

1. Flippers of Penguins and Dolphins are examples of :
- (1) Adaptive radiation
  - (2) Convergent evolution
  - (3) Industrial melanism
  - (4) Natural selection
2. Name the plant growth regulator which upon spraying on sugarcane crop, increases the length of stem, thus increasing the yield of sugarcane crop.
- (1) Cytokinin
  - (2) Gibberellin
  - (3) Ethylene
  - (4) Abscisic acid
3. Secondary metabolites such as nicotine, strychnine and caffeine are produced by plants for their :
- (1) Nutritive value
  - (2) Growth response
  - (3) Defence action
  - (4) Effect on reproduction
4. The body of the ovule is fused within the funicle at :
- (1) Hilum
  - (2) Micropyle
  - (3) Nucellus
  - (4) Chalaza
5. Match the following columns and select the **correct** option.
- | Column - I                        | Column - II                           |
|-----------------------------------|---------------------------------------|
| (a) <i>Clostridium butylicum</i>  | (i) Cyclosporin-A                     |
| (b) <i>Trichoderma polysporum</i> | (ii) Butyric Acid                     |
| (c) <i>Monascus purpureus</i>     | (iii) Citric Acid                     |
| (d) <i>Aspergillus niger</i>      | (iv) Blood cholesterol lowering agent |
- |     | (a)   | (b)   | (c)  | (d)   |
|-----|-------|-------|------|-------|
| (1) | (iii) | (iv)  | (ii) | (i)   |
| (2) | (ii)  | (i)   | (iv) | (iii) |
| (3) | (i)   | (ii)  | (iv) | (iii) |
| (4) | (iv)  | (iii) | (ii) | (i)   |
6. The process responsible for facilitating loss of water in liquid form from the tip of grass blades at night and in early morning is :
- (1) Transpiration
  - (2) Root pressure
  - (3) Imbibition
  - (4) Plasmolysis
7. Which of the following is **not** an inhibitory substance governing seed dormancy ?
- (1) Gibberellic acid
  - (2) Abscisic acid
  - (3) Phenolic acid
  - (4) Para-ascorbic acid
8. Identify the **incorrect** statement.
- (1) Heart wood does not conduct water but gives mechanical support.
  - (2) Sapwood is involved in conduction of water and minerals from root to leaf.
  - (3) Sapwood is the innermost secondary xylem and is lighter in colour.
  - (4) Due to deposition of tannins, resins, oils etc., heart wood is dark in colour.
9. Choose the **correct** pair from the following :
- (1) Ligases - Join the two DNA molecules
  - (2) Polymerases - Break the DNA into fragments
  - (3) Nucleases - Separate the two strands of DNA
  - (4) Exonucleases - Make cuts at specific positions within DNA
10. By which method was a new breed 'Hisardale' of sheep formed by using Bikaneri ewes and Marino rams ?
- (1) Out crossing
  - (2) Mutational breeding
  - (3) Cross breeding
  - (4) Inbreeding

11. Dissolution of the synaptonemal complex occurs during :
- (1) Pachytene
  - (2) Zygotene
  - (3) Diplotene
  - (4) Leptotene
12. Match the following diseases with the causative organism and select the **correct** option.
- | Column - I     |  | Column - II             |  |
|----------------|--|-------------------------|--|
| (a) Typhoid    |  | (i) <i>Wuchereria</i>   |  |
| (b) Pneumonia  |  | (ii) <i>Plasmodium</i>  |  |
| (c) Filariasis |  | (iii) <i>Salmonella</i> |  |
| (d) Malaria    |  | (iv) <i>Haemophilus</i> |  |
- |     | (a)   | (b)   | (c)   | (d)   |
|-----|-------|-------|-------|-------|
| (1) | (i)   | (iii) | (ii)  | (iv)  |
| (2) | (iii) | (iv)  | (i)   | (ii)  |
| (3) | (ii)  | (i)   | (iii) | (iv)  |
| (4) | (iv)  | (i)   | (ii)  | (iii) |
13. According to Robert May, the global species diversity is about :
- (1) 1.5 million
  - (2) 20 million
  - (3) 50 million
  - (4) 7 million
14. In light reaction, plastoquinone facilitates the transfer of electrons from :
- (1) PS-II to  $\text{Cytb}_6/\text{f}$  complex
  - (2)  $\text{Cytb}_6/\text{f}$  complex to PS-I
  - (3) PS-I to  $\text{NADP}^+$
  - (4) PS-I to ATP synthase
15. Match the following columns and select the **correct** option.
- | Column - I          |  | Column - II              |  |
|---------------------|--|--------------------------|--|
| (a) Pituitary gland |  | (i) Grave's disease      |  |
| (b) Thyroid gland   |  | (ii) Diabetes mellitus   |  |
| (c) Adrenal gland   |  | (iii) Diabetes insipidus |  |
| (d) Pancreas        |  | (iv) Addison's disease   |  |
- |     | (a)   | (b)   | (c)  | (d)   |
|-----|-------|-------|------|-------|
| (1) | (iv)  | (iii) | (i)  | (ii)  |
| (2) | (iii) | (ii)  | (i)  | (iv)  |
| (3) | (iii) | (i)   | (iv) | (ii)  |
| (4) | (ii)  | (i)   | (iv) | (iii) |
16. Which of the following statements are **true** for the phylum-Chordata ?
- (a) In Urochordata notochord extends from head to tail and it is present throughout their life.
  - (b) In Vertebrata notochord is present during the embryonic period only.
  - (c) Central nervous system is dorsal and hollow.
  - (d) Chordata is divided into 3 subphyla : Hemichordata, Tunicata and Cephalochordata.
- (1) (d) and (c)
  - (2) (c) and (a)
  - (3) (a) and (b)
  - (4) (b) and (c)
17. Select the option including all sexually transmitted diseases.
- (1) Gonorrhoea, Syphilis, Genital herpes
  - (2) Gonorrhoea, Malaria, Genital herpes
  - (3) AIDS, Malaria, Filaria
  - (4) Cancer, AIDS, Syphilis
18. Match the following columns and select the **correct** option.
- | Column - I          |  | Column - II                          |  |
|---------------------|--|--------------------------------------|--|
| (a) Organ of Corti  |  | (i) Connects middle ear and pharynx  |  |
| (b) Cochlea         |  | (ii) Coiled part of the labyrinth    |  |
| (c) Eustachian tube |  | (iii) Attached to the oval window    |  |
| (d) Stapes          |  | (iv) Located on the basilar membrane |  |
- |     | (a)   | (b)   | (c)  | (d)   |
|-----|-------|-------|------|-------|
| (1) | (ii)  | (iii) | (i)  | (iv)  |
| (2) | (iii) | (i)   | (iv) | (ii)  |
| (3) | (iv)  | (ii)  | (i)  | (iii) |
| (4) | (i)   | (ii)  | (iv) | (iii) |
19. Cuboidal epithelium with brush border of microvilli is found in :
- (1) lining of intestine
  - (2) ducts of salivary glands
  - (3) proximal convoluted tubule of nephron
  - (4) eustachian tube

20. Identify the **wrong** statement with reference to transport of oxygen.
- (1) Binding of oxygen with haemoglobin is mainly related to partial pressure of  $O_2$ .
  - (2) Partial pressure of  $CO_2$  can interfere with  $O_2$  binding with haemoglobin.
  - (3) Higher  $H^+$  conc. in alveoli favours the formation of oxyhaemoglobin.
  - (4) Low  $pCO_2$  in alveoli favours the formation of oxyhaemoglobin.
21. Goblet cells of alimentary canal are modified from :
- (1) Squamous epithelial cells
  - (2) Columnar epithelial cells
  - (3) Chondrocytes
  - (4) Compound epithelial cells
22. Identify the **wrong** statement with regard to Restriction Enzymes.
- (1) Each restriction enzyme functions by inspecting the length of a DNA sequence.
  - (2) They cut the strand of DNA at palindromic sites.
  - (3) They are useful in genetic engineering.
  - (4) Sticky ends can be joined by using DNA ligases.
23. Experimental verification of the chromosomal theory of inheritance was done by :
- (1) Mendel
  - (2) Sutton
  - (3) Boveri
  - (4) Morgan
24. Identify the **correct** statement with reference to human digestive system.
- (1) Ileum opens into small intestine.
  - (2) Serosa is the innermost layer of the alimentary canal.
  - (3) Ileum is a highly coiled part.
  - (4) Vermiform appendix arises from duodenum.
25. Identify the **wrong** statement with reference to the gene 'I' that controls ABO blood groups.
- (1) The gene (I) has three alleles.
  - (2) A person will have only two of the three alleles.
  - (3) When  $I^A$  and  $I^B$  are present together, they express same type of sugar.
  - (4) Allele 'i' does not produce any sugar.
26. Match the following columns and select the **correct** option.
- | Column - I         | Column - II                                 |
|--------------------|---|
| (a) Floating Ribs  | (i) Located between second and seventh ribs |
| (b) Acromion       | (ii) Head of the Humerus                    |
| (c) Scapula        | (iii) Clavicle                              |
| (d) Glenoid cavity | (iv) Do not connect with the sternum        |
- | (a)       | (b)   | (c)  | (d)   |
|-----------|-------|------|-------|
| (1) (ii)  | (iv)  | (i)  | (iii) |
| (2) (i)   | (iii) | (ii) | (iv)  |
| (3) (iii) | (ii)  | (iv) | (i)   |
| (4) (iv)  | (iii) | (i)  | (ii)  |
27. The product(s) of reaction catalyzed by nitrogenase in root nodules of leguminous plants is/are :
- (1) Ammonia alone
  - (2) Nitrate alone
  - (3) Ammonia and oxygen
  - (4) Ammonia and hydrogen
28. Match the following columns and select the **correct** option.
- | Column - I   | Column - II             |
|--|-------------------------|
| (a) Gregarious, polyphagous pest                                 | (i) <i>Asterias</i>     |
| (b) Adult with radial symmetry and larva with bilateral symmetry | (ii) Scorpion           |
| (c) Book lungs   | (iii) <i>Ctenoplana</i> |
| (d) Bioluminescence  | (iv) <i>Locusta</i>     |
- | (a)       | (b)   | (c)   | (d)   |
|-----------|-------|-------|-------|
| (1) (i)   | (iii) | (ii)  | (iv)  |
| (2) (iv)  | (i)   | (ii)  | (iii) |
| (3) (iii) | (ii)  | (i)   | (iv)  |
| (4) (ii)  | (i)   | (iii) | (iv)  |

29. Snow-blindness in Antarctic region is due to :
- (1) Freezing of fluids in the eye by low temperature
  - (2) Inflammation of cornea due to high dose of UV-B radiation
  - (3) High reflection of light from snow
  - (4) Damage to retina caused by infra-red rays
30. In relation to Gross primary productivity and Net primary productivity of an ecosystem, which one of the following statements is **correct** ?
- (1) Gross primary productivity is always less than net primary productivity.
  - (2) Gross primary productivity is always more than net primary productivity.
  - (3) Gross primary productivity and Net primary productivity are one and same.
  - (4) There is no relationship between Gross primary productivity and Net primary productivity.
31. Select the **correct** statement.
- (1) Glucocorticoids stimulate gluconeogenesis.
  - (2) Glucagon is associated with hypoglycemia.
  - (3) Insulin acts on pancreatic cells and adipocytes.
  - (4) Insulin is associated with hyperglycemia.
32. Select the **correct** events that occur during inspiration.
- (a) Contraction of diaphragm
  - (b) Contraction of external inter-costal muscles
  - (c) Pulmonary volume decreases
  - (d) Intra pulmonary pressure increases
- (1) (a) and (b)
  - (2) (c) and (d)
  - (3) (a), (b) and (d)
  - (4) only (d)
33. Match the following concerning essential elements and their functions in plants :
- |               |   |
|---------------|---|
| (a) Iron      | (i) Photolysis of water                     |
| (b) Zinc      | (ii) Pollen germination                     |
| (c) Boron     | (iii) Required for chlorophyll biosynthesis |
| (d) Manganese | (iv) IAA biosynthesis                       |
- Select the **correct** option :
- |     |            |            |            |            |
|-----|------------|------------|------------|------------|
|     | <b>(a)</b> | <b>(b)</b> | <b>(c)</b> | <b>(d)</b> |
| (1) | (ii)       | (i)        | (iv)       | (iii)      |
| (2) | (iv)       | (iii)      | (ii)       | (i)        |
| (3) | (iii)      | (iv)       | (ii)       | (i)        |
| (4) | (iv)       | (i)        | (ii)       | (iii)      |
34. In which of the following techniques, the embryos are transferred to assist those females who cannot conceive ?
- (1) ZIFT and IUT
  - (2) GIFT and ZIFT
  - (3) ICSI and ZIFT
  - (4) GIFT and ICSI
35. The infectious stage of *Plasmodium* that enters the human body is :
- (1) Trophozoites
  - (2) Sporozoites
  - (3) Female gametocytes
  - (4) Male gametocytes
36. Which of the following hormone levels will cause release of ovum (ovulation) from the graffian follicle ?
- (1) High concentration of Estrogen
  - (2) High concentration of Progesterone
  - (3) Low concentration of LH
  - (4) Low concentration of FSH
37. Presence of which of the following conditions in urine are indicative of Diabetes Mellitus ?
- (1) Uremia and Ketonuria
  - (2) Uremia and Renal Calculi
  - (3) Ketonuria and Glycosuria
  - (4) Renal calculi and Hyperglycaemia

38. Name the enzyme that facilitates opening of DNA helix during transcription.

- (1) DNA ligase
- (2) DNA helicase
- (3) DNA polymerase
- (4) RNA polymerase

39. Match the trophic levels with their **correct** species examples in grassland ecosystem.

- |                          |              |
|--------------------------|--------------|
| (a) Fourth trophic level | (i) Crow     |
| (b) Second trophic level | (ii) Vulture |
| (c) First trophic level  | (iii) Rabbit |
| (d) Third trophic level  | (iv) Grass   |

Select the **correct** option :

- |     | (a)   | (b)   | (c)   | (d)  |
|-----|-------|-------|-------|------|
| (1) | (ii)  | (iii) | (iv)  | (i)  |
| (2) | (iii) | (ii)  | (i)   | (iv) |
| (3) | (iv)  | (iii) | (ii)  | (i)  |
| (4) | (i)   | (ii)  | (iii) | (iv) |

40. Match the following :

- |                                     |               |
|-------------------------------------|---------------|
| (a) Inhibitor of catalytic activity | (i) Ricin     |
| (b) Possess peptide bonds           | (ii) Malonate |
| (c) Cell wall material in fungi     | (iii) Chitin  |
| (d) Secondary metabolite            | (iv) Collagen |

Choose the **correct** option from the following :

- |     | (a)   | (b)   | (c)   | (d)  |
|-----|-------|-------|-------|------|
| (1) | (ii)  | (iv)  | (iii) | (i)  |
| (2) | (iii) | (i)   | (iv)  | (ii) |
| (3) | (iii) | (iv)  | (i)   | (ii) |
| (4) | (ii)  | (iii) | (i)   | (iv) |

41. The first phase of translation is :

- (1) Binding of mRNA to ribosome
- (2) Recognition of DNA molecule
- (3) Aminoacylation of tRNA
- (4) Recognition of an anti-codon

42. Identify the substances having glycosidic bond and peptide bond, respectively in their structure :

- (1) Chitin, cholesterol
- (2) Glycerol, trypsin
- (3) Cellulose, lecithin
- (4) Inulin, insulin

43. Which of the following statements about inclusion bodies is **incorrect** ?

- (1) They are not bound by any membrane.
- (2) These are involved in ingestion of food particles.
- (3) They lie free in the cytoplasm.
- (4) These represent reserve material in cytoplasm.

44. Match the following columns and select the **correct** option.

- |     | Column - I                     |       | Column - II                   |
|-----|--------------------------------|-------|-------------------------------|
| (a) | Bt cotton                      | (i)   | Gene therapy                  |
| (b) | Adenosine deaminase deficiency | (ii)  | Cellular defence              |
| (c) | RNAi                           | (iii) | Detection of HIV infection    |
| (d) | PCR                            | (iv)  | <i>Bacillus thuringiensis</i> |

- |     | (a)   | (b)   | (c)   | (d)   |
|-----|-------|-------|-------|-------|
| (1) | (iv)  | (i)   | (ii)  | (iii) |
| (2) | (iii) | (ii)  | (i)   | (iv)  |
| (3) | (ii)  | (iii) | (iv)  | (i)   |
| (4) | (i)   | (ii)  | (iii) | (iv)  |

45. Identify the **correct** statement with regard to G<sub>1</sub> phase (Gap 1) of interphase.

- (1) DNA synthesis or replication takes place.
- (2) Reorganisation of all cell components takes place.
- (3) Cell is metabolically active, grows but does not replicate its DNA.
- (4) Nuclear Division takes place.

46. Which of the following is put into Anaerobic sludge digester for further sewage treatment ?

- (1) Primary sludge
- (2) Floating debris
- (3) Effluents of primary treatment
- (4) Activated sludge

47. Which of the following statements is **correct** ?
- (1) Adenine pairs with thymine through two H-bonds.
  - (2) Adenine pairs with thymine through one H-bond.
  - (3) Adenine pairs with thymine through three H-bonds.
  - (4) Adenine does not pair with thymine.
48. The sequence that controls the copy number of the linked DNA in the vector, is termed :
- (1) Selectable marker
  - (2) Ori site
  - (3) Palindromic sequence
  - (4) Recognition site
49. Select the **correct** match.
- |                         |   |  |
|-------------------------|---|--|
| (1) Haemophilia         | - | Y linked                                 |
| (2) Phenylketonuria     | - | Autosomal dominant trait                 |
| (3) Sickle cell anaemia | - | Autosomal recessive trait, chromosome-11 |
| (4) Thalassaemia        | - | X linked                                 |
50. Which of the following is **not** an attribute of a population ?
- (1) Sex ratio
  - (2) Natality
  - (3) Mortality
  - (4) Species interaction
51. Strobili or cones are found in :
- (1) *Salvinia*
  - (2) *Pteris*
  - (3) *Marchantia*
  - (4) *Equisetum*
52. Which is the important site of formation of glycoproteins and glycolipids in eukaryotic cells ?
- (1) Endoplasmic reticulum
  - (2) Peroxisomes
  - (3) Golgi bodies
  - (4) Polysomes
53. Which of the following is **correct** about viroids ?
- (1) They have RNA with protein coat.
  - (2) They have free RNA without protein coat.
  - (3) They have DNA with protein coat.
  - (4) They have free DNA without protein coat.
54. The process of growth is maximum during :
- (1) Log phase
  - (2) Lag phase
  - (3) Senescence
  - (4) Dormancy
55. Which of the following regions of the globe exhibits highest species diversity ?
- (1) Western Ghats of India
  - (2) Madagascar
  - (3) Himalayas
  - (4) Amazon forests
56. The number of substrate level phosphorylations in one turn of citric acid cycle is :
- (1) Zero
  - (2) One
  - (3) Two
  - (4) Three
57. Meiotic division of the secondary oocyte is completed :
- (1) Prior to ovulation
  - (2) At the time of copulation
  - (3) After zygote formation
  - (4) At the time of fusion of a sperm with an ovum
58. Which of the following pairs is of unicellular algae ?
- (1) *Laminaria* and *Sargassum*
  - (2) *Gelidium* and *Gracilaria*
  - (3) *Anabaena* and *Volvox*
  - (4) *Chlorella* and *Spirulina*

59. The QRS complex in a standard ECG represents :
- (1) Repolarisation of auricles
  - (2) Depolarisation of auricles
  - (3) Depolarisation of ventricles
  - (4) Repolarisation of ventricles
60. Some dividing cells exit the cell cycle and enter vegetative inactive stage. This is called quiescent stage ( $G_0$ ). This process occurs at the end of :
- (1) M phase
  - (2)  $G_1$  phase
  - (3) S phase
  - (4)  $G_2$  phase
61. Match the following with respect to meiosis :
- |                |                     |
|----------------|---------------------|
| (a) Zygotene   | (i) Terminalization |
| (b) Pachytene  | (ii) Chiasmata      |
| (c) Diplotene  | (iii) Crossing over |
| (d) Diakinesis | (iv) Synapsis       |
- Select the **correct** option from the following :
- |     |            |            |            |            |
|-----|------------|------------|------------|------------|
|     | <b>(a)</b> | <b>(b)</b> | <b>(c)</b> | <b>(d)</b> |
| (1) | (iii)      | (iv)       | (i)        | (ii)       |
| (2) | (iv)       | (iii)      | (ii)       | (i)        |
| (3) | (i)        | (ii)       | (iv)       | (iii)      |
| (4) | (ii)       | (iv)       | (iii)      | (i)        |
62. Which one of the following is the most abundant protein in the animals ?
- (1) Haemoglobin
  - (2) Collagen
  - (3) Lectin
  - (4) Insulin
63. The ovary is half inferior in :
- (1) Brinjal
  - (2) Mustard
  - (3) Sunflower
  - (4) Plum
64. Ray florets have :
- (1) Inferior ovary
  - (2) Superior ovary
  - (3) Hypogynous ovary
  - (4) Half inferior ovary
65. The oxygenation activity of RuBisCo enzyme in photorespiration leads to the formation of :
- (1) 2 molecules of 3-C compound
  - (2) 1 molecule of 3-C compound
  - (3) 1 molecule of 6-C compound
  - (4) 1 molecule of 4-C compound and 1 molecule of 2-C compound
66. The plant parts which consist of two generations - one within the other :
- (a) Pollen grains inside the anther
  - (b) Germinated pollen grain with two male gametes
  - (c) Seed inside the fruit
  - (d) Embryo sac inside the ovule
- (1) (a) only
  - (2) (a), (b) and (c)
  - (3) (c) and (d)
  - (4) (a) and (d)
67. Match the following columns and select the **correct** option.
- |     | Column - I  |       | Column - II                              |
|-----|-------------|-------|--|
| (a) | Eosinophils | (i)   | Immune response                          |
| (b) | Basophils   | (ii)  | Phagocytosis                             |
| (c) | Neutrophils | (iii) | Release histaminase, destructive enzymes |
| (d) | Lymphocytes | (iv)  | Release granules containing histamine    |
- |     |            |            |            |            |
|-----|------------|------------|------------|------------|
|     | <b>(a)</b> | <b>(b)</b> | <b>(c)</b> | <b>(d)</b> |
| (1) | (iii)      | (iv)       | (ii)       | (i)        |
| (2) | (iv)       | (i)        | (ii)       | (iii)      |
| (3) | (i)        | (ii)       | (iv)       | (iii)      |
| (4) | (ii)       | (i)        | (iii)      | (iv)       |

68. Bilaterally symmetrical and acoelomate animals are exemplified by :
- (1) Ctenophora
  - (2) Platyhelminthes
  - (3) Aschelminthes
  - (4) Annelida
69. Identify the basic amino acid from the following.
- (1) Tyrosine
  - (2) Glutamic Acid
  - (3) Lysine
  - (4) Valine
70. Match the following columns and select the **correct** option.
- | Column - I                | Column - II                             |
|---------------------------|---|
| (a) Placenta              | (i) Androgens                           |
| (b) Zona pellucida        | (ii) Human Chorionic Gonadotropin (hCG) |
| (c) Bulbo-urethral glands | (iii) Layer of the ovum                 |
| (d) Leydig cells          | (iv) Lubrication of the Penis           |
- | (a)       | (b)   | (c)  | (d)   |
|-----------|-------|------|-------|
| (1) (iv)  | (iii) | (i)  | (ii)  |
| (2) (i)   | (iv)  | (ii) | (iii) |
| (3) (iii) | (ii)  | (iv) | (i)   |
| (4) (ii)  | (iii) | (iv) | (i)   |
71. Bt cotton variety that was developed by the introduction of toxin gene of *Bacillus thuringiensis* (Bt) is resistant to :
- (1) Insect pests
  - (2) Fungal diseases
  - (3) Plant nematodes
  - (4) Insect predators
72. Match the following columns and select the **correct** option.
- | Column - I                     | Column - II          |
|--------------------------------|----------------------|
| (a) 6 - 15 pairs of gill slits | (i) <i>Trygon</i>    |
| (b) Heterocercal caudal fin    | (ii) Cyclostomes     |
| (c) Air Bladder                | (iii) Chondrichthyes |
| (d) Poison sting               | (iv) Osteichthyes    |
- | (a)       | (b)   | (c)   | (d)  |
|-----------|-------|-------|------|
| (1) (ii)  | (iii) | (iv)  | (i)  |
| (2) (iii) | (iv)  | (i)   | (ii) |
| (3) (iv)  | (ii)  | (iii) | (i)  |
| (4) (i)   | (iv)  | (iii) | (ii) |
73. Floridean starch has structure similar to :
- (1) Starch and cellulose
  - (2) Amylopectin and glycogen
  - (3) Mannitol and algin
  - (4) Laminarin and cellulose
74. Which of the following statements is **not correct** ?
- (1) In man insulin is synthesised as a proinsulin.
  - (2) The proinsulin has an extra peptide called C-peptide.
  - (3) The functional insulin has A and B chains linked together by hydrogen bonds.
  - (4) Genetically engineered insulin is produced in *E-Coli*.
75. If the head of cockroach is removed, it may live for few days because :
- (1) the supra-oesophageal ganglia of the cockroach are situated in ventral part of abdomen.
  - (2) the cockroach does not have nervous system.
  - (3) the head holds a small proportion of a nervous system while the rest is situated along the ventral part of its body.
  - (4) the head holds a 1/3<sup>rd</sup> of a nervous system while the rest is situated along the dorsal part of its body.
76. The enzyme enterokinase helps in conversion of :
- (1) protein into polypeptides
  - (2) trypsinogen into trypsin
  - (3) caseinogen into casein
  - (4) pepsinogen into pepsin
77. The transverse section of a plant shows following anatomical features :
- (a) Large number of scattered vascular bundles surrounded by bundle sheath.
  - (b) Large conspicuous parenchymatous ground tissue.
  - (c) Vascular bundles conjoint and closed.
  - (d) Phloem parenchyma absent.
- Identify the category of plant and its part :
- (1) Monocotyledonous stem
  - (2) Monocotyledonous root
  - (3) Dicotyledonous stem
  - (4) Dicotyledonous root



78. In water hyacinth and water lily, pollination takes place by :
- (1) insects or wind
  - (2) water currents only
  - (3) wind and water
  - (4) insects and water
79. In gel electrophoresis, separated DNA fragments can be visualized with the help of :
- (1) Acetocarmine in bright blue light
  - (2) Ethidium bromide in UV radiation
  - (3) Acetocarmine in UV radiation
  - (4) Ethidium bromide in infrared radiation
80. How many true breeding pea plant varieties did Mendel select as pairs, which were similar except in one character with contrasting traits ?
- (1) 4
  - (2) 2
  - (3) 14
  - (4) 8
81. Which of the following refer to **correct** example(s) of organisms which have evolved due to changes in environment brought about by anthropogenic action ?
- (a) Darwin's Finches of Galapagos islands.
  - (b) Herbicide resistant weeds.
  - (c) Drug resistant eukaryotes.
  - (d) Man-created breeds of domesticated animals like dogs.
- (1) only (a)
  - (2) (a) and (c)
  - (3) (b), (c) and (d)
  - (4) only (d)
82. Match the organism with its use in biotechnology.
- |                                      |  |
|--------------------------------------|--|
| (a) <i>Bacillus thuringiensis</i>    | (i) Cloning vector                       |
| (b) <i>Thermus aquaticus</i>         | (ii) Construction of first rDNA molecule |
| (c) <i>Agrobacterium tumefaciens</i> | (iii) DNA polymerase                     |
| (d) <i>Salmonella typhimurium</i>    | (iv) Cry proteins                        |
- Select the **correct** option from the following :
- |     |            |            |            |            |
|-----|------------|------------|------------|------------|
|     | <b>(a)</b> | <b>(b)</b> | <b>(c)</b> | <b>(d)</b> |
| (1) | (ii)       | (iv)       | (iii)      | (i)        |
| (2) | (iv)       | (iii)      | (i)        | (ii)       |
| (3) | (iii)      | (ii)       | (iv)       | (i)        |
| (4) | (iii)      | (iv)       | (i)        | (ii)       |
83. From his experiments, S.L. Miller produced amino acids by mixing the following in a closed flask :
- (1) CH<sub>4</sub>, H<sub>2</sub>, NH<sub>3</sub> and water vapor at 800°C
  - (2) CH<sub>3</sub>, H<sub>2</sub>, NH<sub>4</sub> and water vapor at 800°C
  - (3) CH<sub>4</sub>, H<sub>2</sub>, NH<sub>3</sub> and water vapor at 600°C
  - (4) CH<sub>3</sub>, H<sub>2</sub>, NH<sub>3</sub> and water vapor at 600°C
84. Embryological support for evolution was disapproved by :
- (1) Karl Ernst von Baer
  - (2) Alfred Wallace
  - (3) Charles Darwin
  - (4) Oparin
85. If the distance between two consecutive base pairs is 0.34 nm and the total number of base pairs of a DNA double helix in a typical mammalian cell is  $6.6 \times 10^9$  bp, then the length of the DNA is approximately :
- (1) 2.0 meters
  - (2) 2.5 meters
  - (3) 2.2 meters
  - (4) 2.7 meters

86. Identify the **wrong** statement with reference to immunity.
- (1) When exposed to antigen (living or dead) antibodies are produced in the host's body. It is called "Active immunity".
  - (2) When ready-made antibodies are directly given, it is called "Passive immunity".
  - (3) Active immunity is quick and gives full response.
  - (4) Foetus receives some antibodies from mother, it is an example for passive immunity.
87. The specific palindromic sequence which is recognized by EcoRI is :
- (1) 5' - GAATTC - 3'  
3' - CTTAAG - 5'
  - (2) 5' - GGAACC - 3'  
3' - CCTTGG - 5'
  - (3) 5' - CTTAAG - 3'  
3' - GAATTC - 5'
  - (4) 5' - GGATCC - 3'  
3' - CCTAGG - 5'
88. Which of the following would help in prevention of diuresis ?
- (1) More water reabsorption due to undersecretion of ADH
  - (2) Reabsorption of  $\text{Na}^+$  and water from renal tubules due to aldosterone
  - (3) Atrial natriuretic factor causes vasoconstriction
  - (4) Decrease in secretion of renin by JG cells
89. Montreal protocol was signed in 1987 for control of :
- (1) Transport of Genetically modified organisms from one country to another
  - (2) Emission of ozone depleting substances
  - (3) Release of Green House gases
  - (4) Disposal of e-wastes
90. The roots that originate from the base of the stem are :
- (1) Fibrous roots
  - (2) Primary roots
  - (3) Prop roots
  - (4) Lateral roots
91. The solids which have the negative temperature coefficient of resistance are :
- (1) metals
  - (2) insulators only
  - (3) semiconductors only
  - (4) insulators and semiconductors
92. A charged particle having drift velocity of  $7.5 \times 10^{-4} \text{ m s}^{-1}$  in an electric field of  $3 \times 10^{-10} \text{ Vm}^{-1}$ , has a mobility in  $\text{m}^2 \text{V}^{-1} \text{s}^{-1}$  of :
- (1)  $2.25 \times 10^{15}$
  - (2)  $2.5 \times 10^6$
  - (3)  $2.5 \times 10^{-6}$
  - (4)  $2.25 \times 10^{-15}$
93. For transistor action, which of the following statements is **correct** ?
- (1) Base, emitter and collector regions should have same doping concentrations.
  - (2) Base, emitter and collector regions should have same size.
  - (3) Both emitter junction as well as the collector junction are forward biased.
  - (4) The base region must be very thin and lightly doped.
94. In a guitar, two strings A and B made of same material are slightly out of tune and produce beats of frequency 6 Hz. When tension in B is slightly decreased, the beat frequency increases to 7 Hz. If the frequency of A is 530 Hz, the original frequency of B will be :
- (1) 523 Hz
  - (2) 524 Hz
  - (3) 536 Hz
  - (4) 537 Hz
95. A wire of length L, area of cross section A is hanging from a fixed support. The length of the wire changes to  $L_1$  when mass M is suspended from its free end. The expression for Young's modulus is :
- (1)  $\frac{MgL_1}{AL}$
  - (2)  $\frac{Mg(L_1 - L)}{AL}$
  - (3)  $\frac{MgL}{AL_1}$
  - (4)  $\frac{MgL}{A(L_1 - L)}$