3 (Sem–3/CBCS) BOT HC 1

2022

BOTANY

(Honours)

Paper : BOT–HC–3016

(Morphology and Anatomy of Angiosperm)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Answer the following as directed :
   (any seven)   1×7=7

   (a) When the stamens and carpel unite, the structure is termed as _____ .
   (Fill in the blank)

   (b) Mention *one* function of tapetum.

   (c) What are hydathodes ?

(d) When a flower has both androecium and gynoecium, it is called monoecious flower. *(State True or False)*

(e) What are the components of xylem tissue ?

(f) The Casperian strip is mainly made of —

    (i) Lignin

    (ii) Suberin

    (iii) Cellulose

    (iv) Hemicellulose

                 (Choose the correct one)

(g) Function of Plasmodesmata is —

    (i) to provide cell to cell connection

    (ii) to help in cell division and thus plant development

    (iii) to maintain coordination and signaling responses during plant interactions

    (iv) All of the above

                 (Choose the correct one)

(h) What is quiescent center ?

(i) Write the botanical name of a plant where cyathium type of inflorescence is found.

(j) Define trichomes.

(k) What are the types of tissue systems found in the primary structure of plants ?

(l) Who proposed 'histogen theory' to explain shoot apical organization ?

2. Explain the following : *(any four)* 2×4=8

(a) Stele and its types.

(b) Dendrochronology.

(c) Permanent tissue and its types.

(d) Difference between heartwood and sapwood.

(e) Importance of anatomy in pharmacognosy.

Contd.

(f) Kranz anatomy.

(g) Structure of amphitropous ovule.

(h) Tunica-corpus theory.

3. Answer *any three* of the following :

5×3=15

(a) Distinguish between xerophytes and hydrophytes with regard to anatomical adaptations.

(b) Describe about the characteristic features of secondary xylem and secondary phloem.

(c) With the help of suitable diagrams explain about sunken and raised stomata found in different plants.

(d) Describe the role of polarity in plant development.

(e) Give an account on the morphological nature of gynoecium.

(f) Discuss about the different types of epidermal outgrowths.

(g) What are secretory tissues ? Write about the external secretory structures.

(h) Give a brief account of the internal structure of dorsiventral leaf with example.

4. Answer the following questions : (*any three*)
   10×3=30

(a) What is Telome theory ? Explain the theory with suitable diagram, mentioning its significance. 2+6+2=10

(b) Define apical meristems. Explain the mode of growth found in shoot apical meristem with the help of different theories. 2+8=10

(c) What is ground tissue system ? Describe about its different components, mentioning the importance in plant growth and development. 2+8=10

Contd.

(d) Give a detailed account on application of morphology in Angiospermic plant classification.

(e) Define permanent tissues. What are its types ? Illustrate about the complex tissues with the help of suitable diagrams.   1+2+7=10

(f) With the help of suitable examples discuss about the anatomical characteristics of dicot and monocot stem.

(g) What are periderm and lenticels ? How are they developed during secondary growth ? Explain with diagram.

5+5=10

(h) Explain how lateral roots are developed in flowering plants.

(i) What is cambium ? How is it involved in seasonal activity and secondary growth in dicot plants ? Explain with help of diagrams.   2+8=10

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3 (Sem–3/CBCS) BOT HC 2

2022

BOTANY

(Honours)

Paper : BOT–HC–3026

(Economic Botany)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Answer the following questions/Choose the correct one : *(any seven)*   1×7=7

    (a) Write the full form of NBPGR.

    (b) Write the botanical name of wheat.

    (c) What type of soil is suitable for cotton cultivation ?

    (d) Name a drug yielding plant where drug is obtained from root.

(e) From which part of the plant *Papaver somniferum* 'opium' is extracted ?

(f) Choose the correct answer :

Botanical name of the plant that yields pararubber :

   (i)   *Ficus elastica*

   (ii)   *Heuea brasiliensis*

   (iii)   *Manihot glaziovii*

   (iv)   *Ficus religiosa*

(g) Choose the correct answer :

Cinchona officinalis belongs to the family :

   (i)   Acanthaceae

   (ii)   Verbenaceae

   (iii)   Rubiaceae

   (iv)   Asteraceae

(h) What is the source of 'Congo Coffee' ?

(i) Linseed oil is obtained from which plant ?

(j) Name the family of *Tectona grandis*.

(k) What is the advantage of eating ground nuts ?

(l) Define 'loss of crop genetic diversity'.

2. Answer the following very briefly : *(any four)*

                                      $2 \times 4 = 8$

(a) What is 'Orange Fannings' ?

(b) What is the nature of chief food reserve in —

   (i)   Soybean

   (ii)   Rice

   (iii)   Potato and

   (iv)   Sugarcane ?

(c) Mention the importance of leguminous plants to the ecosystem.

(d) How potato plant is propagated ?

(e) From which part of the plant *Papaver somniferum* 'opium' is extracted ?

(f) Choose the correct answer :

Botanical name of the plant that yields pararubber :

(i) *Ficus elastica*

(ii) *Heuea brasiliensis*

(iii) *Manihot glaziovii*

(iv) *Ficus religiosa*

(g) Choose the correct answer :

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(d) How potato plant is propagated ?

(e) What do you understand by domestication?

(f) State the uses of Coir.

(g) What is the greatest advantage of plant introduction?

(h) What are germplasm banks?

3. Answer briefly : *(any three)*   5×3=15

(a) Mention the uses of tobacco.

(b) Mention the importance of germplasm diversity.

(c) Write briefly about *two* spices (mention scientific name) that are used in Indian cuisine.

(d) Mention the uses of timber obtained from Pine.

(e) Write short note on habit-forming drugs.

(f) Write a brief account on millets.

(g) Give the scientific name, family and parts used of the following :

(i) Cardamom

(ii) Cumin

(h) 'Cannabis' is obtained from which plant? Point out the therapeutic effects of cannabis.

4. Answer *any three* of the following :

                  10×3=30

(a) Describe the method of processing of sugarcane. Mention the products and by-products of sugarcane industry.

                  4+6=10

(b) Write an essay on drug yielding plants studied by you.

(c) What is plant introduction? What are the different types of plant introduction? Mention the steps involved in plant introduction.

                  3+2+5=10

(d) What are essential oils? Write briefly about various methods of extraction of essential oils. How essential oils differ from fatty oils? 2+6+2=10

(e) Define fibres from anatomical point of view. How fibres can be classified on the basis of their origin? 4+6=10

(f) What is tapping? Describe the processing and uses of rubber.

3+4+3=10

(g) Write the scientific name, family, part used and economic importance of the following spices — 2½×4=10

(i) Fennel

(ii) Saffron

(iii) Clove

(iv) Black pepper

(h) Discuss briefly the cultivation practices of tea. Describe various steps of processing of black tea. 4+6=10

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3 (Sem–3/CBCS) BOT HC 3

2022

BOTANY

(Honours)

Paper : BOT–HC–3036

(Genetics)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Answer **any seven** of the following questions : 1×7=7

   (i) The transmission of characters or traits from one generation to another is called _____ . (Fill in the blank)

   (ii) The genotypic ratio of law of independent assortment is—

   (a) 1 : 1 : 1 : 1

   (b) 9 : 3 : 3 : 1

   (c) 9 : 3 : 3 : 3

   (d) 3 : 9 : 1 : 3

   (Choose the correct answer)

(iii) When the phenotypic expression of a heterozygote is more extreme than that of either homozygous parent, then it is—

(a) Co-dominance

(b) Dominance

(c) Overdominance

(d) Incomplete dominance
(Choose the correct answer)

(iv) Genes which have little or no effect of their own but increase or decrease the expression of other major genes are known as—

(a) Pleotropic genes

(b) Modifying genes

(c) Over dominant genes

(d) Epistasis
(Choose the correct answer)

(v) Coupling and repulsion phases are two aspects of the same phenomenon called _____.
(Fill in the blank)

(vi) Autosomes are concerned with—

(a) Sex determination

(b) Body characters

(c) Femaleness

(d) Maleness
(Choose the correct answer)

(vii) Y-linked genes are called _____.
(Fill in the blank)

(viii) _____ is the change in frequency of an existing gene variant in the population due to random chance.
(Fill in the blank)

(ix) The loss of a segment of genetic material from a chromosome is termed as—

(a) Duplication

(b) Deficiency

(c) Translocation

(d) Inversion
(Choose the correct answer)

(iii) When the phenotypic expression of a heterozygote is more extreme than that of either homozygous parent, then it is—

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(d) Inversion

(Choose the correct answer)

(x) _____ is the smallest unit of DNA capable of recombination.

(Fill in the blank)

(xi) _____ refers to the number of processes by which a cell identifies corrects damage to the DNA molecules that encode its genome.

(Fill in the blank)

(xii) Nullisomic is represented by—

(a) $2n-2$

(b) $2n+1+1$

(c) $2n+1$

(d) $2n+2$

(Choose the correct answer)

2. Answer **any four** out of the following questions : 2×4=8

(i) What are tetrasomics ?

(ii) What are sex chromosomes ?

(iii) What are exons ?

(iv) What is the difference between complete and incomplete linkage ?

(v) What is pseudo-dominance ?

(vi) What is the purpose of a pedigree analysis ?

(vii) What is genetic variation ?

(viii) Differentiate between Mendelian and non-Mendelian inheritance.

3. Write short notes on **any three** of the following : 5×3=15

(i) Frameshift mutation

(ii) Epistasis

(iii) Mitochondrial DNA

(iv) Intercalating Agents

(v) Transposons

(vi) Speciation

(vii) Spontaneous mutation

(viii) Multiple Alleles

4. Answer **any three** of the following questions : 10×3=30

(i) What are Mendel's law? Describe Mendel's second law with a suitable example. 2+8=10

(ii) What is crossing over? Describe the cytological basis of crossing over with a suitable example. 2+8=10

(iii) Explain with the help of diagram meiotic behaviour of paracentric and pericentric inversion. 5+5=10

(iv) What do you mean by extra chromosomal inheritance? Describe with an example. 2+8=10

(v) Define aneuploids. Discuss the causes of origin of aneuploids. 2+8=10

(vi) With the help of suitable example discuss polygenic inheritance.

(vii) What is induced mutation? Give a detailed account of physical mutagens. 2+8=10

(viii) Describe Hardy-Weinberg's law.

————

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