

U.G./P.G. ENTRANCE EXAMINATION, APRIL 2021

BIOTECHNOLOGY (NATIONAL STREAM)

Time : One Hour and a Half

Maximum : 100 Marks

General Instruction to the candidates :

1. Questions are Multiple Choices Type.
2. Answer all questions.
3. Each question carries 2 marks.
4. There are no negative marks for wrong answer.

1. Probiotics are :

- | | |
|--------------------------------|------------------------------------|
| a) Cancer-inducing microbes. | b) Safe antibiotics. |
| c) New kind of food allergens. | d) Live microbial food supplement. |

2. Which among the following is an aromatic amino acid ?

- | | |
|-------------|----------------|
| a) Glycine. | b) Tryptophan. |
| c) Alanine. | d) Valine. |

3. 2020 Nobel Prize was awarded to Harvey J. Alter, Michael Houghston and Charles M. Rice for the work related to :

- a) Molecular response of genes for varying levels of oxygen.
- b) Discovery of Hepatitis C virus.
- c) Molecular mechanisms controlling the circadian rhythm.
- d) Mechanisms for cell autophagy.

4. All are membrane bound organelle of a cell, except :

- | | |
|---------------------|--------------|
| a) Lysosome. | b) Ribosome. |
| c) Golgi apparatus. | d) Nucleus. |

5. Hardy-Weinberg equilibrium is related to :

- | | |
|-------------------------|------------------------|
| a) Mendelian genetics. | b) Bacterial Genetics. |
| c) Population Genetics. | d) Molecular Genetics. |

Turn over

6. Bowman's capsule is a part of :
- a) Neuron.
 - b) Fungal fruiting body.
 - c) Nephron.
 - d) Golgi complex.
7. Helix pitch and diameter of B-DNA is :
- a) 34 Å and 20 Å.
 - b) 20 Å and 34 Å.
 - c) 3.4 Å and 10 Å.
 - d) 10 Å and 3.4 Å.
8. Gout is a disease associated with _____.
- a) Purine metabolism.
 - b) Protein metabolism.
 - c) Glycogen metabolism.
 - d) All of the above.
9. Sex linked characters were first explained by :
- a) T H Morgan.
 - b) William Bateson.
 - c) R C Punnet.
 - d) Boveri.
10. Live cell imaging is possible by :
- a) Electron microscopy.
 - b) Light microscope.
 - c) Atomic force microscope.
 - d) Confocal microscope.
11. Nucleoside is made up of :
- a) Sugar and nitrogen base.
 - b) Phosphate and sugar.
 - c) Nitrogen base and phosphate.
 - d) Phosphate, sugar and nitrogen base.
12. _____ is not a PCR based technique.
- a) RFLP.
 - b) AFLP.
 - c) RAPD.
 - d) None of the above.
13. Down's syndrome is a disease associated with :
- a) Virus infection.
 - b) Chromosomal aberration.
 - c) Mutation of gene.
 - d) Sex linkage.
14. Who invented Polymerase Chain Reaction ?
- a) Robert Mullis.
 - b) Herbert Boyer.
 - c) Kary Mullis.
 - d) Daniel Nathans.

15. Dideoxy method of DNA sequencing is also known as :
- a) Pyrosequencing.
 - b) Edman degradation.
 - c) Chain termination method.
 - d) None of the above.
16. Which among the following is a symbiotic nitrogen fixing organism ?
- a) Clostridium.
 - b) Azotobacter.
 - c) Azolla.
 - d) Rhizobium.
17. Mass spectrometric analysis is based on the principle of :
- a) Mass.
 - b) Molecular weight.
 - c) Charge.
 - d) Mass to charge ratio.
18. Klenow fragment of DNA polymerase *does not* show :
- a) Proof reading activity.
 - b) 5' to 3' exonuclease activity.
 - c) 3' to 5' exonuclease activity.
 - d) 5' to 3' polymerase activity.
19. Rb gene is a :
- a) Oncogene.
 - b) Part of Gal operons.
 - c) Tumor suppressor gene.
 - d) All the above.
20. Ramachandran plot is for determination of protein ———.
- a) Primary structure.
 - b) Secondary structure.
 - c) Amino acid composition.
 - d) protein to protein interactions.
21. ——— is a basic dye.
- a) Eosin.
 - b) Methylene blue.
 - c) Giemsa.
 - d) Nigrosin.
22. RecA and LexA genes are involved in which type of DNA repair system :
- a) Photolyase.
 - b) SOS repair.
 - c) Mismatch repair.
 - d) Nucleotide excision repair.
23. Down Syndrome is :
- a) Trisomy 21.
 - b) trisomy 12.
 - c) Gene duplication.
 - d) 12 to 21 translocation.

Turn over

24. Purity of an enzyme preparations can be determined by _____.
- a) Specific activity.
 - b) Enzyme activity.
 - c) Specificity.
 - d) Turnover of enzyme.
25. Benzene is having _____ hybridization.
- a) SP.
 - b) SP².
 - c) SP³.
 - d) SP⁴.
26. Substituent to an aromatic ring can be achieved by :
- a) Grignard synthesis.
 - b) Friedel-Crafts reaction.
 - c) Reimer Tiemann reaction.
 - d) Lewis Bronsted reaction.
27. SARS disease is caused by :
- a) Coronavirus.
 - b) Rabies viruses.
 - c) Bacterial influenza.
 - d) Bacterial streptococcal infection.
28. Immunoglobulin that can transfer through placenta :
- a) IgM.
 - b) IgG.
 - c) IgE.
 - d) IgD.
29. _____ is an inhibitory plant hormone.
- a) Gibberellins.
 - b) Cytokinins.
 - c) Abscisic acid.
 - d) Auxins.
30. Glucagon is produced by :
- a) Pancreas.
 - b) Thyroid.
 - c) Gonads.
 - d) Epinephrine.
31. Benedict's test is used for :
- a) Protein estimation.
 - b) Determination of sugar.
 - c) Lipid estimation.
 - d) Nucleic acid estimation.
32. Analogous organs are having :
- a) Same function different origin.
 - b) Same origin same function.
 - c) Different function same origin.
 - d) Different origin different function.

33. Isotonic solution of NaCl is :
- a) 0.9 M.
 - b) 9 M.
 - c) 0.9%.
 - d) 9%.
34. Oral Polio vaccine is :
- a) Heat inactivated vaccine.
 - b) Chemically inactivated viruses.
 - c) Recombinant viral vector vaccine.
 - d) Live attenuated vaccine.
35. Region of brain associated with memory :
- a) Hippocampus.
 - b) Medulla oblongata.
 - c) Hypothalamus.
 - d) Optic chiasma.
36. Indian born scientist who received Nobel prize for ribosome studies :
- a) Venkataraman Ramakrishnan.
 - b) C V Raman.
 - c) Khorana.
 - d) R Ramachandran.
37. Which of the following statement regarding endotoxin is correct ?
- a) Are found in both gram positive and gram negative bacterial cell wall.
 - b) Are heat stable proteins.
 - c) Are part of the cell wall of gram positive bacteria only.
 - d) None of the above statement is correct.
38. Ring worm is a disease caused by :
- a) Bacteria.
 - b) Fungus.
 - c) Tape worm.
 - d) Round worm.
39. A typical growth curve consists of 4 phases. Which is the correct sequence ?
- a) Exponential, lag, stationary, death.
 - b) Lag, exponential, stationary, death.
 - c) Stationary, exponential, lag, death.
 - d) Lag, stationary, exponential, death.

Turn over

40. To which of the following kingdom do viruses belong to :
- a) Monera.
 - b) Protista.
 - c) Fungi.
 - d) None of the above.
41. Mycorrhiza is a :
- a) Symbiotic association of a fungus with an algae.
 - b) Symbiotic association of a fungus with a root system.
 - c) Parasitic association of a fungus with a root system.
 - d) Parasitic association of an algae with a shoot system.
42. Which of the following bacterium is called as the superbug that could clean oil spills ?
- a) *Bacillus subtilis*.
 - b) *Pseudomonas putida*.
 - c) *Pseudomonas dentrificans*.
 - d) *Bacillus dentrificans*.
43. Ehrlich and Hata discovered _____ that was used to treat _____.
- a) Salvarsan ; syphilis.
 - b) Penicillin ; surgical wounds.
 - c) Salvarsan ; malaria.
 - d) Prontosil ; malaria.
44. *Thermus aquaticus* is the source of :
- a) Vent polymerase.
 - b) Taq polymerase.
 - c) Both a) and b).
 - d) Primase.
45. The third amino acid in the peptidoglycan crosslinking chain is either diaminopimilic acid or lysine because this amino acid must :
- a) Be positively charged for a salt bridge to form.
 - b) Be hydrophilic.
 - c) Have a free amino group for peptide bond formation.
 - d) Have a large R-side chain to fill space in the cell wall.
46. Peripatus is a connecting link between :
- a) Ctenophora and Platyhelminthes.
 - b) Mollusca and Echinodermata.
 - c) Annelida and Arthropoda.
 - d) Coelenterata and Porifera.

47. Find the odd one out :

- a) Puffer fish.
- b) Silver fish.
- c) Cuttle fish.
- d) Flying fish.

48. Which of the following is not a gaseous biogeochemical cycle in ecosystem ?

- a) Sulphur cycle.
- b) Phosphorus cycle.
- c) Nitrogen cycle.
- d) Carbon cycle.

49. Chitin is :

- a) Sulphur containing polysaccharide.
- b) Simple polysaccharide.
- c) Nitrogen containing polysaccharide.
- d) Phosphorous containing polysaccharide.

50. Enzymes are chemically :

- a) Proteins.
- b) Proteins and rarely nucleic acids both DNA and RNA.
- c) Proteins and rarely ribonucleic acids.
- d) Proteins and rarely carbohydrates.