

Code No.

N – 3568

Entrance Examination for Admission to the P.G. Courses in the Teaching Departments, 2022

CSS

BIOTECHNOLOGY

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 | | | | | | | | |

PART – A

(Objective Type)

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

(60 × 1 = 60 marks)

1. Collagen triple helix is

| | |
|------------------------|------------------------------|
| a) Secondary structure | b) Super Secondary structure |
| c) Tertiary structure | d) Quaternary structure |

DO NOT WRITE HERE

2. Chitin is present in

- | | |
|------------|------------------|
| a) Fungi | b) Crustaceans |
| c) Insects | d) All the above |

3. On classical considerations secondary metabolites are not present in

- | | |
|------------|-------------|
| a) Animals | b) Plants |
| c) Fungi | d) Bacteria |

4. The current concept is that the following is/are secondary metabolites

- | | |
|-------------|-------------------|
| a) steroids | b) prostaglandins |
| c) melanins | d) all the above |

5. Pyramid of biomass in pond ecosystem is
 - a) Upright
 - b) Spindle shaped
 - c) Straight
 - d) inverted
6. Whose scientific contributions you may connect with Western Ghats
 - a) Dr Gadgil
 - b) Dr Swaminathan
 - c) Dr C V Raman
 - d) Dr G N Ramachandran
7. The enzymes with slight variation in structure, but the same catalytic action called
 - a) Holoenzyme
 - b) Isoenzyme
 - c) Apoenzyme
 - d) Coenzyme
8. Which of the following is not a herbicide
 - a) Bensulide
 - b) Trifluralin
 - c) Napropamide
 - d) None
9. The optimum temperature for wine-fermentation of fruit juice is
 - a) 10°F
 - b) 110°F
 - c) 120°F
 - d) 68°F
10. Volume of urine is regulated by
 - a) Aldosterone
 - b) Aldosterone and ADH
 - c) Aldosterone, ADH and testosterone
 - d) ADH
11. Receptors of pain are known as
 - a) Rheoreceptors
 - b) Algesireceptors
 - c) Tangoreceptors
 - d) Mehanocerptors
12. Wine yeast is
 - a) *Saccharomyces cerevisiae*
 - b) *S. ellipsoids*
 - c) *Cryptococcus*
 - d) None of the above

13. The branch of science dealing with death is called
- a) Thanatology
 - b) Teratology
 - c) Toxicology
 - d) Tricology
14. The antibiotic gentamycin is produced from
- a) *Micromonosperma purpurea*
 - b) *Streptomyces griseus*
 - c) *Penicillium notatum*
 - d) None above
15. Cell organelle related to photorespiration is
- a) Peroxisome
 - b) Ribosome
 - c) Lysosome
 - d) Liposome
16. Aerobic respiration produces more energy than fermentation because fermentation involves
- a) Alcohol production
 - b) Formation of CO₂ and H₂O
 - c) Incomplete oxidation of food
 - d) Formation of acid
17. The best source of Vit C among the following is
- a) Glycine max
 - b) Arachis hypogeal
 - c) *Embllica officinalis*
 - d) Mangifera indica
18. An antiserum would contain
- a) Antigens
 - b) Antibodies
 - c) Leucocytes
 - d) RBCs
19. A condition of failure of the kidney to form urine is
- a) Creatinine
 - b) Hematuria
 - c) Anuria
 - d) Ketouria
20. Insulin is secreted by
- a) Spleen
 - b) α -cells of islets of Langerhans of the pancreas
 - c) β -cells of islets of Langerhans of the pancreas
 - d) Mucosa of the esophagus

21. The virus that infects bacteria are called
- a) Mycophage
 - b) Bacteriophage
 - c) HIV
 - d) Retrovirus
22. Frame shift mutation occurs when
- a) Base is added
 - b) Base is removed
 - c) Two bases are added
 - d) Two bases are removed
23. Which of the following has the lowest pH among them
- a) Bile
 - b) Saliva
 - c) Gastric juice
 - d) Pancreatic juice
24. Lysis of foreign cells is mediated through
- a) IgM
 - b) IgA
 - c) IgM & IgG
 - d) IgE
25. Cyclosporine is used
- a) For allergy
 - b) As immune depressant
 - c) As prophylactic for virus
 - d) For treatment of TB
26. Which one of the following pairs of terms means the same thing
- a) Gene pool – genome
 - b) Codon – gene
 - c) Cistron – triplet
 - d) DNA fingerprinting – DNA profiling
27. Continued consumption of a diet rich in butter, red meat and eggs for a long period may lead to
- a) Vit A toxicity
 - b) Kidney stones
 - c) Hypercholesterolemia
 - d) Urine lade with ketone bodies
28. Which of the following statements is true regarding t-RNA?
- a) It binds with an amino acid at its 3' end
 - b) It has five double-stranded regions
 - c) It conforms to B-DNA
 - d) It looks like a cloverleaf in its 3-D structure

29. Photochemical smog formed in congested metropolitan cities mainly consist of
- Ozone, peroxyacetyl nitrate and NO_x
 - Smoke, peroxyacetyl nitrate and SO_2
 - Hydrocarbons, SO_2 and CO_2
 - Hydrocarbons, ozone and SO_x
30. Which one of the following codons code for the same information as UGC?
- UGU
 - UGA
 - UAG
 - UGG
31. The Source of somatostatin is same as that of
- Thyroxin and calcitonin
 - Insulin and glucagon
 - Somatotropin and prolactin
 - Vasopressin and oxytocin
32. The *Bt* in *Bt*-cotton means
- Barium-treated
 - Bigger Thread variety
 - Produced by Biotechnological methods
 - Carrying endotoxin gene from *Bacillus thuringiensis*
33. The total number of nitrogenous bases in human genome is estimated to be about
- 3.1 billion
 - 31 million
 - 3.5 million
 - 3500 x thousand
34. Dolly is the first _____ animal
- Cloned
 - Genetically modified
 - IVF-produced
 - None above
35. Insecticides act upon
- respiratory system
 - muscular system
 - nervous system
 - both (a) and (c)

36. Which of the following will be different in different animals?
- a) Carbohydrate
 - b) Proteins
 - c) Lipids
 - d) Vitamins
37. If the sequence of bases is TAGC, then, the sequence of in mRNA will be
- a) ATCG
 - b) TAGC
 - c) AUCG
 - d) AUGC
38. Penicillin is obtained from
- a) *Penicillium chrysogenum*
 - b) *Penicillium rimosus*
 - c) *Penicillium notatum*
 - d) All the above
39. Industrially citric acid is produced by
- a) *Aspergillus niger*
 - b) *Streptococcus lactis*
 - c) *Candida utilis*
 - d) *Acetobacter suboxydans*
40. The transgenic animals are
- a) Foreign DNA in some of its cells
 - b) Foreign DNA in all of its cells
 - c) Foreign RNA in some of its cells
 - d) Foreign RNA in all of its cells
41. The tailed bacteriophages are
- a) non motile
 - b) actively motile in water
 - c) motile on bacteria
 - d) motile on plants
42. The water potential and osmotic potential of pure water are
- a) 100 and zero
 - b) Zero and zero
 - c) 100 and 200
 - d) zero and 100
43. What is Agent Orange?
- a) A biodegradable insecticide
 - b) A weedicide containing dioxin
 - c) Color used in lamp
 - d) Color used in paints

44. Restriction endonucleases are
- a) Synthesized by bacteria
 - b) Present in mammalian cells
 - c) Used for *in vitro* DNA synthesis
 - d) Used in genetic engineering
45. The following is not true about DNA synthesis:
- a) It requires DNA polymerase
 - b) Reverse transcriptase enzymes are involved
 - c) Moves in a 5' → 3' direction
 - d) Cytarabine inhibits DNA synthesis
46. With regard to DNA molecules:
- a) They contain adenine, cytosine, guanine and uracil bases
 - b) They can be detected with Western blotting
 - c) They cannot be detected with Southern blotting
 - d) They are denatured at a temperature of 100°C
47. G-proteins:
- a) Can be mutated in tumour cells
 - b) They are inactivated by cholera toxins
 - c) Mediate the action of glucocorticoid hormone
 - d) Bind to DNA to regulate gene transcription
48. The following is true about gluconeogenesis:
- a) It occurs in liver
 - b) It is inhibited by glucagon
 - c) It occurs in adipose tissue
 - d) It is stimulated by insulin
49. With regard to membrane receptors for hormones:
- a) They are not glycoproteins
 - b) They are important for hormones made up of steroid
 - c) Those for insulin exhibit an intrinsic protein kinase activity
 - d) Glucagon uses calcium as a second messenger

50. Ethanol is prepared from glucose by the process of
- a) respiration
 - b) fermentation
 - c) catalytic hydration
 - d) photosynthesis
51. What type of reaction takes place when propane is formed from propanol?
- a) condensation
 - b) hydrolysis
 - c) dehydration
 - d) hydration
52. When an alcohol is completely oxidised the products are
- a) carbon dioxide and hydrogen
 - b) carbon dioxide and water
 - c) carbon monoxide and hydrogen
 - d) carbon dioxide and water
53. The type(s) of alcohol which can be oxidised are
- a) primary only
 - b) secondary only
 - c) tertiary only
 - d) none of the above answers
54. The first Indian to solve a protein's 3D structure
- a) Prof Gopinath Kartha
 - b) Prof M Vijayan
 - c) Prof G N Ramachandran
 - d) None above
55. 'Cultured milk products' means
- a) products by souring of skimmed or partially skimmed milk
 - b) milk products of dairy farms
 - c) milk products of stall-fed cows
 - d) all the above
56. The following belong to approved GM product
- a) apple
 - b) papaya
 - c) pineapple
 - d) all the above

57. In the regulation of genes, the following is not true:
- a) more than 90% of the base sequences in human DNA have not known function
 - b) exons are the part of the gene that code for amino acids found in the final proteins
 - c) Splicing cut out the mRNA coded by introns
 - d) Introns usually begins with the nucleotide sequence GT
58. Thromboxane A₂ (TXA₂)
- a) Does not require lipoxygenase for its production
 - b) Is not derived from the membrane phospholipid
 - c) Its production is not decreased by non-steroidal anti-inflammatory drugs
 - d) Does not cause platelet aggregation
59. In the eye lens:
- a) Pentose phosphate pathway metabolizes 30% of the available glucose
 - b) The capsule is not made up of type IV collagen
 - c) Most metabolism is not carried out in the anterior pole
 - d) Anaerobic glycolysis is not the main source of energy
60. The following is not true about the oxidation of glucose:
- a) Glycolysis produces 3% of the energy ultimately obtained from glucose
 - b) Glucose does not enter the Krebs's cycle as pyruvate
 - c) Glycolysis occurs within the mitochondria
 - d) The first stage of glycolysis involves phosphorylation of glucose to 1,6-fructose biphosphate.

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. How transgenic organisms may be made?
2. Explain the first and zeroth laws of thermodynamics.
3. How ATP is produced during photosynthesis?
4. Role of liver in metabolism.
5. Role of kidney in homeostasis in human body.
6. Briefly describe the features of lichens.
7. What are bisexual plants?
8. Briefly describe the male hormones of female human body.
9. Briefly describe the COVID-19 vaccines made in India.
10. What is hybridoma technology?
11. Why multi drug treatment is required for TB?
12. What are the features of monoculture farming?

