BOOKLET-C

M.Sc (Biological Sciences) Admission Test, 2013
PRESIDENCY UNIVERSITY, KOLKATA

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Select the correct answer from the given options for every question and fill the appropriate position in the OMR sheet provided [Each question carries 2 marks and negative marking is 0.5 for each incorrect answer]

1. In gluconeogenesis , glucose is formed from which of the following (both are to be considered) :- (a)Lactate and β- hydroxylbutyrate (b) Amino acid and fatty acid (c) Glycerol and acetoacetic acid (d) None of these.
2. The overall reaction for oxidative phosphorylation is given where the number of water molecule is missing, find out the correct option: $10\ NADH^+ + 10\ H^+ + 2FADH_2 + 34\ ADP + 34P_i + 6O_2 \longrightarrow 10\ NAD^+ + 2FAD + H_2O + 34\ ATP$: (a) 6 (b) 24 (c) 8 (d) None of these.
3. A bacterium can divide every 20 minutes. Beginning with a single individual, how many bacteria will there be in the population if there is exponential growth for 3 hours? (a) 18 (b) 440 (c) 512 (d) 1024.
4. You have homogenized plant tissue in order to separate chloroplast from nuclei. Which of the following methods would be most suitable? (a)Polyacrylamide gel electrophoresis (b) Gel filtration (c) Column chromatography (d) Differential centrifugation using sucrose gradient.
5. Biomagnification refers to :– (a) Absorption of a chemical from the media to concentrate in the organism's tissue that are greater than in surrounding environment (b) Tendency to some chemicals to become increasingly concentrated at successively higher trophic levels in a food chain (c) The tendency for a compound to accumulate in an organism's tissue (d) All the statements are incorrect.
6. Fertilizers can be washed into rivers by the rain. This can cause : (a) Bioaccumulation (b) Biodegradation (c) Eutrophication (d) Spontaneous combustion.
7. The amount of genotypic variation in a natural population can be increased by all of the following except : (a) Mutation (b) Recombination (c) immigration (d) Inbreeding.
8. Two linked genes either in the cis-arrangement or trans-arrangement will produce: (i) Identical phenotypes (ii) dissimilar results in test cross (iii) test cross offsprings will be phenotypically identical to P1 parents:- (a) All i,,ii,iii are true (b) Only i &ii are true (c) Only i & iii are true (d) Only ii & iii are true.
9. Statement – 1: Several tRNAs exist for certain amino acids; Statement – 2: Some tRNAs recognize more than one codon:- (a) Only Statement 1 is true (b) Only Statement 2 is true (c) Both statements are true (d) Neither of the statements are true.
10. Statement 1 : Oncogenes of DNA Cancer virus are of viral origin; Statement 2 : Oncogenes of RNA Cancer virus are of host origin- (a) Only 1 is correct (b) Only 2 is correct (c) Neither 1 nor 2 is correct (d) Both 1 & 2 are correct.
11. Dialysis is a method for separating :- (a) lyophilic sols from lyophobic sols (b) suspensoids from colloids (c) colloid particles from small solutes (d) gels from sols.
12. Osmotic pressure may be measured by:- (a) drop weight method (b) Berkeley-Hartley method (c) wire pool method (d) falling sphere method.
13. The most predominant form of DNA in eukaryotic nuclear chromatin is :- (a) Z form (b) A form (c) B form (d) D form.
14. RNA polymerase II is involved in transcription of :- (a) hnRNA (b) tRNA (c) 45S rRNA (d) 5S rRNA.
15. Which of the following is not an intermediate of TCA cycle? (a) citrate (b) succinyl CoA (c) pyruvate (d) malate.
16. Which of the following glycosidic bonds is absent in glycogen? (a) α 1,4 (b) β 1,4 (c) α 1,6 (d) both α 1,4 and α 1,6.
17. A protein molecule moves fastest in :- (a) Bacterial cell (b) yeast cell (c) Healthy mammalian cell (d) Cancer cell.
18. Fill in the blanks: Fluorescence signal appears at _____ wavelength than excitation :- (a) lower (b) higher (c) same (d) all of these.
19. Numerical value of pH of a solution can be calculated from :- (a) H^+ ion concentration only (b) OH^- ion concentration only (c) both H^+ and OH^- ions (d) None of these.
20. Which of the following hormone is a modified amino acid? (a) Prostaglandin (b) Estrogen (c) Epinephrine (d) Progesterone.
21. In a biochemical reaction, function of an enzyme is to :- (a) lower the activation energy (b) lower the free energy (c) increase the activation energy (d) increase the free energy.
22. An enzyme catalyzed reaction is a zero order reaction when :- (a) the velocity of the enzyme action is

very low (b) velocity of enzyme action reaches V_{max} (c) concentration of enzyme is very high (d) all of these.

23. G protein is so called, because :- (a) it has GTPase activity (b) it binds GTP (c) it binds GDP (d) None of these.
24. The Dengue Virus is a :- (a) positive strand RNA virus (b) negative strand RNA virus (c) double strand DNA virus (d) single strand DNA virus.
25. An inverted pyramid of number is found in :- (a) grazing food chain (b) detritus based food chain (c) parasitic food chain (d) all of these.
26. Abzymes are :- (a) proteinaceous in nature (b) catalytic in nature (c) antibody in nature (d) all of these.
27. Platelet is found in :- (a) birds and mammals (b) all vertebrates (c) only mammals (d) reptiles, birds and mammals.
28. Substances of plant origin that is comparable to antibodies are known as :- (a) phytochrome (b) phytoalexin (c) lectin (d) pectin.
29. *E. coli* chromosome has 4.7 X 10^6 base pairs; in a normal DNA replication, fork progresses at about 1000 nucleotides/second. Therefore, the minimum time required to complete replication is :- (a) 12 min (b) 24 min (c) 39 min (d) 78 min.
30. Why is a RNA primer necessary for DNA replication? (a) The RNA primer is essential for the activity of DNA ligase. (b) The RNA primer creates the 5' and 3' ends of the strand (c) DNA polymerase can only add nucleotides to RNA molecules. (d) free 3'OH end must be provided to start off the DNA chain synthesis by DNA polymerase.
31. If spermatogenesis is normal and all cells survive, how many sperms will result from 50 primary spermatocytes and 50 spermatids respectively? (a) 200 and 200 (b) 50 and 200 (c) 200 and 50 (d) 50 and 50.
32. What is the probability of the child of a man with hairy pinna of the ear showing the same phenotype? (a)100% for each son (b) 100% for each daughter (c) 25% for each child (d) 75% for each child.
33. How many Barr bodies are expected to occur in cell nuclei with XXXY chromosomal complements? (a) 0 (b) 1 (c) 2 (d) 3 .
34. If linkage strength between any two gene loci is 70%, what would be the amount of crossing over between these loci? (a) 15% (b) 30% (c) 70% (d) none of these.
35. The probable blood group of a child with mother having AB type and father having O type are :- (a) AB type or O type (b) A type or B type (c) A type or B type or AB type (d) O type only.
36. Colchicine treatment results in chromosome doubling in plants by :- (a) inducing illegitimate replication (b) interfering with spindle formation and chromosome segregation (c) preventing cell wall formation (d) all of these.
37. An example of an optically inactive amino acid :- (a) alanine (b) glycine (c) leucine (d) isoleucine.
38. The resolving power of a TEM is very high, because :- (a) it has electromagnetic lenses (b) it uses more than one condenser lenses (c) it has a vacuum-tight column (d) the wavelength of an electron beam is very short.
39. The chromosome number of somatic cells in case of nullisomy is represented as : - (a) 2n + 2 (b) 2n – 2 (c) 2n – 1 – 1 (d) 2n + 1 + 1.
40. If three coins are tossed simultaneously, the probability of getting 'head' in all the three coins is :- (a) 2/3 (b) 3/2 (c) 1/8 (d) 1/6.
41. mtDNA is :- (a) single-stranded, circular (b) single-stranded, linear (c) double-stranded, circular (d) double-stranded, linear.
42. The statement that holds true for double-stranded DNA is :- (a) A + T = G + C (b) A + G = C + T (c) A/G = C/T (d) A/C = G/T.
43. 10 ml of an acid sample has a pH of 2.0. The volume of deionised water that should be added to this acid sample to make its pH 3.0 is :- (a) 5 ml (b) 10 ml (c) 90 ml (d) 100 ml.
44. Glycogenolysis does not occur in muscles, since :- (a) glycogen is absent in muscles (b) myoglobin inhibits glycogenolysis (c) glucose-6-phosphatase is absent in muscles (d) muscles do not require any glucose at all.
45. Criss-cross pattern of inheritance is exhibited by :- (a) sex-linked genes (b) sex-influenced genes (c) sex-limited genes (d) holandric genes.
46. SDS-PAGE technique separates proteins based on their (a) differential charge (b) differential mass (c) both mass and charge (d) none of these.
47. Presence of a competitive inhibitor in an enzymatic reaction results in :- (a) Increase in V_{max} and K_m values (b) V_{max} remains unaltered but K_m increases (c) Decrease in V_{max} and K_m values (d) No net change in K_m and V_{max} values.
48. The frequency of children homozygous for a recessive lethal gene is about 1 in 25000. What is the proportion of carriers (heterozygotes)? (a) 0.006 (6 per 1000) (b) 0.012 (12 per 1000) (c) 0.00004 (4 per 100000) (d) none of these.
49. Glycosylation occurs in :- (a) Cytoplasm (b) Mitochondria (c) Golgi apparatus (d) Peroxisome.
50. N/10 Sodium hydroxide is prepared by dissolving :- (a) 4 g of NaOH dissolved in 1 litre of H_2O (b) 40 g of NaOH dissolved in 1 litre of H_2O (c) 4 g of NaOH dissolved in 100 ml of H_2O (d) 8 g of NaOH dissolved in 100 ml of H_2O.