

## P.G. BOTANY

1. In lower Pteridophytes, like Psilophytes and Lycophytes, the antheridia and archegonia are borne in the
  - (A) sporocarp
  - (B) independent prothalus
  - (C) micro and megasporangia of the sporophyte
  - (D) directly on the sporophyte
2. Which of the following acts as a protective covering, formed by the curling of the leaf margin over the sori ?
  - (A) tapetum
  - (B) inducium
  - (C) calyptra
  - (D) perichaetum
3. The presence of cranial and vascular canals is the characteristic anatomical features of
  - (A) *Equisetum* stem
  - (B) *Selaginella* stem
  - (C) *Lycopodium* stem
  - (D) *Marsilea* stem
4. *Cycas* is considered to have evolved from fern like ancestors because of the presence of the fern characters like
  - (A) flagellated antherozoids, circinate ptyxis and persistent prothallial cell
  - (B) flagellated antherozoids, circinate ptyxis and absence of prothallial cell
  - (C) flagellated antherozoids, condensed male cone and absence of prothallial cell
  - (D) flagellated antherozoids, integumented ovule and pinnate leaves
5. In *Gnetum*, the development of female gametophyte is haploid but
  - (A) monosporic
  - (B) bisporic
  - (C) tetrasporic
  - (D) with well developed archegonia
6. The rhizoidal grooves are formed from the ventral surface in the erectly growing reproductive branches of
  - (A) *Riccia*
  - (B) *Marchantia*
  - (C) *Porella*
  - (D) *Funaria*

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7. In which of the following genera, the sporogenous tissues are of endothelial origin ?  
(A) *Riccia* (B) *Sphagnum* (C) *Funaria* (D) *Andraea*
8. The nursing cells produced to provide the nourishment to the growing embryo in a developing gymnospermous seed are cytologically  
(A) haploid (B) diploid (C) triploid (D) tetraploid
9. Tubular and/or legulate flowers are present in the inflorescence of  
(A) Rosaceae (B) Rubiaceae  
(C) Caesalpiniaceae (D) Asteraceae
10. In accordance with Article 11 of ICN, the author whose specific epithet enjoys priority for a combination, is referred as the author of  
(A) tautonym (B) basionym (C) combination (D) homonym
11. Which of the following classifications of angiosperms is based on the phylogenetic relationships among the taxa ?  
(A) Bentham and Hooker (B) Hutchinson  
(C) Humboldt and Bonpland (D) G. Bauhin
12. The marginal placentation, adelphous stamens and united corolla are the characteristic features of the family  
(A) Solanaceae (B) Rubiaceae  
(C) Fabaceae (D) Acanthaceae
13. Which of the following families is considered to be most advanced among monocots ?  
(A) Poaceae (B) Commelinaceae  
(C) Orchidaceae (D) Cyperaceae

14. In a distribution with a mean and standard deviation of 32 and 4, respectively, the coefficient of variation will be  
(A) 12.5%                      (B) 8%                      (C) 1.28%                      (D) 0.8%
15. When two random samples are drawn from a homogeneous population, the sampling differences between the samples is expected to be  
(A) always significant                      (B) generally significant  
(C) always insignificant                      (D) can not be determined
16. In a sample with 100 replicates and a standard error of 0.16, the variance of the sample will be  
(A) 0.04                      (B) 1.6                      (C) 16                      (D) 2.56
17. In a sample with 40 replicates, the frequency of the median class and the cumulative frequency before the median class are 12 and 14, respectively. The median frequency class has a magnitude of 4 and lowest value of 18. The median of the sample will be  
(A) 19                      (B) 20                      (C) 21                      (D) 22
18. The difference between the means of two sample is required while calculating  
(A) F-value                      (B) coefficient of variation  
(C) t-value                      (D) Chi square value
19. The number of Mn atoms that forms an integral part of the Oxygen evolving complex in green plants is  
(A) 10                      (B) 4                      (C) 3                      (D) 2
20. Accumulation of malate, as a reserve of  $\text{CO}_2$  for efficient photosynthetic performance when the stomata is closed, is seen in  
(A)  $\text{C}_4$  plants only                      (B)  $\text{C}_3$  and  $\text{C}_4$  plants  
(C)  $\text{C}_4$  and CAM plants                      (D)  $\text{C}_3$  and CAM plants

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21. Which of the following reaction step is an energy yielding step during glycolytic break down of glucose to pyruvate ?
- (A) 1, 3-bisphosphoglycerate to 3-phosphoglycerate
  - (B) 3-phosphoglycerate to 2-phosphoglycerate
  - (C) glucose-6-phosphate to fructose-6-phosphate
  - (D) 2-phosphoglycerate to enolpyruvate
22. When an inhibitor is binding to an enzyme-substrate complex and is not competing with the substrate, its addition to the reaction mixture will result in
- (A) no change in  $V_{max}$  but increases in  $K_m$
  - (B) decreased  $V_{max}$  but no change in  $K_m$
  - (C) decreased  $V_{max}$  and decreased  $K_m$
  - (D) decreased  $V_{max}$  and increased  $K_m$
23. The phycobiliproteins forms the primary photosynthetic pigments in
- (A) diatoms and green algae
  - (B) cyanobacteria and red algae
  - (C) xanthophytes and dinoflagellates
  - (D) green algae and cyanobacteria
24. Unilocular and pleurilocular sporangia are formed during asexual reproduction in
- (A) *Chara*
  - (B) *Vaucheria*
  - (C) *Ectocarpus*
  - (D) *Batrachospermum*
25. Which of the following has a multinucleated and siphonous thallus as the main plant body ?
- (A) *Polysiphonia*
  - (B) *Ulothrix*
  - (C) *Vaucheria*
  - (D) *Fucus*
26. The dikaryotic spore that is produced in the primary host *Puccinia graministritici* and is responsible for rapid infection is
- (A) acidospore
  - (B) uredispore
  - (C) picnospore
  - (D) teleutospore

27. When the entire plant body of a fungus is metamorphosed into a reproductive structure, the structure is called
- (A) ascus  
(B) gamentagium  
(C) sporangiphore  
(D) crozier
28. The disease "Witche's Broom" of alfa alfa is caused due to the infection of
- (A) *Albugo candida*  
(B) *Circospora api*  
(C) *Mycoplasma*  
(D) *Virus*
29. Formation of ascus during the process of sexual reproduction if not seen in
- (A) *Mucor*  
(B) *Aspergillus*  
(C) *Neurospora*  
(D) *Penicillium*
30. The lichen that forms leaf like thalli with lobed margin adhering to the growing surface is known as
- (A) crustose lichen  
(B) fructicose lichen  
(C) old man's beard  
(D) foliose lichen
31. Which of the following statements is true with regard to the genetic material of viruses ?
- (A) the bacteriophage has RNA and DNA as the genetic materials  
(B) a single stranded RNA constitute the genetic material of TMV  
(C) all plant viruses have DNA as genetic material  
(D) the genetic material of all viruses is DNA
32. When F plasmid is incorporated into the genome of a  $F^+$  bacterium prior to conjugation, the  $F^+$  male changes to a super male called
- (A)  $F^+$  super  
(B) hfr male  
(C)  $F^+$  conjugate  
(D) hfr conjugate

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33. The Tikka disease of ground nut is caused by  
(A) *Albugo* infection (B) *Circospora* infection  
(C) Tikka virus infection (D) *Fusarium* infection
34. The pair of rings associated with the basal body of the bacterial flagellum is  
(A) L and P rings (B) P and M rings  
(C) S and P rings (D) S and M rings
35. Which of the following is not a functional group in biomolecules ?  
(A)  $-\text{COO}-$  (B)  $\text{C}=\text{O}$  (C)  $-\text{SH}$  (D)  $\text{C}=\text{C}$
36. Downy mildew of jawar is caused by the fungus  
(A) *Erysiphe sorghi* (B) *Sclerospora sorghi*  
(C) *Sphacelotheca sorghi* (D) *Ustilago hordei*
37. The barley stripe disease is caused by the infection of  
(A) fungus (B) bacteria  
(C) virus (D) micoplasma
38. The secretory system, by which it becomes possible for a bacterium to secrete pathogenicity determinants like pectinase and cellulase to establish infection is  
(A) type I secretory system (B) type II secretory system  
(C) type III secretory system (D) type IV secretory system
39. A typical bisporic embryo sac of *Plumbago* type has  
(A) three antipodals and two polar nuclei  
(B) two antipodals and two synergids  
(C) two antipodals and two polar nuclei  
(D) one egg and three synergids

40. The hairy roots are induced by the infection of the bacterium having
- (A) Ti plasmid (B) Ri plasmid  
(C) HR plasmid (D) F plasmid
41. During translation of mRNA, the codon AUG is directed to the suitable position on the 30 S sub unit by
- (A) consensus sequence (B) RNA polymerase D  
(C) Shine-Dalgarno sequence (D) t-RNA
42. The plants having identical genotypes produced by plant breeding method are together called a
- (A) donor line (B) hybrid line  
(C) pure line (D) dominant parental line
43. Emasculation is generally done in
- (A) an immature flower bud  
(B) a mature flower bud just before opening  
(C) a young flower after opening  
(D) a matured flower
44. A segment of DNA, which is with a partly purine and partly pyrimidine sequence, is designated as
- (A) heterogamous (B) heteronomous  
(C) pleomorphic (D) heteromorphic
45. Increase in the concentration of dissolved organic matter, contributed by allochthonous sources, causes
- (A) increase of BOD (B) increase of DO  
(C) decrease of bacterial population (D) decrease of CO<sub>2</sub>

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46. By the anomalous function of the inter-fascicular zone of the cambium ring, islands of soft basts occur in bands called
- (A) medullary rays (B) phloem bands  
(C) interxylary phloem (D) secondary pericycle
47. Which of the following amino acids is coded by a single codon ?
- (A) methionine (B) phenylalanine (C) tyrosine (D) asparagine
48. During photomorphogenetic responses, the blue light signal is perceived by
- (A) phytochromes and cryptochromes (B) phytochromes and phototropins  
(C) phototropins and cryptochromes (D) cryptochromes and chlorophylls
49. In an interphase, the mitotic preparation through the synthesis of various RNAs and structural and enzymatic proteins occur in
- (A) G1 phase (B) S phase  
(C) G2 phase (D) the entire interphase
50. In a plant cell, the non-cellulosic polysaccharides, pectins, lignins and phenolic substances are present in
- (A) the primary cell wall (B) the middle lamella  
(C) the secondary cell wall (D) the entire cell wall
51. Cisternae, vesicles and tubules are the structures present in
- (A) ribosome (B) mitochondria  
(C) peroxisome (D) endoplasmic reticulum
52. Out of the following green house gases, which gas has the highest global warming potential ?
- (A) CO<sub>2</sub> (B) CH<sub>4</sub> (C) CO (D) CFC

53. When an entire pair of chromosome is lost a diploid set, the aneuploid is called  
(A) monosomic (B) double monosomic  
(C) trisomic (D) nullisomic
54. The alleles that produce independent heterozygous condition are called  
(A) supplementary (B) complementary  
(C) epistatic (D) co-dominant
55. During salinity stress, plants adopt various strategies to maintain the osmotic potential of root cells. One of such strategies is  
(A) accumulation of salt in the cytoplasm  
(B) accumulation of organic osmolytes in the cytoplasm  
(C) accumulation of reducing sugar in vacuoles  
(D) thickening of cell wall to prevent water loss
56. For complete oxidation of glucose to  $\text{CO}_2$  and  $\text{H}_2\text{O}$  and to generate maximum energy, the terminal electron acceptor must be  
(A)  $\text{NAD}^+$  (B)  $\text{FAD}^+$  (C)  $\text{O}_2$  (D)  $\text{NO}_3^-$
57. In cotton, the fibres develop from the  
(A) ovary wall (B) seed coat  
(C) inner integument of ovule (D) embryo
58. A free nuclear type of endosperm development is seen in  
(A) *Plumbago* (B) Coconut (C) Mango (D) Guava
59. Which of the following is not considered as an ecological factor?  
(A) soil (B) light  
(C) diversity (D) temperature

60. A long food chain containing more than four trophic levels is not ecologically sustainable because
- (A) the energy content logarithmically decreases with the trophic levels
  - (B) Long food chains have high entropy
  - (C) availability of food decreases with the trophic levels
  - (D) climatic conditions become unsuitable
61. When a nucellar epidermis degenerates, an integument layer inner to the nucellar epidermis becomes distinct with prominent nucleus and dense cytoplasm and is called
- (A) epithelium
  - (B) endothelium
  - (C) mesothelium
  - (D) epithecium
62. In ground nut seeds, the food is reserved as protein and oil droplets in the
- (A) endosperm
  - (B) seed coat
  - (C) cotyledons
  - (D) embryonal axis
63. Which of the following tissues provide cortical mechanical support to the stem ?
- (A) parenchyma
  - (B) chlorenchyma
  - (C) collenchyma
  - (D) aerenchyma
64. Which of the following is used as a light source in a UV-Vis spectrophotometer ?
- (A) sodium lamp
  - (B) mercury lamp
  - (C) deuterium lamp
  - (D) infra red lamp
65. Glucosamine, glucuronic acid and gluconic acid are
- (A) natural pentoses
  - (B) oligosaccharides
  - (C) derived monosaccharides
  - (D) derived disaccharides

66. Which of the following characters does not have any importance of identification of an individual chromosome ?
- (A) length of the chromosome (B) arm ratio  
(C) position of the secondary constriction (D) mitotic index
67. A jelly like material used as a support in the electrophoretic separation of nucleic acids is
- (A) agar agar (B) starch (C) agarose (D) gelatin
68. The tetrameric DNA unwinding protein, that is responsible for unwinding of ds DNA, binds to the 8-10 nucleotide long binding site as a
- (A) monomer or tetramer (B) dimer or tetramer  
(C) monomer or dimer (D) tetramer only
69. Which of the following provides the signal to the ribosome for the attachment of the release factor ?
- (A) the terminal amino acid  
(B) the length of the polypeptide  
(C) the termination codon  
(D) the t-RNA that brings in the last amino acid
70. The addition or deletion of one or few bases of a nucleic acid chain results in
- (A) silent mutation (B) frame shift mutation  
(C) mis-sense mutation (D) translocation
71. The transfer RNAs at both A and P site of a ribosome of bacteria are located in
- (A) 30S subunit (B) 30S-50S interface  
(C) 50S subunit (D) codon site

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72. When spherical bacterial cells are aggregated as irregular bunches, they are termed as
- (A) staphylococci (B) streptococci  
(C) streptobacilli (D) staphylobacilli
73. In many bacteria, especially the Gram negative ones, the plasma membrane is folded repeatedly to form an enzymatically active structure called
- (A) microsome (B) mesosome (C) sphaerosome (D) liposome
74. Many bacteria produce endospores to overcome the unfavourable conditions. The number of endospores formed by a bacterial cell is
- (A) one (B) two  
(C) four (D) more than four
75. Which of the following is a typical character of viruses ?
- (A) ability for growth and division (B) independent metabolic activity  
(C) absence of cellular structure (D) capacity to produce spores
76. After attachment of a phage tail to the bacterial cell wall, a small region of the cell wall is drilled by the enzyme
- (A) pectinase (B) cellulase (C) invertase (D) lysozyme
77. If the diameter of a specimen is measured 1 cm in a Camera-Lucida viewed through a microscope having 10X and 20X eye piece and objective, respectively, the original size of the specimen is
- (A) 50  $\mu\text{m}$  (B) 100  $\mu\text{m}$  (C) 10  $\mu\text{m}$  (D) 5  $\mu\text{m}$
78. In ion exchange chromatography, the proteins adhered to the column are released by the washing solution with
- (A) high temperature and salt concentration (B) changed pH and salt concentration  
(C) distilled water (D) a hydrophobic solvent



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86. The plant growth become stunted due to the deficiency of
- (A) iron and potassium (B) nitrogen and potassium  
(C) nitrogen and calcium (D) iron and zinc
87. During active transport in the plant cell, the ions the transported a cross the membrane by
- (A) a concentration gradient (B) an electrochemical gradient  
(C) the function of the carrier (D) a sodium gradient
88. Gaseous exchange between air and the internal tissue of an old corky stem takes place through
- (A) hydathodes (B) lenticels (C) pits (D) dry barks
89. Which of the following positive interactions is the strongest making the species adapt to a new environment
- (A) commensalism (B) syntrophy  
(C) allelopathy (D) symbiosis
90. The study of a species from its growth to maturity and its interaction with the environment is called
- (A) community ecology (B) autoecology  
(C) synecology (D) ethology
91. Which of the following is not true with regard to the adaptation of a species to a xeric environment ?
- (A) thick hypodermis  
(B) well developed root system  
(C) absence of stomata  
(D) reduced leaves

92. Acid rain is mainly caused by the increased atmospheric concentration of  
(A)  $\text{NO}_2$  and  $\text{SO}_2$  (B)  $\text{NO}_2$  and  $\text{NH}_3$   
(C)  $\text{NO}_2$  and CO (D)  $\text{CO}_2$  and CO
93. The finger like projections of the capsule wall that tightly holds the operculum and helps in dehiscence of the capsule on drying are called  
(A) annulus (B) peristome teeth  
(C) sclerotia (D) trabeculae
94. Which of the following is a sustainable source of energy ?  
(A) coal (B) petroleum (C) wood (D) sun
95. Which of the following laws of Mendels is not true for linked genes ?  
(A) law of unit character (B) law of dominance  
(C) law of independent assortment (D) all of these
96. All the pea plants with wrinkled seed and green cotyledons will  
(A) breed true for recessive characters  
(B) produce phenotypes in dihybrid ratio on selfing  
(C) breed true for dominant characters  
(D) show incomplete dominance on selfing
97. Which of the following is a physical mutagen ?  
(A) strong light (B) uv rays  
(C) far red light (D) magnetic field
98. Genes located on same locus of chromosomes are called  
(A) polygenes (B) multiple alleles  
(C) dominant alleles (D) supplementary alleles

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**99.** The bridge-breakage and fusion cycle of a chromosome during cell division will occur due to

- (A) loss of telomere in one of the arms of the chromosome
- (B) fusion of the centromere of two chromosomes
- (C) the telocentric nature of the chromosomes
- (D) duplication of genes

**100.** The number of linkage group present in *E coli* is

- (A) 1                      (B) 2                      (C) 10                      (D) 22
-