MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

<table>
<thead>
<tr>
<th>Semester</th>
<th>II (New)</th>
<th>Term</th>
<th>II</th>
<th>Academic Year : 2016-17</th>
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<tbody>
<tr>
<td>Course No.</td>
<td>SSAC 122</td>
<td>Title</td>
<td>Soil Chemistry, Soil Fertility and Nutrient Management</td>
<td></td>
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<tr>
<td>Credits</td>
<td>3 (2+1)</td>
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<tr>
<td>Day &amp; Date</td>
<td>Thursday, 27.04.2017</td>
<td>Time</td>
<td>09.00 to 12.00</td>
<td>Total Marks : 80</td>
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Note: 1. Solve ANY EIGHT questions from SECTION “A”.
2. All questions from SECTION “B” are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION “A”

Q.1 a) Define essential nutrients. Classify the essential nutrients giving the ionic forms in which they are absorbed by plants.
b) State the Arnon’s criteria of essentiality of nutrients.

Q.2 a) Enlist the various mechanisms of nutrient ion transport from soil to plant.
    Describe in brief mass flow.
b) Enlist the factors affecting nutrient availability and explain any two of them.

Q.3 a) Write down the deficiency symptoms of phosphorus and boron in plant.
b) Give the functions and toxicity symptoms of sulphur.

b) Define soil pollutants. Enlist the different kinds of pollutants.

Q.5 a) How are acid soils formed? Describe the methods of reclamation of acid soil.
b) Explain the term available nutrient.

b) Give the criteria for evaluation of irrigation water.

Q.7 a) Define integrated nutrient supply system. Give its components and importance.
b) Define calcareous soil. State its effect on plant growth.

Q.8 a) Define submerged soil. Explain the nitrogen transformation in submerged soil.
b) Explain the term indicator plant.

Q.9 a) What are the different fertilizer recommendation approaches? Describe STCR approaches.
b) Explain nutrient management in sodic soils.

Q.10 Write short notes (Any Two):
    1) Fertilizer use efficiency
    2) Use of saline water for agriculture
    3) Biofertilizer

(P.T.O.)
SECTION “B”

Q.11 Fill in the blanks.
1) Essentiality criteria of nutrients is given by ____________.
2) The most available form of nitrogen present in soil is ____________.
3) ____________ is the nutrient which regulates the opening and closing of stomata.
4) ____________ is the secondary nutrient that strengthens plant cell wall.
5) Gypsum is used as an amendment for the reclamation of ____________ soil.
6) Cracking of fruit develops due to deficiency of ____________.
7) ____________ secondary nutrient is responsible for synthesis of oil in oilseed crops.
8) Potassium is absorbed by roots mainly in the form of ____________.

Q.12 Match the following pairs.

“A”            “B”
1) Khaira disease of paddy  a) Nitrogen 18%
2) Urea  b) Fried and Dean
3) “A’ value technique  c) Sulphur 24%
4) DAP  d) Zinc deficiency
5) Olsen method  e) Silicon
6) Ammonium sulphate  f) Available P
7) pH  g) Nitrogen 46%
8) Beneficial nutrient  h) Sorenson

★ ★ ★ ★ ★ ★ ★ ★
**MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE**  
**SEMESTER END EXAMINATION**  
**B.Sc. (Agri.)**

<table>
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<tr>
<th>Semester</th>
<th>II (New)</th>
<th>Term</th>
<th>II</th>
<th>Academic Year</th>
<th>2016-17</th>
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<tr>
<td>Course No.</td>
<td>STAT 121</td>
<td>Title</td>
<td>Statistics</td>
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<tr>
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<td>Day &amp; Date</td>
<td>Saturday, 29.04.2017</td>
<td>Total Marks</td>
<td>40</td>
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**Note:**
1. Solve **ANY EIGHT** questions from **SECTION “A”**.
2. All questions from **SECTION “B”** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

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**SECTION “A”**

Q.1 List out and explain steps involved in testing hypothesis. Explain two types of errors occurring in testing hypothesis.

Q.2 What is meant by ‘Measures of Dispersion”? Write formula for Standard Deviation of individual series, discrete frequency distribution and continuous frequency distribution.

Q.3 What is meant by correlation? Give different types of correlation. Discuss the method of studying correlation by using ‘scatter diagram’.

Q.4 State and explain three basic principles of Design of Experiments. Prepare layout of Randomized Complete Block Design having four replications and six treatments.

Q.5 What is meant by classification? Enlist types of classification. Write merits of Arithmetic Mean.


Q.7 What is Pearson’s correlation co-efficient? Distinguish between correlation and regression.

Q.8 Define Dependent events, Equally likely events, Mutually exclusive events. State the properties of Normal probability distribution.

Q.9 What is meant by measures of central tendency? What are the characteristics of ideal/good measures of central tendency? Define any two types of averages.

Q.10 Write short notes (Any Two).
   1) Student t-distribution.
   2) F-test.
   3) Chi-square test for goodness-of-fit.

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**SECTION “B”**

Q.11 Define the following terms.
   1) Hypothesis
   2) Variable
   3) Statistic
   4) Population

Q.12 Fill in the blanks:-
   1) The Standard Deviation of sample mean distribution is known as __________.
   2) __________ is used to test means of two populations.
   3) The sum of the deviation of the items from __________ ignoring signs is the least.
   4) __________ is one of the type of measures of central tendency which can be determined by histogram.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★
MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

<table>
<thead>
<tr>
<th>Semester</th>
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<tbody>
<tr>
<td>Course No.</td>
<td>MIBO 121</td>
<td>Title</td>
<td>Agricultural Microbiology</td>
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<td>Credits</td>
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<tr>
<td>Day &amp; Date</td>
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<td>Time</td>
<td>09.00 to 12.00</td>
<td>Total Marks</td>
<td>80</td>
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Note:
1. Solve ANY EIGHT questions from SECTION “A”.
2. All questions from SECTION “B” are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION “A”

Q.1 Define microbiology. Give brief account of its scope and importance in agriculture and allied fields with suitable examples.

Q.2 Draw a labeled diagram of bacterial cell and explain different parts of bacterial cell.

Q.3 Describe in brief the following methods of sexual reproduction in fungi.
   1) Gamentangial copulation
   2) Gamentangial contact
   3) Spermatization
   4) Somatogamy

Q.4 Define the biofertilizer. Enlist the various methods of application of biofertilizers and explain them in short.

Q.5 Define Nitrogen cycle and elucidate it along with diagram, biochemical reaction and microbes involved.

Q.6 Define rhizosphere. Describe in detail the factors affecting microflora of rhizosphere.

Q.7 What do you mean by genetic recombination in bacteria? Explain in detail various modes of genetic recombination in bacteria.

Q.8 Define Biogenesis. Explain the theory of spontaneous generation including contribution of scientists.

Q.9 Differentiate between (Any Two).
   1) Prokaryote and Eukaryotes
   2) Autotrophs and Heterotrophs
   3) Gram positive and Gram negative bacteria

Q.10 Write short notes (Any Two).
    1) Bacteriophages
    2) Biopesticide
    3) Germ theory of diseases

(P.T.O.)
Q.11 State True or False.

1) Study of algae is known as mycology.
2) Matchsticks like cell grouping in bacteria are called palisade.
3) The process of deamination which leads to the production of ammonia is termed as Nitrification.
4) *Rhizobium* is nitrogen fixing bacteria growing in the roots of legumes.
5) *Tricoderma spp.* is the most potent biocontrol agent employed for control of animal disease.
6) Protozoa maintain the ecological balance in nature.
7) A.V. Leeuwenhoek discovered the antibiotic streptomycin.
8) Aureofungin is the antifungal antibiotic.

Q.12 Match the following pairs.

<table>
<thead>
<tr>
<th>“A”</th>
<th>“B”</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Dolland</td>
<td>a) Entomopathogenic fungi</td>
</tr>
<tr>
<td>2) Paul Ehrlich</td>
<td>b) Non flagellate bacteria</td>
</tr>
<tr>
<td>3) Atrichous</td>
<td>c) Father of chemotherapy</td>
</tr>
<tr>
<td>4) Beauveria</td>
<td>d) Oil immersion lenses</td>
</tr>
<tr>
<td>5) Cellulomonas</td>
<td>e) Rhizosphere</td>
</tr>
<tr>
<td>6) P.A. Millardet</td>
<td>f) Method of food preservation</td>
</tr>
<tr>
<td>7) Canning</td>
<td>g) Bordeaux mixture</td>
</tr>
<tr>
<td>8) Hiltner</td>
<td>h) Hydrolytic bacteria</td>
</tr>
</tbody>
</table>

♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦
MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester : II (New)          Term : II          Academic Year : 2016-17
Course No. : EXTN 122       Title : Dimensions of Agricultural Extension
Credits : 2 (1+1)           Time : 09.00 to 11.00      Total Marks : 40
Day & Date : Wednesday, 03.05.2017

Note : 1. Solve ANY EIGHT questions from SECTION “A”.
2. All questions from SECTION “B” are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION “A”

Q.1 Enlist the Principles of Extension Education and discuss in detail any two of them.
Q.2 Define the term ‘Education’. Differentiate between Formal and Informal Education.
Q.3 Define ‘Rural Development’. State and explain problems in rural development.
Q.4 What do you mean by Community Development? Differentiate between Community Development and Extension Education.
Q.5 What is Panchayati Raj system? Explain the functions of Grampanchayat.
Q.6 Enlist Poverty Alleviation Programmes and discuss in detail any one programme.
Q.7 Describe in detail Watershed Development Programme.
Q.9 Explain Broad Based Extension with respect to its areas.
Q.10 What is T and V system? Explain the Salient Features of T and V System.

SECTION “B”

Q.11 Give full forms of the following.
   1) DWCRA  2) ICDS
   3) MAVIM  4) MSY

Q.12 Fill in the blanks.
   1) The term Extension Education was first coined by ___________ University.
   2) Community Development Programme was started in the year ____________.
   3) Institution Village Linkage Programme was started in the year ____________.
   4) ____________ of Zilla Parishad is the Chairman of Standing Committee of Zilla Parishad.

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester : II (New)  Term : II  Academic Year : 2016-17
Course No. : AGRO 124  Title : Water Management including Micro
Credits : 3 (2+1)  irrigation
Day & Date : Thursday, 04.05.2017  Time : 09.00 to 12.00  Total Marks : 80

Note:
1. Solve ANY EIGHT questions from SECTION “A”.
2. All questions from SECTION “B” are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION “A”

Q.1 Define infiltration and describe factors affecting infiltration rate.
Q.2 Define water requirement. Describe the factors affecting the water requirement.
Q.3 Enlist different methods of soil moisture estimation and explain in short the
pressure plate apparatus method.
Q.4 What do you mean by available and unavailable water? Explain in brief different
soil moisture constants.
Q.5 Enlist the various irrigation scheduling approaches and describe in detail the
climatological approach.
Q.6 Enlist different components of the drip irrigation system and give its merits and
demerits.
Q.7 Define drainage. Explain the causes of water logging. Describe the effects of
drainage on soil improvement and crop growth.
Q.8 Explain in short the strategies for utilization of poor quality water.
Q.9 Explain the term effective rainfall and give factors influencing effective rainfall.
Q.10 Write short notes (Any Two).
   1) Sprinkler irrigation
   2) Objectives of irrigation
   3) Role of water in plant

SECTION “B”

Q.11 Define the following terms.
   1) Water management
   2) Evapotranspiration
   3) Cusec
   4) Net irrigation requirement
   5) Irrigation efficiency
   6) Micro irrigation
   7) Adhesion
   8) Fertigation

(P.T.O.)
Q.12 Fill in the blanks.

1) For determination of P.W.P. _______ plant is used.
2) Generally irrigation may be given at _________ percentage of depletion of available soil moisture.
3) At field capacity, available soil moisture is _________ per cent.
4) _________ is the most appropriate plant for bio-drainage.
5) _________ pores serve as major channel for movement of gravitational water.
6) The period between two successive irrigations is known as _________.
7) Soil attains the field capacity in _________ to _________ hrs. after saturation.
8) 1 bar = _________ atm.

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester : II (New)  Term : II  Academic Year : 2016-17
Course No. : ENGG 121  Title : Fundamentals of Soil and Water
Credits : 2 (1+1)  Conservation Engineering
Day & Date : Friday, 05.05.2017  Time : 09.00 to 11.00  Total Marks : 40

Note :
1. Solve ANY EIGHT questions from SECTION “A”.
2. All questions from SECTION “B” are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION “A”

Q.1 Give detail classification of surveying.
Q.2 Define leveling. Explain the principles of leveling.
Q.3 What is contour? Give the characteristics of contour lines.
Q.4 a) Compute discharge of a rectangular weir 45 cm long with a head of 14 cm,
    1) with one end contraction and 2) with two end contractions.
    b) Compute discharge through 90 V-notch under the heads of 10 cm and 20 cm.
Q.5 Write the advantages and disadvantages of the plane table survey.
Q.6 Explain the different types of strip cropping.
Q.7 Explain the characteristics of watershed which affect the function of watershed.
Q.8 What is runoff? Enlist the different factors affecting the runoff.
Q.9 Explain the construction of centrifugal pumps and write hydraulic principle used in
    the centrifugal pump.
Q.10 The following perpendicular offsets were taken at 10 meter intervals from survey
    line to the irregular boundary line as 3.8, 4.3, 6.8, 5.2, 7.5, 8.9, 9.5, 8.4 and 6.4 m.
    Calculate the area enclosed between the survey line, the irregular boundary line
    and the first and last offset by applying i) Simpson’s rule and ii) Trapezoidal rule

SECTION “B”

Q.11 Define the following terms.
    1) Geological erosion  2) Static discharge head
    3) Bench mark  4) Ranging
Q.12 State True or False.
    1) In cross staff survey the given area is divided into number of right angled
        triangles and trapezoids.
    2) Bench terraces are generally constructed on hilly areas.
    3) Gully erosion is the removal of soil by running water with the formation
        channels that can be smoothed out completely by normal cultivation..
    4) A station is a point at which the level is set up during levelling.
MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester : II (New)   Term : II   Academic Year : 2016-17  
Course No. : BOT 122   Title : Principles of Genetics  
Credits : 3 (2+1)  
Day & Date : Saturday, 06.05.2017   Time : 09.00 to 12.00   Total Marks : 80

Note : 1. Solve ANY EIGHT questions from SECTION “A”.  
2. All questions from SECTION “B” are compulsory.  
3. All questions carry equal marks.  
4. Draw neat diagrams wherever necessary.

SECTION “A”

Q.1 Define genetics. Discuss the Pre-Mendelian era.

Q.2 State the law of segregation. Explain it with suitable example and state the reasons for Mendel’s success in his work.

Q.3 What do you mean by DNA replication? State the different types of DNA replication and explain semi-conservative DNA replication.

Q.4 Define crossing over and describe its mechanism.

Q.5 What is cell division? Enlist different stages and sub stages of mitosis and meiosis cell division. Explain mitosis with figures.

Q.6 Describe in brief the operon model of protein synthesis.

Q.7 What are chromosomal aberrations? Enlist different types and sub types of Chromosomal aberrations. Explain in detail duplication.

Q.8 State the different theories of sex - determination. Explain the chromosomal theory of sex- determination.

Q.9 Write short notes (Any Two).  
1) Types of RNA  
2) Allopolyploid  
3) Gene interaction

Q.10 What is genetic code? Describe in short features of genetic code.

SECTION “B”

Q.11 Define the following terms.  
1) Penetrance  
2) Transcription  
3) Linkage map  
4) Synapsis  
5) Genome  
6) Sex-linked characters  
7) Multiple alleles  
8) Incomplete dominance

(P.T.O.)
Q.12  Fill in the blanks.

1) Linkage is broken down due to the __________.
2) An autopolyploid individual with a genotype AAAA is called ________.
3) Chromosome number is reduced in __________ cell division.
4) Presence of kappa particles in paramecium is an example of ________ inheritance.
5) Mendel studied __________ pairs of contrasting characters.
6) __________ coined the term genetics in 1906.
7) __________ described the sex chromosome in 1902.
8) Union of two dissimilar gametes that is male and female is known as ________.
MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester: II (New)  Term: II  Academic Year: 2016-17
Course No.: ECON 121  Title: Principles of Agricultural Economics
Credits: 2 (2+0)  Day & Date: Monday, 08.05.2017  Time: 09.00 to 12.00  Total Marks: 80

Note:
1. Solve ANY EIGHT questions from SECTION “A”.
2. All questions from SECTION “B” are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION “A”

Q.1 What do you mean by public finance? Distinguish in detail between public and private finance.

Q.2 Give the definition of economics by J.M.Keynes. Explain the nature and scope of economics.

Q.3 Define the national income. What are the methods of measuring the national income? Explain which method is suitable under Indian conditions.

Q.4 State the classification of human wants. Explain the different characteristics of human wants.

Q.5 State and explain the law of diminishing marginal utility with suitable example. Enlist the exceptions to the law of diminishing marginal utility.

Q.6 Define elasticity of demand. State the different types of elasticity of demand. Explain factors influencing elasticity of demand.

Q.7 Define inflation. Enumerate various anti-inflationary measures. Explain open market operation method to control inflation.

Q.8 Explain the principles of public expenditure.

Q.9 Define direct and indirect tax. State and explain in brief advantages and disadvantages of direct taxes.

Q.10 Explain in brief conditions of paretian optimum.

SECTION “B”

Q.11 Fill in the blanks.
1) When price begins to rise at more than three digit rate per annum, inflation is called ____________.
2) ____________ laid the foundation of welfare economics.
3) ____________ expressed in terms of money is called price.
4) Good will of business is called ______________ good.

(P.T.O.)
5) Want satisfying quality in good is called _____________.
6) ___________ is difference between what we are prepared to pay and what we actually pay.
7) ___________ of demand means more demand at less price.
8) ___________ in supply means less is offered at the same price or same quantity is offered at higher price.

Q.12 State True or False.
1) In economics the term value is used in the sense of value – in – use.
2) Wealth is flow and income is fund.
3) The transportation of goods from point of production to point of consumption adds time utility to the goods.
4) When price rises, demand decreases.
5) Stock is a potential supply.
6) The direct taxes are elastic.
7) Government expenditure on administration is revenue expenditure.
8) Consumption is destruction of utility.

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