



BOTANY

SECTION-A

1. Severalandchanges are initiated which lead to the differentiation and further development of the floral primordium:

(1) Hormonal and structural
(2) Physiological and Genetic
(3) Structural and genetic
(4) Hormonal and Genetic

2. Synergid, zygote and primary endosperm nucleus respectively are;

(1) diploid, diploid and triploid.
(2) haploid, diploid and diploid.
(3) haploid, diploid and triploid.
(4) triploid, haploid and diploid.

3. The acceptance and rejection by continuous dialogue between pollen grain and pistil mediated by chemical components of pollen and pistil result in;

(1) autogamy (2) pollen pistil interaction
(3) geitonogamy (4) pollination

4.



Above diagram represents

(1) Multicarpellary, syncarpous pistil of Papaver
(2) multicarpellary, apocarpous gynoecium of Michelia
(3) Multicarpellary, syncarpous pistil of Hibiscus
(4) Both (1) and (3)

5. Which of the following represent recurrent agamospermy?

(1) Embryosac \rightarrow Egg \rightarrow Organism
(2n) (2n) (2n)
(2) Nucellar cell \rightarrow Embryo \rightarrow Organism
(2n) (2n) (2n)
(3) Embryosac \rightarrow Egg \rightarrow Organism
(n) (n) (n)
(4) Embryosac \rightarrow Egg \rightarrow Fertilisation \rightarrow Zygote
(n) (n) (n)

6. A pea plant having violet-coloured flowers with unknown genotype was crossed with a plant having white-coloured flowers. In the progeny, 50% of the flowers were violet and 50% were white. The genotypic constitution of the parent having violet-coloured flowers was;

(1) homozygous (2) azygous
(3) heterozygous (4) hemizygous

7. Mendel was **not** able to get any linkage due to the

(1) law of dominance;
(2) law of unit character
(3) law of independent assortment
(4) None of these

8. In keeping with the law of independent assortment, what is actually assorted?

(1) Different genes on the same chromosome
(2) Centromeres
(3) Homologous chromosomes
(4) Heterologous chromosomes

9. Marriages between close relatives should be avoided because it includes more;

(1) recessive alleles to come together.
(2) mutations.
(3) multiple births.
(4) blood group abnormalities.

10. Mr. Sandival has blood type B and Mrs. Sandival has blood type O. They have three children of their own and one adopted child. Om has blood type AB, Jai has blood type O, Aman has blood type B, and Priya has blood type B. Which child is adopted one?

(1) Priya (2) Jai
(3) Om (4) Aman

11. In a random mating, population frequency of dominant allele is 0.7. What will be the frequency of recessive phenotype?

(1) 0.49 (2) 0.09
(3) 0.3 (4) 0.21



12. Autogamy refers to;
- (1) Transfer of pollen grain to stigma of another flower
 - (2) Transfer of pollen grain to stigma of same flower
 - (3) Both (1) and (2)
 - (4) Transfer of poller grain to stigma of another flower of another plant
13. A family has 9 girls. Probability of son at 10th birth is;
- (1) 50%
 - (2) 100%
 - (3) 25%
 - (4) 75%
14. nu body of nucleosome consists of;
- (1) H₁ and H₂A
 - (2) H₂A and H₂B
 - (3) H₃ and H₄
 - (4) Both (2) and (3)
15. The length of DNA molecule greatly exceeds the dimensions of the nucleus in eukaryotic cells. How is this DNA accommodated?
- (1) Super coiling in nucleosomes
 - (2) DNAase digestion
 - (3) Through elimination of repetitive DNA
 - (4) Deletion of non-essential genes
16. Which of the following RNA is found in maximum amount in a cell?
- (1) rRNA
 - (2) mRNA
 - (3) tRNA
 - (4) snRNA
17. *Escherichia coli* cells were grown for many generations in ¹⁵NH₄Cl as sole nitrogen source. Subsequently, these cells were grown exactly for four generations in medium containing ¹⁵NH₄Cl. The DNA from these cells were isolated and separated. If ¹⁵N/¹⁵N represents the two strands of DNA where both strands have heavy nitrogen; ¹⁵N/¹⁴N as intermediate DNA; and ¹⁴N/¹⁴N as DNA containing light nitrogen, the ratios for heavy: intermediate: light DNA, respectively would be
- (1) 1 : 0 : 7
 - (2) 1 : 1 : 6
 - (3) 0 : 1 : 7
 - (4) 0 : 8 : 0
18. Fifth charged tRNA attaches itself to of ribosome in translation.
- (1) Shine Dalgarno (SD) sequence
 - (2) P site
 - (3) A site
 - (4) anti SD sequence
19. Wobbling helps to maintain economy in number of tRNA molecules because;
- (1) genetic code is unambiguous and specific.
 - (2) tRNA contains anticodons.
 - (3) first two bases in the codon are specific.
 - (4) genetic message is read in open frame.
20. Which of the following steps of translation does **not** consume a high-energy phosphate bond?
- (1) Peptidyl transferase reaction
 - (2) Aminoacyl tRNA binding to A site
 - (3) Translocation
 - (4) Amino acid activation
21. Imagine an error occurring during DNA replication in a cell, so that where there is supposed to be an A in one of the genes there is a C instead. What effect will this probably have on the cell?
- (1) The amino acid sequence will be completely hanged
 - (2) An amino acid will be missing
 - (3) An incorrect amino acid will appear
 - (4) An additional amino acid will appear
22. Khorana synthesised two RNAs (a) with repeat sequence of AB and (b) with repeat sequence of ABC, the polypeptides coded by (a) and (b) are respectively;
- (1) homopolypeptides in both (a) and (b).
 - (2) heteropolypeptides in both (a) and (b).
 - (3) homopolypeptide in (a) and heteropolypeptide in (b).
 - (4) heteropolypeptide in (a) and homopolypeptide in (b).
23. Consider the following statement.
- A. Number of gene loci on chromosome can be more than one.
- B. In one gene loci two allele is present in diploid organism.
- Mark the **correct**.
- (1) only A
 - (2) only B
 - (3) both A and B
 - (4) both wrong
24. XO type of sex determination can be found in;
- (1) Drosophila
 - (2) Birds
 - (3) Grasshoppers
 - (4) Monkeys



25. Thalassemia and sickle cell anemia are caused due to a problem in globin molecule synthesis. Select the **correct** statement.
- (1) Both are due to a qualitative defect in globin chain synthesis
 - (2) Thalassemia is due to less synthesis of globin molecules
 - (3) Sickle cell anemia is due to a quantitative problem of globin molecules
 - (4) Both are due to a quantitative defect in globin chain synthesis
26. **Assertion (A):-** In co-dominance and incomplete dominance, the genotypic & phenotypic ratios are same.
Reason (R):- In case of co-dominance the F₁ generation resembles both parents.
- (1) Both **Assertion (A)** and **Reason (R)** are correct and the **Reason (R)** is a correct explanation of the **Assertion (A)**.
 - (2) Both **Assertion (A)** and **Reason (R)** are correct but **Reason (R)** is not a correct explanation of the **Assertion (A)**.
 - (3) **Assertion (A)** is correct but the **Reason (R)** is incorrect.
 - (4) Both **Assertion (A)** and **Reason (R)** are incorrect.
27. Select the compound and technique used for separation of DNA in this experiment.
- (1) CsCl and electrophoresis
 - (2) NaCl and centrifugation
 - (3) NaCl and electrophoresis
 - (4) CsCl and centrifugation
28. During DNA replication, Okazaki fragments are used to elongate;
- (1) The lagging strand towards replication fork
 - (2) The leading strand away from replication fork
 - (3) The lagging strand away from the replication fork
 - (4) The leading strand towards replication fork
29. The inheritance of flower colour in *Antirrhinum* (dog flower) is an example of;
- (1) incomplete dominance
 - (2) codominance
 - (3) multiple alleles
 - (4) linkage
30. BOD can be defined as;
- (1) amount of CO₂ consumed if all the inorganic matter in one litre of water is oxidised by bacteria.
 - (2) amount of O₂ consumed if all the organic matter in one decilitre of water is reduced by bacteria.
 - (3) amount of O₂ consumed if all the organic matter in one litre of water is oxidised by bacteria.
 - (4) amount of O₂ consumed if all the inorganic matter in one litre of water is oxidised by bacteria.
31. Biogas production is a;
- (1) three-step microbial process.
 - (2) three-step physical process.
 - (3) four-step aerobics process.
 - (4) four-step anaerobic process.
32. *Trichoderma* has been proved as a useful microorganism for;
- (1) biological control of soil-borne plant pathogens.
 - (2) bioremediation of contaminated soils.
 - (3) reclamation of waste lands.
 - (4) gene transfer in higher plants.
33. **Assertion (A):** Biologists are not sure about how many prokaryotic species there might be;
Reason (R): Taxonomic methods are not suitable for identifying microbial species.
- (1) Both **Assertion (A)** and **Reason (R)** are correct and the **Reason (R)** is a correct explanation of the **Assertion (A)**.
 - (2) Both **Assertion (A)** and **Reason (R)** are correct but **Reason (R)** is not a correct explanation of the **Assertion (A)**.
 - (3) **Assertion (A)** is correct but the **Reason (R)** is incorrect.
 - (4) Both **Assertion (A)** and **Reason (R)** are incorrect.



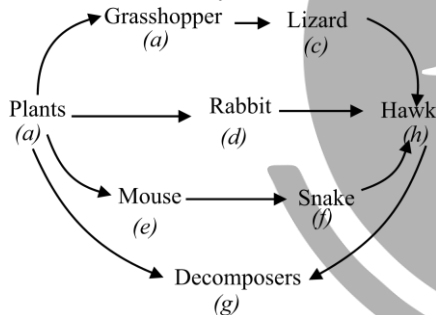
34. Ecological niche is normally occupied by;
- (1) a population.
 - (2) a small community.
 - (3) competing species..
 - (4) competing genera

35. Vital index of a population is;
- (1) $\frac{B}{D} \times 100$
 - (2) $B - D$
 - (3) $\frac{D}{B} \times 100$
 - (4) $B + D$

SECTION - B

36. AbinDgdon tortoise in Galapagos Islands became extinct within a decade after were introduced on the island, because of the greater browsing efficiency of the introduced animals on the island.
- (1) cows
 - (2) buffaloes
 - (3) goats
 - (4) camels

37. Which of the following organisms in the given food web act as a secondary-consumers?



- (1) (a) and (d)
 - (2) (e) and (f)
 - (3) (c) and (f)
 - (4) (d) and (g)
38. Assuming that the energy transfer efficiency between trophic levels is 10%, how much grain would be required to produce 70 kg of human biomass if the grain is eaten by cows and the cows are eaten by humans?
- (1) 210 kg
 - (2) 700 kg
 - (3) 2,100 kg
 - (4) 7,000 kg
39. A person who eats a chicken that ate grain is a
- (1) primary producer
 - (2) primary consumer
 - (3) secondary consumer
 - (4) quaternary consumer

40. Primary productivity;
- (1) is equal to the standing crop of an ecosystem.
 - (2) is greatest in freshwater ecosystems.
 - (3) is the rate of conversion of light to chemical energy in the ecosystem.
 - (4) is inverted in some aquatic ecosystems.

41. In which summit, 190 countries were agreed for significant reduction in the current rate of Biodiversity loss at global, regional and local levels by 2010?
- (1) Earth Summit Rio de Janeiro, 1992
 - (2) Beijing protocol, 1999
 - (3) World Summit Johannesburg, 2002
 - (4) Kyoto Protocol, 1997

42. Gametes of threatened species can be preserved in viable and fertile condition for long periods using
- (1) PCR technique;
 - (2) CTAB
 - (3) cryopreservation technique
 - (4) *in situ* conservation

43. Which zone of biosphere reserve is managed to accommodate a greater variety for resource, use strategies, research and educational activities?
- (1) Natural zone
 - (2) Core zone
 - (3) Buffer zone
 - (4) Transition zone

44. Which of the following organisms are badly affected when large habitats are broken up into small fragments due to various human activities?
- (1) Mammals requiring small territories
 - (2) Planktons showing diapause
 - (3) Animals with migratory habits
 - (4) Birds requiring small territories

45. Steller's sea cow and passenger pigeon became extinct due to;
- (1) alien species invasion
 - (2) co-extinction
 - (3) habitat loss and fragmentation
 - (4) over-exploitation

46. Presently which of the following face maximum threat of extinction?
- (1) Birds
 - (2) Amphibians
 - (3) Mammals
 - (4) Gymnosperm



47. The number of individual of the same species that have come into the habitat from elsewhere during the time period under consideration is called;

- (1) Natality
- (2) Mortality
- (3) Immigration
- (4) Emigration

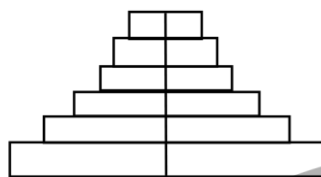
48. Wine and Beer are produced;

- (1) by distillation only.
- (2) by fermentation and distillation.
- (3) by fermentation but without distillation.
- (4) without fermentation and distillation.

49. Post-reproductive

Reproductive

Pre-reproductive



Expanding

Above diagram represents the Population

- (1) Expanding
- (2) Stable
- (3) Declining
- (4) All

50. **Statement-I:** Decomposition is largely an oxygen requiring process.

Statement-II: Ecosystems follow both first and second law of thermodynamics.

- (1) Both Statement I and Statement II are correct.
- (2) Statement I is correct but Statement II is incorrect.
- (3) Statement I is incorrect but Statement II is correct.
- (4) Both Statement I and II are incorrect.

