

41. An element has a body centered cubic (bcc) structure with a cell edge of 288 pm. The atomic radius is:
- (1)  $\frac{\sqrt{3}}{4} \times 288$  pm
  - (2)  $\frac{\sqrt{2}}{4} \times 288$  pm
  - (3)  $\frac{4}{\sqrt{3}} \times 288$  pm
  - (4)  $\frac{4}{\sqrt{2}} \times 288$  pm
42. Which of the following is a cationic detergent ?
- (1) Sodium lauryl sulphate
  - (2) Sodium stearate
  - (3) Cetyltrimethyl ammonium bromide
  - (4) Sodium dodecylbenzene sulphonate
43. Reaction between acetone and methylmagnesium chloride followed by hydrolysis will give :
- (1) Isopropyl alcohol
  - (2) Sec. butyl alcohol
  - (3) Tert. butyl alcohol
  - (4) Isobutyl alcohol
44. Find out the solubility of  $\text{Ni}(\text{OH})_2$  in 0.1 M NaOH. Given that the ionic product of  $\text{Ni}(\text{OH})_2$  is  $2 \times 10^{-15}$ .
- (1)  $2 \times 10^{-13}$  M
  - (2)  $2 \times 10^{-8}$  M
  - (3)  $1 \times 10^{-13}$  M
  - (4)  $1 \times 10^8$  M
45. Which of the following oxoacid of sulphur has -O-O- linkage ?
- (1)  $\text{H}_2\text{SO}_3$ , sulphurous acid
  - (2)  $\text{H}_2\text{SO}_4$ , sulphuric acid
  - (3)  $\text{H}_2\text{S}_2\text{O}_8$ , peroxodisulphuric acid
  - (4)  $\text{H}_2\text{S}_2\text{O}_7$ , pyrosulphuric acid
46. Bilaterally symmetrical and acoelomate animals are exemplified by :
- (1) Ctenophora
  - (2) Platyhelminthes
  - (3) Aschelminthes
  - (4) Annelida
47. 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
48. 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)   |
49. 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
50. From his experiments, S.L. Miller produced amino acids by mixing the following in a closed flask :
- (1)  $\text{CH}_4$ ,  $\text{H}_2$ ,  $\text{NH}_3$  and water vapor at  $800^\circ\text{C}$
  - (2)  $\text{CH}_3$ ,  $\text{H}_2$ ,  $\text{NH}_4$  and water vapor at  $800^\circ\text{C}$
  - (3)  $\text{CH}_4$ ,  $\text{H}_2$ ,  $\text{NH}_3$  and water vapor at  $600^\circ\text{C}$
  - (4)  $\text{CH}_3$ ,  $\text{H}_2$ ,  $\text{NH}_3$  and water vapor at  $600^\circ\text{C}$

51. 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) |

52. 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) |

53. 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

54. 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

55. The ovary is half inferior in :

- (1) Brinjal
- (2) Mustard
- (3) Sunflower
- (4) Plum

56. In light reaction, plastoquinone facilitates the transfer of electrons from :

- (1) PS-II to Cytb<sub>6</sub>f complex
- (2) Cytb<sub>6</sub>f complex to PS-I
- (3) PS-I to NADP<sup>+</sup>
- (4) PS-I to ATP synthase

57. 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.

58. 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) |

59. 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

60. 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  $1/3^{\text{rd}}$  of a nervous system while the rest is situated along the dorsal part of its body.

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

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

62. Ray florets have :

- (1) Inferior ovary
- (2) Superior ovary
- (3) Hypogynous ovary .
- (4) Half inferior ovary

63. 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.

64. 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.

65. 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.

66. 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

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     |

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

68. 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

69. Flippers of Penguins and Dolphins are examples of :

- (1) Adaptive radiation
- (2) Convergent evolution
- (3) Industrial melanism
- (4) Natural selection

70. 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'

71. The QRS complex in a standard ECG represents :

- (1) Repolarisation of auricles
- (2) Depolarisation of auricles
- (3) Depolarisation of ventricles
- (4) Repolarisation of ventricles

72. According to Robert May, the global species diversity is about :

- (1) 1.5 million
- (2) 20 million
- (3) 50 million
- (4) 7 million

73. 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

74. 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>Ctenoplane</i> |
| (d) Bioluminescence  | (iv) <i>Locusta</i>     |

|   | (a)   | (b)   | (c)   | (d)   |
|---|-------|-------|-------|-------|
| (1)                                     | (i)   | (iii) | (ii)  | (iv)  |
| <input checked="" type="checkbox"/> (2) | (iv)  | (i)   | (ii)  | (iii) |
| (3)                                     | (iii) | (ii)  | (i)   | (iv)  |
| (4)                                     | (ii)  | (i)   | (iii) | (iv)  |

75. 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

76. 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)  | <input checked="" type="checkbox"/> (d) |
|---|-------|-------|------|---|
| (1)                                     | (ii)  | (iv)  | (i)  | (iii)                                   |
| (2)                                     | (i)   | (iii) | (ii) | (iv)                                    |
| (3)                                     | (iii) | (ii)  | (iv) | (i)                                     |
| <input checked="" type="checkbox"/> (4) | (iv)  | (iii) | (i)  | (ii)                                    |

77. 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

78. The roots that originate from the base of the stem are :

- (1) Fibrous roots
- (2) Primary roots
- (3) Prop roots
- (4) Lateral roots

79. 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

80. 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*.

81. 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.

82. Which of the following regions of the globe exhibits highest species diversity ?

- (1) Western Ghats of India
- (2) Madagascar
- (3) Himalayas
- (4) Amazon forests

83. 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 :

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

84. 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)

85. 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

86. Identify the basic amino acid from the following.

- (1) Tyrosine
- (2) Glutamic Acid
- (3) Lysine
- (4) Valine

87. 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.
88. The process of growth is maximum during :
- (1) Log phase
  - (2) Lag phase
  - (3) Senescence
  - (4) Dormancy
89. The body of the ovule is fused within the funicle at :
- (1) Hilum
  - (2) Micropyle
  - (3) Nucellus
  - (4) Chalaza
90. Dissolution of the synaptonemal complex occurs during :
- (1) Pachytene
  - (2) Zygotene
  - (3) Diplotene
  - (4) Leptotene
91. 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)
92. Which one of the following is the most abundant protein in the animals ?
- (1) Haemoglobin
  - (2) Collagen
  - (3) Lectin
  - (4) Insulin
93. 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.
94. 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
95. 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)
96. 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

7. 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 :

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

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

**Column - I**

- (a) Bt cotton  
(b) Adenosine deaminase deficiency  
(c) RNAi  
(d) PCR

**Column - II**

- (i) Gene therapy  
(ii) Cellular defence  
(iii) Detection of HIV infection  
(iv) *Bacillus thuringiensis*

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

99. 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)       |

100. 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 |

101. 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

102. 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

103. 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

104. Which of the following is **not** an attribute of a population ?

- (1) Sex ratio  
(2) Natality  
(3) Mortality  
(4) Species interaction

105. The infectious stage of *Plasmodium* that enters the human body is :

- (1) Trophozoites
- (2) Sporozoites
- (3) Female gametocytes
- (4) Male gametocytes

106. 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.

107. 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*

108. 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.

109. 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)   |

110. 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

111. 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

112. 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)

113. Experimental verification of the chromosomal theory of inheritance was done by :

- (1) Mendel
- (2) Sutton
- (3) Boveri
- (4) Morgan

114. 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



115. 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 :

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

116. Match the following columns and select the correct option.

Column - I

Column - II

- |                                |                      |
|--------------------------------|----------------------|
| (a) 6 - 15 pairs of gill slits | (i) Trygon           |
| (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) |

117. Goblet cells of alimentary canal are modified from :

- (1) Squamous epithelial cells
- (2) Columnar epithelial cells
- (3) Chondrocytes
- (4) Compound epithelial cells

118. 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 → 3 |
| (2) 2.5 meters | 3 → 4 |
| (3) 2.2 meters | 4 → 9 |
| (4) 2.7 meters |       |

119. The number of substrate level phosphorylations in one turn of citric acid cycle is :

- (1) Zero
- (2) One
- (3) Two
- (4) Three

120. Which is the important site of formation of glycoproteins and glycolipids in eukaryotic cells ?

- (1) Endoplasmic reticulum
- (2) Peroxisomes
- (3) Golgi bodies
- (4) Polysomes

121. Strobili or cones are found in :

- (1) *Salvinia*
- (2) *Pteris*
- (3) *Marchantia*
- (4) *Equisetum*

122. 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) |

123. 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

124. Select the correct match.

- (1) Haemophilia - Y linked ~~f~~
- (2) Phenylketonuria - Autosomal dominant trait
- (3) Sickle cell anaemia - Autosomal recessive trait, chromosome-11
- (4) Thalassemia - X linked

125. Floridean starch has structure similar to :

- (1) Starch and cellulose
- (2) Amylopectin and glycogen
- (3) Mannitol and algin
- (4) Laminarin and cellulose

126. 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.

127. 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.

128. Identify the correct statement with regard to  $G_1$  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.

129. The enzyme enterokinase helps in conversion of :

- (1) protein into polypeptides
- (2) trypsinogen into trypsin
- (3) caseinogen into casein
- (4) pepsinogen into pepsin

130. 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

131. 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

132. 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

133. 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

134. 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

135. Embryological support for evolution was disapproved by :

- (1) Karl Ernst von Baer  
 (2) Alfred Wallace  
 (3) Charles Darwin  
 (4) Oparin

136. The increase in the width of the depletion region in a p-n junction diode is due to :

- (1) forward bias only  
 (2) reverse bias only  
 (3) both forward bias and reverse bias  
 (4) increase in forward current

137. Light of frequency 1.5 times the threshold frequency is incident on a photosensitive material. What will be the photoelectric current if the frequency is halved and intensity is doubled ?

- (1) doubled  
 (2) four times  
 (3) one-fourth  
 (4) zero

138. A resistance wire connected in the left gap of a metre bridge balances a  $10\ \Omega$  resistance in the right gap at a point which divides the bridge wire in the ratio 3 : 2. If the length of the resistance wire is 1.5 m, then the length of  $1\ \Omega$  of the resistance wire is :

- (1)  $1.0 \times 10^{-2}$  m  
 (2)  $1.0 \times 10^{-1}$  m  
 (3)  $1.5 \times 10^{-1}$  m  
 (4)  $1.5 \times 10^{-2}$  m

139. The energy required to break one bond in DNA is  $10^{-20}$  J. This value in eV is nearly :

- (1) 6  
 (2) 0.6  
 (3) 0.06  
 (4) 0.006

140. The phase difference between displacement and acceleration of a particle in a simple harmonic motion is :

- (1)  $\pi$  rad  
 (2)  $\frac{3\pi}{2}$  rad  
 (3)  $\frac{\pi}{2}$  rad  
 (4) zero

141. A ball is thrown vertically downward with a velocity of 20 m/s from the top of a tower. It hits the ground after some time with a velocity of 80 m/s. The height of the tower is : ( $g = 10\ \text{m/s}^2$ )

- (1) 360 m  
 (2) 340 m  
 (3) 320 m  
 (4) 300 m

142. A short electric dipole has a dipole moment of  $16 \times 10^{-9}$  C m. The electric potential due to the dipole at a point at a distance of 0.6 m from the centre of the dipole, situated on a line making an angle of  $60^\circ$  with the dipole axis is :

$$\left( \frac{1}{4\pi\epsilon_0} = 9 \times 10^9\ \text{N m}^2/\text{C}^2 \right)$$

- (1) 50 V  
 (2) 200 V  
 (3) 400 V  
 (4) zero

143. An iron rod of susceptibility 599 is subjected to a magnetising field of  $1200\ \text{A m}^{-1}$ . The permeability of the material of the rod is :

$$(\mu_0 = 4\pi \times 10^{-7}\ \text{T m A}^{-1})$$

- (1)  $2.4 \times 10^{-4}\ \text{T m A}^{-1}$   
 (2)  $8.0 \times 10^{-5}\ \text{T m A}^{-1}$   
 (3)  $2.4 \times 10^{-5}\ \text{T m A}^{-1}$   
 (4)  $2.4 \times 10^{-7}\ \text{T m A}^{-1}$

144. Two cylinders A and B of equal capacity are connected to each other via a stop cock. A contains an ideal gas at standard temperature and pressure. B is completely evacuated. The entire system is thermally insulated. The stop cock is suddenly opened. The process is :

- (1) isothermal  
 (2) adiabatic  
 (3) isochoric  
 (4) isobaric