

37. The average thermal energy for a mono-atomic gas is : ( $k_B$  is Boltzmann constant and  $T$ , absolute temperature)
- (1)  $\frac{3}{2} k_B T$
  - (2)  $\frac{5}{2} k_B T$
  - (3)  $\frac{7}{2} k_B T$
  - (4)  $\frac{1}{2} k_B T$
38. Find the torque about the origin when a force of  $3\hat{j}$  N acts on a particle whose position vector is  $2\hat{k}$  m .
- (1)  $6\hat{j}$  N m
  - (2)  $-6\hat{i}$  N m
  - (3)  $6\hat{k}$  N m
  - (4)  $6\hat{i}$  N m
39. 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) four times
  - (2) one-fourth
  - (3) zero
  - (4) doubled
40. A long solenoid of 50 cm length having 100 turns carries a current of 2.5 A. The magnetic field at the centre of the solenoid is : ( $\mu_0 = 4\pi \times 10^{-7} \text{ T m A}^{-1}$ )
- (1)  $3.14 \times 10^{-4} \text{ T}$
  - (2)  $6.28 \times 10^{-5} \text{ T}$
  - (3)  $3.14 \times 10^{-5} \text{ T}$
  - (4)  $6.28 \times 10^{-4} \text{ T}$
41. The Brewsters angle  $i_b$  for an interface should be :
- (1)  $30^\circ < i_b < 45^\circ$
  - (2)  $45^\circ < i_b < 90^\circ$
  - (3)  $i_b = 90^\circ$
  - (4)  $0^\circ < i_b < 30^\circ$
42. An electron is accelerated from rest through a potential difference of  $V$  volt. If the de Broglie wavelength of the electron is  $1.227 \times 10^{-2} \text{ nm}$ , the potential difference is :
- (1)  $10^2 \text{ V}$
  - (2)  $10^3 \text{ V}$
  - (3)  $10^4 \text{ V}$
  - (4)  $10 \text{ V}$
43. Taking into account of the significant figures, what is the value of  $9.99 \text{ m} - 0.0099 \text{ m}$  ?
- (1)  $9.98 \text{ m}$
  - (2)  $9.980 \text{ m}$
  - (3)  $9.9 \text{ m}$
  - (4)  $9.9801 \text{ m}$
44. A screw gauge has least count of 0.01 mm and there are 50 divisions in its circular scale. The pitch of the screw gauge is :
- (1) 0.25 mm
  - (2) 0.5 mm
  - (3) 1.0 mm
  - (4) 0.01 mm
45. The phase difference between displacement and acceleration of a particle in a simple harmonic motion is :
- (1)  $\frac{3\pi}{2}$  rad
  - (2)  $\frac{\pi}{2}$  rad
  - (3) zero
  - (4)  $\pi$  rad
46. 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 :
- |     | (a)   | (b)   | (c)   | (d)  |
|-----|-------|-------|-------|------|
| (1) | (iv)  | (iii) | (i)   | (ii) |
| (2) | (iii) | (ii)  | (iv)  | (i)  |
| (3) | (iii) | (iv)  | (i)   | (ii) |
| (4) | (ii)  | (iv)  | (iii) | (i)  |

47. 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) | (iii)      | (i)        | (iv)       | (ii)       |
| (2) | (iii)      | (iv)       | (i)        | (ii)       |
| (3) | (ii)       | (iii)      | (i)        | (iv)       |
| (4) | (ii)       | (iv)       | (iii)      | (i)        |
48. The plant parts which consist of two generations - one within the other :
- Pollen grains inside the anther
  - Germinated pollen grain with two male gametes
  - Seed inside the fruit
  - Embryo sac inside the ovule
- (a), (b) and (c)
  - (c) and (d)
  - (a) and (d)
  - (a) only
49. The oxygenation activity of RuBisCo enzyme in photorespiration leads to the formation of :
- 1 molecule of 3-C compound
  - 1 molecule of 6-C compound
  - 1 molecule of 4-C compound and 1 molecule of 2-C compound
  - 2 molecules of 3-C compound
50. In relation to Gross primary productivity and Net primary productivity of an ecosystem, which one of the following statements is **correct** ?
- Gross primary productivity is always more than net primary productivity.
  - Gross primary productivity and Net primary productivity are one and same.
  - There is no relationship between Gross primary productivity and Net primary productivity.
  - Gross primary productivity is always less than net primary productivity.
51. The product(s) of reaction catalyzed by nitrogenase in root nodules of leguminous plants is/are :
- Nitrate alone
  - Ammonia and oxygen
  - Ammonia and hydrogen
  - Ammonia alone
52. Identify the **incorrect** statement.
- Sapwood is involved in conduction of water and minerals from root to leaf.
  - Sapwood is the innermost secondary xylem and is lighter in colour.
  - Due to deposition of tannins, resins, oils etc., heart wood is dark in colour.
  - Heart wood does not conduct water but gives mechanical support.
53. Bt cotton variety that was developed by the introduction of toxin gene of *Bacillus thuringiensis* (Bt) is resistant to :
- Fungal diseases
  - Plant nematodes
  - Insect predators
  - Insect pests
54. Which of the following pairs is of unicellular algae ?
- Gelidium* and *Gracilaria*
  - Anabaena* and *Volvox*
  - Chlorella* and *Spirulina*
  - Laminaria* and *Sargassum*
55. Strobili or cones are found in :
- Pteris*
  - Marchantia*
  - Equisetum*
  - Salvinia*
56. Name the enzyme that facilitates opening of DNA helix during transcription.
- DNA helicase
  - DNA polymerase
  - RNA polymerase
  - DNA ligase

57. Identify the **wrong** statement with reference to transport of oxygen.
- (1) Partial pressure of  $\text{CO}_2$  can interfere with  $\text{O}_2$  binding with haemoglobin.
  - (2) Higher  $\text{H}^+$  conc. in alveoli favours the formation of oxyhaemoglobin.
  - (3) Low  $\text{pCO}_2$  in alveoli favours the formation of oxyhaemoglobin.
  - (4) Binding of oxygen with haemoglobin is mainly related to partial pressure of  $\text{O}_2$ .
58. Identify the **correct** statement with regard to  $\text{G}_1$  phase (Gap 1) of interphase.
- (1) Reorganisation of all cell components takes place.
  - (2) Cell is metabolically active, grows but does not replicate its DNA.
  - (3) Nuclear Division takes place.
  - (4) DNA synthesis or replication takes place.
59. Which of the following statements about inclusion bodies is **incorrect** ?
- (1) These are involved in ingestion of food particles.
  - (2) They lie free in the cytoplasm.
  - (3) These represent reserve material in cytoplasm.
  - (4) They are not bound by any membrane.
60. 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) (iii) | (iv)  | (i)   | (ii)  |
| (2) (ii)  | (i)   | (iii) | (iv)  |
| (3) (iv)  | (i)   | (ii)  | (iii) |
| (4) (i)   | (iii) | (ii)  | (iv)  |
61. Meiotic division of the secondary oocyte is completed :
- (1) At the time of copulation
  - (2) After zygote formation
  - (3) At the time of fusion of a sperm with an ovum
  - (4) Prior to ovulation
62. By which method was a new breed 'Hisardale' of sheep formed by using Bikaneri ewes and Marino rams ?
- (1) Mutational breeding
  - (2) Cross breeding
  - (3) Inbreeding
  - (4) Out crossing
63. The number of substrate level phosphorylations in one turn of citric acid cycle is :
- (1) One
  - (2) Two
  - (3) Three
  - (4) Zero
64. Choose the **correct** pair from the following :
- (1) Polymerases - Break the DNA into fragments
  - (2) Nucleases - Separate the two strands of DNA
  - (3) Exonucleases - Make cuts at specific positions within DNA
  - (4) Ligases - Join the two DNA molecules
65. The infectious stage of *Plasmodium* that enters the human body is :
- (1) Sporozoites
  - (2) Female gametocytes
  - (3) Male gametocytes
  - (4) Trophozoites
66. Which of the following is **not** an attribute of a population ?
- (1) Natality
  - (2) Mortality
  - (3) Species interaction
  - (4) Sex ratio

67. Select the **correct** events that occur during inspiration.
- Contraction of diaphragm
  - Contraction of external inter-costal muscles
  - Pulmonary volume decreases
  - Intra pulmonary pressure increases
- (c) and (d)
  - (a), (b) and (d)
  - only (d)
  - (a) and (b)
68. According to Robert May, the global species diversity is about :
- 20 million
  - 50 million
  - 7 million
  - 1.5 million
69. The QRS complex in a standard ECG represents :
- Depolarisation of auricles
  - Depolarisation of ventricles
  - Repolarisation of ventricles
  - Repolarisation of auricles
70. Which of the following statements is **not correct** ?
- The proinsulin has an extra peptide called C-peptide.
  - The functional insulin has A and B chains linked together by hydrogen bonds.
  - Genetically engineered insulin is produced in *E-Coli*.
  - In man insulin is synthesised as a proinsulin.
71. The transverse section of a plant shows following anatomical features :
- Large number of scattered vascular bundles surrounded by bundle sheath.
  - Large conspicuous parenchymatous ground tissue.
  - Vascular bundles conjoint and closed.
  - Phloem parenchyma absent.
- Identify the category of plant and its part :
- Monocotyledonous root
  - Dicotyledonous stem
  - Dicotyledonous root
  - Monocotyledonous stem
72. Select the **correct** statement.
- Glucagon is associated with hypoglycemia.
  - Insulin acts on pancreatic cells and adipocytes.
  - Insulin is associated with hyperglycemia.
  - Glucocorticoids stimulate gluconeogenesis.
73. Montreal protocol was signed in 1987 for control of :
- Emission of ozone depleting substances
  - Release of Green House gases
  - Disposal of e-wastes
  - Transport of Genetically modified organisms from one country to another
74. 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) | (iii) | (iv)  | (i)   | (ii) |
| (2) | (iv)  | (ii)  | (iii) | (i)  |
| (3) | (i)   | (iv)  | (iii) | (ii) |
| (4) | (ii)  | (iii) | (iv)  | (i)  |
75. Identify the **wrong** statement with regard to Restriction Enzymes.
- They cut the strand of DNA at palindromic sites.
  - They are useful in genetic engineering.
  - Sticky ends can be joined by using DNA ligases.
  - Each restriction enzyme functions by inspecting the length of a DNA sequence.

**G1**

76. 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) (iv)  | (iii) | (ii)  | (i)   |
| (2) (i)   | (ii)  | (iv)  | (iii) |
| (3) (ii)  | (iv)  | (iii) | (i)   |
| (4) (iii) | (iv)  | (i)   | (ii)  |

77. Cuboidal epithelium with brush border of microvilli is found in :

- (1) ducts of salivary glands
- (2) proximal convoluted tubule of nephron
- (3) eustachian tube
- (4) lining of intestine

78. Name the plant growth regulator which upon spraying on sugarcane crop, increases the length of stem, thus increasing the yield of sugarcane crop.

- (1) Gibberellin
- (2) Ethylene
- (3) Abscisic acid
- (4) Cytokinin

79. 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) (iii) | (ii)  | (i)   | (iv)  |
| (2) (ii)  | (iii) | (iv)  | (i)   |
| (3) (i)   | (ii)  | (iii) | (iv)  |
| (4) (iv)  | (i)   | (ii)  | (iii) |

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80. The ovary is half inferior in :

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

81. Which one of the following is the most abundant protein in the animals ?

- (1) Collagen
- (2) Lectin
- (3) Insulin
- (4) Haemoglobin

82. 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) 2.5 meters
- (2) 2.2 meters
- (3) 2.7 meters
- (4) 2.0 meters

83. The first phase of translation is :

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

84. Which of the following hormone levels will cause release of ovum (ovulation) from the graffian follicle ?

- (1) High concentration of Progesterone
- (2) Low concentration of LH
- (3) Low concentration of FSH
- (4) High concentration of Estrogen

85. Flippers of Penguins and Dolphins are examples of :

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

86. Identify the **wrong** statement with reference to the gene 'I' that controls ABO blood groups.
- (1) A person will have only two of the three alleles.
  - (2) When I<sup>A</sup> and I<sup>B</sup> are present together, they express same type of sugar.
  - (3) Allele 'i' does not produce any sugar.
  - (4) The gene (I) has three alleles.
87. Select the option including all sexually transmitted diseases.
- (1) Gonorrhoea, Malaria, Genital herpes
  - (2) AIDS, Malaria, Filariasis
  - (3) Cancer, AIDS, Syphilis
  - (4) Gonorrhoea, Syphilis, Genital herpes
88. 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) (iv) (i) (ii) (iii)
  - (2) (i) (ii) (iv) (iii)
  - (3) (ii) (i) (iii) (iv)
  - (4) (iii) (iv) (ii) (i)
89. 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) (iii) (ii) (i) (iv)
  - (2) (iv) (iii) (ii) (i)
  - (3) (i) (ii) (iii) (iv)
  - (4) (ii) (iii) (iv) (i)
90. In light reaction, plastoquinone facilitates the transfer of electrons from :
- (1) Cytb<sub>6</sub>f complex to PS-I
  - (2) PS-I to NADP<sup>+</sup>
  - (3) PS-I to ATP synthase
  - (4) PS-II to Cytb<sub>6</sub>f complex
91. Embryological support for evolution was disapproved by :
- (1) Alfred Wallace
  - (2) Charles Darwin
  - (3) Oparin
  - (4) Karl Ernst von Baer
92. Bilaterally symmetrical and acoelomate animals are exemplified by :
- (1) Platyhelminthes
  - (2) Aschelminthes
  - (3) Annelida
  - (4) Ctenophora
93. Which of the following would help in prevention of diuresis ?
- (1) Reabsorption of Na<sup>+</sup> and water from renal tubules due to aldosterone
  - (2) Atrial natriuretic factor causes vasoconstriction
  - (3) Decrease in secretion of renin by JG cells
  - (4) More water reabsorption due to undersecretion of ADH
94. 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) (ii) (i) (iv) (iii)
  - (2) (i) (ii) (iv) (iii)
  - (3) (iv) (iii) (ii) (i)
  - (4) (iii) (iv) (ii) (i)

95. 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)  $G_1$  phase
  - (2) S phase
  - (3)  $G_2$  phase
  - (4) M phase
96. In which of the following techniques, the embryos are transferred to assist those females who cannot conceive ?
- (1) GIFT and ZIFT
  - (2) ICSI and ZIFT
  - (3) GIFT and ICSI
  - (4) ZIFT and IUT
97. 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) (c) and (a)
  - (2) (a) and (b)
  - (3) (b) and (c)
  - (4) (d) and (c)
98. Snow-blindness in Antarctic region is due to :
- (1) Inflammation of cornea due to high dose of UV-B radiation
  - (2) High reflection of light from snow
  - (3) Damage to retina caused by infra-red rays
  - (4) Freezing of fluids in the eye by low temperature
99. 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) (iii) (ii) (i) (iv)
  - (2) (iii) (i) (iv) (ii)
  - (3) (ii) (i) (iv) (iii)
  - (4) (iv) (iii) (i) (ii)
100. Which of the following statements is **correct** ?
- (1) Adenine pairs with thymine through one H-bond.
  - (2) Adenine pairs with thymine through three H-bonds.
  - (3) Adenine does not pair with thymine.
  - (4) Adenine pairs with thymine through two H-bonds.
101. 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) (iv) (iii) (ii) (i)
  - (2) (iii) (iv) (ii) (i)
  - (3) (iv) (i) (ii) (iii)
  - (4) (ii) (i) (iv) (iii)
102. Which of the following is **not** an inhibitory substance governing seed dormancy ?
- (1) Abscisic acid
  - (2) Phenolic acid
  - (3) Para-ascorbic acid
  - (4) Gibberellic acid

- 103.** From his experiments, S.L. Miller produced amino acids by mixing the following in a closed flask :
- (1)  $\text{CH}_3$ ,  $\text{H}_2$ ,  $\text{NH}_4$  and water vapor at  $800^\circ\text{C}$
  - (2)  $\text{CH}_4$ ,  $\text{H}_2$ ,  $\text{NH}_3$  and water vapor at  $600^\circ\text{C}$
  - (3)  $\text{CH}_3$ ,  $\text{H}_2$ ,  $\text{NH}_3$  and water vapor at  $600^\circ\text{C}$
  - (4)  $\text{CH}_4$ ,  $\text{H}_2$ ,  $\text{NH}_3$  and water vapor at  $800^\circ\text{C}$
- 104.** Experimental verification of the chromosomal theory of inheritance was done by :
- (1) Sutton
  - (2) Boveri
  - (3) Morgan
  - (4) Mendel
- 105.** The body of the ovule is fused within the funicle at :
- (1) Micropyle
  - (2) Nucellus
  - (3) Chalaza
  - (4) Hilum
- 106.** Identify the **correct** statement with reference to human digestive system.
- (1) Serosa is the innermost layer of the alimentary canal.
  - (2) Ileum is a highly coiled part.
  - (3) Vermiform appendix arises from duodenum.
  - (4) Ileum opens into small intestine.
- 107.** Dissolution of the synaptonemal complex occurs during :
- (1) Zygotene
  - (2) Diplotene
  - (3) Leptotene
  - (4) Pachytene
- 108.** Floridean starch has structure similar to :
- (1) Amylopectin and glycogen
  - (2) Mannitol and algin
  - (3) Laminarin and cellulose
  - (4) Starch and cellulose
- 109.** The specific palindromic sequence which is recognized by EcoRI is :
- (1) 5' - GGAACC - 3'  
3' - CCTTGG - 5'
  - (2) 5' - CTTAAG - 3'  
3' - GAATTC - 5'
  - (3) 5' - GGATCC - 3'  
3' - CCTAGG - 5'
  - (4) 5' - GAATTC - 3'  
3' - CTTAAG - 5'
- 110.** Select the **correct** match.
- |                         |   |  |
|-------------------------|---|--|
| (1) Phenylketonuria     | - | Autosomal dominant trait                 |
| (2) Sickle cell anaemia | - | Autosomal recessive trait, chromosome-11 |
| (3) Thalassemia         | - | X linked                                 |
| (4) Haemophilia         | - | Y linked                                 |
- 111.** Identify the substances having glycosidic bond and peptide bond, respectively in their structure :
- (1) Glycerol, trypsin
  - (2) Cellulose, lecithin
  - (3) Inulin, insulin
  - (4) Chitin, cholesterol
- 112.** The process of growth is maximum during :
- (1) Lag phase
  - (2) Senescence
  - (3) Dormancy
  - (4) Log phase
- 113.** 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) | (iii) | (i)   | (iv) | (ii)  |
| (2) | (iv)  | (ii)  | (i)  | (iii) |
| (3) | (i)   | (ii)  | (iv) | (iii) |
| (4) | (ii)  | (iii) | (i)  | (iv)  |



114. 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) Root pressure
  - (2) Imbibition
  - (3) Plasmolysis
  - (4) Transpiration
115. Identify the **wrong** statement with reference to immunity.
- (1) When ready-made antibodies are directly given, it is called "Passive immunity".
  - (2) Active immunity is quick and gives full response.
  - (3) Foetus receives some antibodies from mother, it is an example for passive immunity.
  - (4) When exposed to antigen (living or dead) antibodies are produced in the host's body. It is called "Active immunity".
116. In water hyacinth and water lily, pollination takes place by :
- (1) water currents only
  - (2) wind and water
  - (3) insects and water
  - (4) insects or wind
117. Which is the important site of formation of glycoproteins and glycolipids in eukaryotic cells ?
- (1) Peroxisomes
  - (2) Golgi bodies
  - (3) Polysomes
  - (4) Endoplasmic reticulum
118. Which of the following regions of the globe exhibits highest species diversity ?
- (1) Madagascar
  - (2) Himalayas
  - (3) Amazon forests
  - (4) Western Ghats of India
119. Goblet cells of alimentary canal are modified from :
- (1) Columnar epithelial cells
  - (2) Chondrocytes
  - (3) Compound epithelial cells
  - (4) Squamous epithelial cells
120. Which of the following is **correct** about viroids ?
- (1) They have free RNA without protein coat.
  - (2) They have DNA with protein coat.
  - (3) They have free DNA without protein coat.
  - (4) They have RNA with protein coat.
121. Secondary metabolites such as nicotine, strychnine and caffeine are produced by plants for their :
- (1) Growth response
  - (2) Defence action
  - (3) Effect on reproduction
  - (4) Nutritive value
122. Match the following columns and select the **correct** option.
- |     | <b>Column - I</b>     | <b>Column - II</b>                      |
|-----|-----------------------|---|
| (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           |
- |     | <b>(a)</b> | <b>(b)</b> | <b>(c)</b> | <b>(d)</b> |
|-----|------------|------------|------------|------------|
| (1) | (i)        | (iv)       | (ii)       | (iii)      |
| (2) | (iii)      | (ii)       | (iv)       | (i)        |
| (3) | (ii)       | (iii)      | (iv)       | (i)        |
| (4) | (iv)       | (iii)      | (i)        | (ii)       |
123. Ray florets have :
- (1) Superior ovary
  - (2) Hypogynous ovary
  - (3) Half inferior ovary
  - (4) Inferior ovary
124. Which of the following is put into Anaerobic sludge digester for further sewage treatment ?
- (1) Floating debris
  - (2) Effluents of primary treatment
  - (3) Activated sludge
  - (4) Primary sludge

125. The enzyme enterokinase helps in conversion of :
- (1) trypsinogen into trypsin
  - (2) caseinogen into casein
  - (3) pepsinogen into pepsin
  - (4) protein into polypeptides

126. 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>Ctenoplanea</i>
(d)	Bioluminescence	(iv)	<i>Locusta</i>

  

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

127. Presence of which of the following conditions in urine are indicative of Diabetes Mellitus ?
- (1) Uremia and Renal Calculi
  - (2) Ketonuria and Glycosuria
  - (3) Renal calculi and Hyperglycaemia
  - (4) Uremia and Ketonuria

128. 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)	(i)	(iii)	(ii)	(iv)
(2)	(iii)	(ii)	(iv)	(i)
(3)	(iv)	(iii)	(i)	(ii)
(4)	(ii)	(iv)	(i)	(iii)

129. How many true breeding pea plant varieties did Mendel select as pairs, which were similar except in one character with contrasting traits ?

- (1) 2
- (2) 14
- (3) 8
- (4) 4

130. If the head of cockroach is removed, it may live for few days because :

- (1) the cockroach does not have nervous system.
- (2) the head holds a small proportion of a nervous system while the rest is situated along the ventral part of its body.
- (3) 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.
- (4) the supra-oesophageal ganglia of the cockroach are situated in ventral part of abdomen.

131. 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) (a) and (c)
  - (2) (b), (c) and (d)
  - (3) only (d)
  - (4) only (a)

132. Identify the basic amino acid from the following.

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

133. In gel electrophoresis, separated DNA fragments can be visualized with the help of :

- (1) Ethidium bromide in UV radiation
- (2) Acetocarmine in UV radiation
- (3) Ethidium bromide in infrared radiation
- (4) Acetocarmine in bright blue light

- 134.** The sequence that controls the copy number of the linked DNA in the vector, is termed :
- (1) Ori site
  - (2) Palindromic sequence
  - (3) Recognition site
  - (4) Selectable marker
- 135.** The roots that originate from the base of the stem are :
- (1) Primary roots
  - (2) Prop roots
  - (3) Lateral roots
  - (4) Fibrous roots
- 136.** The calculated spin only magnetic moment of  $\text{Cr}^{2+}$  ion is :
- (1) 4.90 BM
  - (2) 5.92 BM
  - (3) 2.84 BM
  - (4) 3.87 BM
- 137.** Match the following and identify the **correct** option.
- |  |   |
|--|---|
| (a) $\text{CO}(\text{g}) + \text{H}_2(\text{g})$ | (i) $\text{Mg}(\text{HCO}_3)_2 + \text{Ca}(\text{HCO}_3)_2$ |
| (b) Temporary hardness of water                  | (ii) An electron deficient hydride                          |
| (c) $\text{B}_2\text{H}_6$                       | (iii) Synthesis gas   |
| (d) $\text{H}_2\text{O}_2$                       | (iv) Non-planar structure                                   |
- |     | (a)   | (b)   | (c)  | (d)  |
|-----|-------|-------|------|------|
| (1) | (iii) | (ii)  | (i)  | (iv) |
| (2) | (iii) | (iv)  | (ii) | (i)  |
| (3) | (i)   | (iii) | (ii) | (iv) |
| (4) | (iii) | (i)   | (ii) | (iv) |
- 138.** The mixture which shows positive deviation from Raoult's law is :
- (1) Benzene + Toluene
  - (2) Acetone + Chloroform
  - (3) Chloroethane + Bromoethane
  - (4) Ethanol + Acetone
- 139.** Identify the **correct** statement from the following :
- (1) Blister copper has blistered appearance due to evolution of  $\text{CO}_2$ .
  - (2) Vapour phase refining is carried out for Nickel by Van Arkel method.
  - (3) Pig iron can be moulded into a variety of shapes.
  - (4) Wrought iron is impure iron with 4% carbon.
- 140.** Urea reacts with water to form **A** which will decompose to form **B**. **B** when passed through  $\text{Cu}^{2+}$  (aq), deep blue colour solution **C** is formed. What is the formula of **C** from the following ?
- (1)  $[\text{Cu}(\text{NH}_3)_4]^{2+}$
  - (2)  $\text{Cu}(\text{OH})_2$
  - (3)  $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$
  - (4)  $\text{CuSO}_4$
- 141.** Hydrolysis of sucrose is given by the following reaction.
- $$\text{Sucrose} + \text{H}_2\text{O} \rightleftharpoons \text{Glucose} + \text{Fructose}$$
- If the equilibrium constant ( $K_c$ ) is  $2 \times 10^{13}$  at 300 K, the value of  $\Delta_r G^\ominus$  at the same temperature will be :
- (1)  $8.314 \text{ J mol}^{-1} \text{ K}^{-1} \times 300 \text{ K} \times \ln(2 \times 10^{13})$
  - (2)  $8.314 \text{ J mol}^{-1} \text{ K}^{-1} \times 300 \text{ K} \times \ln(3 \times 10^{13})$
  - (3)  $-8.314 \text{ J mol}^{-1} \text{ K}^{-1} \times 300 \text{ K} \times \ln(4 \times 10^{13})$
  - (4)  $-8.314 \text{ J mol}^{-1} \text{ K}^{-1} \times 300 \text{ K} \times \ln(2 \times 10^{13})$
- 142.** Identify the **incorrect** match.
- |     | Name        |       | IUPAC Official Name |
|-----|-------------|-------|---------------------|
| (a) | Unnilunium  | (i)   | Mendelevium         |
| (b) | Unniltrium  | (ii)  | Lawrencium          |
| (c) | Unnilhexium | (iii) | Seaborgium          |
| (d) | Unununnium  | (iv)  | Darmstadtium        |
- (1) (b), (ii)
  - (2) (c), (iii)
  - (3) (d), (iv)
  - (4) (a), (i)
- 143.** Which of the following is a basic amino acid ?
- (1) Alanine
  - (2) Tyrosine
  - (3) Lysine
  - (4) Serine