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ANSWERS & HINTS

for

WBJEE - 2010

by Aakash Institute & Aakash IIT-JEE

MULTIPLE CHOICE QUESTIONS
SUB : BIOLOGY

1. First Genetically modified plant commercially released in India is :
 (A) Golden rice (B) Slow ripening tomato (C) Bt-brinjal (D) Bt-Cotton
Ans : (D)
Hints : Bt cotton was developed by MAHYCO (Maharashtra Hybrid Seed Company Limited) in collaboration with Monsanto.
2. Quiescent centre is found in plants at :
 (A) Root tip (B) Cambium (C) Shoot tip (D) Leaf tip
Ans : (A)
Hints : It is a zone of low mitotic activity located in the sub-apical region of root.
3. In a DNA molecule distance between two bases is
 (A) 2 nm/20Å (B) 0.2 nm/2Å (C) 3.4 nm / 34 Å (D) 0.34 nm/3.4 Å
Ans : (D)
Hints : The distance between two bases is 0.34 nm / 3.4 Å
4. Exine of pollen grain is made up of
 (A) Pectocellulose (B) Ligno cellulose (C) Sporopollenin (D) Pollen Kit
Ans : (C)
Hints : Sporopollenin is the product of oxidative polymerisation of carotenoids.
5. When the cell is fully turgid, its
 (A) $DPD = OP$ (B) $DPD = \text{Zero}$ (C) $WP = TP$ (D) $OP = \text{Zero}$
Ans : (B)
Hints : Since $DPD = OP - TP$
 In a fully turgid cell, $OP = TP$
 $\therefore DPD = \text{Zero}$
6. Which one is true for ATP ?
 (A) ATP is prosthetic part of an enzyme (B) ATP is an enzyme
 (C) ATP is organic ions of enzyme (D) ATP is a Co-enzyme
Ans : (D)
Hints : ATP is a multifunctional nucleotide which acts as a coenzyme.
7. Root cells of Wheat has $2n = 42$ chromosomes. Which one of the following is the basic chromosome number of Wheat ?
 (A) 42 (B) 21 (C) 7 (D) 14
Ans : (C)

Hints : For wheat, $2n = 6x = 42$

$\therefore x = 7$

'x' represents basic or genomic number.

8. Purines possess nitrogen at

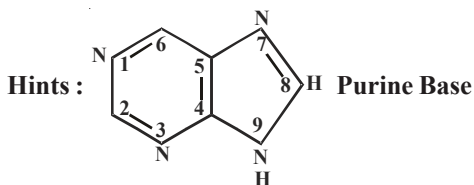
(A) 1, 2, 4 and 6 position

(B) 1, 3, 5 and 7 position

(C) 1, 3, 7 and 9 position

(D) 1, 2, 6 and 8 position

Ans : (C)



9. Thylakoids occur inside

(A) Mitochondria

(B) Chloroplast

(C) Golgi apparatus

(D) Endoplasmic reticulum

Ans : (B)

Hints : Thylakoid occurs in chloroplast.

10. Micropropagation is a technique

(A) for production of true to type plants

(B) for production of haploid plant

(C) for production of Somatic hybrids

(D) for production of Soma clonal plants

Ans : (A)

Hints : Raising of new plantlets through tissue culture technique producing similar plants (true type plants).

11. Test cross is a cross between

(A) Hybrid \times Dominant parent

(B) Hybrid \times Recessive parent

(C) Hybrid \times Hybrid parent

(D) Two distantly related species

Ans : (B)

Hints : Test cross - F_1 hybrid is crossed with recessive parent.

12. Mitochondria are semi autonomous as they possess

(A) DNA

(B) DNA + RNA

(C) DNA + RNA Ribosomes

(D) Protein

Ans : (C)

Hints : Due to presence of 70s ribosome, RNA and *ds* circular DNA mitochondria is semiautonomous.

13. Chitin is a

(A) Polysaccharide

(B) Nitrogenous polysaccharide

(C) Lipo Protein

(D) Protein

Ans : (B)

Hints :

Polymer of N-acetylglucosamine ($C_8H_{13}O_5N$)_n that forms exoskeleton of arthropods and cell wall of fungi.

14. Balbiani rings are the sites of

(A) DNA replication

(B) RNA and protein synthesis

(C) Synthesis of lipids

(D) Synthesis of polysaccharides

Ans : (B)

Hints : These rings contain active DNA so RNA and proteins are synthesized here.

15. Which of the cell organelle lacks membrane ?

(A) Mesosome

(B) Mitochondria

(C) Ribosome

(D) Liposome

Ans : (C)

Hints : Smallest cell organelle without cell membrane is ribosome.

16. Interfacicular cambium is a
 (A) Primary meristematic tissue (B) Primordial meristem
 (C) Type of Protoderm (D) Secondary meristematic tissue
Ans : (D)
Hints : Parenchymatous cells present between two vascular bundles give rise to interfascicular cambium after dedifferentiation.
17. Cotton fibre is basically a type of
 (A) Trichome (B) Scale (C) Dried seed coat (D) Non glandular hair
Ans : (D)
Hints : Cotton fibres are epidermal out growth in form of hairs.
18. Chloroplast dimorphism is a characteristic feature of
 (A) Plants with Calvin cycle (B) C₄-Plants
 (C) All plants (D) Only in algae
Ans : (B)
Hints : Two types of chloroplast are found in plant having Kranz anatomy
19. In which type of reactions related to plant photosynthesis peroxisomes are involved ?
 (A) Glycolate cycle (B) Calvin cycle
 (C) Bacterial photosynthesis (D) Glyoxylate cycle
Ans : (A)
Hints : Peroxisome perform photorespiration that is also called as glycolate cycle.
20. The term Alpha diversity refers to
 (A) Genetic diversity (B) Community & ecosystem diversity
 (C) Species diversity (D) Diversity among the plants
Ans : (B)
Hints : Alpha diversity is a type of community or ecosystem diversity
21. How many variable segments are present in the basic structure of antibody molecules ?
 (A) One (B) Two (C) Three (D) Four
Ans : (D)
Hints : 2 present in heavy chain and 2 present in light chain.
22. Which one is diaminodicarboxylic amino acid ?
 (A) Cystine (B) Lysine (C) Cysteine (D) Aspartic Acid
Ans : (a)
Hints : The chemical formula is (SCH₂-CH(NH₂)CO₂H)₂
23. Which one is the cofactor of carbonic anhydrase ?
 (A) Fe (B) Zn (C) Cu (D) Mg
Ans : (B)
Hints : 'Zn' acts as cofactor for carbonic anhydrase
24. Vitamin - D is produced in human body in -
 (A) Muscles (B) Nerves (C) Skin (D) Bone-marrow
Ans : (C)
Hints : Vitamin D is synthesized in the skin in presence of sunlight
25. Bacteriophages kill
 (A) Fungi (B) Parasites (C) Bacteria (D) Viruses
Ans : (C)
Hints : A virus that is parasite over bacteria is called Bacteriophage
26. What is mitoplast ?
 (A) Membraneless mitochondria (B) Another name of mitochondria
 (C) Mitochondria without outer membrane (D) Mitochondria without inner membrane
Ans : (C)
Hints : Mitochondria without outer membrane is called as mitoplast.

27. Transposons are –
 (A) House - keeping genes (B) Jumping genes
 (C) Transporting genes (D) Stationary genes
Ans : (B)
28. Which of the following is not a conjugated protein ?
 (A) Peptone (B) Phosphoprotein (C) Lipoprotein (D) Chromoprotein
Ans : (A)
Hints : Peptone is a derived protein. Others are conjugated proteins.
29. The outer covering of cartilage is called
 (A) Peritonium (B) Periosteum (C) Endosteum (D) Perichondrium
Ans : (D)
Hints : Perichondrium is the outer covering of cartilage.
30. The blood does not clot inside the body because of :
 (A) Oxygenation of blood (B) Movement of blood
 (C) Heparin in blood (D) Absence of fibrinogen in blood
Ans : (C)
Hints : Heparin prevent clotting of blood inside the body.
31. Red cell count is carried out by –
 (A) Haemocytometer (B) Haemoglobinometer
 (C) Sphygmomanometer (D) Electrocardiogram
Ans : (A)
Hints : Blood corpuscle counting is done by this instrument.
32. Rh factor can produce disease
 (A) AIDS (B) Turner's Syndrome (C) Erythroblastosis foetalis (D) Sickle - cell anaemia
Ans : (C)
Hints : During second pregnancy it may rupture foetal RBC due to antibody agglutination if the father is Rh⁺ ve and the mother is Rh⁻ ve.
33. Name the hormone that stimulates the secretion of gastric juice
 (A) Renin (B) Enterokinase (C) Enterogastrone (D) Gastrin
Ans : (D)
Hints : Gastric glands are activated by this secretion of Argentaffin cell.
34. Bile salts act as activator of which enzyme ?
 (A) Pepsinogen (B) Trypsinogen (C) Lipase (D) Pancreatic amylase
Ans : (C)
Hints : Bile salt activates lipase & also emulsifies the fat
35. Heparin is produced by –
 (A) Kidney Cells (B) Blood Cells (C) Bone marrow (D) Liver cell
Ans : (D)
Hints : Heparin is produced by liver cells mainly.
36. Which of the following cells produce HCl ?
 (A) β -Cell (B) α -Cell (C) Oxyntic Cell (D) Chief Cell
Ans : (C)
Hints : Oxyntic or parietal cell of stomach secretes HCl.
37. Which ribs show "bucket - handle" type of movement ?
 (A) Rib No. 1 – 2 (B) Rib No. 3 – 5 (C) Rib No. 6 – 10 (D) Rib No. 11 – 12
Ans : (C)
Hints : The upward and downward movement of the shaft of the rib no 6 - 10 has been likened to raising the handle from the side of a bucket. Therefore, they show bucket handle movement

38. In which of the following subjects the dead space is highest ?
(A) Old man (B) Old woman (C) Young man (D) Young woman
Ans : (A)
Hints : Old man having high dead space volume due to low supply of blood to lungs
39. Which one has the thickest wall ?
(A) Right auricle (B) Right Ventricle (C) Left auricle (D) Left ventricle
Ans : (D)
Hints : The thickest wall of heart is found in left ventricle.
40. The cardiac cycle in normal subject is about
(A) 0.5 second (B) 0.8 second (C) 1.0 second (D) 1.2 second
Ans : (B)
Hints : One cardiac cycle is completed in 0.8 sec.
41. What is glycosuria ?
(A) Low amount of sugar in urine (B) Low amount of fat in urine
(C) Average amount of carbohydrate in urine (D) High amount of sugar in urine
Ans : (D)
Hints : Glycosuria is the high amount of sugar in urine mainly due to insulin deficiency.
42. Volume of urine is regulated by –
(A) Aldosterone (B) Aldosterone and testosterone
(C) ADH (D) Aldosterone and ADH
Ans : (D)
Hints : Volume of urine is regulated by Aldosterone and ADH via RAAS involving juxta medullary nephron.
43. Skin is an accessory organ of respiration in –
(A) Human (B) Frogs (C) Rabbit (D) Lizard
Ans : (B)
Hints : Skin is an accessory respiratory organ in amphibians.
44. Name the condition when the concentration of Ketone body increases in urine
(A) Acromegaly (B) Diabetes mellitus (C) Diabetes insipidus (D) Cushing's disease
Ans : (B)
Hints : In diabetes mellitus ketone body synthesis increases due to cellular starvation.
45. Hormone responsible for the secretion of milk after parturition
(A) ICSH (B) Prolactin (C) ACTH (D) LH
Ans : (B)
Hints : Prolactin secreted from pituitary is responsible for secretion of milk after parturition.
46. Endemic goitre is a state of
(A) Increased thyroid function (B) Normal thyroid function
(C) Decreased thyroid function (D) Moderate thyroid function
Ans : (C)
Hints : Endemic goitre is due to low iodine in soil and water in hilly areas.
47. Islets of Langerhans are found in
(A) Anterior Pituitary (B) Kidney Cortex (C) Spleen (D) Endocrine pancreas
Ans : (D)
Hints : Islets of Langerhans are the endocrine part of pancreas.
48. Which of the following is the function of Adrenaline ?
(A) Helps in gastric juice secretion (B) Increases heart rate and blood pressure
(C) Increases blood calcium (D) Helps in milk secretion
Ans : (B)
Hints : Adrenaline is released in stress condition and is responsible for increased heart rate and blood pressure.

49. Which of the following is not related to the autonomic nervous system ?
(A) Peristalsis (B) Digestion (C) Excretion (D) Memory and learning
Ans : (D)
Hints : Autonomic nervous system controls involuntary functions of the visceral organs.
50. Comprehension of spoken and written words take place in the region of
(A) Association Area (B) Motor Area (C) Wernicke's Area (D) Broca's Area
Ans : (C)
Hints : Wernicke's area is responsible for understanding speech.
51. Which one of the following cranial nerves is carrying the nerve fibres originating from the Edinger-Westphal nucleus ?
(A) Oculomotor (B) Trochlear (C) Abducens (D) Vagus
Ans : (A)
Hints : Oculomotor nerve has oculomotor nucleus and Edinger-Westphal nucleus.
52. How many laminae are present in the grey matter of spinal cord ?
(A) Four (B) Six (C) Eight (D) Ten
Ans : (D)
Hints : Rexed, based on the cyto architectural pattern as well as on the density of neuronal packing, identified several groups of arrangement which are 10 in number and now called Rexed laminae.
53. Colour blindness is due to defect in
(A) Cones (B) Rods (C) Rods and cones (D) Rhodopsin
Ans : (A)
Hints : Cones are related with coloured vision.
54. MRI is not allowed in the following conditions except one. Identify the exception.
(A) Presence of pacemaker in the body
(B) Pregnant women
(C) Person suffering from stroke
(D) Presence of metallic plate in the body for treatment of broken bones
Ans : (B)
Hints : It uses no ionizing radiation, but uses a powerful magnetic field to align the nuclear magnetization of Hydrogen atom in water inside body.
55. Which of the following diseases is related to cadmium pollution ?
(A) Minamata (B) Pneumoconiosis (C) Anaemia (D) Itai-itai
Ans : (D)
Hints : Itai-Itai (ouch-ouch disease) is due to Cd poisoning in the drinking water result into skeletal deformity.
56. Percentage composition of Fibroin and Sericin in silk is
(A) 50 : 40 (B) 80 : 20 (C) 30 : 70 (D) 40 : 60
Ans : (B)
Hints : Fibroin is the core silk protein and sericin is the surface gum-like compound.
57. Which one of the following is used as biological insecticide ?
(A) Tiger beetle (B) Caterpillar (C) Silkworm (D) Mazra Poka
Ans : (A)
Hints : Caterpillar - larval stage of insects, silkworm is used in silk culture and Mazra poka is the paddy pest.
58. Which one of the following diseases is spread by Housefly ?
(A) Dengue fever (B) Encephalitis (C) Filariasis (D) Typhoid
Ans : (D)
Hints : Others are spread by mosquito.
59. Water-Vascular system is found in
(A) Sea-anemone (B) Sea-pen (C) Sea-cucumber (D) Sea-horse
Ans : (C)
Hints : Water vascular system is found in echinoderms.

60. Nutrient enrichment of a lake will cause
 (A) Eutrophication (B) Stratification (C) Biomagnification (D) Bioaccumulation
Ans : (A)
Hints : Eutrophication or nutrient enrichment of water body is basically due to excessive presence of nitrates & phosphates.
61. Lichens are described as indicator of
 (A) Air pollution (B) Water pollution (C) Soil pollution (D) Agriculture productivity
Ans : (A)
Hints : Lichens are indicator plant of air pollution particularly of SO₂
62. Most abundant mineral of animal body is
 (A) Iron (B) Sodium (C) Potassium (D) Calcium
Ans : (D)
Hints : Primary component of bones and also present in muscles and blood.
63. Retrogressive metamorphosis occurs in
 (A) Hemichordata (B) Cephalochordata (C) Urochordata (D) Vertebrata
Ans : (C)
Hints : Larva is more developed and has notochord and locomotory organ
64. 'Organ of Jacobson' helps in
 (A) Touch (B) Vision (C) Smell (D) Hear
Ans : (C)
Hints : Also called vomeronasal organ. It is an olfactory sense organ. Commonly found in reptiles.
65. Cysticercus stage is formed in
 (A) *Taenia* (B) *Plasmodium* (C) *Leishmania* (D) *Wuchereria*
Ans : (A)
Hints : Formed in the life-cycle of pork tapeworm (*Taenia solium*)
66. Which one of the following viruses contains both DNA and RNA ?
 (A) Cyanophage (B) Herpes Virus (C) Leuko Virus (D) Polio Virus
Ans : (C)
Hints : Lenko virus (a Retro virus) possess both DNA & RNA in life cycle.
67. The hormone responsible for "Fight and Flight" response is
 (A) Adrenalin (B) Thyroxine (C) ADH (D) Oxytocin
Ans : (A)
Hints : Fight and flight response is due to adrenalin released from adrenal medulla.
68. Tuberculosis is caused by :
 (A) *Mycobacterium sp.* (B) *Aspergillus sp.* (C) *Clostridium sp.* (D) *Vibrio sp.*
Ans : (A)
Hints : T. B. is caused by *Mycobacterium tuberculi*.
69. Which of the following is a catadromous fish ?
 (A) *Hilsa sp.* (B) *Mystus sp.* (C) *Anguilla sp.* (D) *Channa sp.*
Ans : (C)
Hints : *Anguilla sp.* (Eel) is a catadromous fish that lives in freshwater and breeds in sea.
70. Which animal of the following belongs to class crustacea ?
 (A) Cockroach (B) Cyclops (C) Grasshopper (D) Mosquito
Ans : (B)
Hints : Class crustacea includes *cyclops*. Other options are from class insecta.
71. Radula is found in :
 (A) *Pila sp.* (B) *Chiton sp.* (C) *Lamellidens sp.* (D) *Pinctada sp.*
Ans : (A)
Hints : Radula is found in gastropods.

72. The scientific name of Java man is
 (A) *Homo habilis* (B) *Homo sapiens neanderthalensis*
 (C) *Homo erectus erectus* (D) *Australopithecus boisei*
Ans : (C)
Hints : Scientific name *Homo erectus erectus* was given by Ernst Mayr.
73. Which phase comes in between the G₁ and G₂ phases of cell cycle ?
 (A) M-phase (B) Go-phase (C) S-phase (D) Interphase
Ans : (C)
Hints : The sequence of Interphase (I-phase) is G₁ → S → G₂
74. How many effective codons are there for the synthesis of twenty amino acids ?
 (A) 64 (B) 32 (C) 60 (D) 61
Ans : (D)
Hints : Out of 64 codons, 61 codons code for amino acids & the rest three - UAG, UAA & UGA are stop codons (i.e do not specify any amino acid)
75. Which of the following condition is called monosomic ?
 (A) 2n+1 (B) 2n+2 (C) n+1 (D) 2n-1
Ans : (D)
Hints : Monosomy (2n-1) is a kind of aneuploidy where one chromosome is devoid of its homologue.
76. Chromosome is made up of
 (A) DNA + pectin (B) RNA + DNA (C) DNA + Histone (D) Only histone
Ans : (C)
Hints : Chemical composition of a typical chromosome : DNA=40%, Histone = 50%, Non histone = 8.5%, RNA=1.5%
77. Cell division can not be stopped in which phase of the cell cycle ?
 (A) G₁-phase (B) G₂-phase (C) S-phase (D) Prophase
Ans : (C)
Hints : The check points are basically present in the interphase.
78. Which of the following is structural subunit of DNA ?
 (A) Protein (B) Carbohydrate (C) RNA (D) Nucleotides
Ans : (D)
Hints : DNA is the polymer of deoxyribonucleotides.
79. Cell theory is not applicable for
 (A) Bacteria (B) Fungus (C) Algae (D) Virus
Ans : (D)
Hints : Since virus lacks cellular organization so, cell theory is not applicable.
80. The difference between systolic and diastolic pressure in human is
 (A) 120 mmHg (B) 80 mmHg (C) 40 mmHg (D) 200 mmHg
Ans : (C)
Hints : This is called as pulse pressure. Normal systolic pressure = 120 mm Hg
 Normal Diastolic pressure = 80 mm Hg

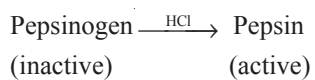


DESCRIPTIVE TYPE QUESTIONS
SUB : BIOLOGY

1. What is Cochlear microphonics ?
A. It is the electrical potential generated in the hair cells of organ of Corti in response to acoustic stimulation, called as cochlear microphonic.
2. What is axon reflex ?
A. Axon reflex is a response brought on by peripheral nerve stimulation. It is also known as Hunter reflex reaction as it causes vasodilation and loss of body heat from extremities.
3. What is enterohepatic circulation of bile salt ? Mention its significance .
A. Enterohepatic recirculation operates between ileum and liver in which bile salts are absorbed from ileum and re-enters into liver for the reutilisation of bile salts.
4. Mention the location and function of juxtaglomerular apparatus .
A. JGA is found between the vascular pole of the renal corpuscle and the returning DCT of the same nephron.
Function of JGA : It secretes renin & erythropoietin. Renin controls RAAS and is responsible for osmoregulation.
5. What is telomere ? State its function .
A. Telomere is a region of repetitive DNA at the end of a chromosome. It protects the end of the chromosome from deterioration.
6. Name two internal characteristic features of class Mammalia.
A. Internal characteristic of class mammalia
 - Presence of corpus callosum in brain.
 - Presence of Sertoli cells in testis.
 - Presence of diaphragm.
 - Presence of spongy lungs.
 - Presence of corpus luteum
7. State the advantages of composite fish culture.
A. Advantage of composite fish culture are
 1. Different type of carps reared in the same pond.
 2. It is economical and highly productive.
 3. Carps reared in different strata of pond habitat utilise different types of food.
8. What is ribophorin ?
A. Ribophorins are ribosome receptor proteins that aid in the binding 60S subunit of ribosomes to the rough endoplasmic reticulum. Two kinds of Ribophorins are Ribophorin I and Ribophorin II.

9. What is Pro-enzyme ?

A. These are inactive forms of enzymes which are activated in presence of activators.



10. Name two sulphur containing and two basic amino acids .

A. The sulphur containing amino acids are

– Methionine

– Cysteine

– Cystine

Basic amino acids are :

– Lysine

– Arginine

– Histidine

