

**P.G./INTEGRATED P.G. ENTRANCE EXAMINATION, APRIL 2023****APPLIED PLANT SCIENCE**

Time : Two Hours

Maximum : 400 Marks

*Attempt all questions. All questions carry 4 marks each.**For each wrong answer 1 mark will be deducted.*

1. Viroids differ from virions in having :
  - (A) DNA molecule with protein coat.
  - (B) Single stranded DNA molecule with protein coat.
  - (C) RNA molecule without protein coat.
  - (D) RNA molecule with protein coat.
  
2. Bacteria that lack cell wall :
  - (A) Rickettsia.
  - (B) Gram negative bacteria.
  - (C) Mycoplasma.
  - (D) Actinomycetes.
  
3. Thread-like chain of cells which represents earliest stage of gametophytic development of mosses are known as :
  - (A) Protonema.
  - (B) Prothallus.
  - (C) Columella.
  - (D) Perichaetium.
  
4. During DNA replication primer removal is carried out by :
  - (A) 3' - 5' endonuclease.
  - (B) 5' - 3' endonuclease.
  - (C) 3' - 5' exonuclease.
  - (D) 5' - 3' exonuclease.

**Turn over**

5. Which of the following type of bacteria converts nitrites to nitrates ?
- (A) Nitrobacter. (B) Nitrosomonas.  
(C) Denitrifying bacteria. (D) Thiobacillus.
6. Cephaleuros is an example for :
- (A) Parasitic fungi. (B) Parasitic green algae.  
(C) Parasitic brown algae. (D) Parasitic protozoan.
7. Choose the correct order of plant cell wall layers from inside to outside of the cell :
- (A) Secondary cell wall - Primary cell wall - Middle lamella.  
(B) Primary cell wall - Secondary cell wall - Middle lamella.  
(C) Middle lamella - Secondary cell wall - Primary cell wall.  
(D) Middle lamella - Primary cell wall - Secondary cell wall.
8. Protein part of a conjugate enzyme is known as :
- (A) Holoenzyme. (B) Apoenzyme.  
(C) Coenzyme. (D) Co-factor.
9. Termination codon UAA also known as :
- (A) Ochre. (B) Opal  
(C) Amber. (D) Met codon.
10. Sedimentation co-efficient of mitochondrial ribosome :
- (A) 80s. (B) 16s.  
(C) 70s. (D) 5.8s.
11. Which of the following cell type will lose their nuclei upon maturity ?
- (A) Sieve element. (B) Red blood cells.  
(C) Xylem vessels. (D) All of the above.

12. A patient with Turner syndrome will have :
- (A) 44 Chromosomes. (B) 45 Chromosomes.  
(C) 46 Chromosomes. (D) 47 Chromosomes.
13. 'Balbiani rings' are characteristic features of :
- (A) Lampbrush Chromosomes.  
(B) B-Chromosomes.  
(C) Polytene Chromosomes.  
(D) Satellite Chromosomes.
14. If the haploid number of chromosomes in a particular angiosperm crop plant is 10, then what will be the number of chromosomes in somatic cells of monosomic formed from this plant ?
- (A) 9. (B) 19.  
(C) 21. (D) 11.
15. Genetic material of a species is dsDNA. It contains 22 % Guanine. What will be the percentage of Adenine in its DNA ?
- (A) 22 %. (B) 78 %.  
(C) 28 %. (D) 56 %.
16. Oxysomes are located on the
- (A) Inner mitochondrial membrane.  
(B) Outer mitochondrial membrane.  
(C) Glyoxysome membrane.  
(D) Lysosome membrane.
17. Histones are positively charged due the presence of amino acids.
- (A) Lysine and arginine. (B) Glycine and alanine.  
(C) Glycine and Leucine. (D) Lysine and aspartate.
18. In Meselson Stahl experiment, *E.coli* cells were grown for several generations in  $^{15}\text{N}$  containing growth media. What percentage of DNA was composed of one light strand and one heavy strand after two generations of growth in  $^{14}\text{N}$  containing growth media ?
- (A) 100 %. (B) 50 %.  
(C) 75 %. (D) 25 %.

Turn over

19. Colourless plastids which stores starch are called :

- (A) Elaioplast. (B) Etioplast.  
(C) Aleuroplast. (D) Amyloplast.

20. In chloroplast chlorophyll is located in :

- (A) Stroma. (B) Thylakoid membrane.  
(C) Inter membrane space. (D) All of the above.

21. Histogen concept of root apex organisation is put forwarded by :

- (A) C. Nageli. (B) Clowes.  
(C) Hanstein. (D) Schuepp.

22. Anomalous secondary growth is present in :

- (A) Boerhaavia. (B) Polyalthia.  
(C) Vernonia. (D) Tinospora.

23. Cork cells are :

- (A) Living. (B) Dead.  
(C) Physiologically active. (D) Photosynthetic.

24. Choose the correct statement :

- (A) In root vascular bundles are radial and endarch.  
(B) In root vascular bundles are radial and exarch.  
(C) In stem vascular bundles are conjoint and exarch.  
(D) In root vascular bundles are conjoint and endarch.

25. Casparian strips are seen in :

- (A) Epidermis. (B) Endothecium.  
(C) Endodermis. (D) Pericycle.

26. Cambium developed from some cells of medullary rays is known as :
- (A) Fascicular cambium. (B) Intrafascicular cambium.  
(C) Cork cambium. (D) Interfascicular cambium.
27. In some cases, mature differentiated cells will regain its meristematic activity. This is called :
- (A) Differentiation. (B) Dedifferentiation.  
(C) Redifferentiation. (D) Transdifferentiation.
28. In woody trees, central portion of stem is hard and dark in colour. It is called :
- (A) Heart wood. (B) Sap wood.  
(C) Alburnum. (D) Spring wood.
29. Bulliform cells or motor cells are present in :
- (A) Mangifera leaves. (B) Ixora leaves.  
(C) Wheat leaves. (D) Sunflower leaves.
30. Endemic species are defined as :
- (A) Species introduced into a new area where it did not exist before.  
(B) Species at risk of extinction.  
(C) Species native to a specific area.  
(D) Species found in an area and nowhere else.
31. A messenger RNA is 999 bases long including initiation and terminator codons. The number of amino acids in the polypeptide translated from this is :
- (A) 333. (B) 332.  
(C) 331. (D) 999.
32. Chemical nature of primer in eukaryotic DNA replication :
- (A) ssDNA. (B) dsDNA.  
(C) RNA. (D) Protein.

Turn over

33. Molarity of a solution having 10 moles of solute present in 2 litre of solution is :
- (A) 5 M. (B) 0.5 M.  
(C) 20 M. (D) 0.2 M.
34. The term 'meristem' was coined by :
- (A) N. Grew. (B) Marcello Malpighi.  
(C) C.Nageli. (D) Buvat.
35. pH of a solution is 6. Then what will be the pOH of the solution ?
- (A) 6. (B) - 6.  
(C) 8. (D) 13.
36. Beer's law states that intensity of a beam of monochromatic light transmitted by a solution decreases inversely with the \_\_\_\_\_ of the solution.
- (A) Path length. (B) Volume.  
(C) Pressure. (D) Concentration.
37. In graphical representation of data, cumulative frequency curve is also known as :
- (A) Frequency polygon. (B) Ogives.  
(C) Histogram. (D) Cartograms.
38. If a couple have two daughters and one son. what is the chance that the fourth child will be son ?
- (A) 100 %. (B) 50 %.  
(C) 25 %. (D) 75 %.
39. Which of the following is not an example for measures of dispersion ?
- (A) Median. (B) Range.  
(C) Variance. (D) Standard deviation.

40. A couple have four children with blood group A, AB, B and O. Then genotypes of their parents will be :
- (A)  $I^A I$  and  $I^B I^B$ . (B)  $I^A I^B$  and  $I I$ .  
(C)  $I^A I$  and  $I^B I$ . (D)  $I^A I^B$  and  $I^A I^B$ .
41. Phase contrast microscope was invented by :
- (A) Frits Zernike. (B) Z. Jannssen.  
(C) Zsigmondy. (D) M. Knoll and Ruska.
42. Acetocarmine stains :
- (A) Cytoplasm. (B) Chromosomes.  
(C) Starch. (D) Fatty substance.
43. Group of flagella is present only at one end of the bacterial cell in :
- (A) Monotrichous bacteria. (B) Amphitrichous bacteria.  
(C) Lophotrichous bacteria. (D) Peritrichous bacteria.
44. Bacteria used in large scale production of Butyl alcohol is :
- (A) *Clostridium botulinum*. (B) *Clostridium acetibutyricum*.  
(C) *Bacillus megatherium*. (D) *Bacillus amyloliquifaciens*.
45. Interferons are produced in response to infection caused by :
- (A) Bacteria. (B) Viruses.  
(C) Fungi. (D) Protozoan.
46. Bacteriophage mediated transfer of genetic material in bacteria :
- (A) Transformation. (B) Conjugation.  
(C) Transduction. (D) Transgenesis
47. Genome of HIV :
- (A) dsDNA. (B) ssDNA.  
(C) dsRNA. (D) ssRNA.

Turn over

48. Largest human chromosome is :
- (A) Chromosome 1. (B) Chromosome 8.  
(C) Chromosome 22. (D) X chromosome.
49. The amino acid which act as precursor for Auxin biosynthesis is :
- (A) Tyrosine. (B) Tryptophan.  
(C) Methionine. (D) Alanine.
50.  $\lambda$ gt10 is a :
- (A) Plasmid vector. (B) Cosmid vector.  
(C) Phage vector. (D) BAC.
51. Which of the following nucleotide sequence represents telomere repeats in humans ?
- (A) TTAGGG. (B) TAATGG.  
(C) GAATCC. (D) GGATCC.
52. 'Red snow' is caused by :
- (A) Sargassum vulgare. (B) Polysiphonia nigra.  
(C) Chlamydomonas nivalis. (D) Pinnularia viridis.
53. Which of the following crossing method is adapted for identifying whether an organism exhibit a dominant trait is homozygous or heterozygous for that allele ?
- (A) Monohybrid cross. (B) Test cross.  
(C) Back cross. (D) Dihybrid cross.
54. Following genotypes are found in a population.
- |                  |     |    |     |    |
|------------------|-----|----|-----|----|
| Genotype         | ... | AA | Aa  | aa |
| No. of organisms | ... | 40 | 140 | 20 |
- What are the allelic frequencies of A and a ?
- (A) 0.55 and 0.45. (B) 0.9 and 0.1.  
(C) 0.35 and 0.65. (D) 0.75 and 0.25.



59. Floridean starch is the reserve food material in :
- (A) Gelidium. (B) Dictyota.  
(C) Sargassum. (D) Pinnularia.
60. Coenocytic algae :
- (A) Oedogonium. (B) Vaucheria.  
(C) Oscillatoria. (D) Polysiphonia.
61. Oedogonium species in which antheridia develops on short filaments are called :
- (A) Nannandrous. (B) Macrandrous.  
(C) Heterothallus. (D) Heterotrichous.
62. Carrageenin is obtained from the algal species :
- (A) Chondrus crispus. (B) Ectocarpus commensalis.  
(C) Chara vulgaris. (D) Vaucheria dichotoma.
63. Identify aquatic bryophyte :
- (A) Polytrichum juniperum. (B) Anthoceros himalayensis.  
(C) Riccia fluitans. (D) Buxbaumia aphylla.
64. Only the disintegration of the gametophytic plant body liberates spores from the sporophyte
- (A) Riccia. (B) Anthoceros.  
(C) Funaria. (D) Polytrichum.
65. In some pteridophytes sporangium develop from a single cell. This is termed as :
- (A) Homosporous type. (B) Heterosporous type.  
(C) Eusporangiate type. (D) Leptosporangiate type.
66. Pteridophytes are also known as :
- (A) Vascular phanerogams. (B) Amphibians of plant kingdom.  
(C) Vascular thallophytes. (D) Snakes of plant kingdom.

67. Trabeculated endodermis is seen in :

- (A) Selaginella. (B) Psilotum.  
(C) Equisetum. (D) Marsilea.

68. Monomers of microtubules :

- (A) Myosin. (B) Actin.  
(C) Integrin. (D) Tubulin.

69. Photophosphorylation was discovered by :

- (A) J. C. Bose. (B) Blackman.  
(C) D. Arnon. (D) Melvin Calvin.

70. The limitations of embryo expansion is removed and the germination of many seeds can be accelerated through mechanical disruption of seed coat. This process is called :

- (A) Seed dormancy. (B) Scarification.  
(C) Stratification. (D) Lyophilization.

71. Vivipary is a characteristic feature of :

- (A) Orchids. (B) Rhizophora.  
(C) Marantaceae. (D) Heliconiaceae.

72. Aerobic respiratory pathway is :

- (A) Catabolic. (B) Anabolic.  
(C) Amphibolic. (D) None of the above.

73. Gross primary productivity minus respiration losses is termed as :

- (A) Net primary productivity. (B) Community productivity.  
(C) Secondary productivity. (D) Primary productivity.

Turn over

74. Arrange the following geological periods in correct order of their occurrence :

- (A) Permian - Devonian - Carboniferous - Jurassic - Triassic - Cretaceous.
- (B) Carboniferous - Devonian - Permian - Jurassic - Triassic - Cretaceous.
- (C) Carboniferous - Devonian - Permian - Triassic - Jurassic - Cretaceous.
- (D) Devonian - Carboniferous - Permian - Triassic - Jurassic - Cretaceous

75. Match the following :

*Column I*

*Column II*

(A) Psilotum

(I) Sporocarp.

(B) Marsilea

(II) Vallecular canal.

(C) Equisetum

(III) Spike moss.

(D) Selaginella

(IV) Synangium.

(a) A - III, B - I, C - II, D - IV.

(b) A - III, B - II, C - I, D - IV.

(c) A - IV, B - I, C - II, D - III.

(d) A - I, B - II, C - IV, D - III.

76. DNA fingerprinting was discovered by :

(A) Kary mullis.

(B) Alec Jeffreys.

(C) Beadle and Tatum.

(D) Daniel Nathans.

77. Golden rice is a genetically modified rice, which is modified by inserting :

(A) Polygalacturonase gene.

(B) Biotin gene.

(C) Thiamine gene.

(D)  $\beta$ -Carotene gene.

78. Auxin used in plant tissue culture :

(A) Kinetin.

(B) Benzylaminopurine.

(C) IAA.

(D) Zeatin.

79. DNA blotting technique is :
- (A) Southern blotting. (B) Northern blotting.  
(C) Western blotting. (D) None of the above.
80. Who is the father of genetic engineering ?
- (A) William French Anderson. (B) Jennifer Doudna.  
(C) Archibald Garrod. (D) Paul Berg.
81. Variable Number of Tandem Repeats (VNTR) also known as :
- (A) Mini-satellite. (B) Micro-satellite.  
(C) Simple sequence repeats. (D) ISSR.
82. Who first proved that DNA is the genetic material in living organisms ?
- (A) Watson and Crick. (B) Meselson and Stahl.  
(C) Hershey and Chase. (D) Frederick Griffith.
83. The species that invades a bare area are called :
- (A) Pioneer species. (B) Xerophytic species.  
(C) Lithophytic species. (D) Climax community.
84. Reaction centre in PS I :
- (A) P 700. (B) P 680.  
(C) P 780. (D) Both P 700 and P 680.
85. Which part of the cell act as the site for glycolysis ?
- (A) Mitochondria. (B) Cytoplasm.  
(C) Thylakoid. (D) Both mitochondria and cytoplasm.

Turn over

86. Which of the following is the correct sequence of movement of electrons in non-cyclic photophosphorylation ?
- (A) Water, P 680, cytochrome b6f complex, P 700, NADP.  
 (B) Water, P 700, cytochrome b6f complex, P 680, NADP.  
 (C) Water, NADP, P 680, cytochrome b6f complex, P 700.  
 (D) NADP, water, P 700, P 680, water, Cytochrome b6f complex.
87. The pH at which net charge of amino acids become zero is called :
- (A) Neutral pH. (B) Compensation point.  
 (C) Isoelectric point. (D) Denaturation point.
88. Which of the RNA polymerase is involved in the synthesis of mRNA ?
- (A) RNA polymerase I. (B) RNA polymerase II.  
 (C) RNA polymerase III. (D) RNA polymerase V.
89. Pendant inflorescence with unisexual flowers :
- (A) Spike. (B) Catkin.  
 (C) Umbel. (D) Coenanthium.
90. Who put forward the phylogenetic system of classification ?
- (A) Engler and Prantl. (B) Bentham and Hooker.  
 (C) Huntchinson. (D) Linnaeus.
91. Match the following flower parts with its homologies.

*Column I**Column II*

- |               |                         |
|---------------|-------------------------|
| (A) Ovule     | (I) Female gametophyte. |
| (B) Egg       | (II) Megasporangium.    |
| (C) Carpel    | (III) Female gamete.    |
| (D) Embryosac | (IV) Megasporophyll.    |

(A) A - II, B - III, C - IV, D - I.

(B) A - I, B - III, C - IV, D - II.

(C) A - III, B - I, C - II, D - IV.

(D) A - III, B - I, C - IV, D - II.

92. International Plant Genetic Resources Institute (IPGRI) is located in :

(A) Manila, Philippines.

(B) Rome, Italy.

(C) Kew, England.

(D) Geneva, Switzerland

93. Persistent calyx is present in :

(A) Fabaceae.

(B) Liliaceae.

(C) Solanaceae.

(D) Malvaceae.

94. Pollination by the agency of snail :

(A) Malacophily.

(B) Myrmecophily.

(C) Ornithophily.

(D) Anemophily.

95. Anther lobes are fused together but filaments remains free in :

(A) Syngenesious.

(B) Synandrous.

(C) Monoadelphous.

(D) Monothealous.

96. Which of the following is an example of dry dehiscent fruit ?

(A) Berry.

(B) Hesperidium.

(C) Pepo.

(D) Capsule.

97. Perianth in Poaceae :

(A) Palea.

(B) Lemma.

(C) Lodicules.

(D) Glumes.

Turn over

98. C-2 epimer of D-glucose is :

(A) D- mannose.

(B) D- galactose.

(C) D- fructose.

(D) D- arabinose.

99. International Day of Forests :

(A) March 21.

(B) April 21.

(C) March 23.

(D) February 23.

100. Inverted 'Omega' shaped arrangement of vascular bundles are found in :

(A) Cycas root.

(B) Cycas leaflet.

(C) Cycas coralloid root.

(D) Cycas rachis.