

1. (C)

Auxin promotes Rhizogenesis (formation of roots)

Topic: Plant growth and development_ Sub-topic: Auxin_ L - 1

2. (D)

In embryos, extra embryonic membranes chorion and allantois help in gaseous exchange.

Topic: Human reproduction _ L - 3

3. (B)

Short day plants requires day length less than the critical day length.

Topic: Plant growth and development_ Sub-topic: Photoperiodism_ L-2

4. (D)

Two restriction sites for EcoRI will produce three fragments and three restriction sites for T₄ phage DNA will form four fragments.

Topic: Principle and process of Biotechnology_ Sub-topic: Gel electrophoresis_ L - 2

5. (C)

Bacteria synthesizes starvation proteins during stationary phase during which there is competition for available resources.

Topic: Plant growth and development_ Sub-topic: Geometric growth_ L - 3

6. (A)

In the pyramid of number of organisms are considered.

Topic: Ecosystem_ Sub-topic: Ecological Pyramids_ L - 3

7. (C)

Stratified squamous epithelium is found in Oesophagus.

Topic: Structural organization in Animals _ Sub-topic: Epithelial tissue _ L - 2

8. (B)

Fire burns the aerial part of vegetation.

Topic: Ecosystem_ Sub-topic: Ecological succession_ L - 3

9. (C)

Statement i, iv and v are correct.

Topic: Biomolecule_ Sub-topic: Water _ L - 2

10. (D)

When injected with Antigen A - antibody response was at its peak on 14th day. On restimulation with Antigen A and Antigen B, response to Antigen A will be much faster and reach its peak on 7th day as if is resensitized and as stimulation with Antigen B was for the first time it respond peak was attained on 14th day.

Topic: Human health and Disease _ Sub-topic: ____ L - 1

11. (B)

Photosynthetic organisms evolved oxygen

Topic: Cell as unit of life _ Sub-topic: Chloroplast and mitochondria _ L - 3

12. (D)

All the statements are correct.

Topic: Ecosystem _ Sub-topic: Ecological adaptations _ L - 2

13. (B)

Statements i and ii are correct.

Topic: Biomolecule _ Sub-topic: Lipid _ L - 2

14. (C)

Due to alkyl group, amino acid becomes rigid so it supports H - bonding.

Topic: Biomolecule _ Sub-topic: Structure of protein _ L - 2

15. (A)

i, iii and v are correct

Topic: Ecology _ Sub-topic: Ecological stress _ L - 3

16. (*)

17. (A)

Movement of oxygen molecules in the cell is an example of transport across all membranes by passive diffusion due to difference in concentration gradient between the blood and body cells.

Topic: Breathing and Respiration _ Sub-topic: _____ _ L - 1

18. (B)

Cytoplasmic streaming in a cell of chara doesn't require actin and myosin.

Topic: Cell as unit of life _ Sub-topic: Cytoskeleton _ L - 2

19. (B)

Lysosome doesn't have DNA so it can not synthesize its own protein.

Topic: Cell as unit of life _ Sub-topic: _____ _ L - 2

20. (C)

Nitrogen bend is avoided by diving mammals like whales because peripheral circulation is minimal while diving.

Topic: Breathing and Respiration L - 3

21. (C)

Frog's egg when centrifuged leads to abnormal development because the grey crescent is shifted horizontally.

Topic: Reproduction/animal kingdom _ L - 2

22. (C)
It removes the weaker members from ecosystem.

Topic: Ecology _ Sub-topic: Population interaction _ L - 3

23. (D)
The key event in embryo formation in humans are :
Fertilization → cleavage → Gastrulation → Neurulation → Organogenesis

Topic: Human Reproduction _ L- 1

24. (A)
The molecules absorbed and secreted into the lumen of malpighian bodies are sodium ureate by active transport and urea by diffusion. Transport and urea by diffusion.

Topic: Morphology and Anatomy of Cockroach _ L- 3

25. (A)
The least percentage of water is encountered in fluid in convoluted tubule.

Topic: Excretion and Osmoregulation _ L - 2

26. (B)
Vestigial organ in Bat is leg muscles, in mole - eyes, in python legs, in ostrich - wings.

Topic: Evolution_ L - 3

27. (C)
It can be expressed outside a eukaryotic cell.

Topic: Gene : Its structure and function _ Sub-topic: Reverse transcription _ L - 3

28. (C)
In presence of competitive inhibitor. The K_m remains same the affinity of substrate molecule with enzyme molecule will decrease so V_{max} will increase.

Topic: Biomolecules _ Sub-topic: Enzyme _ L - 3

29. (B)
During conjugation, one strand of F plasmid is copied and transferred to another bacteria. Recipient bacteria synthesizes the complementary strand and turns to F- positive bacteria.

Topic: Biological classification_ Sub-topic: Reproduction in Bacteria _ L - 3

30. (C)
Linear polymer of 30 Arginines are formed by release of 29 molecules of water molecule. So, its linear molecular weight will be.

$$(30 \times 174) - (18 \times 29) = 4698$$

Topic: Biomolecule _ Sub-topic: Protein _ L - 3

31. (B)

It is a fact.

Topic: Cell as unit of life _ Sub-topic: _____ L - 3

32. (D)

Nitella is a green alga which has high magnesium content when chlorine content in cytoplasm is high, sodium and potassium are almost same.

Topic: Cell : A unit of life _ Sub-topic: Chloroplast_ L - 3

33 (B)

NAD is the hydrogen acceptor in the oxidative phosphorylation of PGAL.

Topic: Respiration_ Sub-topic: Glycolysis_ L- 3

34. (C)

Secondary spermatocyte and spermatid are haploid cells rest germinal cell, spermatogonium and primary spermatocytes are diploid cells.

Topic: Human Reproduction _ Sub-topic: _____ _ L - 2

35. (D)

Prokaryotic cells do not have membrane bound cell organelles.

Topic: Cell : The unit of life _ Sub-topic: Prokaryotic cell _ L - 2

36. (C)

Acetyl CoA is involved in metabolic reaction. Such as respiration, oxidation of fats and protein metabolism.

Topic: Respiration_ Sub-topic: Application based _ L- 2

37. (B)

Propagules below the soil are not destroyed by fire.

Topic: Ecosystem_ Su-topic: Ecological succession_ L- 3

38. (D)

EMP pathway and lactate fermentation are anaerobic processes.

Topic: _____ sub- topic: _____ _ L -

39. (D)

mRNA is single stranded hence Erwin Chargaff's rule are not applicable.

Topic: Molecular basis of inheritance_ Sub-topic: RNA_ L- 3

40. (B)

Eukaryotic mRNA : 5' AUCGACGAUACGAAAGCCGUACGCUAU3'

DNA sequence after

Reverse transcription : 5'TAGCTGCTATGCTTTCGGCATGCCATA3'

Retrovirus Genome : 5'AUCGACGAUACGAAAGCCGUACGCUAU3'

Topic: Molecular Basis of Inheritance _ Sub-topic: Transcription_ L- 3

41. (D)

TATA box is the promoter region where the enzyme RNA polymerase binds.

Statement 4 is incomplete.

Topic: Molecular basis of inheritance _ L - 3

42. (A)

The biomass of diatoms is less than small fish so the biomass pyramid will be inverted.

Topic: Ecosystem_Sub-topic: Ecological pyramids_L-2

43. (D)

Innate immunity is provided by

Mucous membrane - Anatomical barrier

Phagocytic cells - Monocytes and Neutrophils

Inflammatory response - Basophils and mast cells

Antimicrobial proteins - like interferons - cytokine barriers

Topic: Human health and disease _ Sub-topic: _____ _ L - 3

44. (C)

Na^+ are pumped across the plasma membrane with the use of ATP.

Topic: Cell: The Unit of life_Sub-topic: Plasma Membrane _ L - 3

45. (D)

The small DNA band is a small circular plasmid DNA.

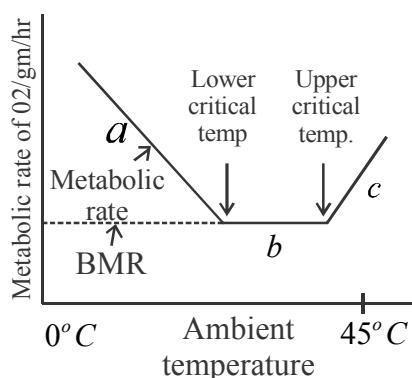
Topic: Molecular Basis of Inheritance; Sub-topic: DNA fingerprinting_L_3

46. (D)

Floating hydrophytes have epistomatic leaves while xerophytes have hypostomatic leaves. Floating hydrophytes. Have aerenchyma.

Topic: Ecosystem_Subtopic: Ecological adaptatons _ L - 3

47. (B)



According to Thermoneutral, a = Below the lower critical temperature, the animal produces metabolic heat to compensate for increased heat loss to environment.

Topic Ecology and Environ_Sub-topic: _____ _ L - 3

48. (D)

An unclothed man when exposed to a low temperature of 20°C will suffer from hypothermia and when exposed to 40°C will have hyperthermia. But humans are homeotherms.

Topic: Breathing and Respiration _ Sub-topic: _____ L - 3

49. (B)

The given pedigree is of an autosomal recessive trait as in autosomal dominant condition. We cannot have carriers and if it is X linked recessive disorder, males cannot be a carrier and in y linked disease females will neither be carrier nor sufferer as they do not have y chromosome.

Topic: Principles of inheritance and variation _ Sub-topic: _____ L - 2

50. (D)

Gel electrophoresis separates DNA fragments based on their difference in sizes.

Topic: Molecular Basis of inheritance _ Sub topic: DNA fingerprinting _ L - 2

51. (B)

Ecotypes are morphological adaptations to the physical environment.

Topic: Ecosystem _ L - 2

52. (D)

sympatric speciation is a process through which new species evolve from a single ancestral species while inhabiting the same geographic region.

Reduced interactions between population, Niche separation, divergent evolution are involved in speciation.

Topic: Evolution _ L - 1

53. (A)

Bryophyllum is CAM plant which have a high concentration of malic acid in the leaf as they carry out synthesis of malic acid at night. Hence if the leaves are collected before day break they may show high concentration of malic acid responsible for dissolution of calcium carbonate.

Topic: Photosynthesis _ Subtopic: CAM pathway _ L - 3

54. (A)

In polygenic inheritance producing 5 types of phenotypes is produced when there are 2 genes involved.

Topic: Principles of Inheritance and Variation _ L - 3

55. (A)

Diagenesis of organic sediments into mineral oils does not absorb or fix atmospheric CO₂.

Topic: Environmental Issues _ Subtopic: Global warming _ L - 3

56. (C)

Green algae stores starch. Brown algae stores laminarin and mannitol.

Topic: Plant kingdom_ Subtopic: Algae _ L - 2

57. (A)

Maximum CO₂ fixation by photosynthesis occurs in oceans.

Topic: Environmental issues _ Subtopic: Global warming. _ L - 3

58. (D)

Meiosis occurs in reproductive cells.

Topic: Cell division_ Subtopic: Meiosis_ L - 2

59. (A)

Cambium is crushed and secondary growth has not occurred in the direction of x.

Topic: Anatomy of Plants _ L - 3

60. (C)

LH - Leutinizing hormone in males is called ICSH - Interstitial cell stimulating hormone which stimulates interstitial cells / leydig cells to produce testosterone.

Topic: Chemical coordinati9on and human reproduction _ L - 3

61. (C)

Enzyme gets saturated with substrate molecules.

Topic: Biomolecules _ Subtopic: Enzymes_ L - 3

62. (A)

Class of arthropoda having 2 pairs of antennae and compound eyes on the stalk are crustaceans.

Topic: Animal kingdom _ Sub-topic: _____ _ L - 3

63. (B)

Ecosystem cannot exist without primary producers and decomposers.

Topic: Cell : A unit of life _ Sub-topic: Chloroplast _ L - 3

64. (B)

Camelids have a similar digestive structure to other ruminants although camelides only have three separate stomach. Ilamas camelid.

Topic: Digestion and Absorption _ Sub-topic: _____ L - 3

65. (B)

Shark have gill slits through whcih they respire and frogs respire through skin, lungs and beccopharynx, so with help of this can differentiate animal 1 from 2.

Lizards and Tiger have amniotic egg, Tiger and Gorilla hair (with skin - i.e. fur) , Gorilla and humans - have loss of tail

Topic: Anumal Kingdom _ Sub-topic: _____ _ L - 3

66. (D)

Hardy Weinberg's principle frequency of alleles in population is represented as $p + q = 1$.

Topic: Principles of Inheritance and variation _ Sub-topic: _____ L - 3

67. (D)

Zoology student found the specimen of endoparasite like liver fluke; as an endoparasite - anaerobic animal can withstand low oxygen levels, lack special senses like eyes and poorly developed nervous system.

Topic: Animal kingdom _ Sub-topic: _____ L - 3

68. (A)

Down's syndrome is a Trisomy 21 condition. So, karyotyping shows $2n + 1$ condition. Whereas rest are examples of genetic disorder.

Topic: Principles of Inheritance and Variation _ L - 1

69. (C)

To find out the map distance between the genes we use formula.

$$\text{Map distance} = \frac{\text{No. of recombinant offspring}}{\text{Total number of offspring}} \times 100$$

Here, total number of gametes = $AaBb = 450 + aabb = 450 + Aabb + 50 + aaBb = 50$
Where $AaBb$ and $aabb$ = parental combination and $Aabb$ and $aaBb$ = Recombination

$$\therefore \text{Map unit} = \frac{100}{1000} \times 10 = 10 \text{ cM}$$

1 map unit = 1 centimorgan = 1 % Recombination frequency

Topic: Principles of Inheritance and variation _ Sub-topic: _____ L - 3

70. (B)

When reducing agent like mercaptoethanol is added to immunoglobulin and molecule it will break disulphide bond and all 4 polypeptide chains will be separated.

Topic: Human health and disease _ Sub-topic: _____ L - 3

71. (D)

The doubling of catalase may lower the time duration but the pattern will remain same.

Topic: Biomolecules _ Enzymes _ L - 3

72. (C)

Both curling & straightening requires breaking and making of SH bonds.

Topic: Biomolecules _ L - 3

73. (C)

Allopatric speciation is speciation that occurs when biological populations of the same species become vicariant, or isolated from each other to an extent that prevents or interferes with genetic interchange.

Torrential rains changing course of wide rivers leads to Allopatric speciation.

Topic: Evolution _ L - 2

74. (C)
Primary structure has peptide bonds between amino acids secondary structure is established by H-bonds.

Topic: Biomolecules _ Sub-topic: Proteins _ L - 3

75. (A)
When the gravity detecting organ is removed they are unable to orient to gravity, they orient towards light, pointing in any direction to which other sense direct them, even swimming upside down as they become lost in space.

Topic: Nervous control and coordination, Sub-topic: _____ L - 3

76. (C)
Temperature should be above 18°C but below 37°C for best ligation.

Topic: Biomolecules _ Sub-topic: Enzymes _ L - 2

77. (D)
Difference between excitatory and inhibitory response across a synapse is mainly due to type of neurotransmitter secreted and type of gated channel opened in its response.

Topic: Nervous control and coordination _ Sub-topic: _____ L - 3

78. (C)
Free ribosomes are not attached to mRNA. They are likely to be attached to ER or nuclear membrane.

Topic: Cell : The unit of life _ Sub-topic: Ribosomes _ L - 3

79. (D)
Effect of adrenal activation through sympathetic stimulation due to stress is Gluconeogenesis resulting in increased blood glucose and increased breathing rate.

Topic: Chemical coordination _ Sub-topic: _____ L - 3

80. (B)
Up take of water increases the volume of cytoplasm.

Topic: Plant growth and development _ Sub-topic: Growth _ L - 2