

KEAM 2010 Paper II Biology

- During meiosis I, the bivalent chromosomes clearly appear as tetrads during:
 - Diakinesis
 - Diplotene
 - Leptotene
 - Zygotene
 - Pachytene
- Which of these is **wrongly** matched?
 - Chloroplasts – Chlorophyll
 - Elaioplasts – Starch
 - Chromoplasts – Carotenoids
 - Amyloplasts – Carbohydrates
 - Aleuroplasts – Proteins
- Pick out the lectin from those given below:
 - Gum
 - Diterpene
 - Curcumin
 - Morphine
 - Concanavalin A
- Arrange the steps of catalytic action of an enzyme in order and choose the right option:
 - The enzyme releases the products of the reaction and the enzyme is free to bind to another substrate
 - The active site of enzyme is in close proximity of the substrate and breaks the chemical bonds of the substrate
 - The binding of substrate induces the enzyme to alter its shape fitting more tightly around the substrate
 - The substrate binds to the active site of the enzyme fitting into the active site
 - IV, III, II, I
 - III, II, I, IV
 - IV, II, I, III
 - II, I, IV, III
 - III, IV, I, II
- Find out the **wrongly** matched pair.
 - Primary metabolite – Ribose
 - Secondary metabolite – Anthocyanins
 - Protein – Insulin
 - Chitin – Polysaccharide
 - Cellulose – Heteropolymer
- Match the following and choose the correct combination from the options given:

	Column I		Column II
a	Sulphur	1	Chlorophyll
b	Zinc	2	Nitrogenase
c	Magnesium	3	Methionine
d	Molybdenum	4	Auxin

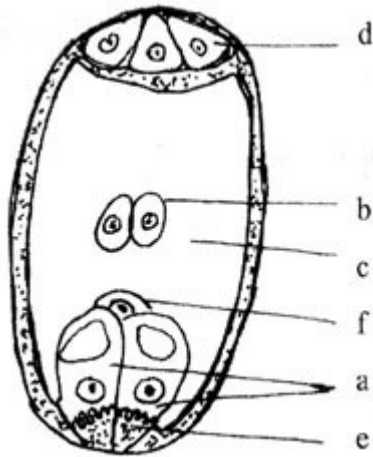
- a – 1, b – 2, c – 3, d – 4
- a – 3, b – 4, c – 1, d – 2

- (C) a – 3, b – 1, c – 2, d – 4
 (D) a – 2, b – 4, c – 1, d – 3
 (E) a – 4, b – 3, c – 2, d – 1
7. Necrosis, or death of tissue particularly leaf tissue, is due to the deficiency of:
 (A) N, K, S
 (B) N, K, Mg and Fe
 (C) Mn, Zn and Mo
 (D) Ca, Mg, Cu and K
 (E) N, K, Mg, Fe, Mn, Zn and Mo
8. Which of the following is a 4-carbon compound?
 (A) Oxaloacetic acid
 (B) Phosphoglyceric acid
 (C) Ribulose bis phosphate
 (D) Phosphoenol pyruvate
 (E) Citric acid
9. Attraction of water molecules to polar surfaces is known as:
 (A) Cohesion
 (B) Capillarity
 (C) Surface Tension
 (D) Tensile strength
 (E) Adhesion
10. Oxidation of one molecule of NADH gives rise to:
 (A) 3 ATP molecules
 (B) 12 ATP molecules
 (C) 2 ATP molecules
 (D) 1 ATP molecule
 (E) 8 ATP molecules
- Which of the following is **wrongly** matched?
 (A) Sorghum – Kranz anatomy
 (B) PEP Carboxylase – Mesophyll cells
 (C) Blackman – Law of limiting factors
 (D) Photorespiration – C₃ plants
 (E) PSII – P700
11. Which of the following is not a purpose of transpiration?
 (A) Supplies water for photosynthesis
 (B) Helps in translocation of sugars from source to sink
 (C) Maintains shape and structure of the plants
 (D) Cools leaf surfaces
 (E) Transports minerals from the soil to all parts of the plant
12. The minerals involved in water-splitting reaction during photosynthesis are:
 (A) Magnesium and Chlorine
 (B) Pottassium and Manganese
 (C) Manganese and Chlorine
 (D) Molybdenum and Manganese
 (E) Copper and Chlorine
13. Which of the following is a bacterium involved in denitrification?
 (A) *Nitrococcus*
 (B) *Nitrosomonas*
 (C) *Pseudomonas*

- (D) *Nitrobacter*
 (E) *Azotobacter*
14. Which of the following statements regarding C₄ plants is **false**?
- (A) The primary CO₂ acceptor is a 5 carbon molecule
 (B) The initial carboxylation reaction occurs in mesophyll
 (C) The leaves that fix CO₂ have two cell types
 (D) The mesophyll cells lack RuBisCO enzyme
 (E) The Calvin pathway does not take place in the mesophyll cells but does so only in the bundle sheath cells
15. When tripalmitin is used as a substrate in respiration, the R.Q. is:
- (A) >1
 (B) 1.0
 (C) 0.9
 (D) ∞
 (E) 0.7
16. Find out the **wrongly** matched pair:
- (A) Tuber – Potato
 (B) Rhizome – Ginger
 (C) Bulbil – *Agave*
 (D) Leaf buds – Banana
 (E) Offset – Water hyacinth
17. Which of the following is pollinated by water?
- (A) *Viola*
 (B) *Yucca*
 (C) *Oxalis*
 (D) *Commelina*
 (E) *Zostera*
18. Match the items in Column I with Column II and choose the correct option:

Column I	Column II
a) Binary fission	1) Algae
b) Zoospore	2) <i>Amoeba</i>
c) Conidium	3) <i>Hydra</i>
d) Budding	4) <i>Penicillium</i>
e) Gemmules	5) Sponge

- (A) a – 1; b – 4; c – 5; d – 3; e – 2
 (B) a – 2; b – 1; c – 4; d – 3; e – 5
 (C) a – 2; b – 4; c – 3; d – 5; e – 1
 (D) a – 1; b – 4; c – 3; d – 2; e – 5
 (E) a – 4; b – 1; c – 3; d – 5; e – 2
19. Which of the following statements about sporopollenin is **false**?
- (A) Exine is made up of sporopollenin
 (B) sporopollenin is one of the resistant organic materials
 (C) Exine has apertures called germ pores where sporopollenin is present
 (D) sporopollenin can withstand high temperatures and strong acids
 (E) No enzyme that degrades sporopollenin is so far known



In the diagram given above, parts labelled as 'a', 'b', 'c', 'd', 'e', and 'f' are respectively identified as:

- (A) Synergids, Polar nuclei, Central cell, Antipodals, Filiform apparatus and Egg
 (B) Polar nuclei, Egg, Antipodals, Central cell, Filiform apparatus and Synergids
 (C) Egg, Synergids, Central cell, Filiform apparatus, Antipodals and Polar nuclei
 (D) Central cell, Polar nuclei, Filiform apparatus, Antipodals, Synergids, and Egg
 (E) Filiform apparatus, Polar nuclei, Egg, Antipodals, Synergids and Central cell
22. The formula of growth rate for population in a given time is:
 (A) $\frac{dt}{dN} = rN$
 (B) $\frac{dt}{rN} = dN$
 (C) $\frac{rN}{dN} = dt$
 (D) $\frac{dN}{rN} = dt$
 (E) $\frac{dN}{dt} - rN$
23. Many fresh water animals cannot live for long in sea water and vice versa mainly because of the:
 (A) Change in N levels
 (B) Change in the levels of thermal tolerance
 (C) Variations in light intensity
 (D) Osmotic problems
 (E) Spectral quality of solar radiation
24. Some of the nutrient cycles are labelled as below:
 Sulphur cycle (a), phosphorous cycle (b), carbon cycle (c), and nitrogen cycle (d). Of these, the sedimentary cycle is represented by:
 (A) (a) only
 (B) (b) only
 (C) (c) only
 (D) (a) and (b) only
 (E) (c) and (d) only
25. The species diversity of plants on earth will be
 (A) 2.4 %
 (B) 22 %
 (C) 8.1 %
 (D) 85 %
 (E) 70 %
26. One green house gas contributes 14% to total global warming and another contributes 6%. These are respectively identified as:

- (A) N₂O and CO₂
 - (B) CFCs and N₂O
 - (C) Methane and CO₂
 - (D) Methane and CFCs
 - (E) CFCs and CO₂
27. Which of the following is **false**?
- (A) Quantity of biomass in a trophic level at a particular period is called as standing crop.
 - (B) The energy content in a trophic level is determined by considering a few individuals of a species in that trophic level.
 - (C) The succession that occurs in newly cooled lava is called primary succession.
 - (D) Rate of succession is faster in secondary succession.
 - (E) Phytoplanktons are the pioneers in the aquatic ecosystem
28. Which of the following statements regarding decomposition is **false**?
- (A) Warm and moist environment favours decomposition
 - (B) Decomposition rate is slower if detritus is rich in chitin and lignin
 - (C) Earthworm is a detritivore
 - (D) Precipitation of soluble inorganic nutrients into the soil horizon as unavailable salts is called mineralisation
 - (E) Detritus is the raw material for decomposition
29. Increase in concentration of a toxicant at successive trophic levels is called:
- (A) Eutrophication
 - (B) Accelerated eutrophication
 - (C) Biomagnification
 - (D) Cultural eutrophication
 - (E) Algal bloom
30. Barnacles growing on the back of whale is an example for:
- (A) Mutualism
 - (B) Commensalism
 - (C) Parasitism
 - (D) Amensalism
 - (E) Predation
31. The thickness of ozone in a column of air from the ground to the top of the atmosphere is measured in terms of:
- (A) Decibel units
 - (B) Pascal units
 - (C) Svedberg units
 - (D) Dobson units
 - (E) Angstrom units
31. Cry II Ab and Cry I Ab produce toxins that control:
- (A) Cotton bollworms and corn borer respectively
 - (B) Corn borer and cotton bollworms respectively
 - (C) Tobacco budworms and nematodes respectively
 - (D) Nematodes and tobacco budworms respectively
 - (E) Corn borer and tobacco budworms respectively
32. The vector for T-DNA is:
- (A) *Thermus aquaticus*
 - (B) *Salmonella typhimurium*

- (C) *Agrobacterium tumefaciens*
- (D) *Escherichia coli*
- (E) *Bacillus thuringiensis*

33. Which of the following is a plasmid?

- (A) pBR 322
- (B) BamH I
- (C) Sal I
- (D) EcoR I
- (E) Hind III

34. Which of the following statements regarding universal rules of nomenclature is wrong?

- (A) The first word in biological name represents the genus
- (B) The first word denoting the genus starts with a capital letter
- (C) Both the words in a biological name, when handwritten, are separately underlined
- (D) Biological names are generally in Greek and written in italics
- (E) The second component in a biological name denotes the specific epithet

35. Match the following and choose the correct combination from the options given:

	Column I (Common name)		Column II (Taxonomic category - Order)
a	Wheat	1	Primata
b	Mango	2	Diptera
c	Housefly	3	Sapindales
d	Man	4	Poales

- (A) a – 1, b – 2, c – 4, d – 3
- (B) a – 4, b – 3, c – 2, d – 1
- (C) a – 2, b – 4, c – 1, d – 3
- (D) a – 3, b – 4, c – 2, d – 1
- (E) a – 4, b – 2, c – 3, d – 1

36. Which of the following is **not** a character of Protista?

- (A) Protists are prokaryotic
- (B) Some Protists have cell walls
- (C) Mode of nutrition is both autotrophic and heterotrophic
- (D) Body organisation is cellular
- (E) Membrane bound organelles are present in cells

37. Specialized cells called heterocysts are present in:

- (A) Dinoflagellates
- (B) Chrysophytes
- (C) Euglenoids
- (D) Cyanobacteria
- (E) Archaeobacteria

38. Which of the following is a flagellated protozoan?

- (A) *Amoeba*
- (B) *Entamoeba*
- (C) *Plasmodium*
- (D) *Trypanosoma*
- (E) *Paramecium*

39. Systema Naturae was written by:

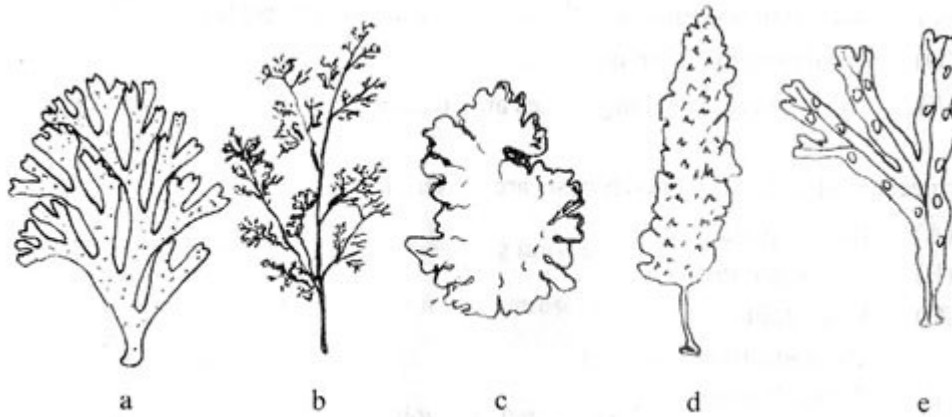
- (A) Ernst Mayr
- (B) Carolus Linnaeus
- (C) R.H. Whittaker
- (D) W.M. Stanley
- (E) M.W. Beijerinck

41. Match Column I with Column II and choose the right option:

I	II
a. <i>Rhizopus</i>	1. Ascomycetes
b. <i>Penicillium</i>	2. Basidiomycetes
c. <i>Ustilago</i>	3. Deuteromycetes
d. <i>Alternaria</i>	4. Phycomycetes

- (A) a - 4, b - 3, c - 1, d - 2
- (B) a - 2, b - 3, c - 4, d - 1
- (C) a - 4, b - 1, c - 2, d - 3
- (D) a - 3, b - 4, c - 1, d - 1
- (E) a - 2, b - 1, c - 4, d - 3

42.



In the diagram given above, some of the algae have been labelled as 'a', 'b', 'c', 'd', and 'e'. These algae are respectively identified as:

- (A) *Dictyota*, *Polysiphonia*, *Porphyra*, *Fucus* and *Laminaria*
- (B) *Porphyra*, *Dictyota*, *Laminaria*, *Fucus* and *Polysiphonia*
- (C) *Dictyota*, *Polysiphonia*, *Porphyra*, *Laminaria*, and *Fucus*
- (D) *Fucus*, *Porphyra*, *Dictyota*, *Polysiphonia*, and *Laminaria*
- (E) *Laminaria*, *Polysiphonia*, *Porphyra*, *Dictyota*, and *Fucus*

43. Identify the alga which exhibits diplontic life cycle:

- (A) *Spirogyra*
- (B) *Chlamydomonas*
- (C) *Fucus*
- (D) *Volvox*
- (E) *Ectocarpus*

44. Which of the following pteridophyte is heterosporous in nature?

- (A) *Psilotum*
- (B) *Adiantum*
- (C) *Equisetum*
- (D) *Salvinia*
- (E) *Lycopodium*

45. Which of the following is **wrongly** matched?

- (A) *Indigofera* – Dye
- (B) *Sesbania* – Fodder
- (C) *Petunia* – Fumigatory
- (D) *Aloe* – Medicine
- (E) *Asparagus* – Vegetable

46. Which one of the following floral formula represents the mustard plant?

- (A) $\oplus \quad \text{♀} \quad K_{2+2} C_4 A_{2+4} \quad \overline{G} (2)$
- (B) $\oplus \quad \text{♀} \quad P_{3+3} C_4 A_{3+3} \quad \underline{G} (3)$
- (C) $\oplus \quad \text{♀} \quad K_{(5)} \overset{\curvearrowright}{C_{(5)} A_{(5)}} \quad \underline{G} (2)$
- (D) $\text{♂} \quad \text{♀} \quad K_{(5)} C_{1+2+(2)} A_{(9)+1} \quad \underline{G} 1$
- (E) $\oplus \quad \text{♀} \quad K_{2+2} C_4 A_{2+4} \quad \underline{G} (2)$

47. Consider the following statements regarding gymnosperms and choose the correct option.

- a. In gymnosperms, the male and female gametophytes have an independent existence
 - b. The multicellular female gametophyte is retained within the megasporangium
 - c. The gymnosperms are heterosporous
- (A) (a) and (b) are true but (c) is false
 - (B) (a) and (c) are true but (b) is false
 - (C) (b) and (c) are false but (a) is true
 - (D) (a) and (c) are false but (b) is true
 - (E) (b) and (c) are true but (a) is false

48. Whorled type of phyllotaxy is found in:

- (A) Mustard
- (B) China rose
- (C) Guava
- (D) *Calotropis*
- (E) *Alstonia*

49. Which of the following is not a part of epidermal tissue system?

- (A) Companion cells
- (B) Trichomes
- (C) Root hairs
- (D) Guard cells
- (E) Subsidiary cells

50. Which of the following statements is true?

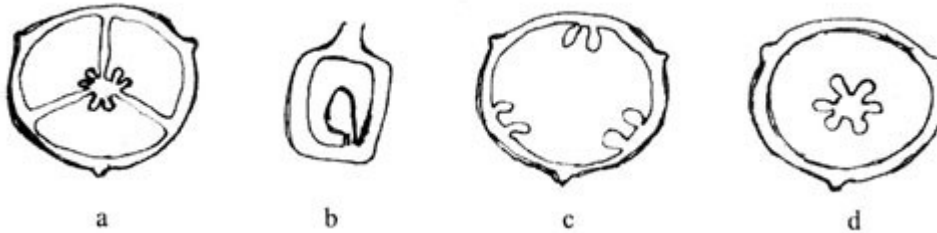
- (A) The collenchyma occurs in layers below the epidermis in monocotyledonous plants
- (B) Sclerenchyma cells are usually dead and without protoplasts
- (C) Xylem parenchyma cells are living and thin walled and their cell walls are made up of lignin
- (D) The companion cells are specialized sclerenchymatous cells
- (E) Phloem fibres are generally present in the primary phloem

51. Which of these is an example for zygomorphic flower with imbricate aestivation?

- (A) *Calotropis*
- (B) Mustard
- (C) *Canna*
- (D) *Cassia*

(E) Cucumber

52.



In the diagram of types of placentation given above 'a', 'b', 'c', and 'd' respectively represent:

- (A) Basal, Axile, Parietal, and Free central
- (B) Free central, Parietal, Basal and Axile
- (C) Axile, Basal, Parietal and Free central
- (D) Parietal, Axile, Free central, and Basal
- (E) Axile, Free central, Basal, and Parietal

53. Consider the following statements.

- a. In racemose inflorescence the flowers are borne in a basipetal order
- b. Epigynous flowers are seen in rose plant
- c. In brinjal the ovary is superior

- (A) (a) and (b) are true but (c) is false
- (B) (a) and (c) are true but (b) is false
- (C) (a) and (b) are false but (c) is true
- (D) (a) and (c) are false but (b) is true
- (E) (b) and (c) are true but (a) is false

54. Pick out the **wrong** statement:

- (A) Double fertilization is unique to gymnosperms and monocotyledons
- (B) Sequoia, a gymnosperm, is one of the tallest trees
- (C) Phaeophyceae members possess chlorophyll a, c, carotenoids and xanthophylls
- (D) Moss is a gametophyte which consists of two stages namely, protonema stage and leafy stage
- (E) Evolutionarily, pteridophytes are the first terrestrial plants to possess xylem and phloem

55. The monocotyledonous seed consists of one large and shield shaped cotyledon known as:

- (A) Aleurone layer
- (B) Scutellum
- (C) Coleoptile
- (D) Hilum
- (E) Coleorrhiza

56. In woody trees, the exchange of gases between the outer atmosphere and the internal tissue of the stem takes place through:

- (A) Aerenchyma
- (B) Stomata
- (C) Pneumatophores
- (D) Lenticels
- (E) Trichomes

57. Consider the following statements.

- a. Plant cells have centrioles which are absent in almost all animal cells
- b. Ribosomes are the site of protein synthesis
- c. The middle lamella is a layer mainly of calcium carbonate which holds the different neighbouring cells together

d. In animal cells steroidal hormones are synthesized by smooth endoplasmic reticulum

Of the above statements:

- (A) (a) and (b) only are correct
- (B) (c) and (d) only are correct
- (C) (b) and (d) only are correct
- (D) (a) and (d) only are correct
- (E) (b) and (c) only are correct

58. Which one of the following organelles is not surrounded by any membrane?

- (A) Mitochondrion
- (B) Vacuole
- (C) Chloroplast
- (D) Endoplasmic reticulum
- (E) Ribosome

59. The name chromatin was coined by:

- (A) Flemming
- (B) Robert Brown
- (C) George Palade
- (D) Camillo Golgi
- (E) Rudolf Virchow

60. The infoldings in mitochondria are known as:

- (A) Cristae
- (B) Matrix
- (C) Cistermae
- (D) Thylakoids
- (E) Grana

61. Pick the correct statement

- (A) The contraction of internal intercostal muscles lifts up the ribs and sternum
- (B) The RBCs transport oxygen only
- (C) The thoracic cavity is anatomically an air tight chamber
- (D) Healthy man can inspire approximately 500 ml of air per minute
- (E) During expiration, the interpulmonary pressure is slightly below the surrounding atmospheric pressure

61. The Sphincter of Oddi found in man, guards the:

- (A) Pancreatic duct
- (B) Hepatopancreatic duct
- (C) Bile Duct
- (D) Cystic duct
- (E) Duodenum

62. The partial pressure of oxygen in the alveolar air is:

- (A) 45 mm of Hg
- (B) 95 mm of Hg
- (C) 104 mm of Hg
- (D) 110 mm of Hg
- (E) 125 mm of Hg

63. Match Column I with Column II and choose the correct option

- | I | II |
|-----------------------|-------------------|
| a. <i>Rhizopus</i> | 1. Ascomycetes |
| b. <i>Penicillium</i> | 2. Basidiomycetes |

c. *Ustilago*

3. Deuteromycetes

d. *Alternaria*

4. Phycomycetes

(A) i – c, ii – a, iii – d, iv – b

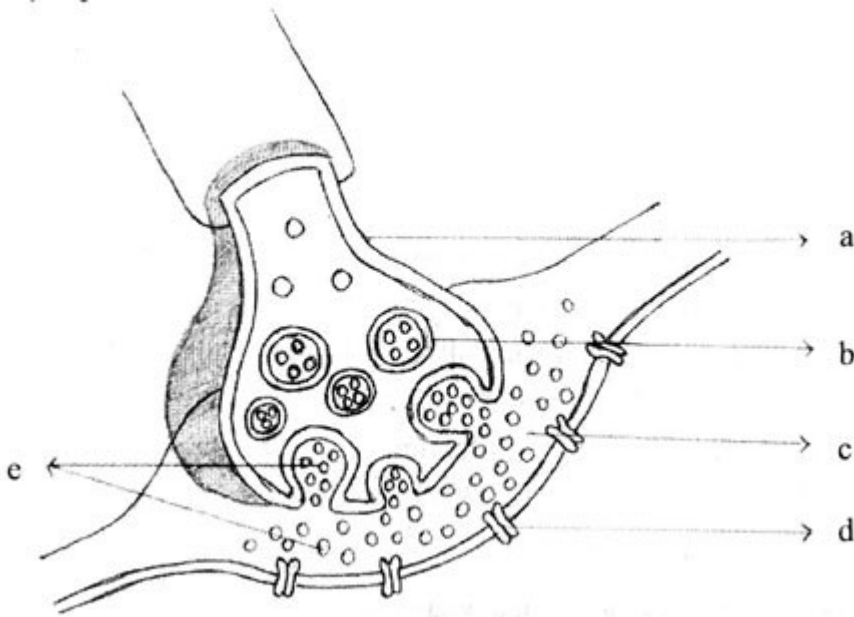
(B) i – c, ii – c, iii – d, iv – b

(C) i – b, ii – c, iii – a, iv – d

(D) i – d, ii – a, iii – b, iv – c

(E) i – b, ii – a, iii – d, iv – c

64. In the following diagram showing axon terminal and synapse a, b, c, d and e respectively represents:



(A) axon terminal, synaptic cleft, synaptic vesicles, neurotransmitters and receptors

(B) axon terminal, synaptic vesicles, synaptic cleft, receptors and neurotransmitters

(C) synaptic cleft, synaptic vesicles, axon terminal, neurotransmitters and receptors

(D) synaptic cleft, axon terminal, synaptic vesicles, neurotransmitters and receptors

(E) synaptic vesicles, axon terminal, synaptic cleft, receptors and neurotransmitters

65. The main mineralocorticoid in human is:

(A) Aldosterone

(B) Cortisol

(C) Testosterone

(D) Progesterone

(E) Adrenaline

66. Chorda tendinae are found in:

(A) Atria of heart

(B) Ventricles of heart

(C) Joints of legs

(D) Joints of hands

(E) Ventricles of brain

67. The average quantity of urea excreted in urine by man per day is:

(A) 1–5 gm

(B) 25–30 gm

(C) 1–1.5 litres

(D) 80 gm

- (E) 100-500 mg
68. The number of occipital condyles in man is/are:
- (A) one
 - (B) two
 - (C) three
 - (D) four
 - (E) five
69. The complex system of the inner ear associated with maintenance of body balance is:
- (A) cochlea
 - (B) Reissner's membrane
 - (C) vestibular apparatus
 - (D) basilar membrane
 - (E) oval window
71. Progressive degeneration of skeletal muscle, mostly due to genetic disorder occurs in:
- (A) Myasthenia gravis
 - (B) Muscular dystrophy
 - (C) Tetany
 - (D) Osteoporosis
 - (E) Arthritis
72. Epinephrine, on basis of its chemical nature, is a/an:
- (A) Peptide hormone
 - (B) Steroid
 - (C) Iodothyronine
 - (D) Glucocorticoid
 - (E) Amino acid derivative
73. Match the following and choose the correct option:
- | Types of Synovial Joints | Bones Involved |
|--------------------------|-----------------------------------|
| a. Ball and Socket | 1. Carpal and metacarpal of thumb |
| b. Hinge | 2. Atlas and axis |
| c. Pivot | 3. Frontal and parietal |
| d. Saddle | 4. Knee |
| | 5. Humerus and pectoral girdle |
- (A) a – 5, b – 4, c – 2, d – 1
 - (B) a – 1, b – 3, c – 4, d – 5
 - (C) a – 5, b – 4, c – 3, d – 1
 - (D) a – 1, b – 2, c – 5, d – 4
 - (E) a – 2, b – 5, c – 4, d – 1
74. The respiratory rhythm centre is present in the:
- (A) Cerebrum
 - (B) Cerebellum
 - (C) Hypothalamus
 - (D) Corpora quadrigemina
 - (E) Medulla oblongata
75. The hormone which regulates sleep – wake cycle in man is:
- (A) Oxytocin
 - (B) Vasopressin
 - (C) Thyroxine
 - (D) Melatonin

- (E) Thyrocalcitonin
76. Read the statements regarding muscle proteins.
- Actin is a thin filament and is made up of two F-actins
 - The complex protein, tropomyosin is distributed at regular intervals on the troponin
 - Myosin is a thick filament which is also a polymerized protein
 - The globular head of meromyosin consists of light meromyosin (LMM)
- (A) i, ii and iii are correct
(B) i, ii and iv are correct
(C) i and iii are correct
(D) ii and iv are correct
(E) ii, iii and iv are correct
77. The innermost layer of the human eye is:
- (A) choroid
(B) cornea
(C) sclera
(D) retina
(E) lens
78. Human chorionic gonadotropin is secreted by:
- (A) Chorion
(B) Amnion
(C) Corpus luteum
(D) Placenta
(E) Ovaries
79. In human, the unpaired male reproductive structure is:
- (A) seminal vesicle
(B) prostate
(C) bulbourethral gland
(D) testes
(E) vas deferens
80. The process of delivery of the foetus is called:
- (A) Parturition
(B) Implantation
(C) Fertilisation
(D) Lactation
(E) Ovulation
81. Identify the **wrongly** matched pair:
- (A) Typhoid – Widal test
(B) Plague – Viral disease
(C) Malignant malaria – *Plasmodium falciparum*
(D) Common cold – Rhinovirus
(E) *Trychophyton* – Ringworm
82. The alien species introduced into Lake Victoria that was responsible for the extinction of cichlid fishes is:
- (A) African catfish
(B) Water hyacinth
(C) Carrot grass
(D) Nile perch
(E) Murrels

83. Match the microbes in Column I with their commercial / industrial products in Column II and choose the correct answer:

- | Column I | Column II |
|--------------------------------------|------------------|
| i. <i>Aspergillus niger</i> | a. Ethanol |
| ii. <i>Clostridium butylicum</i> | b. statins |
| iii. <i>Saccharomyces cerevisiae</i> | c. citric acid |
| iv. <i>Trichoderma polysporum</i> | d. butyric acid |
| v. <i>Monascus purpureus</i> | e. cyclosporin A |
- (A) i – d, ii – e, iii – b, iv – a, v – c
(B) i – e, ii – d, iii – a, iv – b, v – c
(C) i – c, ii – d, iii – a, iv – e, v – b
(D) i – c, ii – d, iii – e, iv – a, v – b
(E) i – b, ii – c, iii – d, iv – e, v – a

84. In the immune system, interferons are a part of:

- (A) Physiological barriers
- (B) Cellular barriers
- (C) Physical barriers
- (D) Cytokine barriers
- (E) Macrophages

85. The immunoglobulin abundant in colostrum is:

- (A) Ig G
- (B) Ig M
- (C) Ig D
- (D) Ig E
- (E) Ig A

86. Which of the following is an opioid drug?

- (A) Heroin
- (B) Cocaine
- (C) Marijuana
- (D) Hashish
- (E) Charas

87. In the early earth, water and CO₂ were produced by the combination of O₂ with:

- (A) Ammonia and methane
- (B) Hydrogen
- (C) Organic matter
- (D) Sulphates and nitrates
- (E) Hydrogen sulphide

88. The primate which existed 15 mya among these was:

- (A) *Homo habilis*
- (B) *Australopithecines*
- (C) *Ramapithecus*
- (D) *Homo erectus*
- (E) Neanderthal man

89. Single step large mutation leading to speciation is also called:

- (A) Founder effect
- (B) Saltation
- (C) Branching descent
- (D) Natural selection

- (E) Adaptive radiation
90. One of the following is **not** a characteristic feature of sponges:
- (A) Cellular level of organization
 - (B) Presence of ostia
 - (C) Intercellular digestion
 - (D) Body supported by chitin
 - (E) Indirect development
91. Match the following and select the correct answer:
- | | | |
|------------------|--------------------|----------------|
| i. Choanocytes | a. Platyhelminthes | |
| ii. Cnidoblasts | b. Ctenophora | |
| iii. Flame cells | c. Porifera | |
| iv. Nephridia | d. Coelenterata | v. Comb plates |
| | | e. Annelida |
- (A) i – b, ii – a, iii – d, iv – e, v – c
 (B) i – b, ii – d, iii – a, iv – e, v – c
 (C) i – e, ii – a, iii – c, iv – b, v – d
 (D) i – c, ii – d, iii – a, iv – e, v – b
 (E) i – c, ii – a, iii – d, iv – e, v – b
92. The pseudocoelomate among these is:
- (A) Porifera
 - (B) Annelida
 - (C) Aschelminthes
 - (D) Mollusca
 - (E) Platyhelminthes
93. The limbless amphibian is:
- (A) *Ichthyophis*
 - (B) *Hyla*
 - (C) *Rana*
 - (D) *Salamandra*
 - (E) *Bufo*
94. Which one of the following is **not** a mammalian character?
- (A) Presence of milk producing glands
 - (B) They have two pairs of limbs
 - (C) Skin is unique in possessing hair
 - (D) Presence of external ears called pinnae
 - (E) Homodont type of dentition
95. The flightless bird among the following is:
- (A) *Columba*
 - (B) *Neophron*
 - (C) *Struthio*
 - (D) *Corvus*
 - (E) *Pavo*
96. Which one of the following animals possesses high regeneration capacity?
- (A) *Planaria*
 - (B) *Taenia*
 - (C) *Salpa*
 - (D) *Periplaneta*
 - (E) *Ascidian*
97. Identify the aquatic mammal(s) from the following:

- i) *Balaenoptera* ii) *Equus* iii) *Delphinus* iv) *Pteropus* v) *Felis*
 (A) i and iii only
 (B) ii and iv only
 (C) v only
 (D) iv and v only
 (E) ii and v only
98. Fibroblasts, macrophages and mast cells are present in:
 (A) cartilage tissue
 (B) adipose tissue
 (C) areolar tissue
 (D) glandular epithelium
 (E) compund epithelium
99. Spermathecae in *Pheretima* is located in the segments:
 (A) 14 to 18
 (B) 10 to 13
 (C) 6 to 10
 (D) 6 to 9
 (E) 17 to 19
100. The graphical representation to calculate the probability of all possible genotypes of offspring in a genetic cross is called:
 (A) pedigree analysis
 (B) karyotype
 (C) Punnett square
 (D) chromosome map
 (E) genotype ratio
101. In the Lac Operon system, β -galactosidase is coded by:
 (A) *a*-gene
 (B) *i*-gene
 (C) *l*-gene
 (D) *y*-gene
 (E) *z*-gene
102. Inheritance of flower colour is an example of incomplete dominance, which is seen in:
 (A) *Antirrhinum*
 (B) *Pisum*
 (C) *Solanum*
 (D) *Hibiscus*
 (E) *Bamboo*
103. Match the codons with their respective amino acids and choose the correct answer:
 i. UUU a. Serine
 ii. GGG b. Methionine
 iii. UCU c. Phenylalanine
 iv. CCC d. Glycine v. AUG e. Proline
- (A) i – c, ii – d, iii – a, iv – e, v – b
 (B) i – c, ii – a, iii – d, iv – e, v – b
 (C) i – c, ii – d, iii – e, iv – a, v – b
 (D) i – b, ii – d, iii – a, iv – e, v – c
 (E) i – b, ii – d, iii – a, iv – c, v – e
104. Identify the **wrong** statement:

- (A) In male grasshoppers 50% of the sperms have no sex chromosome
 (B) Usually female birds produce two types of gametes based on sex chromosomes
 (C) The human males have one of their sex chromosomes much shorter than the other
 (D) The male fruit fly is heterogametic
 (E) In domesticated fowls the sex of the progeny depends on the type of sperm that fertilizes the egg
105. The ABO blood grouping in human beings is an example for:
 i) Dominance ii) Incomplete dominance iii) Co-dominance iv) Multiple alleles
 (A) i and ii only
 (B) ii, iii and iv
 (C) i, iii and iv
 (D) iii and ii only
 (E) iv and ii only
106. Which of the following genotype does not produce any sugar polymer on the surface of the RBC?
 (A) $I^A I^A$
 (B) $I^b i$
 (C) $I^A I^B$
 (D) $i i$
 (E) $I^B I^B$
107. Gynaecomastia is a common feature seen in:
 (A) Down's syndrome
 (B) Turner's syndrome
 (C) PKU
 (D) Cystic fibrosis
 (E) Klinefelter's syndrome
108. In bacteria, the formation of peptide bond during translation is effected by:
 (A) Lysozyme
 (B) Ribozyme
 (C) Nucleosome
 (D) Microsome
 (E) Peroxisome
109. Haemophilia in man is due to:
 (A) sex-linked inheritance
 (B) sex-limited inheritance
 (C) sex-influenced inheritance
 (D) primary non-disjunction
 (E) secondary non-disjunction
110. Locations or sites in the human DNA where single base DNA differences occurs are called:
 (A) Repetitive DNA
 (B) VNTR
 (C) SNP
 (D) SSCP
 (E) Expressed sequence tags
111. Which of the following is **not** a Mendelian disorder?
 (A) Haemophilia
 (B) Cystic fibrosis
 (C) Colour blindness

- (D) Thalesemia
 - (E) Turner's syndrome
112. The technique of DNA finger printing was initially developed by:
- (A) Ian Wilmut
 - (B) Hargobind Khorana
 - (C) Jacque Monod
 - (D) Alec Jeffreys
 - (E) Francois Jacob
113. Histones are rich in:
- (A) Alanine and glycine
 - (B) Lysine and arginine
 - (C) Histidine
 - (D) Cysteine and tyrosine
 - (E) Serine
114. The process of copying genetic information from one strand of the DNA into RNA is termed as:
- (A) Translation
 - (B) Transmination
 - (C) Replication
 - (D) Transcription
 - (E) Deamination
115. Consider the following statements:
- I. r-RNA provides the template for synthesis of proteins
 - II. t-RNA brings amino acids and reads the genetic code
 - III. RNA polymerase binds to promoter and initiates transcription
 - IV. A segment of DNA coding for polypeptide is called intron
- (A) I and III are correct
 - (B) I and II are correct
 - (C) I, II and III are correct
 - (D) II and III are correct
 - (E) I, II and IV are correct
116. During Messelson and Stahl's experiments, heavy DNA was distinguished from normal DNA by centrifugation in:
- (A) CsOH gradient
 - (B) $^{14}\text{NH}_4\text{Cl}$
 - (C) $^{15}\text{NH}_4\text{Cl}$
 - (D) $^{35}\text{SO}_2$
 - (E) CsCl gradient
117. The process of removal of introns and joining of exons is called:
- (A) Capping
 - (B) Tailing
 - (C) Termination
 - (D) Initiation
 - (E) Splicing
118. Human dental formula is

2123
2123
(A)

2123
1223
(B)

1223
2123
(C)

1223
1223
(D)

2213
2213
(E)

119. The gastric juice contains:

- (A) trypsin, pepsin, lipase
- (B) pepsin, lipase, rennin
- (C) pepsin, amylase, trypsin
- (D) trypsin, pepsin, rennin
- (E) pepsin, rennin, carboxypeptidase

120. Find out the **wrong** match:

- (A) Eosinophils – allergic response
- (B) Basophils – secrete histamine and serotonin
- (C) Neutrophils – phagocytic and destroy foreign organisms
- (D) Lymphocytes – immune responses
- (E) Monocytes – secrete heparin