

1. Which one of the following is a unicellular, non-motile desmid?

- (a) *Chromatium* (b) *Cosmarium*
(c) *Chlorobium* (d) *Clostridium*

2. Some of the steps involved in the production of humulin are given below. Choose the correct sequence.

- I. Synthesis of gene (DNA) for human insulin artificially
II. Culturing recombinant *E.coli* in bioreactors
III. Purification of humulin
IV. Insertion of human insulin gene into plasmid

V. Introduction of recombinant plasmid into *E.coli*

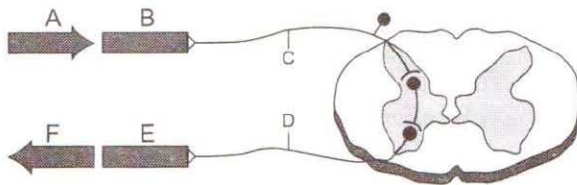
VI. Extraction of recombinant gene product from *E.coli*

- (a) I, IV, V, II, VI, III
(b) III, V, II, I, VI, IV
(c) II, I, IV, III, V, VI
(d) I, III, V, VI, II, IV

3. Cockroaches can climb smooth or steep surfaces due to the presence of adhesive pads found on the torses of their legs. They are called

- (a) pretarsus (b) arolium
(c) plantulae (d) tibia

15. The following is the scheme showing the path of reflex arc. Identify the different labellings A, B, C, D, E, F in the reflex arc.



- (a) A–Stimulus, B–Effector, C–Motor nerve, D–Sensory nerve, E–Receptor, F–Response
 (b) A–Stimulus, B–Receptor, C–Motor nerve, D–Sensory nerve, E–Effector, F–Response
 (c) A–Stimulus, B–Effector, C–Sensory nerve, D–Motor nerve, E–Receptor, F–Response
 (d) A–Stimulus, B–Receptor, C–Sensory nerve, D–Motor nerve, E–Effector, F–Response
16. Mendel found that the reciprocal crosses yielded identical results. From that he concluded that
 (a) there is no dominance of any trait
 (b) sex has no influence on the dominance of traits
 (c) there is independent assortment of traits
 (d) sex plays a role in deciding the dominance of a trait
17. Compare the statement A and B.
Statement A : Synthesis of DNA takes place in the S-phase of interphase.
Statement B : Every chromosome, during metaphase, has two chromatids.
 Select the correct description.
 (a) Both the statement A and B are correct and A is the reason for B
 (b) Both the statement A and B are correct and A is not the reason for B
 (c) Statement A is wrong and B is correct
 (d) Statement A is correct and B is wrong
18. Match the animals listed in column I with their of nature of blood listed in column II. Choose the answer which gives the correct combination of alphabets of the two columns.

Column I	Column II
A. Man	1. Plasma and cells are colourless
B. Earthworm	2. Plasma is colourless and nucleated RBCs
C. Cockroach	3. Plasma is colourless and enucleated RBCs
D. Frog	4. Plasma is red and nucleated, colourless RBCs
	5. Plasma and RBCs have haemoglobin

	A	B	C	D
(a)	1	4	2	3
(b)	5	3	1	4
(c)	3	4	1	2
(d)	4	5	3	2

19. During lactic acid fermentation
 (a) O_2 is used, CO_2 is not liberated
 (b) O_2 is not used, CO_2 is liberated
 (c) O_2 is used, CO_2 is liberated
 (d) neither O_2 is used, nor CO_2 is liberated
20. Which one of the following is not the function of insulin?
 (a) Initiates the conversion of glycogen to glucose
 (b) Initiates the formation of hepatic glycogen from excess of glucose
 (c) Increases the permeability of cell membrane to glucose
 (d) Increases the oxidation of glucose in the cells
21. The sugar present in milk is
 (a) glucose (b) lactose
 (c) fructose (d) sucrose
22. According to Steward's starch hydrolysis theory, which one of the following is the principal reason for the opening of stomata during daytime?
 (a) Efflux of K^+ ions from guard cells under the influence of ABA hormone
 (b) Photosynthetic utilisation of CO_2 in guard cells
 (c) Influx of K^+ ions into guard cells under the influence of ABA hormone
 (d) Conversion of sugar into starch in guard cells

23. Which one of the following processes results in the formation of a clone of bacteria?
 (a) Transformation (b) Transduction
 (c) Binary fission (d) Conjugation

24. Match the types of immunity listed in column I with the examples listed in column II. Choose the answer that gives the correct combination of alphabets of the two columns.

Column I	Column II
A. Natural active	1. Immunity developed by heredity
B. Artificial passive	2. From mother to foetus through placenta
C. Artificial active	3. Injection of antiserum to travellers
D. Natural passive	4. Fighting infections naturally
	5. Induced by vaccination

	A	B	C	D
(a)	1	2	3	5
(b)	4	3	5	2
(c)	4	5	2	3
(d)	5	4	3	1

25. How do you differentiate a butterfly from a moth?
 (a) Moth is diurnal but butterfly is nocturnal
 (b) Moth has simple eyes but butterfly has compound eyes
 (c) Moth has feathery antennae but butterfly has club-shaped antennae
 (d) Moth has one pair of wings but butterfly has two pairs of wings

26. Compare the statement A and B.
Statement A : To counteract the increase in turgor pressure in plant cells, the cell wall produces an equal and opposite pressure, *ie*, wall pressure.
Statement B : When plant cells undergo endosmosis, they swell but do not burst.
 Select the correct description.
 (a) Statement A is wrong and B is correct
 (b) Both the statement A and B are correct and A is not the reason for B
 (c) Both the statement A and B are correct and A is the reason for B
 (d) Statement A is correct and B is wrong

27. When red blood corpuscles containing both A and B antigens are mixed with your blood serum, they agglutinate. Hence your blood group is type.

- (a) A (b) B
 (c) AB (d) O

28. Bovine spongiform encephalopathy is a disease caused by prions in a
 (a) potato (b) man
 (c) sheep (d) cow

29. Compare the statement A and B.
Statement A : When the urine moves through the descending limb, it becomes hypertonic and as it passes through the ascending limb of Henle's loop, it becomes hypotonic.
Statement B : The descending limb is permeable to sodium ions, while the ascending limb is impermeable to sodium ions.

Select the correct description.

- (a) Both statement A and B are wrong
 (b) Both statement A and B are correct
 (c) Statement A is correct and B is wrong
 (d) Statement A is wrong and B is correct

30. To meet the demands of the society, *in vitro* production of a large number of plantlets in a short duration is practiced in floriculture and horticulture industry today. This is called

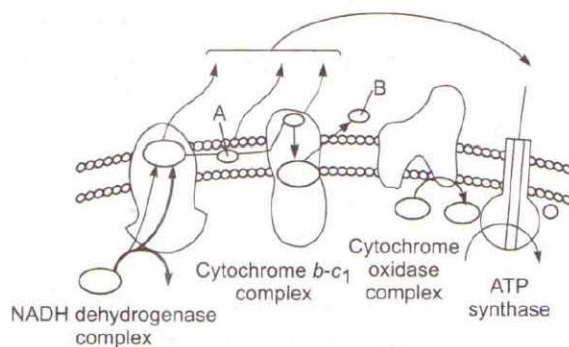
- (a) somatic hybridisation
 (b) micropropagation
 (c) hybridoma technology
 (d) somaclonal variation

31. Due to non-disjunction of chromosomes during spermatogenesis, sperms carry both sex chromosomes (22A + XY) and some sperms do not carry any sex chromosome (22A + O). If these sperms fertilise normal eggs (22A + X), what types of genetic disorders appear among the offsprings?

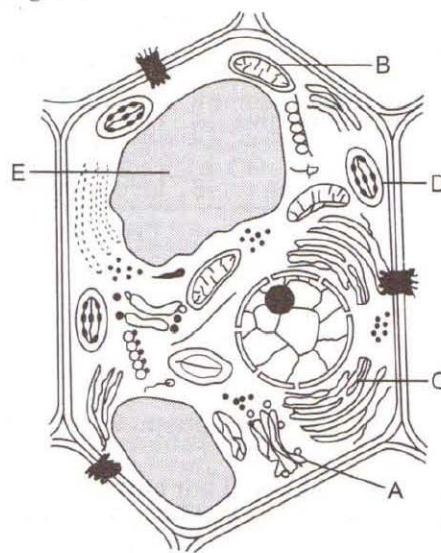
- (a) Down's syndrome and Turner's syndrome
 (b) Down's syndrome and Cri-du-chat syndrome
 (c) Turner's syndrome and Klinefelter's syndrome
 (d) Down's syndrome and Klinefelter's syndrome

32. When a freshwater protozoan is placed in marine water the
 (a) contractile vacuoles disappear
 (b) contractile vacuoles remain unchanged
 (c) contractile vacuoles become bigger in size
 (d) number of contractile vacuoles increase
33. Which one of the following pairs is an example for lateral meristem?
 (a) Phellogen and phelloderm
 (b) Phellogen and fascicular cambium
 (c) Procambium and phelloderm
 (d) Interfascicular cambium and phellem
34. In peritoneal dialysis, the blood is
 (a) not removed from the body and an artificial filter is used
 (b) removed from the body and an artificial filter is employed
 (c) removed from the body and a natural filter is employed
 (d) not removed from the body and a natural filter is used

35. The following is a scheme showing the electron transport system. Identify the electron carrier molecules indicated as A and B. Choose the correct option.



- (a) A-Fe-S protein, B-FMN
 (b) A-FMN, B-Be-S protein
 (c) A-Coenzyme Q, B-Cytochrome-c
 (d) A-Cytochrome-c, B-Coenzyme Q
36. Which one of the following statement is not correct during protein synthesis?
 (a) UAA codon codes for lysine
 (b) UGG codon codes for tryptophan
 (c) Cysteine is coded by UGU and UGC codons
 (d) Tyrosine is coded by UAU and UAC codons
37. In the absence of acrosome, the sperm can not
 (a) get food (b) swim
 (c) penetrate the egg (d) get energy
38. Which one of the following species of earthworm is not recommended for vermicomposting?
 (a) *Perionyx excavatus*
 (b) *Pheretima posthuma*
 (c) *Eudrilus eugeneae*
 (d) *Eisenia foetidae*
39. The diagram of the ultrastructure of a plant cell is given below. Identify the function of the organelles labelled A, B, C, D, E, in the diagram.



- (a) A-Site of photophosphorylation, B-Storage of cell sap, C-Intracellular transport, D-Site of oxidative phosphorylation, E-Principal director of macromolecular traffic
- (b) A-Storage of cell sap, B-Site of oxidative phosphorylation, C-Principal director of macromolecular traffic, D-Site of photophosphorylation, E-Intracellular transport
- (c) A-Intracellular transport, B-Site of oxidative phosphorylation, C-Principal director of macromolecular traffic, D-Site of photophosphorylation, E-Storage of cell sap
- (d) A-Principal director of macromolecular traffic, B-Site of oxidative phosphorylation C-Intracellular transport, D-Site of photophosphorylation, E-Storage of cell sap

40. The main aim of the human genome project is
- to develop better techniques for comparing two different human DNA samples
 - to remove disease causing genes from human DNA
 - to introduce new genes into humans
 - to identify the sequence all the genes present in human DNA

41. Succus entericus is secreted by
- Peyer's patches
 - crypts of Leiberkuhn
 - Auerbach's plexus
 - Brunner's glands

42. Cell A and cell B are adjacent plant cells. In cell A, $\psi_s = -20$ bars and $\psi_p = 8$ bars. In cell 'B', $\psi_s = -12$ bars and $\psi_p = 2$ bars. Then,
- water moves from cell B to cell A
 - equal amount of water is simultaneously exchanged between cell A and cell B
 - water moves from cell A to cell B
 - there is no movement of water between cell A and cell B

43. Populations are said to be sympatric when two populations
- are isolated but occasionally come together to interbreed
 - share the same environment but can not interbreed
 - live together and freely interbreed to produce sterile offspring
 - are physically isolated by natural barriers

44. In which of the following situations, is there a risk factor for children of incurring erythroblastosis foetalis?
- Mother is Rh⁺ and father is Rh⁺
 - Mother is Rh⁺ and father is Rh⁻
 - Mother is Rh⁻ and father is Rh⁻
 - Mother is Rh⁻ and father is Rh⁺

45. Compare the statement A and B.

Statement A : RNA produced during transcription in eukaryotic cells cannot be straight away used in photosynthesis.

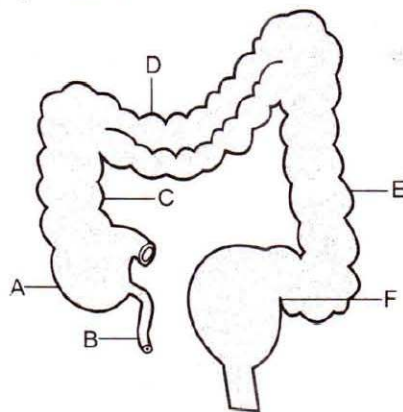
Statement B : RNA splicing phenomena helps in the removal of exons.

Select the correct description.

- Statement A is correct and B is wrong
- Statement A is wrong and B is correct

- Both the statement A and B are wrong
- Both the statement A and B are correct

46. The diagram of large intestine of man is given below. Identify the parts labelled A, B, C, D, E and F.



- A-Caecum, B-Vermiform appendix, C-Ascending colon, D-Transverse colon, E-Descending colon, F-Sigmoid
 - A-Sigmoid, B-Vermiform appendix, C-Descending colon, D-Transverse colon, E-Ascending colon, F-Caecum
 - A-Sigmoid, B-Vermiform appendix, C-Ascending colon, D-Transverse colon, E-Descending colon, F-Caecum
 - A-Caecum, B-Vermiform appendix, C-Sigmoid, D-Ascending colon, E-Transverse colon, F-Descending colon
47. In genetic fingerprinting, the 'probe' refers to a radioactively labelled
- double-stranded RNA molecule
 - double-stranded DNA molecule
 - single-stranded DNA molecule
 - single-stranded RNA molecule
48. Which one of the following is not a method of soil conservation?
- Strip cropping
 - Crop rotation
 - Mulching
 - Overgrazing
49. In C₄-pathway, the CO₂ fixation in mesophyll cells is carried out by the enzyme
- pyruvate dehydrogenase
 - pyruvate decarboxylase
 - PEP carboxylase
 - Rubisco
50. Which one of the following is a driving force for the process of passive absorption of water in roots?

Answer – Key

1. b	2. a	3. b	4. c	5. a	6. a	7. c	8. a	9. b	10. c
11. b	12. a	13. a	14. d	15. d	16. b	17. d	18. c	19. d	20. a
21. b	22. b	23. c	24. b	25. c	26. c	27. d	28. d	29. c	30. b
31. c	32. a	33. b	34. d	35. c	36. a	37. c	38. b	39. d	40. d
41. b	42. a	43. b	44. d	45. a	46. a	47. c	48. d	49. c	50. b
51. a	52. d	53. a	54. d	55. c	56. a	57. b	58. d	59. c	60. d