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BIOLOGY
QUESTIONS & ANSWERS

1. The length of DNA hgaving 23 base pair is

(A) 78 Å (B) 78.4 Å (C) 74.8 Å (D) 78.2 Å

Ans : (D)

Hints : Distance between adjacent base pairs = 3.4Å

2. Which I_g is produced in primary immune response?

(A) I_gA (B) I_gE (C) I_gG (D) I_gM

Ans : (D)

Hints : IgM is produced in primary response to the given antigen

3. The average diameter of Red Blood Corpuscles of man is

(A) 7.2 μm (B) 8.1 μm (C) 9.2 μm (D) 10.3 μm

Ans : (A)

Hints : The average diameter of RBC of man is 7.2 μm

4. FAD is electron acceptor during oxidation of which of the following?

(A) α-ketoglutarate $\rightarrow$ Succinyl CoA (B) Succinic acid $\rightarrow$ Fumaric acid

(C) Succinyl CoA $\rightarrow$ Succinic acid (D) Fumaric acid $\rightarrow$ Malic acid

Ans : (B)

Hints : FAD is electron acceptor during oxidation of succinic acid to fumaric acid

5. The chemical nature of hormones secreted by α & δ cells of pancreas is –

(A) Glycolipid (B) Glycoprotein (C) Steroid (D) Polypeptide

Ans : (D)

Hints : Hormones produced by α cells (glucagon) and β cells (somatostatin) are polypeptide

6. The genetic material of Rabies virus is

(A) Double stranded RNA (B) Single stranded RNA (C) Double stranded DNA (D) ssDNA

Ans : (B)

Hints : The genetic material of Rabies virus is ss RNA

7. T-lymphocyte is produced in

(A) Bone marrow (B) Spleen (C) Pancreas (D) Thymus

Ans : (A)

Hints : T-lymphocyte are produced in bone marrow but mature in thymus

8. How many ATP molecules are obtained from fermentation of 1 molecule of glucose?
(A) 2 (B) 4 (C) 3 (D) 5
Ans : (A)
Hints : Two molecules of ATP are produced by fermentation of one molecule of glucose

9. Number of nitrogenous bases in a Codon is
(A) 3 (B) 2 (C) 1 (D) 5
Ans : (A)
Hints : Three nitrogenous bases are found in a codon.

10. A character which is expressed in a hybrid is called
(A) Dominant (B) Recessive (C) Co-dominant (D) Epistatic
Ans : (A)
Hints : Dominant gene is expressed in a hybrid

11. In which stage of cell division chromosomes are most condensed?
(A) Prophase (B) Metaphase (C) Anaphase (D) Telophase
Ans : (B)
Hints : Chromosome is most condensed in metaphase

12. Which of the following is correct
(A) Haemophilic-Y chromosome (B) Down's syndrome - 21st chromosome
(C) Sickle cell anaemia-X chromosome (D) Parkinson's disease-X and Y chromosome
Ans : (B)
Hints : Down's syndrome is trisomy of 21st chromosome

13. Genetically engineered bacteria are being employed for production of
(A) Thyroxine (B) Human insulin (C) Cortisol (D) Epinephrine
Ans : (B)
Hints : Human insulin is now being produced by genetically engineered bacteria (E.coli). This insulin is called Humulin

14. Scientific name of sunflower is
(A) Hibiscus rosa-sinensis (B) Solanum nigram (C) Oryza sativa (D) Helianthus annus
Ans : (D)
Hints : Helianthus annuus is sunflower

15. By which of the following methods, new and better varieties of plants can be formed?
(A) Selection (B) Grafting
(C) Hybridization (D) Hybridization followed by selection
Ans : (D)
Hints : Better variety of plant can be formed by hybridisation followed by selection.

16. Which one is product of aerobic respiration?
(A) Malic acid (B) Ethyl alcohol (C) Lactic acid (D) Pyruvic acid
Ans : (A)
Hints : Malic acid is product of aerobic respiration

17. CO_2 acceptor in C_3 cycle is
(A) OAA (B) RUBP (C) PEP (D) Malic acid
Ans : (B)
Hints : RUBP (Ribulose 1.5. biphosphate) is CO_2 acceptor in C_3 plant

18. Virus was discovered by whom?
(A) Stanley (B) Ivanowsky (C) Herelle (D) Beijerinek
Ans : (B)
Hints : Ivanowsky discovered virus

19. Electron microscope is based on principle of
(A) Electromagnetic theory (B) Resolution of glass lenses (C) Magnification of glass lenses (D) Refraction of light
Ans : (A)
Hints : Electrton microscope is based on principle of electromagnetic theory

20. Citric acid cycle is the alternate name of which of the following?
(A) HMP shunt (B) Glycolysis (C) TCA cycle (D) Calvin cycle
Ans : (C)
Hints : Citric acid cycle or Krebs'cycle or Tricarboxylic acid cycle is alternative names.

21. Vascular tissue in higher plants develop from which of the following :
(A) Procambium (B) Protoderm (C) Periblem (D) Cortex
Ans : (A)
Hints : Procambium forms vascular tissue in higher plants

22. Which element is cause of etai etai disease
(A) Hg (B) Pb (C) Cd (D) As
Ans : (C)
Hints : Etai etia is caused by Cd

23. Chromosomes can be stained with one of the following chemicals
(A) Acetocarmine (B) Safranine (C) Light green (D) Eosin
Ans : (A)
Hints : Acetocarmine is used to stain chromosome

24. Which one of the following is the American Poultry breed
(A) Australop (B) Minovca (C) Assel (D) Rhod Island Red
Ans : (D)
Hints : Rhod island Red is the American Poultry Breed

25. Which part of the human brain is largest :
(A) Cerebellum (B) Thlamus (C) Cerebrum (D) Medulla
Ans : (C)
Hints : Cerebrum is the largest part of brain

26. When the other floral parts are arranged at the base of the gynoecium, the flower is called :
(A) Hypogynous flower (B) Perigynous flower (C) Epigynous flower (D) Agynous flower
Ans : (A)
Hints : Hypogynous flower/Superior ovary

27. In a CAM plant the concentration of organic acid :
(A) increases during the day (B) decreases or increases during the day
(C) increases during night (D) decreases during any time
Ans : (C)
Hints : In a CAM plant the concentration of organic acid increases during night

28. Protein coat of virus is known as :
(A) Capsid (B) Virion (C) Virioid (D) Bacterial wall
Ans : (A)
Hints : Protein coat of virus is called capsid

29. Net yield of aerobic respiration during Krebs' cycle per glucose molecule is :
(A) 2 ATP molecules (B) 8 ATP molecules (C) 36 ATP molecules (D) 38 ATP molecules
Ans : (A)
Hints : Net yield of 2ATP for two Krebs' cycle (1 glucose molecule) is produced at SLP

30. Feedback inhibition of enzymes is affected by which of the following
(A) enzyme (B) substrate (C) end products (D) intermediate end products
Ans : (C)
Hints : Feedback inhibition is affected by end products

31. The discovery of gibberellins is related with one of the following :
(A) Blast disease of rice (B) Rust disease of wheat
(C) 'Bakanae' disease of rice (D) Early blight disease of potato
Ans : (C)
Hints : Bakanae disease of rice/foolish seedling disease, discovered in Japan

32. Ornithophily refers to the pollination by which of the following :
(A) Insects (B) Birds (C) Snails (D) Air
Ans : (B)
Hints : Pollination by bird is called ornithophily.

33. Which f the following is an example of man-made ecosystem?
(A) Herbarium (B) Aquarium (C) Tissue culture (D) Forest
Ans : (B)
Hints : Aquarium is man-made ecosystem

34. Respiratory enzymes are present in the following organelle :
(A) Peroxysome (B) Chloroplast (C) Mitochondrion (D) Lysosome
Ans : (C)
Hints : Mitochondrion has respiratory enzymes for food oxidation

35. Pellagra is caused due to deficiency of the vitamin :
(A) Thiamin (B) Niacin (C) Pyridoxin (D) Biotin
Ans : (B)
Hints : Pellagra is caused by Niacin (nicotinic acid)

36. Which one of the following Leucocytes transforms into macrophages?
(A) Eosinophil (B) Basophil (C) Monocyte (D) Lymphocyte
Ans : (C)
Hints : Monocytes transforms to form macrophages

37. Mention the "Incubation Period" of P.vivax :
(A) 10–14 days (B) 20–25 days (C) 30 days (D) 45 days
Ans : (A)
Hints : Incubation period of P.vivax is 10-14 days.

38. The specific region of Hypothalamus, responsible for physiological sweat secretion, is
(A) Para-ventricular nucleus (B) Supra-Optic nucleus (C) Median Eminence (D) Pars Distalis
Ans : (A)
Hints : Paraventricular nucleus of hypothalamus is related to sweat secretion

39. The duration of cardiac cycle is :
(A) 0.8 sec (B) 0.8 μ sec (C) 0.08 sec (D) 0.008 sec
Ans : (A)
Hints : The duration of cardiac cycle is 0.8 sec

40. The intensity levels of whispering noise is :
(A) 10 – 15 dB (B) 20 – 40 dB (C) 45 – 50 dB (D) 50 – 55 dB
Ans : (A)

41. The wildlife Protection Act was introduced in :
(A) 1974 (B) 1981 (C) 1986 (D) 1991
Ans : (A)

42. In honey the percentage of Maltose and other sugar is
(A) 9.2 (B) 8.81 (C) 10.5 (D) 11.2
Ans : (B)

43. Identify the correct type of food chain :
dead animal → blow fly maggots → common frog → snake
(A) Grazing food chain (B) Detrital food chain (C) Decomposer food chain (D) Predator food chain
Ans : (B)
Hins : It is Detritus food chain. Always starts from dead organic material.

44. Which is *not* applicable to the Biological species concept ?
(A) Hybridization (B) Natural population (C) Reproductive isolation (D) Gene Pool
Ans : (A)
Hints : Hybridization is not applicable to the bilogical species concept.

45. DNA sequence that code for protein are known as —
(A) Introns (B) Exons (C) Control regions (D) Intervening sequences
Ans. (B)
Hints : Exon is a part of DNA which codes for a protein

46. Which one of the following is a systemic insecticide ?
(A) Malathion (B) Parathion (C) Endrin (D) Furadan
Ans : (D)
Hints : The systemic insecticide is parathion.

47. The resolving power of a compound microscope will increase with —
(A) decrease in wave length of light and increase in numerical aperture
(B) increase in wave length of light and decrease in numerical aperture
(C) increase in both wave length of light and numerical aperture
(D) decrease in both wave length of light and numerical aperture
Ans : (A)
Hints : Decrease in wavelength of light and increase in numerical aperature is responsible.

48. Osteomalacia is a disease caused by the deficiency of —
(A) Calciferol (B) Retinol (C) Tocopherol (D) Phylloquinone
Ans : (A)
Hints : Osteomalacia is caused by calciferol deficiency in body

49. Which is the correct sequence of arrangement of types of W.B.C. in decreasing order in terms of number per mm^3 of human blood ?
(A) Eosinophils > Basophils > Neutrophils (B) Basophils > Eosinophils > Neutrophils
(C) Neutrophils > Eosinophils > Basophils (D) Eosinophils > Neutrophils > Basophils
Ans : (C)

50. Cells in G_0 phase of cell cycle
(A) Exit cell cycle (B) Enter cell cycle (C) Suspend cell cycle (D) Terminate cell cycle
Ans : (C)
Hints : G_0 is the arrest / suspended phase of cell cycle.

51. Choose the correct non-protein amino acid
(A) Hydroxyproline (B) hydroxylysine (C) cystine (D) γ amino butyric acid
Ans : (D)

52. Seedless Banana is
(A) Parthenocarpic fruit (B) Multiple fruit (C) Drupe fruit (D) True fruit
Ans : (A)
Hints : It is formed by parthenocarpy (i.e. without fertilization)

53. The major site of protein breakdown to form free amino acids is in the
(A) Kidney (B) Spleen (C) Liver (D) Bone-Marrow
Ans : (C)

54. Collagen is a
(A) Phosphoprotein (B) Globulin (C) Derived Protein (D) Scleroprotein
Ans : (D)
Hints : Collagen is scleroprotein that requires vit-C for synthesis

55. The "Repeating Unit" of glycogen is
(A) Fructose (B) Mannose (C) Glucose (D) Galactose
Ans : (C)
Hints : Glycogen is a homopolymer of glucose

56. Graham's Law is correlated with
(A) Diffusion (B) Osmoregulation (C) Osmosis (D) Adsorption
Ans : (A)
Hints : Graham's law of diffusion, rate of diffusion $\alpha \frac{1}{\sqrt{\text{Density of particle}}}$

57. Which of the following does not act as a neurotransmitter ?
(A) Acetyl-choline (B) Glutamic acid (C) Epinephrine (D) Tyrosine
Ans : (D)
Hints : Tyrosine is not a neurotransmitter, it is an amono acid.

58. The generation of excitation-contraction coupling involves all the following events except :
(A) Generation of end-plate potential (B) Release of calcium from troponin
(C) Formation of cross-linkages between actin and myosin (D) Hydrolysis of ATP to ADP
Ans : (B)
Hints : During generation of excitation contraction coupling calcium is attached to troponin.

59. In AIDS, HIV kills :
(A) Antibody molecule (B) T_{HELPER} cell (C) Bone-Marrow cells (D) $T_{Cytotoxic}$ cell
Ans : (B)
Hints : HIV kills helper T cells.

60. Generally artificial Pacemaker consists of one battery made up of
(A) Nickel (B) Dry Cadmium (C) Photo Sensitive Material (D) Lithium
Ans : (D)
Hints : Lithium halide battery is used in artificial pacemaker

61. Goitre can occur as a consequence of all the following except :
(A) Iodine deficiency (B) Pituitary Adenoma
(C) Grave's disease (D) Excessive intake of exogenous thyroxine
Ans : (D)
Hints : Excessive intake of exogenous thyroxine will not produce the symptoms of Goitre.

62. Pernicious anaemia results due to deficiency of
(A) Vit B_1 (B) Vit A (C) Vit B_{12} (D) Iron
Ans : (C)

Hints : Pernicious anaemia is caused by deficiency of vit B_{12} or Cyanocobalamine.

63. Which of the following substances yield less than 4 Kcal/mol when its phosphate bond is hydrolysed
(A) Creatine Phosphate (B) ADP (C) Glucose-6-Phosphate (D) ATP
Ans : (C)

64. The Genetic deficiency of ADH-receptor leads to
(A) Diabetes mellitus (B) Glycosuria (C) Diabetes Insipidus (D) Nephrogenic Diabetes
Ans : (D)
Hints : Nephrogenic diabetes is due to genetic deficiency of ADH-receptor linked to x-chromosome.

65. Out of A-T, G-C pairing, bases of DNA may exist in alternate valency state owing to arrangement called
(A) Tautomerisational mutation (B) Analogue substitution
(C) Point mutation (D) Frameshift mutation
Ans : (A)
Hints : Tautomers are isomers of organic compund that readily interconvert by a chemical reaction. Commonly this reaction result in the formed migration of a H-atom or proton.

66. Cellular Totipotency was first demonstrated by
(A) F.C. Steward (B) Robert Hooke (C) T.Schwann (D) A.V. Leeuwenhock
Ans : (A)

67. Molecular scissors which cut DNA at specific site is
(A) Pectinase (B) Polymerase
(C) Restriction endo nuclease (D) Ligase
Ans : (C)
Hints : Restriction endonuclease is used to cut DNA at specific site (molecular scissor).

68. SO_2 pollution is indicated by
(A) *Desmodium* (Grasses) (B) *Sphagnum* (Mosses) (C) *Usnea* (Lichens) (D) *Cucurbita* (Climbers)
Ans : (C)
Hints : Lichon is the indicator of SO_2 pollution

69. Sporopollenin is chemically
(A) Homopolysaccharide (B) Fatty substance (C) Protein (D) Heteropolysaccharide
Ans : (B)
Hints : Sporopollenin is chemically a fatty substance that persits in fossil state.

70. During replication of DNA, Okazaki fragments are formed in the direction of :
(A) $3' \rightarrow 5'$ (B) $5' \rightarrow 3'$ (C) $5' \rightarrow 5'$ (D) $3' \rightarrow 3'$
Ans : (B)
Hints : Okazaki fragments are formed in the direction of $5' \rightarrow 3'$, they join after wards.

71. The chemical nature of chromatin is as follows :
(A) Nucleic acids (B) Nucleid acid & histone proteins
(C) Nucleic acids, histone & non histone proteins (D) Nucleic acids & non-histone proteins
Ans : (C)
Hints : Chromatin = nucleic acid + histone proteins + non - histone proteins.

72. Choose the minor carp from the following :
(A) *Cyprinus carpio* (B) *Labeo calbasu*
(C) *Labeo bata* (D) *Ctenopharyngodon idella*
Ans : (C)
Hints : *Laveo bata* is a minor carp., it size is smaller and growth rate slower.

73. The scientific name of Asian tiger mosquito :
(A) *Aedes aegypti* (B) *Aedes albopictus* (C) *Aedes taeniorhynchus* (D) *Aedes albolineatus*

Ans : (B)

Hints : *Aedes albopictus* is an Asian tiger mosquito.

74. The size of filtration slits of Glomerulus :
(A) 10 nm (B) 15 nm (C) 20 nm (D) 25 nm
Ans : (D)
Hints : Average size of filteration slit of glomerulus is 25 nm.

75. *Ornithorhynchus* is an example of :
(A) Dinosaur (B) Monotreme mammal (C) Marsupial mammal (D) Eutherian mammal
Ans : (B)
Hints : *Ornithorhynchus* (Duckbilled platypus) is monotreme.

76. *Scirpophage incertulus* is an example of :
(A) Monophagus pest (B) Diphagus pest (C) Oligophagus pest (D) Polyphagus pest
Ans : (A)
Hints : *Scrirpophaga incertelus* is a monophagus pest that feeds on a single plant.

77. Which one of the following ancestors of man first time showed bipedal movement ?
(A) Australopithecus (B) Cro-magnon (C) Java apeman (D) Peking man
Ans : (A)

78. Trophic levels in ecosystem is formed by :
(A) only bacteria (B) only plants
(C) only herbivores (D) Organisms linked in food chain
Ans : (D)
Hints : Trophic levels in ecosystem is formed by organisms linked in the food chain.

79. The life span of Honey bee drone is :
(A) 3 – 4 months (B) 1 – 2 months (C) 6 – 7 months (D) 10 – 12 months
Ans : (A)

80. Name of a gaseous plant hormone is
(A) IAA (B) Gibberellin (C) Ethylene (D) Abscisic acid
Ans. : (C)
Hints : Ethylene is a gaseous plant hormone that acts for ripening.

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BIOLOGY

SECTION-II

1. Name one each specific plant hormone which perform the following exclusive physiological roles :
   a. Maintenance of apical dominance of shoots
   b. Internodal elongation
   c. Enhancement of cell division
   d. Change of sex in flowers

   A. a) Apical dominance of shoot is maintained by Auxin
   b) Internodal elongation by gibberellin
   c) Enhancement of cell division by cytokinin
   d) Change of sex in flowers G.A/Auxin/CK

2. Mention the function of the enzyme aconitase in Kreb's cycle

   A. $Citrate \xrightarrow{Aconitase\ ,\ Fe^{2+}} Cis\ aconitate$

   $Cis\ aconitate \xrightarrow{Aconitase} Isocitrate$

3. Write down the scientific names of potato and tomato plants

   A.

Name	**Scientific name**	**family**
Patato	Solanum tuberosum	Solanaceae
Tomato	Lycopersicum esculentum	Solanaceae

4. Why honey bee is regarded as social insect?

   A. In bee hive labour based division in found, each having specific function. Queen bee lays eggs, while sterile females act as workers to perform all works of the hive including collection of nectar, formation of honey, rearing of young etc. Drone or male bees only act during the process of mating to provide spermatozoa

5. What are biopesticides ? Give two examples.

   A. Biopestisides are those biological agents that are used for control of weeds, insects and pathogens
   a) Nicotine-tobaco
   b) Azadirachtin-Neem

6. What is Biosphere Reserve? State the main functions of biosphere reserve

   A. Biosphere Reserve are multipurpose protected areas which are meant for preserving genetic diversity. It has 3 zones.
   1) Core or Natural zone
   2) Buffer zone
   3) Transition zone or Manupulation zone.

   Function a) Restoration
   b) Conservation
   c) Development
   d) Monitoring
   e) Education and Research

7. What are stem cells ?

A. Stem cells are cells found in most, if not all, multicellular orginism. They are characterised by the ability to renew themselves through mitotic cell division and differentiating into diverse range of specialised cell types.

Example : Bone marrow cells

8. How ADH increases Blood Pressure?

A. ADH hormone is associated with water absorption by kidney. Hyposecretion of ADH leads to low water absorption and volume of urine is increased so. vol of blood will decrease and finally BP will decrease. More ADH leads to increased blood volume and consequently high B.P. ADH also related to vasoconstriction leading to high B.P.

9. Name two end-products of β -oxidation of fatty acid

A. Two products of - β Oxidation

a) Acetyl CoA

b) $FADH_2$

c) $NADH_2$

10. Mention of transformation event of immature sperm to matured spermatozoa. State the specific location of Sertoli cell within Testis.

A. Cell membrane and nuclear membrane start dissociation. Golgi structure modifies to form acrosome cap to contain the enzymes. Mitochondria increases in number and arrange in the middle piece. Distal centriole acts as basal body to give rise to flagella.