>

Q.6 B. Give full form of following abbreviations

(i). CAZRI  (ii) ICARDA  (iii) FUE  (iv) CRIDA
(v). ICRISAT (vi) LER   (vii) MDI  (viii) ATER
(ix) IER   (x) PET

xxxxxxxxxxx
B. A. COLLEGE OF AGRICULTURE  
ANAND AGRICULTURAL UNIVERSITY, ANAND  
POST GRADUATE SEMESTER END EXAMINATION  
Course No.: AG BT.703  
Course Name: Plant Tissue Culture (2+1)  

Date: 30.06.2010  
Wednesday  
Time: 1000-1200 hrs  
Marks: 50.0

<table>
<thead>
<tr>
<th>Q1. Define (Any EIGHT):</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Auxin autotroph</td>
<td></td>
</tr>
<tr>
<td>ii. Explant</td>
<td></td>
</tr>
<tr>
<td>iii. Embryo culture</td>
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<td>iv. Somatic embryogenesis</td>
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<td>v. Callus</td>
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<td>vi. Hardening</td>
<td>8.0</td>
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<tr>
<td>vii. Totipotency</td>
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<td>viii. Hybrid cell</td>
<td></td>
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<tr>
<td>ix. Fusogen</td>
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<tr>
<td>x. Vitrification</td>
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<table>
<thead>
<tr>
<th>Q2. Give scientific reasons:</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Cryoprotectants are required for cryopreservation</td>
<td>6.0</td>
</tr>
<tr>
<td>b. Osmoticum is used during isolation of protoplasts</td>
<td></td>
</tr>
<tr>
<td>c. Pretreatment is given to anthers used for obtaining haploids</td>
<td></td>
</tr>
<tr>
<td>d. Meristem culture is used for elimination of virus from infected plants</td>
<td></td>
</tr>
<tr>
<td>e. Activated charcoal is sometimes added in tissue culture medium</td>
<td></td>
</tr>
<tr>
<td>f. Aseptic manipulations can be done safely on a laminar flow hood</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q3. Differentiate (Any FOUR):</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. PDEC &amp; IEC</td>
<td>6.0</td>
</tr>
<tr>
<td>B. Growth hormone &amp; Growth regulator</td>
<td></td>
</tr>
<tr>
<td>C. Redifferentiation &amp; dedifferentiation</td>
<td></td>
</tr>
<tr>
<td>D. Embryogenesis &amp; Organogenesis</td>
<td></td>
</tr>
<tr>
<td>E. <em>in vitro</em> cell hybridization &amp; Sexual hybridization</td>
<td></td>
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</tbody>
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<table>
<thead>
<tr>
<th>Q4. Give the details of a tissue culture medium describing the role of different ingredients of it.</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7.0</td>
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</table>

<table>
<thead>
<tr>
<th>Q5. Answer the following (Any FOUR):</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Briefly describe the applications of somatic hybridization.</td>
<td>5.0</td>
</tr>
<tr>
<td>2. What is an artificial seed? Give its production technology.</td>
<td></td>
</tr>
<tr>
<td>3. Give advantages of cryopreservation over conventional germplasm conservation.</td>
<td></td>
</tr>
<tr>
<td>4. Tissue culture raised plants cannot be planted in the field without hardening. Why?</td>
<td></td>
</tr>
<tr>
<td>5. Methods for secondary metabolite production through tissue culture technique.</td>
<td></td>
</tr>
</tbody>
</table>

P.T.O.
| Q6. | Compare and contrast the methods of anther and microspore culture. Discuss the protocol with suitable diagram for both alongwith their applications. | 5.0 |
| Q7. | Explain the problems of seed storage. Why germplasm conservation is needed? What are the advantages of *in vitro* conservation? | 4.0 |
| Q8. | What is the importance of tissue culture in plant biotechnology? Explain different applications of tissue culture in agriculture. | 4.0 |
| Q9. | What is micropropagation? Describe the methods used for rapid multiplication of any one of the crops. | 5.0 |
Q.1 Answer in brief:

1. Irreversible enzymes of glycolysis.
2. Enzymes present in lysosome.
3. Major classes of second messangers.
4. Enlist functions of nucleus.
5. Name of signaling molecules of cells.

Q.2 Explain the following (ANY TEN):

1. Regulation of glycogen synthase.
2. Chloroplast enzyme connections in biochemical processes.
3. Acetyl-CoA utilization step in glyoxylate cycle.
4. Name of amino acids synthesized from oxaloacetate and pyruvate.
5. Glucose-alanine cycle.
6. Which compounds uses phenylalanine as a precursor?
7. Role of ATP/ADP cycle in transfer of high energy phosphate.
8. Enlist protein component and prosthetic groups of ETC.
9. Name of inhibitors and their sites of work during electron transfer process.
10. Biosynthesis of CTP from UMP.
12. Importance of sulfur containing amino acids.

Q.3 Answer the following:

1. Fixation of $\text{H}_2\text{S}$ in the plants.
2. Biosynthesis of AMP and GMP from IMP.
3. Regulation of fatty acid biosynthesis.
4. Steps of urea cycle.
5. Malate-aspartate shuttle of cytosol and mitochondria.

Q.4 Discuss the following (ANY TWO):

1. Overview of amino acid biosynthesis.
2. Summary of amino acid catabolism.
3. Co-ordinated regulation of glyoxylate and citric acid cycles.
Post Graduate Even Semester End Examination- June-July-2010

Course No. Ag. Micro 701
Course Title: Microbial Ecology (1+1)

Date  : 5/7/2010
Day   : Monday
Time  : 1000 to 1200
Total Marks : 50

Note:
1. All Questions Carry Equal Marks
2. Answer Any Five Questions

1. Discuss microbial adaptation in various ecosystems.
2. Discuss energy flow in ecosystem
3. Define and discuss co-metabolism in microbes
4. Classify microbes on the basis of nutrition and discuss different modes of nutrient uptake by microbes.
5. List the stages during composting process and elaborate any one.
6. Discuss models for describing and prediction of population selection within microbial communities.
7. Define following terms (any ten)
   a. Bioremediation
   b. Euphotic zone
   c. Epilimnion
   d. Bioventing
   e. Xenobiotics
   f. Microbial leaching
   g. Decomposers
   h. Food chain
   i. Energy pyramid
   j. Ecosystem
   k. Biological Dispersal
   l. Hexicology
   m. Ethology
   n. Humus
Q.1  (A) Define / Explain the Following terms (ANE TEN)  (5.0)

1 Three line hybrid  2 Prolificacy  3 Siblinging  4 Immune
5 Genetic drift  6 Triticin  7 Amphidiploid  8 So
9 Antibiosis  10 Preference  11 Varietal mosaic  12 Gel consistency

(B) Six varieties of rice were tested in four replication in field. The observations on number of fillers were recorded as under. Carry out complete analysis of the data and give your conclusion. (5.0)

<table>
<thead>
<tr>
<th>Treatments (Varieties)</th>
<th>I</th>
<th>II</th>
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<th>IV</th>
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<td>V – 6</td>
<td>35</td>
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</tbody>
</table>

Q.2  (A) Enlist the various techniques to reduce the breeding cycle in rice and explain any one technique in detail. (6.0)
(B) Enlist the characteristics for which variability is observed in pigeon pea. (4.0)

Q.3  (A) Classify the wheat types according to season in which it is grown with important features of each type (6.0)
(B) Explain half-sib, full sib family selection and its modifications in maize (4.0)

Q.4  Answer the following questions (ANY FIVE) (10.0)

1 Which breeding experiments you have seen on Vegetable research station for chilli?
2 Enlist the reasons for not assigning genomes to various species of cicer.
3 For improvement of which characteristics mutation breeding is used in Soybean?
4 Enlist the qualitative traits for which genetics studies have been made in mungbean.
5 Enlist three wild species of chickpea.
6 Enlist the constraints in effective genetic enhancement for yield in pigeon pea.
7 Discuss three main maturity groups in pigeon pea.

Q.5  Write short notes. (ANY FOUR) (10.0)

1 Recurrent Selection.
2 Male sterility in pigeon pea.
3 Hybrid Soybean.
4 Ideal wheat plant type.
5 Breeding for biotic stresses in pigeon pea.
6 Intra – Population improvement in maize.
Q.1 (A) Explain in brief heterosis and genetic bases of heterosis. (7)

(B) What are the criteria to be followed in the selection of parents in a hybridization programme? (5)

Q.2 (A) Differentiate between the following (Any Three) (9)

(i) Mass selection and Recurrent selection
(ii) Recurrent selection for GCA and SCA
(iii) Breeding Composite and Synthetic populations
(iv) Diallel and Line x Tester mating design

(B) Discuss the heterotic pool concept in breeding of cross pollinated crops. (4)

Q.3 Write short note on the following (Any Three) (12)

(i) Ideotype breeding
(ii) Participatory Plant Breeding
(iii) Quantitative Trait Loci (QTLs)
(iv) Pre-breeding

Q.4 Explain in brief

(A) Molecular marker assisted selection (MAS) and its application in crop breeding. (8)

(B) Write a short note on Transgenic varieties and their impact on present day agriculture. (5)