

Code No.

J – 2267

**Entrance Examination for Admission to the P.G. Courses in the Teaching
Departments, 2020**

CSS

BIOTECHNOLOGY

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General Instructions

1. The Question Paper is having two Parts — Part 'A' Objective type (60%) & Part 'B' Descriptive type (40%).
2. Objective type questions which carry 1 mark each are to be (✓) 'tick marked' in the response sheets against the appropriate answers provided.
3. 8 questions are to be answered out of 12 questions carrying 5 marks each in Part 'B'.
4. **Negative marking** : 0.25 marks will be deducted for each wrong answer in Part 'A'.

Time : 2 Hours

Max. Marks : 100

To be filled in by the Candidate

Register Number	in Figures								
	in words								

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PART – A
(Objective Type)

Choose appropriate answer from the options in the questions. **One mark each.**

(60 × 1 = 60 marks)

1. The primary hosts for HIV-1 virus are
 - a) T8 killer cells
 - b) B cells
 - c) T4 helper cells
 - d) Monocytes

DO NOT WRITE HERE

2. Which of the following amino acids contain sulphur?

- | | |
|-------------|------------------|
| a) Tyrosine | b) Methionine |
| c) Alanine | d) Glutamic acid |

3. Placental connection is typical of

- | | |
|----------------------------|-----------------------------|
| a) Viviparous reproduction | b) Ovoviparous reproduction |
| c) Oviparous reproduction | d) All of the above |

4. Prokaryotic ribosomes are

- | | |
|--------|--------|
| a) 40S | b) 70S |
| c) 80S | d) 58S |

5. Maltose is composed of
- a) Galactose + Glucose
 - b) Glucose + Fructose
 - c) Glucose + Glucose
 - d) Galactose + Ribose
6. Radula is a structure used for food intake by
- a) Arthropods
 - b) Nematodes
 - c) Annelids
 - d) Molluscs
7. Which kind of cleavage is shown by mammalian embryos?
- a) Rotational
 - b) Radial
 - c) Spiral
 - d) Bilateral
8. A three chambered heart is found in
- a) Mammals except human beings
 - b) Birds
 - c) Amphibians
 - d) Fishes
9. Riboflavin is another name for
- a) Vitamin B2
 - b) Vitamin B5
 - c) Vitamin A
 - d) Vitamin B12
10. If pH of a solution is 5.6, then its pOH is
- a) 7.4
 - b) 8.2
 - c) 8.4
 - d) 7.6
11. Protein 'X' from *E.coli* contains 125 amino acids. The number of nucleotides present in the gene encoding the protein will be
- a) 375
 - b) 388
 - c) 378
 - d) 381
12. For an exergonic reaction
- a) $\Delta H > 0$
 - b) $\Delta G > 0$
 - c) $\Delta S > 0$
 - d) All of the above

13. Staphylococci appear purple on gram staining because
- a) The thick peptidoglycan layer retains the crystal violet stain
 - b) The crystal violet stain washes off and safranin counterstain is seen
 - c) The outer lipopolysaccharide layer retains the crystal violet stain
 - d) The crystal violet stains and the safranin counterstain give off a purple colour
14. Bacteria use which of the following organelles for locomotion
- a) Pili
 - b) Flagella
 - c) Ribosome
 - d) Capsule
15. Statins are commonly used as inhibitors of HMG CoA reductase, this kind of inhibition is known as
- a) Uncompetitive inhibition
 - b) Non competitive inhibition
 - c) Competitive inhibition
 - d) Mixed inhibition
16. Manoj is unable to distinguish shades of red and green, however neither his sister nor his parents have the same problem. His mother's father also wasn't able to distinguish between red and green. What is the inheritance pattern of this disorder?
- a) Autosomal dominant colour blindness
 - b) X-linked recessive colour blindness
 - c) Autosomal recessive colour blindness
 - d) X-linked dominant colour blindness
17. The growth of a bacteria can be plotted on a graph in the form of a curve. The maximum growth seen is at
- a) Stationary phase
 - b) Lag phase
 - c) Log phase
 - d) End of lag phase
18. Purple sulfur bacteria is a group of photosynthetic bacteria that are different from other photosynthetic bacteria in the fact that
- a) They are purple in colour
 - b) They require red light to carry out photosynthesis
 - c) They use sulfur as electron donor for photosynthesis
 - d) They produce oxygen via photosynthesis

19. Prokaryotes DNA polymerase involved in removing RNA primer
- a) DNA Pol I
 - b) DNA Pol II
 - c) DNA Pol III
 - d) DNA Pol α
20. Which one of the following is a nitrogen fixing bacteria seen in a symbiotic association with leguminous plants?
- a) Frankia
 - b) Acetobacter
 - c) Azospirillum
 - d) Rhizobium
21. Botulism is a microbial infection acquired by
- a) Mosquito bite
 - b) Needle prick injury
 - c) Contamination of food
 - d) Aerosol containing spores
22. During the annealing step in a PCR reaction
- a) The double stranded dna is separated
 - b) The primers bind to the template strand
 - c) dNTPs are added to the primer
 - d) the polymerase enzyme becomes active and catalyses the reaction
23. Transfer of genetic material between two bacteria via sex pili is called
- a) conjugation
 - b) transformation
 - c) transduction
 - d) gene recombination
24. A mammogram is a routine screening test for breast carcinoma. It is basically a
- a) Biopsy of breast tissue
 - b) Ultrasound examination of breast
 - c) X-ray of the breast
 - d) CT scan of the breast
25. Which of the following is less condensed portion of chromatin?
- a) Pseudochromatin
 - b) Multichromatin
 - c) Heterochromatin
 - d) Euchromatin

26. Mark the process which does not involve histone modification.
- a) Acetylation
 - b) Methylation
 - c) Phosphorylation
 - d) Dehydration
27. The type of plasmid which make the host cell resistant to antibiotic
- a) R plasmid
 - b) F plasmid
 - c) Col plasmid
 - d) Hfr
28. Name the type of bacteria which uses carbon dioxide as the sole source of carbon for growth
- a) Autotroph
 - b) Chemotroph
 - c) Organotroph
 - d) Phototroph
29. Type of culture which is prepared by inoculating directly from the tissue of an organism to culture media
- a) Cell line
 - b) Transformed cells
 - c) Primary culture
 - d) Secondary culture
30. Enzyme which unwinds the double helix of DNA is
- a) Topoisomerase
 - b) Ligase
 - c) Helicase
 - d) Polymerase
31. Which of the following is also known as jumping genes?
- a) Cistron
 - b) Transposon
 - c) Exon
 - d) Replicon
32. The only woman to win an unshared nobel prize in physiology and medicine
- a) Barbara McClintoch
 - b) Marie Curie
 - c) Rosalind Franklin
 - d) Elizabeth H Blackburn
33. Which of the following is not a type of cancer?
- a) Myeoloma
 - b) Sarcoma
 - c) Leukemia
 - d) Condyloma

34. Choose a repressible operon from the following?
- a) Lac operon
 - b) Gal operon
 - c) Trp operon
 - d) None of the above
35. Which one of the following infections is not transmitted by mosquitoes?
- a) Filaria
 - b) Kala-azar
 - c) Japanese Encephalitis
 - d) Influenza
36. Carpopedal spasm is a characteristic symptom seen in which of the following?
- a) Scarlet fever
 - b) Typhoid
 - c) Tetanus
 - d) Black water fever
37. Which of the following is a routine screening test for cervical carcinoma?
- a) Amniocentesis
 - b) Chorionic villi sampling
 - c) Pap Smear
 - d) Colonoscopy
38. Xerophthalmia is a known vitamin deficiency disorder which may be alleviated by
- a) Sunflower seeds
 - b) Mushrooms
 - c) Carrots
 - d) Lentils
39. Which of the following is a defensive mechanism of innate immunity system?
- a) Hair
 - b) Nails
 - c) Epithelium
 - d) Sweat
40. Erythroblastosis Foetalis occurs if
- a) Mother is Rh + and the fetus is Rh-
 - b) Mother is Rh- and fetus is Rh+
 - c) Mother is Rh- and Fetus is Rh+ in first pregnancy, while fetus is Rh+ in second pregnancy
 - d) None of the above

48. Which among the following is an example of passive transport?
- a) Transport of glucose across membrane using ATP
 - b) Osmosis
 - c) Sodium Potassium pump
 - d) Uptake of glucose in root hair
49. Optically inactive amino acid is?
- a) Tyrosine
 - b) Proline
 - c) Glycine
 - d) Alanine
50. What is the principle of spectrophotometer?
- a) Refraction of light
 - b) Beer-Lambert's law
 - c) Defraction
 - d) Huygens-Fresnel principle
51. Choose the correct statement about SDS?
- a) SDS is an anionic detergent that stabilize the protein
 - b) SDS is a cationic detergent that gives uniform charge to protein
 - c) SDS breaks the disulphide bridges
 - d) SDS is an anionic detergent that gives uniform charge to protein
52. Which among the following is not a reducing sugar?
- a) Glucose
 - b) Sucrose
 - c) Cellobiose
 - d) Fructose
53. Choose the executioner caspase from the following?
- a) Caspase 5
 - b) Caspase 3
 - c) Caspase 9
 - d) Caspase 2
54. Fat soluble vitamins are
- a) Vitamin A, B12, D
 - b) Vitamin D, C, K, E
 - c) Vitamin K, E, D, A
 - d) Vitamin B6, D, A, E

55. Respiratory acidosis occurs when
- a) the kidneys are not removing acid from the body
 - b) the lungs can't remove the carbon dioxide (CO₂) produced by the body
 - c) increased respiration elevates the blood pH beyond the normal range
 - d) increased potassium level
56. In the presence of 2, 3-Bisphosphoglycerate, hemoglobin's affinity to oxygen
- a) Increases
 - b) Decreases
 - c) No effect
 - d) Increase at higher temperature
57. Where does Beta oxidation takes place in eukaryotes?
- a) Peroxisome
 - b) Mitochondria
 - c) Cytosol
 - d) Both (a) and (b)
58. Which TCA cycle enzyme is also found in electron transport chain?
- a) Fumerase
 - b) Succinate dehydrogenase
 - c) Isocitrate dehydrogenase
 - d) Citrate synthase
59. Choose the wrong statement about peptide bond formation
- a) It is a condensation reaction
 - b) Peptide bonds are formed between amino group of one amino acid and carboxyl group of other amino acid
 - c) There are 3 peptide bonds in a tripeptide
 - d) Peptide bond formation require ATP
60. RNA required for protein synthesis
- a) mRNA
 - b) tRNA
 - c) rRNA
 - d) All of the above

ANSWER SHEET — PART — A

1	A	B	C	D	E
2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
5	A	B	C	D	E
6	A	B	C	D	E
7	A	B	C	D	E
8	A	B	C	D	E
9	A	B	C	D	E
10	A	B	C	D	E
11	A	B	C	D	E
12	A	B	C	D	E
13	A	B	C	D	E
14	A	B	C	D	E
15	A	B	C	D	E
16	A	B	C	D	E
17	A	B	C	D	E
18	A	B	C	D	E
19	A	B	C	D	E
20	A	B	C	D	E

21	A	B	C	D	E
22	A	B	C	D	E
23	A	B	C	D	E
24	A	B	C	D	E
25	A	B	C	D	E
26	A	B	C	D	E
27	A	B	C	D	E
28	A	B	C	D	E
29	A	B	C	D	E
30	A	B	C	D	E
31	A	B	C	D	E
32	A	B	C	D	E
33	A	B	C	D	E
34	A	B	C	D	E
35	A	B	C	D	E
36	A	B	C	D	E
37	A	B	C	D	E
38	A	B	C	D	E
39	A	B	C	D	E
40	A	B	C	D	E

41	A	B	C	D	E
42	A	B	C	D	E
43	A	B	C	D	E
44	A	B	C	D	E
45	A	B	C	D	E
46	A	B	C	D	E
47	A	B	C	D	E
48	A	B	C	D	E
49	A	B	C	D	E
50	A	B	C	D	E
51	A	B	C	D	E
52	A	B	C	D	E
53	A	B	C	D	E
54	A	B	C	D	E
55	A	B	C	D	E
56	A	B	C	D	E
57	A	B	C	D	E
58	A	B	C	D	E
59	A	B	C	D	E
60	A	B	C	D	E

BIOTECHNOLOGY

PART – B (Descriptive Type)

Answer **any eight** questions.

(8 × 5 = 40 Marks)

1. What is hybridoma technology? Explain the selection process.
2. What is the principle of Nuclear Magnetic Resonance?
3. What are enantiomers and give one example?
4. Which are the important buffers in biological system?
5. What is the difference between reducing and non-reducing sugars with examples?
6. Define Bohr effect.
7. State the difference between oxidative phosphorylation and substrate level phosphorylation.
8. Explain the chemiosmotic theory of ATP production.
9. What are polysomes?
10. Differentiate between isotypic, allotypic and idiotypic and antibodies.
11. Differentiate between monoclonal and polyclonal antibodies.
12. Name any five plant growth hormones and briefly explain their function.

