

A

S. No. 10010

Roll No.

ETO-1343

Ph. D. Entrance Test, Nov. 2013

Bio. Engg.

First Paper

(Objective Type Questions)

Maximum Marks : 100

Time : 60 Minutes

SEAL

NOTE :

- (i) This question booklet comprises of 50 questions.
- (ii) Write your Roll No. on Question Booklet as well as OMR sheet.
- (iii) Each question has four options (a), (b), (c) and (d) out of which one is correct. The candidate is required to darken completely the correct option in the OMR Answer Sheet supplied separately.
- (iv) Each correct answer carries 2 marks.
- (v) There is no negative marking.
- (vi) Rough work may be done in this question booklet itself where the space provided.
- (vii) The question booklet along with the OMR answer sheet is to be handed over by the candidate to the Invigilator at the end of the examination.
- (viii) Use HB Pencil or blue ball pen to dark the answer boxes.

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1. What does a protein loses when it denatures ?
(a) Its primary structure (b) Its peptide bonds
(c) Its sequence of amino acids (d) Its three dimensional shape
2. Which of the following has a quaternary structure ?
(a) α -chymotrypsin (b) Hemoglobin
(c) Insulin (d) Myoglobin
3. A double stranded DNA has 30% Thymine. The percentage of cytosine is :
(a) 30% (b) 20%
(c) 70% (d) 15%
4. The end product of purine catabolism in normal humans is :
(a) Urea (b) Uric Acid
(c) Creatine (d) Xanthine
5. The chitin in the fungal cell wall is :
(a) A protein (b) A glycoprotein
(c) A polysaccharide (d) A lipopolysaccharide
6. Glucose and galactose are two isomeric monosaccharide known as :
(a) Anomers (b) Epimers
(c) Enantiomers (d) Conformers

7. Catalytic antibodies function as enzymes on the principle of :
- (a) Enzymatic conversion of antibodies
 - (b) Stabilizing transition state analogue of substrates
 - (c) Antigen-antibody affinity
 - (d) Monoclonal antibodies with chemical capability
8. Which one of the following is a cofactor and not a coenzyme ?
- (a) Biotin
 - (b) Tetrahydrofolic acid
 - (c) Copper
 - (d) Methylcobalamin
9. Approximately how many okazaki fragments are synthesized during one round of replication of the E. coli genome ?
- (a) 5000 to 10000
 - (b) 4×10^6
 - (c) 2500 to 5000
 - (d) 2
10. Okazaki fragments :
- (a) Require the activity of only a DNA polymerase for synthesis
 - (b) Require only RNA polymerase activity for synthesis
 - (c) Are made when DNA is exposed to UV radiation
 - (d) Are composed of both DNA and RNA
11. Satellite DNA consists of :
- (a) Extra chromosomal DNA
 - (b) Short repetitive nucleotide sequence
 - (c) Ribosomal RNA genes
 - (d) Single gene regions

12. When a substrate concentration is much greater than K_m , the velocity is constant and equal to V_{max} . at this point the rate of reaction is said to be :
- (a) 1st order with respect to substrate
 - (b) 2nd order with respect to substrate
 - (c) Zero order with respect to substrate
 - (d) None of the above
13. Which of the following is a cell adhesion molecule ?
- (a) Integrin
 - (b) Lysine
 - (c) Myosin
 - (d) Keratin
14. Synaptic signaling involves :
- (a) Endocrine signals
 - (b) Paracrine signals
 - (c) Autocrine signals
 - (d) Neurotransmitters
15. In meiosis, replication of DNA occurs at :
- (a) Meiosis I
 - (b) Meiosis II
 - (c) Between Meiosis I and Meiosis II
 - (d) In both Meiosis I and Meiosis
16. Synapsis means :
- (a) Pairing of homologous chromosome during Meiosis I
 - (b) Pairing of any *two* chromosome
 - (c) Pairing of homologous chromosome during Meiosis II
 - (d) None of the above

17. The end product of fermentation of molasses by yeast is :

- (a) Pyruvate
- (b) Methyl alcohol
- (c) Ethyl alcohol
- (d) Lactate

18. During photosynthesis, the final product of calvin cycle is :

- (a) Ribulosebiphosphate
- (b) Phosphoglycerate
- (c) Pyruvate
- (d) Glyceradehye-3-phosphate

19. Cytochromes in cell are acceptor of :

- (a) Oxygen
- (b) H^+ ions
- (c) Electron
- (d) CO_2

20. The replicative polymerase in E. coli is :

- (a) DNA polymerase I
- (b) DNA polymerase II
- (c) DNA polymerase III
- (d) DNA polymerase IV

21. The DNA binding protein that initiates the transcription of bacterial genes is called as :

- (a) Operator
- (b) Promoter
- (c) Repressor
- (d) Sigma factor

22. The first step in PCR is :

- (a) Denaturation
- (b) Primer extension
- (c) Annealing
- (d) Cooling

23. Yeast artificial chromosome (YAC) is used for :
- (a) Cloning large sequence of DNA
 - (b) Cloning only yeast genomic sequences
 - (c) Cloning of only cDNA sequences
 - (d) All DNA except plant DNA sequences
24. What role do opines play in Crown gall diseases ?
- (a) Source of Carbon, Nitrogen and Energy for *Agrobacterium*
 - (b) Transfer of T-DNA to plant cells
 - (c) Attachment of *Agrobacterium* to the plants
 - (d) Induction of expression of *vir* genes
25. One of the Mendel's pure strains of pea plants had green peas. How many different kinds of eggs could such a plant produce with regards to pea color ?
- (a) One
 - (b) Two
 - (c) Three
 - (d) Four
26. In the human ABO blood system, the alleles A and B are dominants to O. What will be the number of different possible genotype ?
- (a) 4
 - (b) 8
 - (c) 6
 - (d) 12
27. Autoclaves are routinely used in laboratories for sterilization. It acts by :
- (a) Disrupting cell membranes
 - (b) Denaturing proteins
 - (c) Changing physically membrane lipids
 - (d) All of the above

28. Animal viruses usually penetrate a host cell by :
- (a) Injection
 - (b) Exocytosis
 - (c) Endocytosis
 - (d) A vector
29. Antigen binding sites of immunoglobulin are located in :
- (a) Light chain alone
 - (b) Heavy chain alone
 - (c) F_c region of the antibody
 - (d) F_{ab} region of the antibody
30. The class of immunoglobulin that can get transported across epithelial cells is :
- (a) IgG
 - (b) IgE
 - (c) IgA
 - (d) IgM
31. J chain or joining chain is found in :
- (a) IgM
 - (b) IgA
 - (c) IgM and IgA
 - (d) IgE
32. DCMU (Dichlorophenyl dimethyl urea) is a herbicide which kills the plant by :
- (a) Inhibition of respiration
 - (b) Destroying the chloroplasts
 - (c) Inhibiting flow of electrons from water to $NADP^+$
 - (d) Inhibiting PSI and photolysis of water
33. An Hfr bacterium is one that contains :
- (a) Many unusual plasmids
 - (b) Chromosomal material acquired from a recipient cell
 - (c) The ability to undergo transduction
 - (d) A plasmid integrated into its chromosome

34. A prophage is :
- (a) An auxotrophic mutant
 - (b) A gene
 - (c) A phage DNA incorporated into host genome
 - (d) The DNA of lytic
35. Calmodulin activates protein kinases in response to a transient increase in :
- (a) cAMP
 - (b) Calcium ions
 - (c) DAG
 - (d) NO
36. Most antibiotics and mycotoxins fall into the category of :
- (a) Primary metabolites
 - (b) Secondary metabolites
 - (c) Both primary and secondary metabolites
 - (d) None of the above
37. Out of the following, which is a naturally occurring auxin ?
- (a) 2, 4-D
 - (b) IAA
 - (c) NAA
 - (d) None of these
38. Which is the best technique to separate two loci on chromosome ?
- (a) C-banding
 - (b) G-banding
 - (c) Gel electrophoresis
 - (d) Chromatography

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39. The role of carrier protein in light reaction is :
- (a) To transfer energetic electrons from PSII to PSI
 - (b) Pumping of protons
 - (c) Formation of ATP
 - (d) Transferring of high electrons from PSI to PSII
40. Among these, which is the source of maximum antibiotics ?
- (a) Streptomyces
 - (b) Penicillin
 - (c) Actinomyces
 - (d) Bacillus
41. Mendel's law of inheritance is applicable to :
- (a) Nucleus
 - (b) Plasmid
 - (c) Mitochondria
 - (d) Plastid
42. If organism is triploid, then hardy-weinberg theorem applicable will be :
- (a) $(p + q)^3$
 - (b) $(p + q)^2$
 - (c) $(p + q + r)^3$
 - (d) $(p + q + r)^2$
43. In which of the following techniques of enzyme immobilization, no chemical modification of the enzyme takes place ?
- (a) Covalent attachment
 - (b) Crosslinking
 - (c) Adsorption
 - (d) Entrapment
44. Ion exchange chromatography is widely used for the separation of :
- (a) Amino acids
 - (b) Lipids
 - (c) Carbohydrates
 - (d) None of these

