

- (b) What is ...
(c) What do you mean by inversion temperature?
(d) Compare isothermal reversible expansion with adiabatic reversible expansion of an ideal gas.
(e) What are the advantages of Berkeley and Hartley's method over other methods of measuring osmotic pressure?
(f) Define enthalpy of hydration.

BOTANY Paper-A

(Plant Diversity-II)

Time : 3 Hours

Max. Marks : 36

- Note : (i) Attempt *five* questions in all.
(ii) Question No. 1 is compulsory.
(iii) Attempt *four* more questions selecting *one* from each Unit (Unit I, II, III, IV).
(iv) Draw well labelled diagrams wherever necessary.

1. Compulsory :

(A) Choose the correct option.

(i) Pyrenoids are found associated with chloroplasts of :

(a) *Anthoceros*

(b) *Funaria*

(c) *Marchantia*

(d) *Riccia*

(ii) "Scouring rushes" is the common name of :

(a) *Selaginella*

(b) *Equisetum*

(c) *Anthoceros*

(d) *Funaria*

- (iii) In which of the following plants independent sporophyte and gametophyte is present?
- (a) Algae
(b) Fungi
(c) Bryophytes
(d) Pteridophytes
- (iv) In the life cycle of a moss which of the generation is dominant?
- (a) Haploid gametophytes
(b) Diploid gametophyte
(c) Haploid sporophyte
(d) Diploid sporophyte
- (v) In *Funaria*, that reduction division takes place in the :
- (a) antheridium
(b) archegonium
(c) capsule
(d) zygote
- (vi) Peltate disc is characteristic feature of strobilus of which pteridophyte?
- (a) *Equisetum*
(b) *Selaginella*
(c) *Psilotum*
(d) *Rhynia* 6×1=6
- (B) Fill in the blanks :
- (i) Dehiscence of moss capsule takes place by the movements of peristome teeth.
- (ii) Antherozoids of *Marchantia* are
- (iii) When two kinds of sex organs are borne on separate branches of the same plant, such are called mosses.
- (iv) Heterospory is considered to be a pre-requisite for
- (v) Aerial branches of *Rhynia* bear
- (vi) *Anthoceros* shows colonies in the thallus 6×1=6

Unit-I

2. (a) Describe the life history of *Marchantia* with the help of series of diagrams only (No description asked)
- (b) Explain mechanism of spore dispersal in the capsule of *Riccia*. 4,2
3. Write notes on any two of the following :
- (a) Gemma cup and gemmae of *Marchantia*
- (b) Archegoniophore of *Marchantia*
- (c) Alternation of generation 3,3

Unit-II

4. (a) Describe sex organs of *Funaria* 4
- (b) Draw V.S. Thallus of *Anthoceros* showing antheridia 2
5. Write notes on any two the following :
- (a) Justify the statement "*Anthoceros* is a synthetic genus."
- (b) *Veratrum*

Unit – III

6. (a) Describe the internal structure of *Rhynia* (= Aglaophyton) stem and sporangium.
(b) Draw well labelled diagrams of mature megagametophyte in *Selaginella*. 3,3
7. Write note on any *two* of the following :
(a) Morphological nature of rhizophore of *Selaginella*
(b) Seed habit in *Selaginella*
(c) T. S. root of *Selaginella* 3,3

Unit – IV

8. Write notes on any *two* of the following :
(a) Dehiscence of sporangium in *Pteris*
(b) Structure of antherozoid in *Equisetum*
(c) Strobilus of *Equisetum* 3,3
9. Draw well labelled diagrams of any *two* of the following :
(a) T.S. aerial stem (internode) of *Equisetum*
(b) T.S. sporophyll of *Pteris*
(c) V. S. prothallus of *Pteris* 3,3

BOTANY Paper-B

(Genetics)

Time : 3 Hours

Max. Marks : 36

Note : Attempt *five* questions in all. Question No. 1 is compulsory and select *one* question from each Unit.

1. (a) MCQ :

- (i) If both the parents have O blood group the offsprings will have:
(a) A group (b) B group
(c) AB group (d) O group
- (ii) Phenotypic ratio of a dihybrid cross is :
(a) 4 : 4 : 4 : 4 (b) 7 : 7 : 7 : 1
(c) 9 : 3 : 3 : 1 (d) 1 : 1 : 1 : 1
- (iii) A cross between a heterozygous individual and a homozygous recessive parent is called :
(a) Test cross (b) Back cross
(c) Dihybrid cross (d) Monohybrid cross
- (iv) Which of the following is not a category of chemical mutagen?
(a) Base modifying
(b) Base analogue
(c) Intercalating compound
(d) Ionising radiations.

- (v) When two pairs of genes interact to give 9 : 7 F₂ ratio they are :
 (a) Supplementary genes
 (b) Complementary genes
 (c) Epistasis
 (d) Duplicating genes
- (vi) Allosomes are also called :
 (a) Odd chromosomes
 (b) Sex chromosomes
 (c) Autosome
 (d) None of these

(b) Fill in the blanks :

- (i) Extra nuclear inheritance is controlled by genes.
 (ii) Skin colour in man is an example of inheritance.
 (iii) Nitrous acid does not affect Thymine because it does not contain
 (iv) UGA, a stop signal codon refers to in mitochondria of animals and fungi.
 (v) Eye colour in *Drosophila* is controlled by alleles.
 (vi) is the phenomenon where none of the two Mendelian factors or alleles is dominant over the other. 12×1=12

Unit – I

2. Explain Mendel's Law of independent assortment. 6
 3. Write notes on : 3,3
 (a) Linkage groups (b) Linkage map

Unit – II

4. Write notes on : 3,3
 (a) Pleiotropic genes (b) Codominance
 5. What is Epistasis? Briefly discuss its types giving one example of each type. 6

Unit – III

6. Describe Inheritance of leaf variegation of Four O'clock plant. 6
 7. Write notes on : 3,3
 (a) Haemophilia
 (b) Chromosomal theory of inheritance

Unit – IV

8. What are Gene mutations? Give mechanism of gene mutations. 6
 9. Write notes on : 3,3
 (a) DNA damage
 (b) Excision repair mechanism in *E. coli*.