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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester	:	**III (New)**	**Term**	:	**I**	**Academic Year** :	**2016-17**
Course No.	:	AGRO 235	**Title**	:	**Field Crops – I (*Kharif* Crops)**		
Credits	:	3(2+1)					
Day & Date	:	Thursday, 17.11.2016	**Time**	:	9.00 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 Write in detail regarding cultivation of soybean on the following points.

a) Land preparation
b) Nutrient management
c) Weed management
d) Harvesting, threshing and yield

Q.2 Advice farmer regarding cultivation of American cotton (rainfed) on the following points.

a) Soil and climate
b) Nutrient management
c) Critical growth stages
d) Picking and yield

Q.3 Describe SRI cultivation of rice on the following points.

a) Spacing and seedling
b) Weed management
c) Water management
d) Yield

Q.4 Give the information on following points about the cultivation of green gram.

a) Economic importance
b) Improved varieties
c) Seed and sowing
d) Harvesting, threshing and yield

Q.5 Prepare a leaflet of groundnut cultivation on the following points.

a) Soil and climate
b) Seed and sowing
c) Intercultural operation
d) Harvesting and yield

Q.6 Write in detail regarding the cultivation of pigeon pea on the following points.

a) Soil and climate
b) Weed management
c) Intercropping
d) Pest management

Q.7 Explain in detail the cultivation of maize (fodder) on the following points.

a) Seed and sowing
b) Water management
c) Nutrient management
d) Harvesting and yield

Q.8 Give information on the following points about the cultivation of *kharif* sorghum.

a) Soil and climate
b) Intercropping
c) Growth stages
d) Harvesting, threshing and yield

(P.T.O)

Q.9 Discuss in detail about sowing and harvesting of the following crops (Any two).

a) Dinanath grass
b) Para grass
c) Hybrid Napier
d) Cluster bean

Q.10 Write short notes on (Any two).

1) Retting and extraction process in jute.
2) Nutritive value of minor millets.
3) Economic importance of soybean.

SECTION "B"

Q.11 Fill in the blanks

1) Pearl millet crop harvested for forage purpose at _____ stage.
2) The oil content in groundnut seed is _____ per cent.
3) _____ is a root parasite of sorghum.
4) Kidney bean belongs to family _____.
5) The ergot is the serious fungus disease of _____.
6) Niger seed contains _____ per cent oil.
7) Jute fiber is known as _____.
8) Inter cultivation in groundnut is restricted after _____ stage.

Q.12 Match the following pairs.

"A"	"B"
1) Pawna grass	a) *Pennisetum glaucum*
2) Horse grass	b) Kultha
3) Forage bajara	c) African tall
4) Maize	d) *Cenchrus ciliaris*
5) Anjan grass	e) Fungal disease
6) Groundnut	f) *Schima nervosum*
7) *Trichoderma*	g) *Arachis hypogaea*
8) Blue panic	h) Neel grass

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

Semester	**: III (New)**	**Term**	**: I**	**Academic Year**	**: 2016-17**
Course No.	**: BOT 233**	**Title**	**: Principles of Plant Breeding**		
Credits	**: 3(2+1)**				
Day & Date	**: Saturday, 19.11.2016**	**Time**	**: 9.00 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 plant breeding. Describe various objectives of plant breeding with suitable examples.

Q.2 Enlist different breeding methods for self and cross pollinated crops. Explain mass selection method with its merits and demerits.

Q.3 What is recurrent selection? Enlist different types of recurrent selection. Explain simple recurrent selection.

Q.4 Define male sterility. Enlist different types of male sterility and explain cytoplasmic genetic male sterility with its merits and demerits.

Q.5 What is polyploidy? Give the classification of polyploidy and explain autopolyploidy.

Q.6 Define mutation. State different types of mutation and explain the procedure of mutation breeding.

Q.7 What is emasculation and pollination? Explain different methods of emasculation with suitable examples.

Q.8 What is self incompatibility? Give the different types of self incompatibility and explain heteromorphic self incompatibility.

Q.9 Define pure line selection. Describe in brief Johannsen pure line theory.

Q.10 Write short notes (Any four).

1) Synthetic variety
2) Transgressive breeding
3) Apomixis
4) Plant introduction
5) Role of wide hybridization in crop improvement.

SECTION "B"

Q.11 Define the following term

1) Cliestogamy
2) Hermaphrodite
3) Allogamy
4) Hybridization
5) Clone
6) Composite variety
7) Heterobeltoisis
8) Euploidy

Q.12 Give contribution of the following scientists.

1) G.H .Shull
2) N.I.Vavilov
3) Thomas Fairchild
4) C.H.Goulden
5) K.Ramaiah
6) C.T.Patel
7) Rimpu
8) M.S.Swaminathan

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B.Sc. (Agri.)

Semester	**:**	**III (New)**	**Term**	**:**	**I**	**Academic Year :**	**2016-17**
Course No.	**:**	BOT 234	**Title**	**:**	**Crop Physiology**		
Credits	**:**	3(2+1)					
Day & Date	**:**	Friday, 11.11.2016	**Time**	**:**	9.00 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 crop physiology. Explain in brief the scope and importance of crop physiology in agriculture.

Q.2 Define plant hormones, enlist their types and write in brief the physiological role of auxin and cytokinin.

Q.3 What is transpiration? What are its different types? Explain the factors that affect the rate of transpiration.

Q.4 What is water use efficiency? Explain the practices followed for its improvement.

Q.5 Define respiration. Explain reactions of Kreb's cycle with neat diagram.

Q.6 Write short notes (Any four).

1) Photorespiration
2) Vernalisation
3) CAM Plants
4) Photoperiodism
5) Phloem loading and unloading

Q.7 Define growth and growth analysis. Explain the phases of growth and give the formulae for NAR and LAI.

Q.8 Discuss Arnon's criteria for essentiality of plant nutrients. Write the functions and deficiency symptoms of N, P, K and Mg.

Q.9 a) What are the climacteric and non-climacteric fruits? Explain in brief maior physiological and biochemical changes during fruit ripening.

b) Write factors affecting storage of fruits.

Q.10 Distinguish between (Any two).

1) Transpiration and Guttation
2) Cyclic photo-phosphorylation and Non- Cyclic photo-phosphorylation
3) Osmosis and Diffusion
4) Abscission and Senesence

(P.T.O.)

SECTION "B"

Q.11 A) Define the following terms.

1) Apical dominance
2) Field capacity
3) Diffusion pressure deficit
4) Photosynthesis

B) State True or False.

1) IAA is root promoting hormone.
2) Water potential is negative in the plant system.
3) Inner wall of guard cell of stomata is thick.
4) Semi-permeable membrane is not required in diffusion.

Q.12 Fill in the blanks.

1) The end product of anaerobic respiration is _____.
2) Sugarcane is an example of _____ plant.
3) O_2 released during photosynthesis comes from _____.
4) Initiation of plasmolysis is called _____.
5) _____ is the main enzyme responsible for CO_2 fixation in C_3 pathway.
6) Value of pressure potential is _____when cell is under flaceed condition.
7) _____ is a ripening hormone.
8) Root hair is _____ cellular organ.

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Semester	:	**III (New)**	**Term**	:	**I**	**Academic Year** :	**2016-17**
Course No.	:	ECON 232	**Title**	:	**Production Economics and Farm Management**		
Credits	:	2(1+1)					
Day & Date	:	Wednesday, 16.11.2016	**Time**	:	9.00 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 What is production economics? Give objectives and scope of production economics.

Q.2 What is farm management? Enlist the principles of farm management and explain the principal of equi-marginal returns.

Q.3 What is farm planning? State the characteristics of good farm plan.

Q.4 What is law of returns? State and explain the law of diminishing returns with suitable example and diagram.

Q.5 What do you mean by production function? Explain different types of production function.

Q.6 What is risk and uncertainty? State and explain sources of risk.

Q.7 Define linear programming and explain its assumptions.

Q.8 Enlist different types of enterprise relationships and explain any two of them.

Q.9 Define iso-cost line. Determine the least cost combination by algebraic and graphic method.

Q.10 Write short notes (Any two).

1) Concepts in production economics 2) Farm budgeting
3) Expansion path

SECTION "B"

Q.11 Fill in the blanks.

1. _____ cost is the earning from the next best alternative foregone.
2. The present value of a given income in a future year is derived by using the _____ technique.
3. A line which defines all possible combinations of two commodities, which would yield an equal revenue or income, is known as _____.
4. _____ is a list of all physical properties of a farm business along with their value at a specific date.

Q.12 State True or False.

1. When total product is maximum, marginal product will be one.
2. Production possibility curve presents all possible combinations of three products.
3. When the value of good is expressed in terms of money it is called price.
4. Elasticity of production is the ratio of MPP to APP.

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Semester	**: III (New)**	**Term**	**: I**	**Academic Year**	**: 2016-17**
Course No.	**: ENTO 231**	**Title**	**: Insect Morphology and Systematics**		
Credits	**: 3(2+1)**				
Day & Date	**: Tuesday, 15.11.2016**	**Time**	**: 9.00 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 Enlist important characteristics of Phylum Arthropoda and differentiate between the Class Insecta and Arachnida.

Q.2 Draw a well labeled diagram of insect integument and enlist its various functions.

Q.3 Enlist different types of mouth parts in insects and describe the mouth parts of cockroach with a labeled diagram.

Q.4 Describe the structure of a typical antenna of an insect with a well labeled diagram and enlist the various types of antenna with one example each.

Q.5 Draw a well labeled diagram of typical wing venation and describe the various modifications of wings.

Q.6 Give the significance of metamorphosis and differentiate between complete and incomplete type of metamorphosis.

Q.7 a) Write in short the characteristic features responsible for dominance of Class Insecta.
b) Give the non-productive and productive appendages of abdomen in insects.

Q.8 State the distinguishing characteristics of Order Coleoptera and mention any four agriculturally important families of Coleoptera with example.

Q.9 Write short notes (Any two).
1) Excretion in insects
2) Functions of blood in insects
3) Photoreceptors in insects

Q.10 Give two differences of each of the following.
1) Campodeiform and Scarabaeiform larvae 2) Butterflies and moths
3) Beetles and weevils 4) Spurs and spines

SECTION "B"

Q.11 Choose the correct answer.
1) Hypognathus type of head is found in_____.
a) Bugs b) Beetles
c) Weevils d) Grasshoppers

(P.T.O.)

2) ICAR- National Bureau of Agricultural Insect Resources (NBAIR) is located at_____.

a) Bangalore b) Hyderabad

c) New Delhi d) Coimbatore

3) The Respiratory system in which the first and last pair of spiracles are functional is called _____.

a) Amphipneustic b) Metapneustic

c) Propneustic d) Peripneustic

4) Nephrocytes are related with_____.

a) Reproduction b) Respiration

c) Excretion d) Digestion

5) The phenomenon where the immature insects or stages give birth to young ones is known as _____.

a) Parthenogenesis b) Viviparity

c) Paedogenesis d) None of these

6) Dr. Kerr published an account of research pertaining to_____.

a) Termites b) Lac insects

c) Honey bees d) Silk worms

7) Juvenile hormone which controls metamorphosis in insects is produced by_____.

a) Prothoracic glands b) Corpora cardiaca

c) Corpora allata d) All of these

8) Filter chamber is present in insects belonging to Order_____.

a) Odonata b) Isoptera

c) Diptera d) Homoptera

Q.12 Match the following pairs.

"A"	"B"
1) Ephemeroptera	a) Caddisfly
2) Odonata	b) Mustard sawfly
3) Mecoptera	c) House fly, midge fly
4) Trichoptera	d) Whitefly
5) Hymenoptera	e) Mayfly
6) Lepidoptera	f) Dragonfly and damselfly
7) Diptera	g) Scorpionfly
8) Hemiptera	h) Butterfly

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B.Sc. (Agri.)

Semester	**: III (New)**	**Term**	**: I**	**Academic Year**	**: 2016-17**
Course No.	**: PATH 232**	**Title**	**: Principles of Plant Pathology**		
Credits	**: 2(1+1)**				
Day & Date	**: Friday, 18.11.2016**	**Time**	**: 9.00 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 Define pathogenesis. Give the role of enzymes and toxins in pathogenesis.

Q.2 Enlist continuous and discontinuous dissemination types and describe continuous dissemination.

Q.3 Describe in detail mode of perpetuation in plant pathogen.

Q.4 Differentiate between (Any two).
1) Host-specific and Non-host specific toxins
2) Horizontal resistance and vertical resistance
3) Simple interest disease and compound interest disease.

Q.5 Define epidemiology and describe on the essential conditions for development of an epiphytotic.

Q.6 Enlist general principles of plant disease management and describe eradication method.

Q.7 Describe pre-existing structural barriers faced by the pathogen after gaining entry into host.

Q.8 Comments on the following (Any two).
1) Plant disease forecasting
2) Mechanism of infection by various pathogens
3) Advantages of integrated plant disease management

Q.9 Describe various avenues of penetration in plant pathogen.

Q.10 Write short notes on (Any two).
1) Role of alternate host in plant disease
2) Phytoalexins
3) Tyloses

SECTION "B"

Q.11 Define the following terms.
1) Biotroph
2) Inoculum
3) Hypersensitivity
4) Epidemic disease

Q.12 Do as directed.
1) Oospore is not a resting spore of downy mildew fungus *plasmopara parasitica.* (State True or False)
2) Give full form of the DIPA.
3) Name the toxin produced by *Pyricularia oryzae.*
4) What do you mean by disease?

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