WARNING :	Any malpractice or any attempt to commit any kind of malpractice in the Examination will DISQUALIFY THE CANDIDATE.	
PAPER – II BIOLOGY		
Version Code : B 1	Question Booklet Serial Number	
Time : 150 Minutes	Number of Questions : 120	Maximum Marks : 480
Name of Candidate		
Roll Number		
Signature of Candidate		

INSTRUCTIONS TO THE CANDIDATE

1. Please ensure that the **VERSION CODE shown at the top of this Question Booklet is the same as that shown in the OMR Answer Sheet issued to you.** If you have received a Question Booklet with a different **VERSION CODE**, please get it replaced with a Question Booklet with the same VERSION CODE as that of the OMR Answer Sheet from the Invigilator. **THIS IS VERY IMPORTANT.**
2. Please fill in the items such as name, signature and roll number of the candidate in the columns given above. Please also write the Question Booklet Sl. No. given at the top of this page against item 4 in the OMR Answer Sheet.
3. Please read the instructions given in the OMR Answer Sheet for marking answers. Candidates are advised to strictly follow the instructions contained in the OMR Answer Sheet.
4. This Question Booklet contains 120 Questions. For each Question, five answers are suggested and given against (A), (B), (C), (D) and (E) of which, only one will be the **Most Appropriate Answer**. Mark the bubble containing the letter corresponding to the 'Most Appropriate Answer' in the OMR Answer Sheet, by using either **Blue or Black ball - point pen only.**
5. Negative Marking: In order to discourage wild guessing, the score will be subject to penalization formula based on the number of right answers actually marked and the number of wrong answers marked. Each correct answer will be awarded FOUR marks. One mark will be deducted for each incorrect answer. More than one answer marked against a question will be deemed as incorrect answer and will be negatively marked.

IMMEDIATELY AFTER OPENING THIS QUESTION BOOKLET, THE CANDIDATE SHOULD VERIFY WHETHER THE QUESTION BOOKLET ISSUED CONTAINS ALL THE 120 QUESTIONS IN SERIAL ORDER. IF NOT, REQUEST FOR REPLACEMENT.

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PLEASE ENSURE THAT THIS BOOKLET CONTAINS 120 QUESTIONS SERIALLY NUMBERED FROM 1 TO 120 (Printed Pages : 32)

1. The type of bond involved in the formation of sodium chloride is
   (A) Ester Bond
   (B) Peptide Bond
   (C) Ionic Bond
   (D) Covalent Bond
   (E) Hydrogen Bond

2. Who was the first to discard the idea of fixity of species?
   (A) Jean Baptiste Lamarck
   (B) Charles Darwin
   (C) Robert Hooke
   (D) William Harvey
   (E) Stanley Cohen

3. Match the items in Column I with Column II and choose the correct option

Column I	Column II
a. Ascus	1. *Spirulina*
b. Basidium	2. *Penicillium*
c. Protista	3. *Agaricus*
d. Cyanobacteria	4. *Euglena*
e. Animalia	5. *Sponges*

   (A) a – 2, b – 3, c – 4, d – 5, e – 1
   (B) a – 1, b – 2, c – 3, d – 5, e – 4
   (C) a – 2, b – 5, c – 3, d – 1, e – 4
   (D) a – 1, b – 2, c – 3, d – 4, e – 5
   (E) a – 2, b – 3, c – 4, d – 1, e – 5

4. Which one of the taxonomic aids can give comprehensive account of complete compiled information of any one genus or family at a particular time?
   (A) Taxonomic Key (B) Flora (C) Herbarium
   (D) Monograph (E) Dictionary

5. The Phylogenetic System of classification was put forth by
(A) Carolus Linnaeus
(B) George Bentham and Joseph Dalton Hooker
(C) Aristotle
(D) Theophrastus
(E) Adolf Engler and Karl Prantl

6. Slimy mass of protoplasm with many nuclei and an amoeba-like thalloid body is a characteristic feature of
(A) Ascomycetes
(B) Actinomycetes
(C) Phycomycetes
(D) Basidiomycetes
(E) Myxomycetes

7. Which one of the following series includes the orders Ranales, Parietales and Malvales?
(A) Bicarpellatae
(B) Thalamiflorae
(C) Calyciflorae
(D) Disciflorae
(E) Inferae

8. Which one of the following classes is included under Gymnosperms?
(A) Lycopsida
(B) Bryopsida
(C) Cycadopsida
(D) Pteropsida
(E) Sphenopsida

9. Which one of the following is an example for sub-aerial modification of stem?
(A) *Agave*
(B) *Oxalis*
(C) *Asparagus*
(D) *Tridax*
(E) *Polyalthia*

10. Multicostate parallel type of venation is found in the leaves of

(A) Grasses and Palms
(B) Banana and Canna
(C) Castor and China Rose
(D) Mango and Peepal
(E) Castor and Tapioca

11.

The above inflorescence is a

(A) Cyathium
(B) Dichasial cyme
(C) Umbel
(D) Panicle
(E) Verticillaster

12. The leaves are modified into spines in

(A) *Nepenthes*
(B) *Opuntia*
(C) Australian *Acacia*
(D) *Utricularia*
(E) *Tamarix*

13. The characteristic type of placentation found in the members of Caryophyllaceae is

(A) Parietal
(B) Marginal
(C) Basal
(D) Axile
(E) Free central

14. Which of the following statements are correct?

a. When a fruit develops from the inflorescence, it is composite
b. Mesocarp is the edible part in apple
c. Gynobasic style is seen in *Ocimum*
d. Hypanthodium is a special type of inflorescence found in *Euphorbia* species

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

15. Which one of the following represent the floral characters of Poaceae?

(A) Pedicellate, bracteate, bisexual, tetramerous, actinomorphic, complete and superior ovary
(B) Pedicellate, bracteate, bisexual, pentamerous, zygomorphic, complete and superior ovary
(C) Sessile, bracteate, bracteolate, incomplete, uni or bisexual, perianth modified into lodicules, stamens three, syncarpous, superior ovary and feathery stigma
(D) Bracteate, unisexual, actinomorphic, stamens five and inferior ovary
(E) Bracteate, bracteolate, bisexual, pentamerous, actinomorphic, complete and superior ovary

16. Select the characters which are not applicable to the family Solanaceae?

a. Epipetalous and syngenesious anthers
b. Bicarpellary and syncarpous ovary
c. Oblique ovary with axile placentation
d. Stamens six, arranged in two whorls
e. Bicarpellary, syncarpous and inferior ovary

(A) b and c only
(B) a, d and e only
(C) b, d and e only
(D) a and c only
(E) c, d and e only

17. The binomial of sunn hemp is

(A) *Crotolaria juncea*
(B) *Erythrina indica*
(C) *Glycine max*
(D) *Arachis hypogea*
(E) *Dalbergia sissoo*

18. Match Column I with II and choose the right option

I	II
1. *Artemisia*	a. Fibre
2. *Astragalus*	b. Insecticide
3. *Phormium*	c. Rat poison
4. *Chrysanthemum*	d. Medicine
5. *Withania*	e. Vermifuge
	f. Gum

(A) 1 – d 2 – c 3 – f 4 – b 5 – e
(B) 1 – b 2 – e 3 – d 4 – c 5 – a
(C) 1 – c 2 – e 3 – a 4 – f 5 – d
(D) 1 – f 2 – e 3 – a 4 – b 5 – d
(E) 1 – e 2 – f 3 – a 4 – b 5 – d

19. Match the following and choose the correct combination

a.	Endodermis	–	1. Companion cells
b.	Stomata	–	2. Lenticels
c.	Sieve tube	–	3. Palisade cells
d.	Periderm	–	4. Passage cells
e.	Mesophyll	–	5. Accessory cells

(A) a – 4, b – 5, c – 2, d – 1, e – 3
(B) a – 5, b – 3, c – 1, d – 2, e – 4
(C) a – 4, b – 5, c – 1, d – 2, e – 3
(D) a – 2, b – 5, c – 3, d – 4, e – 1
(E) a – 4, b – 2, c – 5, d – 3, e – 1

20. Alburnum is otherwise known as

(A) Periderm
(B) Sapwood
(C) Heart wood
(D) Bark
(E) Cork cambium

21. At maturity the sieve plates become impregnated with

(A) Cellulose
(B) Pectin
(C) Suberin
(D) Lignin
(E) Callose

22. Consider the following statements and choose the correct option

a) The thread like cytoplasmic strands, running from one cell to other is known as plasmodesmata
b) Xylem and phloem constitute the vascular bundle of the stem
c) The first formed xylem elements are described as metaxylem
d) Radial vascular bundles are mainly found in the leaves

(A) (a) is true, but (b), (c) and (d) are wrong
(B) (b) is true, but (a), (c) and (d) are wrong
(C) (c) is true, but (a), (b) and (d) are wrong
(D) (d) is true, but (a), (b) and (c) are wrong
(E) (a) and (b) are true, but (c) and (d) are wrong

23. The dry weight of macromolecules like DNA, RNA and proteins can be determined using

(A) Fluorescent Microscopy
(B) Dark Field Microscopy
(C) Phase Contrast Microscopy
(D) Differential Interference Contrast Microscopy
(E) Scanning Electron Microscopy

24. Which one of the following statements is not true?

(A) Immersion oil increases the refractive index
(B) Fluorescent microscopy uses the normal light to view molecules
(C) Electron microscope has only electromagnetic lenses
(D) Scanning tunneling microscope is useful in scanning computer chips for defects
(E) Density gradient centrifugation can be used in the separation of cellular organelles

25. The vacuoles of plant cells are bound by a single semi-permeable membrane called

(A) Cristae
(B) Thylakoids
(C) Tonoplast
(D) Protoplast
(E) Plasmalemma

26. The cell organelle associated with intracellular digestion of macromolecules is

(A) Lysosome
(B) Peroxisome
(C) Polysome
(D) Dictyosome
(E) Glyoxysome

27. Analyze the following pairs and identify the correct options given

a. Chromoplasts – Contain pigments other than chlorophyll
b. Leucoplasts – Devoid of any pigments
c. Amyloplasts – Store proteins
d. Alueroplasts – Store oils and fats
e. Elaioplasts – Store carbohydrates

(A) b and c are correct
(B) c and d are correct
(C) d and e are correct
(D) a and b are correct
(E) a, b and c are correct

28. The heme-protein complexes which act as oxidizing agents are known as

(A) Hemoglobin
(B) Myoglobin
(C) Chlorophyll
(D) Cytochrome
(E) Peptidoglycan

29. Which one of the following is wrongly matched?

(A) Fungi – Chitin
(B) Phospholipid – Plasma membrane
(C) Enzyme – Lipopolysaccharide
(D) ATP – Nucleotide derivative
(E) Antibody – Glycoprotein

30. An example of non-competitive inhibition is

(A) The inhibition of succinic dehydrogenase by malonate
(B) Cyanide action on cytochrome oxidase
(C) Sulpha drug on folic acid synthesizing bacteria
(D) The inhibition of hexokinase by glucose 6-phosphate
(E) Reaction of succinic dehydrogenase

31. The non-sister chromatids twist around and exchange segments with each other during

(A) Diplotene (B) Diakinesis (C) Leptotene
(D) Pachytene (E) Zygotene

32. Cohesion theory of water movement in plants was put forth by

(A) Melvin Calvin
(B) F.F. Blackman
(C) T.W. Englemann
(D) Henry Dixon
(E) Hans A. Krebs

33. Select the correct events leading to the opening of the stomata

a. Decline in guard cell solutes
b. Lowering of osmotic potential of guard cells
c. Rise in potassium levels in guard cells
d. Movement of water from neighbouring cells into guard cells
e. Guard cells becoming flaccid

(A) a and e only
(B) b, c and d only
(C) a, c and d only
(D) b, d and e only
(E) c and e only

34. The enzyme responsible for the reduction of molecular nitrogen to the level of ammonia in leguminous root nodule is

(A) Nitrogenase
(B) Nitrate reductase
(C) Nitrite reductase
(D) Hydrogenase
(E) Carboxylase

35. Which one of the following is an amide involved in nitrogen assimilation by plants?

(A) Glutamate
(B) Alanine
(C) Asparagine
(D) Serine
(E) Glycine

36. In C_3 plants, the first stable compound formed after CO_2 fixation is
(A) Phosphoglyceraldehyde
(B) Malic acid
(C) Oxaloacetic acid
(D) 3-phosphoglycerate
(E) Ribulose 1,5 bisphosphate

37. Which one of the following is not true about the light reactions of photosynthesis?
(A) Light energy provides energy for the photolysis of water through excitation of the reaction centre of PS II
(B) The flow of electrons from water to NADP in non-cyclic electron transport produces one ATP
(C) Reactions of the two photosystems are needed for the reduction of NADP
(D) P_{680} and P_{700} are the reaction centres of PS I and PS II respectively
(E) NADPH is not produced in cyclic electron transport in light reactions

38. The minerals involved in the photolysis of water are
a. Manganese b. Calcium c. Magnesium d. Chloride
(A) a and b only (B) a, b and d only (C) a, b and c only
(D) c and d only (E) a and d only

39. The enzyme responsible for primary carboxylation in C_3 plants is
(A) Hexokinase
(B) Succinic dehydrogenase
(C) Pyruvate carboxylase
(D) RuBP carboxylase oxygenase
(E) PEP carboxylase

40. The R.Q. value of oxalic acid is
(A) 1.0 (B) 0.7 (C) 4
(D) ∞ (E) 1.5

41. The reactions of pentose phosphate pathway (PPP) take place in
(A) Mitochondrion
(B) Cytoplasm
(C) Chloroplast, Peroxisome and Mitochondrion
(D) Chloroplast, Glyoxysome and Mitochondrion
(E) Chloroplast, Lysosome and Mitochondrion

42. Which one of the following is complex V of the ETS of inner mitochondrial membrane?

(A) NADH dehydrogenase
(B) Cytochrome c oxidase
(C) Ubiquinone
(D) Succinate dehydrogenase
(E) ATP synthase

43. Which one of the following statements is not true?

(A) Pollen grains are released from anthers at 2-celled state
(B) Sporogenous cell directly behaves as the megaspore mother cell
(C) Megaspore divides twice to form an eight nucleate embryo sac
(D) Egg and synergids always lie near the micropylar end of ovule
(E) Endosperm is triploid

44. Consider the following statements and choose the correct option

(a) The genetic constitution of a plant is unaffected in vegetative propagation
(b) Rhizome in ginger serves as an organ of vegetative reproduction
(c) Totipotency of cells enables us to micropropagate plants

(A) Statements (a) and (b) alone are true
(B) Statements (b) and (c) alone are true
(C) Statement (b) alone is true
(D) Statement (c) alone is true
(E) All the three statements [(a) (b) and (c)] are true

45. The ripening of fruits can be hastened by treatment with

(A) Gibberellins
(B) Cytokinins
(C) Ethylene gas
(D) Auxin
(E) Abscissic acid

46. Match the following and choose the correct combination

Column I		Column II
a. Zeatin	–	1. Flowering hormone
b. Florigen	–	2. Synthetic auxin
c. IBA	–	3. Cytokinin
d. NAA	–	4. Natural auxin

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

47. The response of different organisms to environmental rhythms of light and darkness is called

(A) Phototropism (B) Phototaxis (C) Photoperiodism
(D) Vernalization (E) Thermotaxis

48. The shade tolerant plants are known as

(A) Psammophytes (B) Heliophytes (C) Halophytes
(D) Sciophytes (E) Hydrophytes

49. Which one of the following is commonly found in temperate coniferous forest?

(A) *Quercus*
(B) *Dipterocarpus*
(C) *Shorea robusta*
(D) *Pinus wallichiana*
(E) *Prosopis*

50. Plant species having a wide range of genetical distribution evolve into a local population known as

(A) Ecotype
(B) Biome
(C) Ecosystem
(D) Population
(E) Ephemerals

51. Select the formula for ecological efficiency

(A) $\frac{\text{Gross primary productivity} \times 100}{\text{Incident total solar radiation}}$

(B) $\frac{\text{Food energy assimilated} \times 100}{\text{Food energy ingested}}$

(C) $\frac{\text{Net primary productivity} \times 100}{\text{Gross primary productivity}}$

(D) $\frac{\text{Energy in biomass production at a trophic level} \times 100}{\text{Energy in biomass production at previous trophic level}}$

(E) $\frac{\text{Volume of } CO_2 \text{ evolved}}{\text{Volume of } O_2 \text{ consumed}}$

52. The percentage of forest cover recommended by the National Forest Policy (1988) is

(A) 33% for plains and 67% for hills
(B) 37% for plains and 63% for hills
(C) 20% for plains and 70% for hills
(D) 23% for plains and 77% for hills
(E) 30% for plains and 60% for hills

53. Which one of the following is not a renewable, exhaustible natural resource?

(A) Water (B) Wild life (C) Soil fertility
(D) Minerals (E) Aquatic animals

54. Which one of the following is not an air pollutant?

(A) Pollen from plants (B) Phosphates (C) Carbon monoxide
(D) Hydrocarbons (E) Sulphur dioxide

55. Which one of the following is a most efficient device to eliminate particulate matters from the industrial emissions?

(A) Cyclonic separators
(B) Trajectory separators
(C) Pyrolysis
(D) Incineration
(E) Electrostatic precipitator

56. Which of the following are true?

(a) Benzene hexachloride is a non biodegradable pollutant
(b) Anthropogenic air pollutants are natural in origin
(c) Carbon monoxide is a primary air pollutant
(d) Sulphur dioxide causes brown air effect during traffic congestion in cities

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

57. Match the following and choose the correct combination from the options given below

	Column I (Green House Gases)		Column II (Concentration in 2000 AD)
(a)	CO_2	(1)	282 ppt
(b)	CH_4	(2)	316 ppb
(c)	N_2O	(3)	368 ppm
(d)	CFC + HFC	(4)	1750 ppb

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

58. The fungus used for the commercial production of SCP is

(A) *Pentadiplandra brazzeana*
(B) *Fusarium graminearum*
(C) *Brassica napus*
(D) *Bacillus thuringiensis*
(E) *Phytophthora infestans*

59. Shakti, Rattan and Protina are three important lysine rich varieties of

(A) Rice (B) Pulses (C) Wheat
(D) Maize (E) Cotton

60. Which one of these diseases in animals is caused by *Babesia bigemina*?

(A) Rinderpest (B) Tick fever (C) Anthrax
(D) Diarrhoea (E) Canker

61. Who postulated the Mutation theory?
(A) G. Mendel
(B) Charles Darwin
(C) J.B. Lamarck
(D) Hugo de Vries
(E) A.Weismann

62. Which one of these is not a case of Artificial Selection?
(A) Shetland pony
(B) Great Dane dog
(C) Broccoli
(D) Peppered moth
(E) Arabian race horse

63. Amphibians were dominant during
(A) Carboniferous (B) Silurian (C) Ordovician
(D) Cambrian (E) Jurassic

64. Which of these is referred to as 'Venus flower basket'?
(A) *Spongilla* (B) *Sycon* (C) *Euplectella*
(D) *Cliona* (E) *Proterion*

65. The presence of tube feet is a characteristic feature of the Phylum
(A) Arthropoda
(B) Annelida
(C) Nemathelminthes
(D) Echinodermata
(E) Mollusca

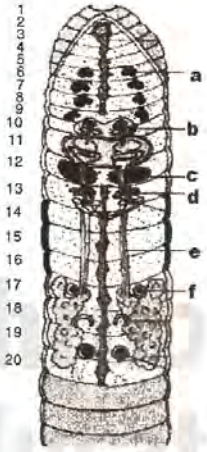
66. Two chambered heart is a feature of
(A) Amphibians
(B) Fishes
(C) Reptiles
(D) Birds
(E) Mammals

67. Match List I with List II and choose the correct option

List I (Organism)	List II (Excretory Structure)
1. Cockroach	a. nephridia
2. Clarias	b. malpighian tubules
3. Earthworm	c. kidneys
4. Balanoglossus	d. flame cells
5. Flatworm	e. proboscis gland

(A) 1 – a, 2 – c, 3 – b, 4 – d, 5 – e
(B) 1 – c, 2 – a, 3 – b, 4 – e, 5 – d
(C) 1 – b, 2 – a, 3 – c, 4 – e, 5 – d
(D) 1 – b, 2 – a, 3 – e, 4 – c, 5 – d
(E) 1 – b, 2 – c, 3 – a, 4 – e, 5 – d

68. Choose the correct combination of labelling from the options given



(A) a–Testis, b–Spermatheca, c–Seminal vesicle, d–Ovary, e–Vas deferens, f–Accessory gland
(B) a–Spermatheca, b–Testis, c–Ovary, d–Seminal vesicle, e–Vas deferens, f–Accessory gland
(C) a–Spermatheca, b–Testis, c–Seminal vesicle, d–Ovary, e–Vas deferens, f–Accessory gland
(D) a–Spermatheca, b–Testis, c–Accessory gland, d–Ovary, e–Vas deferens, f–Seminal vesicle
(E) a–Spermatheca, b–Ovary, c–Seminal vesicle, d–Testis, e–Vas deferens, f–Accessory gland

69. Which one of the following is not a characteristic feature of frog?

(A) The skin is moist and slimy
(B) Each of the fore limbs and hind limbs end in five digits
(C) Hepatic portal and renal portal systems are present
(D) Skin, buccal cavity and lungs are the respiratory organs
(E) Heart is three chambered

70. The second layer of epidermis in rat integument is

(A) Stratum lucidium
(B) Stratum germinativum
(C) Stratum corneum
(D) Stratum granulosum
(E) Dermis

71. Accessory glands associated with the genital organs in female rats are

I. Vestibular Bartholins
II. Cowper's gland
III. Ampullary glands
IV. Vesicular gland

(A) I and II
(B) III and II
(C) IV only
(D) III only
(E) I only

72. Cells of Schwann are associated with

(A) nervous tissue
(B) skeletal muscle
(C) cardiac muscle
(D) connective tissue
(E) cartilage tissue

73. Match List I with List II and find the correct option

List I (Epithelial tissue)	List II (Location)
1. Cuboidal	a. Epidermis of skin
2. Ciliated	b. Inner lining of blood vessels
3. Columnar	c. Inner surface of gall bladder
4. Squamous	d. Inner lining of fallopian tube
5. Keratinized squamous	e. Lining of pancreatic duct

(A) 1 – e, 2 – d, 3 – b, 4 – c, 5 – a
(B) 1 – c, 2 – d, 3 – e, 4 – b, 5 – a
(C) 1 – e, 2 – d, 3 – c, 4 – b, 5 – a
(D) 1 – c, 2 – d, 3 – e, 4 – a, 5 – b
(E) 1 – c, 2 – e, 3 – d, 4 – a, 5 – b

74. Which of the following represents a test cross?

(A) Ww × WW
(B) Ww × Ww
(C) Ww × ww
(D) WW × WW
(E) ww × ww

75. In which one of the following, complementary gene interaction ratio of 9:7 is observed?

(A) Fruit shape in Shepherd's purse
(B) Coat colour in mouse
(C) Feather colour in fowl
(D) Flower colour in pea
(E) Four 'O' clock plant

76. Select the correct bases of DNA, RNA and amino acid of beta chain resulting in sickle cell anaemia

	DNA	RNA	Amino Acid
(A)	CTC/GAG	GUG	Glutamic acid
(B)	CAC/GTG	GUG	Valine
(C)	CAC/GTG	GAG	Valine
(D)	CTC/GAG	GUG	Valine
(E)	CAC/GUG	GAG	Glutamic acid

77. When a segment of a chromosome breaks and later rejoins after 180° rotation, it is known as

(A) Deletion
(B) Duplication
(C) Inversion
(D) Interstitial translocation
(E) Reciprocal translocation

78. Pick out the correct statements

(1) Haemophilia is a sex linked recessive disease
(2) Down's syndrome is due to aneuploidy
(3) Phenylketonuria is an autosomal dominant gene disorder
(4) Phenylketonuria is an autosomal recessive gene disorder
(5) Sickle cell anaemia is an X-linked recessive gene disorder

(A) (1), (3) and (5) are correct
(B) (1) and (3) are correct
(C) (2) and (5) are correct
(D) (1), (4) and (5) are correct
(E) (1), (2) and (4) are correct

79. What would be the correct base sequence in mRNA for the given DNA strand?

5'—AATGCCTTAAGC—3'

(A) 5'—GCUUAAGGCAUU—3'
(B) 5'—UUACGGAATTCG—3'
(C) 3'—UUACGGAAUUCG—5'
(D) 3'—AAUGCCUUAUCG—5'
(E) 5'—UUACCGAUUUCG—3'

80. The inheritance of ABO blood groups in humans is an example of

(A) Pleiotropism
(B) Epistasis
(C) Polygenic inheritance
(D) Incomplete dominance
(E) Multiple allelism

81. In DNA of certain organisms, Guanine constitutes 20% of the bases. What percentage of the bases would be Adenine?

(A) 0% (B) 10% (C) 20%
(D) 30% (E) 40%

82. The dominant epistasis ratio is

(A) 9 : 3 : 3 : 1 (B) 12 : 3 : 1 (C) 9 : 3 : 4
(D) 9 : 6 : 1 (E) 9 : 7

83. The process of transformation was discovered by

(A) Maurice H.F. Wilkins and Rosalind E. Franklin
(B) M. Meselson and F.W. Stahl
(C) James Watson and Francis Crick
(D) Hershey and Chase
(E) Fredrick Griffith

84. Which of the following codons has no tRNA?

(A) UAA (B) UAU (C) UGU
(D) UGC (E) UGG

85. Match Column I with Column II and find the correct answer

COLUMN I	COLUMN II
a. Monoploidy	i. 2n – 1
b. Monosomy	ii. 2n + 1
c. Nullisomy	iii. 2n + 2
d. Trisomy	iv. 2n – 2
e. Tetrasomy	v. n
	vi. 3n

(A) a – v b – i c – iv d – ii e – iii
(B) a – v b – ii c – iv d – i e – iii
(C) a – vi b – v c – iii d – iv e – ii
(D) a – ii b – i c – iii d – vi e – v
(E) a – i b – v c – iii d – ii e – iv

86. Which one of the following nitrogenous base is seen only in RNA?

(A) Adenine (B) Thymine (C) Uracil
(D) Cytosine (E) Guanine

87. In Morgan's experiments on linkage, the percentage of white eyed, miniature winged recombinants in F_2 generation is

(A) 1.3 (B) 37.2 (C) 62.8
(D) 73.2 (E) 98.7

88. Ti plasmids used in genetic engineering is obtained from

(A) *Bacillus thuringiensis*
(B) *Agrobacterium rhizogenes*
(C) *Agrobacterium tumefaciens*
(D) *Pseudomonas syringae*
(E) *Bacillus subtilis*

89. The enzyme used to join the DNA fragments is

(A) Topoisomerase
(B) Adenosine deaminase
(C) DNA ligase
(D) DNA polymerase
(E) Reverse transcriptase

90. Which of these is used as vector in gene therapy for SCID?

(A) Arbovirus
(B) Rotavirus
(C) Enterovirus
(D) Parvovirus
(E) Retrovirus

91. The largest gene in man is

(A) Dystrophin
(B) Insulin gene
(C) Beta globin gene of hemoglobin
(D) Tumor suppressor gene
(E) Oncogene

92. The type of nutrition where organisms engulf food materials is

(A) Saprozoic
(B) Autotrophic
(C) Holozoic
(D) Saprophytic
(E) Parasitic

93. The vitamin essential for blood coagulation is

(A) Vitamin B_6
(B) Vitamin A
(C) Vitamin K
(D) Vitamin E
(E) Vitamin D

94. Dentition in man is

(A) Acrodont and Homodont
(B) Thecodont, Homodont and Polyphyodont
(C) Thecodont, Heterodont and Polyphyodont
(D) Thecodont, Heterodont and Diphyodont
(E) Acrodont, Heterodont and Diphyodont

95. Match List I with List II and choose the correct option

	List I		List II
a.	Salivary amylase	i.	proteins
b.	Bile salts	ii.	milk proteins
c.	Renin	iii.	starch
d.	Pepsin	iv.	lipids
e.	Steapsin	v.	emulsification of fats

(A) a – v b – iv c – i d – ii e – iii
(B) a – ii b – iii c – iv d – v e – i
(C) a – ii b – iv c – iii d – i e – v
(D) a – iii b – v c – ii d – i e – iv
(E) a – iii b – v c – i d – ii e – iv

96. Read the following statements and select the correct one

(A) The H^+ released from carbonic acid combines with haemoglobin to form haemoglobinic acid
(B) Oxyhaemoglobin of erythrocytes is alkaline
(C) More than 70% of carbon dioxide is transferred from tissues to the lungs in the form of carbamino compounds
(D) In a healthy person, the haemoglobin content is more than 25 gms per 100 ml
(E) In lungs, the oxygen from the alveolus reaches the blood through active transport

97. An oval depression called fossa ovalis is seen on
(A) inter atrial septum
(B) inter ventricular septum
(C) right auriculo-ventricular septum
(D) left auriculo-ventricular septum
(E) papillary muscles

98. The deposition of lipids on the wall lining the lumen of large and medium sized arteries is referred to as
(A) Deep vein thrombosis
(B) Stokes – Adams Syndrome
(C) Osteoporosis
(D) Osteoarthritis
(E) Atherosclerosis

99. Find the incorrect statement regarding mechanism of urine formation in man
(A) The glomerular filtration rate is about 125 ml per minute
(B) The ultrafiltration is opposed by the colloidal osmotic pressure of plasma
(C) Tubular secretion takes place in the PCT
(D) Aldosterone induces greater reabsorption of sodium
(E) The counter current systems contribute in diluting the urine

100. A bird excretes nitrogenous waste materials in the form of
(A) Uric acid
(B) Ammonia
(C) Urea
(D) Amino acids
(E) Ammonia and Urea

101. Which of the following is correct with reference to haemodialysis?
(A) Absorbs and resends excess of ions
(B) The dialysis unit has a coiled cellophane tube
(C) Blood is pumped back through a suitable artery after haemodialysis
(D) Anti-heparin is added prior to haemodialysis
(E) Nitrogenous wastes are removed by active transport

102. The longest bone of the human body is

(A) Humerus
(B) Tibia
(C) Vertebra
(D) Femur
(E) Incus

103. The glands which help in absorbing odoriferous substances to stimulate olfactory nerve are

(A) Cerumenous glands
(B) Meibomian glands
(C) Bowman's glands
(D) Cowper's glands
(E) Bidder's glands

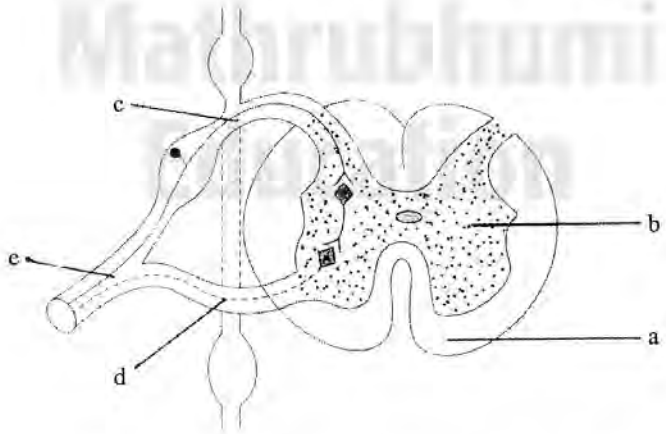
104. The region between two successive Z-lines in a myofibril is

(A) sarcomere
(B) sarcosome
(C) fascia
(D) anisotropic band
(E) isotropic band

105. Which one of the following is wrongly matched?

(A) Myosin	–	contractile protein
(B) Tendon	–	connective tissue
(C) Smooth muscle	–	involuntary muscle
(D) Red muscle	–	myoglobin
(E) Troponin	–	fibrous protein

106. In a cross section of the spinal cord a, b, c, d and e represents



(A) a – white matter, b – grey matter, c – dorsal root, d – ventral root e – spinal nerve

(B) a – white matter, b – grey matter, c – ventral root, d – dorsal root e – spinal nerve

(C) a – grey matter, b – white matter, c – ventral root, d – dorsal root e – spinal nerve

(D) a – grey matter, b – white matter, c – dorsal root, d – ventral root e – spinal nerve

(E) a – white matter, b – grey matter, c – spinal nerve, d – ventral root e – dorsal root

107. Pons, cerebellum and medulla together constitute

(A) hind brain

(B) mid brain

(C) fore brain

(D) telencephalon

(E) cerebral hemispheres

108. Match the following

i.	fovea	a.	provides opening for entry of light
ii.	iris	b.	transduces RGB light
iii.	pupil	c.	transmits information to CNS
iv.	lens	d.	controls amount of light entering
v.	optic nerve	e.	focuses light on the retina

(A) i – d ii – a iii – e iv – b v – c
(B) i – e ii – a iii – d iv – c v – b
(C) i – c ii – a iii – d iv – e v – b
(D) i – a ii – b iii – c iv – d v – e
(E) i – b ii – d iii – a iv – e v – c

109. An adenohypophysis hormone which is regulated by feedback mechanism is

(A) oxytocin
(B) TSH
(C) vasopressin
(D) cortisone
(E) calcitonin

110. Match the hormone with its source of secretion

a.	Somatostatin	i.	Pineal gland
b.	Melatonin	ii.	Corpus luteum
c.	Aldosterone	iii.	Placenta
d.	Progesterone	iv.	Adrenal cortex
e.	HCG	v.	Islet of Langerhans
		vi.	Adenohypophysis

(A) a – v b – i c – vi d – iii e – ii
(B) a – i b – ii c – iv d – iii e – v
(C) a – ii b – vi c – iv d – v e – iii
(D) a – v b – i c – iv d – ii e – iii
(E) a – i b – iii c – iv d – ii e – v

111. Muscular tetany can be caused by deficiency of

(A) Thyroxine
(B) Oxytocin
(C) STH
(D) ADH
(E) Parathyroid hormone

112. The type of asexual reproduction found in Hydra is

(A) Multiple fission
(B) Budding
(C) Sporulation
(D) Binary fission
(E) Gemmule formation

113. The chemical substance released by activated spermatozoa that acts on the ground substances of the follicle cells is known as

(A) Progesterone
(B) Hyaluronidase
(C) Relaxin
(D) Gonadotropin
(E) Teratogen

114. Match List I with List II and choose the correct answer

List I	List II
a. Hypothalamus	1. Sperm lysins
b. Acrosome	2. Estrogen
c. Graafian follicle	3. Relaxin
d. Leydig cells	4. GnRH
e. Parturition	5. Testosterone

(A) a – 4, b – 1, c – 2, d – 3, e – 5
(B) a – 2, b – 1, c – 4, d – 3, e – 5
(C) a – 2, b – 1, c – 5, d – 4, e – 3
(D) a – 4, b – 1, c – 2, d – 5, e – 3
(E) a – 5, b – 1, c – 3, d – 2, e – 4

115. A taxon which is facing an extremely high risk of extinction in the wild in immediate future is known as

(A) Rare
(B) Exotic
(C) Vulnerable
(D) Endangered
(E) Critically endangered

116. Morphine, which is used as an analgesic is obtained from

(A) *Chinchona officinalis*
(B) *Papaver somniferum*
(C) *Taxus brevifolia*
(D) *Berberis nilghiriensis*
(E) *Cupressus cashmeriana*

117. Match Column I with Column II and choose the correct answer

Column I	Column II
a. neoplasm	i. haematopoietic cell tumours
b. benign tumour	ii. bone, cartilage tissue cancers
c. carcinomas	iii. malignant tumour
d. sarcomas	iv. cancer of epithelial tissues
e. lymphomas	v. non-cancerous tumour
	vi. initiation of new tumours

(A) a – iii b – v c – iv d – ii e – i
(B) a – iii b – v c – iv d – i e – ii
(C) a – vi b – iii c – iv d – ii e – i
(D) a – vi b – iv c – iii d – ii e – i
(E) a – ii b – v c – iv d – iii e – vi

118. Match the following and choose the correct answer

Column I	Column II
a. Phobia	1. Maladaptive habit
b. Neurosis	2. Undue concern about health
c. Hypochondria	3. Lack of sleep
d. Insomnia	4. Intense fear

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

119. Choose the wrong statement regarding AIDS

(A) AIDS is an immunodeficiency disease
(B) It is caused by a retrovirus, HIV
(C) HIV selectively infects and kills B-lymphocytes
(D) Retroviruses have RNA genomes that replicate via DNA intermediate
(E) Viral RNA genome is converted into DNA copy by reverse transcriptase

120. Tiny lesions of multiple sclerosis on brain and spinal tissue can be observed by

(A) Magnetic Resonance Imaging
(B) Positron Emission Tomography
(C) X-ray Radiography
(D) Digital Subtraction Angiography
(E) Electro Encephalography

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