



WBJEE (Medical) 2014

Solution

BIOLOGICAL SCIENCES

Category – I

1. The frequency of crossing-over occurring between two genes located on the same chromosome depends on
Solution : (D) Distance between two genes
2. Select the CORRECT statement related to mitosis
Solution : (B) Amount of DNA in the parent cell is first doubled and then distributed into two daughter cells
3. Chlorophyll molecules are located in the
Solution : (A) Thylakoid membrane
4. The Respiratory Quotient (RQ) of glucose is
Solution : (C) 1.0
5. Cleistogamous flowers are
Solution : (B) Bisexual flowers which remain closed
6. Cross-pollination through insect agent is called
Solution : (C) Entomophily
7. Emasculation ensures cross-pollination in
Solution : (B) Bisexual flower
8. Pseudopodia are produced by
Solution : (D) Fibroblast Cell
9. In which one of the followings, expenditure of energy is required ?
Solution : (C) Active transport
10. The protein component of a holoenzyme is known as
Solution : (D) Apoenzyme
11. Industrial Melanism is an
Solution : (D) Evidence in favour of Natural Selection
12. Genes which are located only in the X-Chromosome are known as
Solution : (A) Epistasis genes
13. The concept of Hot-Spot was first introduced by
Solution : (C) Myers
14. The objective of 'Ramsar Convention' was
Solution : (C) Wetland conservation

15. 'Kyoto Protocol' is a multination international treaty for
Solution : (A) Phasing out green house gases
16. Which of the following human parasites require mosquito to complete their life-cycle ?
Solution : (D) *Wuchereria bancrofti* and *Plasmodium ovale*
17. Which one is an example of living fossil ?
Solution : (D) King crab
18. Management of National Park is controlled by
Solution : (B) Central Government
19. The removal of 'Keystone' species will affect
Solution : (C) The ecosystem
20. The volume of air that can be breathed in by maximum forced inspiration over and above the normal inspiration is called
Solution : (B) Inspiratory Reserved Volume
21. The serous membrane which covers the lungs is called
Solution : (D) Pleura
22. How many ATP are produced when one molecule of $FADH_2$ is oxidized to FAD through Electron Transport System ?
Solution : (A) 2
23. Which excitatory neurotransmitter is involved in the transmission of impulse at the neuro-muscular junction?
Solution : (C) Acetyl choline
24. Which blood cells can engulf bacteria by phagocytosis ?
Solution : (C) Neutrophil and Monocyte
25. Which area of cerebral cortex is responsible for the interpretation of speech ?
Solution : (B) Wernicke's area
26. Which of the following processes was discovered by Lederberg and Tatum (1946) ?
Solution : (D) Conjugation
27. Proximal convoluted tubule of nephron is responsible for
Solution : (C) Selective reabsorption of glucose, amino acid, NaCl and water
28. The component of bacteria that retains the crystal violet stain during Gram-staining is
Solution : (C) Peptidoglycan
29. One molecule of triglyceride is produced using
Solution : (D) Three fatty acids and one glycerol
30. Which one of the followings is enriched with a non-reducing sugar ?
Solution : (C) Table sugar
31. Glutenin is an important protein in
Solution : (B) Wheat
32. The primary cell wall is mainly made up of
Solution : (C) Cellulose
33. Which of the following is always ABSENT in prokaryotic cells ?
Solution : (B) Mitochondria

34. Which of the following statements is wrong for sucrose ?
Solution : (D) It is comprised of maltose and fructose
35. Which of the following tissues provide maximum mechanical support to plant organs ?
Solution : (A) Sclerenchyma
36. In apple, the edible portion is
Solution : (D) Thalamus
37. Insect pest resistant Bt-cotton plant was developed using
Solution : (D) Transgenic technology
38. Which one of the followings is a growth regulator produced by plants ?
Solution : (B) Zeatin
39. Anish is having colour-blindness and married to Sheela, who is not colour-blind. What is the chance that their son will have the disease ?
Solution : (D) 0%
40. K_m is
Solution : (C) Constant
41. Juvenile hormone in insects is released from
Solution : (C) Corpora Allata
42. Formation of polysome does not require
Solution : (D) snRNA
43. Proteins helping in Kinetocore formation of yeast are
Solution : (D) CBF2, CBF3 and Kar³ P
44. With the rise of water temperature, dissolved oxygen
Solution : (C) decreases in amount
45. Which codon is not an indicator of completion of protein synthesis ?
Solution : (B) AUG
46. Intermediate host of malarial parasite is
Solution : (B) Man
47. In which diagnostic system, Piezoelectric effect and Reverse Piezoelectric effect are involved ?
Solution : (C) USG
48. The body of Rohu fish is covered by
Solution : (A) Cycloid scale but the tail is homocercal
49. Main cause of Eutrophication is
Solution : (C) Enrichment of nutrients
50. Objects less than $0.2 \mu\text{m}$ in size cannot be seen under light microscope because
Solution : (A) The wave length of visible light is 3900 \AA to 7800 \AA
51. Immunity that develops in the fetus after receiving antibodies from mother's blood through placenta is
Solution : (C) Naturally acquired passive immunity
52. If the sequence of bases in the coding strand of a double stranded DNA is $5' \text{ GTTCGAGTC} - 3'$ in its transcript will be
Solution : (C) $5' \text{-GUUCGAGUC-3'}$

53. Which valve is present at the opening of coronary sinus?
Solution : (C) Thebesian valve
54. The disease that occurs in mature adult human being due to deficiency of calciferol is
Solution : (B) Osteomalacia
55. Which of the following organs does not produce any digestive enzymes?
Solution : (C) Liver
56. Which of the following bacteria is observed as chain-like formation?
Solution : (C) *Streptococcus pyogenes*
57. During gene cloning, the enzyme used to join the insert DNA the plasmid vector is
Solution : (A) DNA ligase
58. Which of the following pituitary hormones is secreted without the involvement of a releasing hormone (RH) ?
Solution : (C) Oxytocin
59. Which of the following is **NOT** involved in muscular contraction?
Solution : (D) Magnesium ion
60. Which of the following hormones is a derivative of fatty acid?
Solution : (D) Prostaglandins

Category – II

61. Match the items in column I with those in column II, and choose the CORRECT answer.
Solution : (B) P-iii, Q-i, R-iv, S-ii
62. Out of 38 molecules of ATP produced upon aerobic respiration of glucose, the break up in ATP production in glycolysis (P), pyruvate to acetyl - CoA formation (Q) and Krebs cycle (R) is as follows
Solution : (B) P = 8, Q = 6, R = 24
63. The correct sequence of embryonic development is
Solution : (C) Zygote - Morula - Blastula - Gastrula - Embryo
64. Which of the following statements is wrong?
Solution : (D) Test tube baby grows following uterine fertilization
65. What type of cartilaginous tissue is found in the inter-vertebral discs?
Solution : (C) White fibrous cartilage
66. Absorption of vitamin B₁₂ in human requires "P" glycoprotein secreted from "Q". The correct choices of P and Q are
Solution : (B) P = intrinsic factor and Q = Stomach
67. The partial floral formula of a flower is $K_{(5)}C_5A_{(\infty)}\underline{G}_{(5)}$. Which of the following set of information is conveyed here ?
Solution : (A) gamosepalous, polypetalous, syncarpous and superior ovary
68. In a plant species, flower colour yellow is dominant over white, and fruit shape round is dominant over elongated. Crossing was performed between two pure lines-one having yellow-flower and round-fruit, and another with white-flower and elongated-fruit. About 20 plants survived in F₁ progeny. Plants of F₁ were allowed to self-fertilize, and about 960 plants wurvived in F₂. If the traits follow Mendelian inheritance, the number of plants would have yellow-flower and round-fruit in F₁ and F₂ are respectively
Solution : (B) 20, 540

69. The correct sequence of organelles in which glycolate and glyoxylate are produced sequentially in photorespiration, is
Solution : (B) Chloroplast and peroxisome
70. X-ray is needed for
Solution : (B) CT scanning
71. Cells die at the time of release of secretory materials in
Solution : (A) Holocrine gland
72. Which of the following statements are **TRUE** for "Motor cortex"?
Solution : (D) (i), (ii), (iv) and (vi)
73. If spermatogenesis proceeds too rapidly, Inhibin is released. Inhibin reduces the secretion of
Solution : (B) Follicle Stimulating Hormone (FSH)
74. The structure of *E. coli* chromosomal DNA is
Solution : (A) Double stranded, right handed and circular
75. The time interval of appearance of fever in the malarial patients depends on the types of malaria. The research evidences suggest that such time intervals are – (1) 36 to 48 hours, (2) 48 hours, and (3) 72 hours. If any such patient experiences fever at an interval of 48 hours, then the said patient suffers from
Solution : (D) Mild tertian malaria or Benign tertian malaria

Category – III

76. Genetically improved crop varieties can be developed in laboratory by
Solution : (A) Somatic hybridization, (B) Transgenic technology, (D) Somaclonal variation
77. Which of the following factor(s) increase blood pressure?
Solution : (A) Increase of cardiac output, (B) Constriction of blood vessel, (D) Increase of blood volume
78. Identify the correct statement(s) in relation to C₄ photosynthesis
Solution : (A) Kranz anatomy is an essential feature for C₄ plants, (B) C₄ plants have higher water use efficiency than C₃ plants, (C) Photorespiration can be minimized when C₄ pathway is in operation
79. Which of the following statement(s) are **TRUE**?
Solution : (B) Disinfectants have better bactericidal efficiency than antibiotics, (C) Antibiotics are of microbial origin but disinfectants are chemical compounds, (D) Antibiotics can be injected into the patients whereas disinfectants are not
80. Sand flies play significant role in spreading Kala-azar because they
Solution : (B) Convert amastigote into promastigote, (C) Engulf amastigote at the time of blood sucking from the infected persons, (D) Inject promastigote into the body of non-infected persons at the time of blood sucking

