SRI CHAITANYA EDUCATIONAL INSTITUTIONS, INDIA

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SEC: INCOMING JUNIORS **DATE: 17-07-2021**

SUB : BOTANY **NEET PART TEST- 1** **Max. Marks: 720**

IMPORTANT INSTRUCTIONS :

- **Pattern of the Entrance Examination**:-
  Paper containing 180 objective type questions ,from Biology, Physics and Chemistry
- **Use Blue/Black Ball Point Pen only** to darken the appropriate circle. Answers marked with pencil would not be evaluated.
- Each item carries 4marks. For each correct response the candidate will get 4 marks. For each incorrect response **1mark** will be deducted from the total score.

1. Many bacteria have small circular DNA outside the genomic DNA. These smaller DNA are called
   1) Phasmids 2) Plastids
   3) Plasmids 4) Prophage
2. Which is not found in prokaryotic cell?
   1) Plasma membrane
   2) Nuclear membrane
   3) Cell wall
   4) Ribosomes
3. Which layer of the cell envelope determines the shape of the cell provides a strong structural support to prevent the bacterium from bursting or collapsing?
   1) Cell wall 2) Cell membrane
   3) Glycocalyx 4) Capsule
4. Which of the following are incorrect mesosomes?
   1) Mesosomes are formed by the extensions of plasma membrane into the cell in the form of vesicles tubules and lamellae
   2) They help in respiration, secretion process, to increase the surface area of the plasma membrane and enzymatic content
   3) They help in the cell wall formation DNA replication and distribution to daughter cells
   4) Absent in Bacteria
5. Omnis cellula-e cellula is generalization given by
   1) Lamarck 2) Dutrochet
   3) Leeuwenhock 4) Virchow
6. The longest portion of the bacterial flagella that extends from the cell surface to the outside is called
   1) Filament 2) Hook
   3) Basal body 4) Shaft
7. Several ribosomes may attach to a single mRNA and form a chain called
   1) Polysome 2) Polyribosome
   3) Phagosome 4) both 1&2
8. Match the columns I and II, and choose the correct combination from the options given

Column-I (Cell)	Column-II (Size)
a) Mycoplasma	K. 3 to 5 µm
b) RBCs	L. 10 to 20 µm
c) Bacteria	M. 7 µm
d) Typical eukaryotic cell	N. 0.3 µm

   1) a-N, b-L, c-K, d-M

2) a-K, b-M, c-N, d-L
3) a-N, b-M, c-K, d-L
4) a-K, b-L, c-N, d-M

9. Centrioles and centrosomes occur in the cells of
1) Green plants
2) Animals
3) Bacteria and cyanobacteria
4) Both 2 & 3

10. An interconnected membranous network of the cell composed of vesicles, flattened sacs and tubules is
1) Mitochondria
2) Endoplasmic reticulum
3) Lysosomes 4) Nucleus

11. Depending on the ease of extraction, membrane proteins can be classified as
1) Saturated and unsaturated
2) Hydrophilic and hydrophobic
3) Integral and peripheral
4) Acidic, basic and neutral

12. Layer of cell wall holds the nighbouring cells together is
1) Primary cell wall
2) Middle lamellum
3) Secondary cell wall
4) Tertiary cell wall

13. Molecules which are transported across the membrane against their concentration gradient, i.e, from the lower to higher concentration. Such a transport is called
1) Active transport, e.g., diffusion
2) Passive transport, e.g., diffusion
3) Active transport, e.g., Na+ /K+ pump
4) Osmosis, a type of simple diffusion

14. Which is a part of endomembrane system of eukaryotic cells?
1) Mitochondria 2) Peroxisomes
3) Chloroplasts 4) Golgi bodies

15. Perinuclear space is around
1) 10 to 20 A 2) 10 to 20 nm
3) 10 to 50 µm 4) 10 to 50 nm

16. Organic acid used to grind living tissue is
1) Chloroform 2) Trichloro acitic acid
3) Oxalo acitic acid 4) Hydrochloric acid

17. Match the column I and II, and choose the correct combination from the options given

Column –I	Column-II
a. Acidic amino acid	1. Valine
b. Basic amino acid	2. Glutamic acid
c. Neutral amino acid	3. Phenylalanine
d. Aromatic amino acid	4. Lysine

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

18. No. of carbon atoms present in palmatic acid is
1) 20 2) 16
3) 24 4) 18

19. Molecules having charged groups of opposite polarity are
1) Zwitter ions 2) Anions
3) Cations 4) Negative ions

20. Which is not a pyrimidine?
1) Guanine 2) Thymine
3) Uracil 4) Cytosine

21. Trihydroxy propane is
1) Palmatic acid
2) Glycerol
3) Arachidonic acid
4) Glycine

22. Inulin is a polymer of

1) Glucose 2) Fructose
3) Galactose 4) Sucrose

23. Read the following statements and find out the incorrect statement.
1) Glycogen is a branched polymer of glucose
2) Cellulose does not contain complex helices and hence cannot give iodine test
3) Paper made from plant pulp is cellulosic
4) Chitin is heteropolymer

24. In a polysaccharide like glycogen, the right end and left end are called
1) N terminal and C terminal respectively
2) C terminal and N terminal respectively
3) Reducing end and non-reducing ends respectively
4) Non-reducing end and reducing end respectively

25. Peptide bond is formed when the
1) Carboxyl group of one amino acid reacts with the carboxyl group of the next amino acid
2) Amino group of one amino acid reacts with the amino group of the next amino acid
3) carboxyl group of one amino acid reacts with amino group of the next amino acid
4) Amino group of one amino acid reacts with carboxyl group of the next amino acid

26. In B-DNA, the rise per base pair would be
1) 0.34 nm 2) 3.4 nm
3) 34 nm 4) 34 $\dot{A}$

27. Which factor(s) affects the enzymatic activity?
1) Temperature and P^H
2) Change in substance concentration
3) Binding of specific chemicals that regulates its activity
4) all of the above

28. Enzymes catalyzing removal of groups and leaving of double bond are
1) Transferases 2) Ligases
3) Lyases 4) Oxidoreductases

29. NAD is
1) Nicotinamide adenosine diphosphate
2) Nicotine adenosine diphosphate
3) Nicotinamide adenine dinucleotide
4) None of the above

30. Ribose is
1) Monosaccaride 2) Disaccharide
3) Polysaccaride 4) Heteropolymer

31. Of the total duration of the cycle, the interphase lasts more than
1) 95% 2) 5%
3) 50% 4) 40%

32. Which phase corresponds to the interval between mitosis and initiation of DNA replication?
1) Gap 1/G_1 phase
2) Gap 2/G_2 phase
3) Synthesis/S phase
4) M Phase

33. Centriole replicates during
1) Interphase 2) Prophase
3) Metaphase 4) Anaphase

34. Which of the following cells in an adult animal do not appear to exhibit division?
1) Bone marrow cells
2) Upper layer of epidermis
3) Heart cells
4) All of the above

35. Which phase of cell cycle called as resting phase ?
1) Interphase 2) Metaphase

3) Anaphase 4) Prophase

36. Which of the following proteinaceous components of the cell cytoplasm help in the initiation of the assembly of mitotic spindle?
1) Microtubules 2) Micro bodies
3) Centromere 4) Kinetochore

37. The centriole begins to move towards opposite poles of the cell in
1) Prophase 2) Metaphase
3) Anaphase 4) Telophase

38. The key features of metaphase are
1) Spindle fibres attach to kinetochores of chromosomes
2) Chromosomes are moved to spindle equator and get aligned along metaphase plate
3) Splitting of centromere
4) Bothe 1 & 2

39. Anaphase stage is characterized by
1) Centromeres split and chromatids separate
2) Chromatids move to opposite poles
3) Nucleolus, Golgi complex and ER reform
4) Bothe 1 & 2

40. In which stage, the chromosomes that have reached their respective poles decondense and lose their individuality
1) Prophase 2) Metaphase
3) Anaphase 4) Telophase

41. Telophase is characterized by
1) Chromosomes cluster at opposite spindle poles and their identify is lost as discrete elements
2) Nuclear envelope assembles around the chromosome clusters
3) Nucleolus, Golgi complex and E.R reform
4) All of the above

42. In plant cells, cytokinesis occurs by
1) Cell plate 2) Invagination
3) Furrowing 4) All of the above

43. In which stage of cell division, chromosomes are most condensed
1) Prophase 2) Anaphase
3) Metaphase 4) Telophase

44. Different shapes likeV,L, J and i chromosomes can be observed in
1) Prophase 2) Anaphase
3) Metaphase 4) Telophase

45. In mitosis, centromere divides during
1) Prophase 2) Anaphase
3) Telophase 4) Metaphase

46. Incomplete digestive system is found in
1) Aschelminthes 2) Annelida
3) Arthropoda 4) Platy helminthes

47. Match the following, and choose the correct sequence.

I) Organ level	p) Pheretima
II)Cellular aggregate level	q) Fasciola
III) Tissue level	r) Spongilla
IV) Organ system level	s) Obelia

1) I-q, II-r, III-s, IV-p
2) I-q, II-s, III-r, IV-p
3) I-s, II-q, III-r, IV-p
4) I-s, II-r, III-p, IV-q

48. Open circulatory system occurs in
1) Earthworm 2) Snail
3) Cockroach 4) Both 2 & 3

49. Which of the following is/are acoelomates?
1) Echinodermata 2) Chordata
3) Platyhelminthes 4) Both 1 & 2

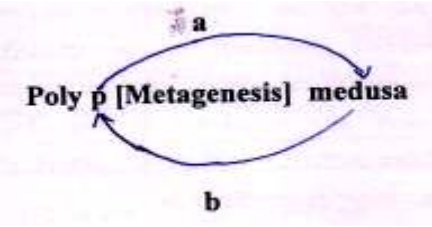
50. Which of the following animal is devoid of tissue?
1) Ctenoplana 2) Meandrina
3) Euspongia 4) Taenia

51. Triploblastic organization and bilateral symmetry starts from which phylum during evolution
1) Porifera 2) Coelenterata
3) Platyhelminthes 4) Annelida

52. True segmentation or metamerism means
1) Body is externally and internally divided into segments
2) Each segment of body has serial repetition of at least some organs
3) Both 1 & 2
4) Alternation of generation in cnidarians

53. When mesoderm is present as scattered pouches in between the ectoderm and endoderm such a body cavity is called
1) Schizo coelom 2) Entero coelom
3) Pseudo coelom 4) A coelom

54. Recognize the figure and find out the correct matching:



1) a-sexually, b-asexually
2) a-asexually, b-sexually
3) a-asexually, b-parthenogenetically
4) a-sexually, b-parthenogenetically

55. Comb plates are found in
1) Pleurobrachia 2) Physalia
3) Obelia 4) Sycon

56. Which of the following is a living fossil?
1) Laccifer 2) Loligo
3) Limulus 4) Lancelet

57. Besides the mammals, viviparity is also found in members of
1) Chandrichthyes 2) Osteichthyes
3) Amphibians 4) Aves

58. Match the column-I and II and choose the correct combination from the options given

Column-I	Column-II
I. Gorgonia	a. Brain coral
II. Adamsia	b. Jelly fish
III. Meandrina	c. Portuguese-man-of-war
IV. Physalia	d. Sea Anemone
V. Pennatula	e. Sea fan
VI. Aurelia	f. Sea-pen

1) I-f, II-d, III-a, IV-c, V-e, VI-b
2) I-e, II-d, III-a, IV-c, V-f, VI-b
3) I-e, II-d, III-a, IV-f, V-c, VI-b
4) I-a, II-b, III-c, IV-d, V-e, VI-f

59. Correct flow of water current in sponges is
1) Ostia – Osculum – spongocoel - outside
2) Osculum – spongocoel - Ostia - outside
3) Ostia – spongocoel – Osculum - outside
4) Osculum - Ostia – spongocoel - outside

60. If '1' represents the extracullular digestion, '2' represents the intracellular digestion and '3' represents both type, then for coelentrata, ctenophora, and porifera select the correct option
1) 1, 2, 3 respectively 2) 3, 3, 2 respectively
3) 3, 2, 1 respectively 4) 3, 2, 2 respectively

61. Read the following statements, find the incorrect statements.
A. Polyp is sessile and cylindrical form like Adamsia

B. Medusa is umbrella shaped and free-living like Aurelia

C. Polyp produce medusa sexually and medusae form the polyp asexually (ex: obelia)

D. Metagenesis is seen in Hydra

1) A,D 2) A,C

3) B,C 4) C,D

62. Read the following statements carefully,

A. Hooks & suckers are present in parasitic forms

B. Some of them absorb nutrients from the host directly through their body surface.

C. Fertilisation is internal and development is through many larval stages.

Here we are talking about:

1) Platyhelminthes 2) Aschelminthes

3) Annelida 4) Molluscs

63. Select the incorrect statement about the phylum aschelminthes.

1) Alimentary canal is complete with well developed muscular pharynx

2) Sexes are separate (dioecious)

3) Often females are longer than males

4) Fertilization is external

64. Which of the following is not correctly matched?

1) Gregarious pest – Locust

2) Living fossil – Limulus

3) Economically important insects – Apis, Bombyx

4) Vectors – anopheles, culex and Lac insect

65. Which is associated with pearl formation?

1) Pinctada 2) Corallium rubrum

3) Aplysia 4) Dentalium

66. Excretory organs of arthropods are

1) Malphigian tubules

2) Coxal glands

3) Green glands

4) All

67. In Echinoderms the excretory system is

1) Proboscis gland 2) Renette gland

3) Antennary gland 4) Absent

68. In chondrichthyes, claspers are seen on

1) Pelvic fins of male

2) Pelvic fins of female

3) Pectoral fins of female

4) Pectoral fins of female

69. Find out the poikilotherm with 4 chambered heart in the following:

1) Psittacula 2) Hemidactylus

3) Pteropus 4) Crocodilus

70. Which of the following is not a Homeotherm?

1) Aptenodytes 2) Testudo

3) Delphinus 4) Neophron

71. Match the columns I and II, and choose the correct combination from the options given.

Column-I	Column-II
I. Cyclostomes	p. Hemichordata
II. Aves	q. Urochordata
III. Tunicates	r. Agnatha
IV. Balanoglossis	s. Pisces
V. Osteichthyes	t. Tetrapoda

1) I-p, II-q, III-r, IV-s, V-p

2) I-q, II-r, III-s, IV-p, V-t

3) I-r, II-p, III-t, IV-q, V-s

4) I-r, II-t, III-q, IV-p, V-s

72. Identify the aquatic mammals from following

i) Balaenoptera ii) Equs

iii) Delphinus iv) Pteropus v) Felis

1) i and iii only 2) v only

3) ii and iv only 4) iv and v only

73. Ascidia belongs to the phylum
1) Hemichordata 2) Urochordata
3) Cephalochordata 4) Chordata

74. Lancelet is the member of
1) Hemichordata 2) Urochordata
3) cephalochordata 4) Cyclostomata

75. Match the following:

Column-I	Column-II
I. Equs	p. Moist skin (without scales)
II. Hyla	q. fore limbs absent
III. Columba	r. Poisonous nature
IV. Bangarus	s. Mammary glands present

1) I-s, II-p, III-q, IV-r
2) I-s, II-p, III-r, IV-q
3) I-q, II-p, III-s, IV-r
4) I-p, II-q, III-r, IV-s

76. Which of the following type of epithelium is find in P.C.T of nephron?
1) Simple squamous epithelium
2) Simple cuboidal epithelium
3) simple columnar epithelium
4) stratified columnar epithelium

77. Match the columns I and II and choose the correct combination from the options given

Column-I	Column-II
a. Adhering junctions	1. Help to stop substances from leaking across a tissue
b. Gap junctions	2. Perform cementing to keep neighbouring cells together
c. Tight junctions	3. Facilitate the cells to communicate with each other.

1) a-3, b-2, c-1 2) a-2, b-3, c-1
3) a-2, b-1, c-3 4) a-1, b-3, c-2

78. Which of the following connective tissue has fibre free matrix?
1) Blood 2) Bone
3) Cartilage
4) Areolar connective tissue

79. Which of the connective tissue often serves as a support framework for epithelium?
1) Areolar tissue
2) Adipose tissue
3) dense regular connective tissue
4) Dense irregular connective tissue

80. The excess of nutrients which are not used immediately are converted into fats and stored in
1) Areolar tissue
2) Adipose tissue
3) dense regular connective tissue
4) Dense irregular connective tissue

81. Which of the following connective tissue contains fibroblasts, macrophages and mast cells?
1) Aereolar tissue
2) Adipose tissue
3) dense regular connective tissue
4) Dense irregular connective tissue

82. Which of the following tissue exerts the greatest control over the body's responsiveness to changing conditions?
1) Epithelial tissue 2) Connective tissue
3) Muscular tissue 4) Neural tissue

83. Neuroglial cells makeup more than
1) One-third the volume of neural tissue in our body and form and protect the neurons

2) One-half the volume of neural tissue in our body

3) One-half the volume of muscular tissue in our body

4) One-third the volume of neural tissue in our body and protect and support neurons

84. Statement-I: Bone is a specialized connective tissue having hard and pliable matrix.

Statement-II: Bone is the main tissue that provides structural frame to the body

1) Both statements I & II are correct

2) Statement I is correct, but statement II is incorrect

3) Statement I is incorrect, but statement II is correct

4) Both statements I & II are incorrect

85. Ligament connects

1) Muscle to skin 2) Bone to bone

3) Muscle to muscle 4) Muscle to bone

86. The type of muscular tissue finds in wall of internal organs such as the blood vessels, stomach etc

1) Skeletal muscle 2) Smooth muscle

3) Cardiac muscle 4) All

87. Outer covering of cartilage is called

1) Peri chondrium 2) Peri osteum

3) Endosteum 4) Peritoneum

88. Which of the following type of cell junction is not found in Animal tissues?

1) Adhering junctions

2) Tight junctions

3) Gap junctions

4) Plasmodesmata

89. In camel, the hump is mainly made up of this tissue

1) Aereolar 2) Adipose

3) Muscular 4) Skeleton

90. Which of the following tissues perform special function of linking and supporting other tissues organs of the body?

1) Epithelial tissue 2) Connective tissue

3) Muscular tissue 4) Neural tissue

91. If displacement of a particle is zero, the distance covered

1) must be zero

2) may or may not be zero

3) cannot be zero

4) depends upon the zero

92. The numerical value of the ratio of displacement to distance is:

1) always less than one

2) always equal to one

3) always more than one

4) equal to or less than one

93. A body covers first one-third of the distance with a velocity $20ms^{-1}$, the second one-third with a velocity of $30ms^{-1}$ and last one-third with a velocity of $40ms^{-1}$. The average velocity is nearly:

1) 28 m/s 2) 38 m/s

3) 18 m/s 4) 8 m/s

94. A particle experiences constant acceleration for 20 seconds after starting from rest. If it travels a distance s_1 in the first 10 seconds and distance s_2 in the next 10 seconds then

1) $S_2 = S_1$ 2) $S_2 = 2S_1$

3) $S_2 = 3S_1$ 4) $S_2 = 4S_1$

95. An engine of a train moving with uniform acceleration passes an electric pole with velocity u and the last compartment with

velocity v. The middle point of the train passes past the same pole with a velocity of

1) $\frac{u+v}{2}$ 2) $\frac{u^2+v^2}{2}$

3) $\sqrt{\frac{u^2+v^2}{2}}$ 4) $\sqrt{\frac{u^2-v^2}{2}}$

96. A bullet fired into a fixed target loses half of its velocity in penetrating 15cm. The further distance it will penetrate before coming to rest is

1) 5cm 2) 15cm

3) 7.5cm 4) 10cm

97. A particle moves along a straight line such that its displacement at any time t is given by: S = t^3 - $6t^2$ + 3t + 4 metres. The velocity when the acceleration is zero is:

1) 3 ms^{-1} 2) – 12 ms^{-1}

3) 42 ms^{-1} 4) – 9 ms^{-1}

98. If displacement travelled by a body in n^{th} sec is S_n = 2 + 0. 4n, then its initial velocity and acceleration respectively are

1) 2units, 0.4 units

2) 0.4 units, 2units

3) 2.2 units, 0.4 units

4) 1 unit, 2 units

99. A ball is dropped from the top of a tower 100m high. Simultaneously another ball is thrown upward from the bottom of the tower with a speed of 50ms^{-1}. The time after which they cross each other is

1) 1s 2) 2s

3) 3s 4) 4s

100. A body travels 200cm in the first two seconds and 220cm in the next 4sec with deceleration. The velocity of the body at the end of the 7^{th} second is:

1) 5cm /s 2) 10cm/s

3) 15 cm/s 4) 20cm/s

101. The ratio of times taken by freely falling body to cover first metre, second metre,.. is

1) $\sqrt{1}:\sqrt{2}:\sqrt{3}$ 2) $\sqrt{1}:\sqrt{2}-\sqrt{1}:\sqrt{3}-\sqrt{2}$

3) $\sqrt{2}:\sqrt{4}:\sqrt{8}$ 4) 2:3:4

102. A car accelerates from rest at a constant rate α for some time, after which it decelerates at a constant rate β and comes to rest. If the total time elapsed is t, the maximum velocity acquired by the car will be:

1) $\frac{\alpha^2-\beta^2}{\alpha\beta}t$ 2) $\frac{\alpha^2+\beta^2}{\alpha\beta}t$

3) $\frac{\alpha+\beta}{\alpha\beta}t$ 4) $\frac{\alpha\beta}{\alpha+\beta}t$

103. One body is dropped while a second body is thrown downwards with an initial velocity of 2m/s simultaneously. The separation between them is 18 metres after a time:

1) 9s 2) 4.5s

3) 18s 4) 9.8s

104. If the velocity of a particle is given by: $V=\sqrt{(180-16x)}m/s$ then its acceleration will be:

1) Zero 2) 8 m/s^2

3) – 8 m/s^2 4) 4 m/s^2

105. Two trains, each 50 m long, are travelling in opposite directions with velocity 10 m/s and 15 m/s. The time of crossing is:

1) 2s 2) 4s

3) $2\sqrt{3}s$ 4) $4\sqrt{3}s$

106. A body is dropped from a height 39.2 m. After it crosses half distance, the acceleration due to gravity ceases to act. The body will hit the ground with velocity:

1) 19.6 m/s 2) 20 m/s

3) 1.96 m/s 4) 196 m/s

107. A stone is thrown vertically upward with an initial velocity u from the top of a tower, reaches the ground with a velocity 3u. The height of the tower is:

1) $\frac{3u^2}{g}$ 2) $\frac{4u^2}{g}$

3) $\frac{6u^2}{g}$ 4) $\frac{9u^2}{g}$

108. A bus starts moving with acceleration $2ms^{-2}$. A cyclist 96m behind the bus starts simultaneously towards the bus at 20 m/s. The minimum time after which he will be able to overtake the bus is

1) 4s 2) 8s

3) 11s 4) 16s

109. A body is thrown vertically up with a velocity u. It passes three points A, B and C in its upward journey with velocities $\frac{u}{2}, \frac{u}{3} and \frac{u}{4}$ respectively. The ratio of the separations between points A and B and between B and C, i.e., AB/BC is :

1) 1 2) 2

3) 10/7 4) 20/7

110. A stone falls freely from rest from a height h and it travels a distance 9h/25 in the last second. The value of h is:

1) 145 m 2) 100 m

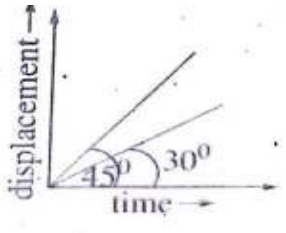
3) 122.5 m 4) 200 m

111. Velocity-time curve for a body, projected vertically upwards, is:

1) Parabola 2) Ellipse

3) Hyperbola 4) Straight line

112. The displacement time graphs of two moving particles make angles of 30° and 45° respectively with x-axis. The ratio of the two velocities is



1) 2 : 1 2) 1 : 1

3) 1 : 2 4) 1 : $\sqrt{3}$

113. The horizontal component of the weight of a body of mass 'm' is

1) mg 2)mg/2

3) Zero 4) Infinity

114. Subtraction of vectors obeys

1) commutative law

2) associative law

3) distributive law

4) All the above

115. The minimum number of unequal forces in a plane that can keep a particle in equilibrium is

1) 4 2) 2

3) 3 4) 6

116. To go from town A to town B a plane must fly about 1780 km at an angle of 30° west of north. How far west of A is B?

1) 1542km 2) 1452km

3) 1254 km 4) 890 km

117. A room has dimensions 3m x 4m x 5m. A fly starting at one corner ends up at the diametrically opposite corner. The magnitude of the displacement of the fly is

1) 12m 2) 60m

3) $2\sqrt{5}$ m 4) $5\sqrt{2}$ m

118. The unit vector parallel to the resultant of the vectors $\vec{A} = 4\hat{i} + 3\hat{j} + 6\hat{k} and \vec{B} = -\hat{i} + 3\hat{j} - 8\hat{k}$ is

1) $\frac{1}{7}\left(3\hat{i} + 6\hat{j} - 2\hat{k}\right)$ 2) $\frac{1}{7}\left(3\hat{i} + 6\hat{j} + 2\hat{k}\right)$

3) $\frac{1}{49}\left(3\hat{i} + 6\hat{j} - 2\hat{k}\right)$ 4) $\frac{1}{49}\left(3\hat{i} - 6\hat{j} + 2\hat{k}\right)$

119. Twelve forces each of 5 N act on a body simultaneously. If each force makes an angle of 30° with other their resultant is

1) 5 N 2)60N

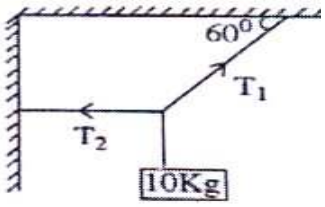
3) 5 N 4) Zero

120. The resultant of two forces, one double the other in magnitude is perpendicular to the smaller of the two forces. The angle between the two forces is

1) 150° 2) 90°

3) 60° 4) 120°

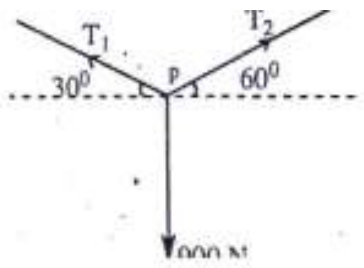
121. A 10 kg wt is suspended as shown below then tension T_1 & T_2 are



1) 20 kg wt, 20 kg wt 2) $\frac{20}{\sqrt{3}} kgwt, \frac{20}{\sqrt{3}} kgwt$

3) $\frac{20}{\sqrt{3}} kgwt, \frac{10}{\sqrt{3}} kgwt$ 4) $\frac{20}{\sqrt{3}} kgwt, 10\sqrt{3} kgwt$

122. If 'P' is in equilibrium then, T_1 / T_2 is



1) $\sqrt{3}$ 2) 2

3) $1/\sqrt{3}$ 4) 1/2

123. The position vector of a particle is given by $\vec{r} = 3t^2\hat{i} + 4t^2\hat{j} + 7\hat{k}m$ at a given time 't'. The net displacement of the particle after 10s is

1) 500 m 2) 400m

3) 300 m 4) 700 m

124. A ship 'A' steams down to North at 16kmph, and ship 'B' due west at 12kmph. Relative velocity of B with respect to A is

1) 10kmph 2) 25kmph

3) 6kmph 4) 20kmph

125. If $\vec{A} = 2\hat{i} - 3\hat{j} + 4\hat{k}$, its component in xy plane is

1) 4 2) $\sqrt{13}$

3) $\sqrt{29}$ 4) 1

126. The resultant of two forces at right angles is 13N. The minimum resultant of the two forces is 7N. The forces are

1) 20N, 6N 2) 10N, 20N

3) 5N, 12N 4) 8N, 15N

127. If a vector $\vec{A}$ makes angles 45° and 60° with x and y axes respectively then the angle made by it with z-axis is

1) 30° 2) 60°

3) 90° 4) 120°

128. A car is moving 40m due east, turns towards north moves 30m, then turns 45° east of north moves $20\sqrt{2}$ m. The net displacement of car is (East is taken positive x-axis, North as positive y-axis)

1) $50\ \hat{i} + 60\hat{j}$ 2) $60\hat{i} + 50\hat{j}$

3) $30\hat{i} + 40\hat{j}$ 4) $40\hat{i} + 30\hat{j}$

129. A 10 kg body is suspended by a rope is pulled by means of a horizontal force to make 60° by rope to vertical. The horizontal force is

1) 10 kgwt 2) 30 kgwt

3) $10\sqrt{3}$ kgwt 4) $30\sqrt{3}$ kgwt

130. A particle is moving eastwards with a velocity of 5m/s. In 10s the velocity changes to 5m/s northwards. Find the average acceleration in this time.

1) $\frac{1}{\sqrt{2}} m/s^2 NE$ 2) $\sqrt{2} m/s^2 NE$

3) $\frac{1}{\sqrt{2}} m/s^2 NW$ 4) $\sqrt{2} m/s^2 NW$

131. If $\vec{A} = 3\hat{i} + 4\hat{j}$ and $\vec{B} = 7\hat{i} + 24\hat{j}$, a vector having the same magnitude as $\vec{B}$ and parallel to $\vec{A}$ is

1) $3\hat{i} - 4\hat{j}$ 2) $-20\hat{i} + 15\hat{j}$

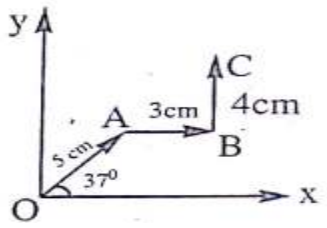
3) $20\hat{i} + 15\hat{j}$ 4) $15\hat{i} + 20\hat{j}$

132. A vector of magnitude 2 units makes an angle 45° with x-axis and 60° with y-axis. Find the vector

1) $\hat{i} + \sqrt{2}\hat{j} + \hat{k}$ 2) $\sqrt{2}\hat{i} - \hat{j} + \hat{k}$

3) $\sqrt{2}\hat{i} + \hat{j} + \hat{k}$ 4) $\sqrt{2}\hat{i} + \sqrt{2}\hat{j} + \hat{k}$

133. Find the resultant of the vectors shown in figure,



1) 12cm at 37° with x-axis

2) 10cm at 45° with x-axis

3) 7√2 cm at 45° with x-axis

4) 7cm at 45° with x-axis

134. Choose the correct statement

1) Scalar + vector = scalar/vector

2) Vector/Vector = scalar

3) Scalar/Vector = Scalar (or) Vector

4) Vector – Vector = Vector

135. If A and B persons are moving with velocities $V_A and V_B$ in opposite directions. Magnitude of relative velocity of B with respect to A is x and magnitude of relative velocity of A with respect to B is y. Then

1) x > y 2) x = y

3) x = 2y 4) 2x = y

136. The highest value of e/m of anode rays has been observed when the discharge tube is filled with:

1) Nitrogen 2) Oxygen

3) Hydrogen 4) Helium

137. Which of the following pairs represents isobars?

1) ${}_3^2He$ and ${}_2^4He$ 2) ${}_{12}^{24}Mg$ and ${}_{12}^{25}Mg$

3) ${}_{19}^{40}K$ and ${}_{20}^{40}Ca$ 4) ${}_{19}^{40}K$ and ${}_{19}^{39}K$

138. Sodium atoms and sodium ions:

1) Are chemically similar

2) Both react vigorously with water

3) Have same number of electrons

4) Have same number of protons

139. The wave number which corresponds to electromagnetic radiations of 600 nm is equal to:

1) 1.6 x 10^4 cm^{-1} 2) 0.16 x 10^4 cm^{-1}

3) 16 x 10^4 cm^{-1} 4) 160 x 10^4 cm^{-1}

140. The ratio of radii 2nd, 4th and 6th orbits of hydrogen atom is

1) 2 : 4 : 6 2) 1 : 4 : 9

3) 1 : 4 : 6 4) 1 : 2 : 3

141. A gas absorbs a photon of wavelength 355 nm and emits two wavelengths. If one of the emission is at 680 nm, the other is at:

1) 518 nm 2) 1035 nm

3) 325 nm 4) 743 nm

142. E_n = - 313.6 / n² Kcal/mol. If the value of E = -34.84 Kcal/mol, to which value does 'n' correspond?

1) 4 2) 3

3) 2 4) 1

143. The De-Broglie wavelength of an electron in the first orbit of He^+ ion is (z=2)

1) $3.33\,\overset{0}{A}$ 2) $1.65\,\overset{0}{A}$

3) $2.15\,\overset{0}{A}$ 4) $1.25\,\overset{0}{A}$

144. The spectral lines corresponding to the radiation emitted by an electron jumping 6^{th}, 5^{th} and 4^{th} orbits to second orbit belong to :

1) Lyman series 2) Balmer series

3) Paschen series 4) Pfund series

145. In a multi-electron atom, which of the following orbitals described by the three quantum numbers will have the same energy in the absence of magnetic and electric fields?

i) n =1, l =0, m=0 ii) n =2, l =0, m=0

iii) n =2, l =1, m=1 iv) n =3, l =2, m=1

v) n =3, l =2, m=0

1) (i) and (ii) 2) (ii) and (iii)

3) (iii) and (iv) 4) (iv) and (v)

146. Any p-orbital can accommodate up to:

1) 4 electrons

2) 2 electrons with parallel spins

3) 6 electrons

4) 2 electrons with opposite spins

147. In Bohr's model, if the atomic radius of the first orbit r_1, then radius of fourth orbit will be

1) $4r_1$ 2) 6r

3) $16r_1$ 4) $r_1/16$

148. The energy of an electron of $2p_y$ orbital is:

1) Greater than $2p_x$ orbital

2) Less than $2p_z$ orbital

3) Equal to 2s orbital

4) Same as that of $2p_x$ and $2p_z$ orbitals

149. The electronic configuration of an atom / ion can be defined by which of the following?

1) Aufbau principle

2) Pauli's exclusion principle

3) Hund's rule of maximum multiplicity

4) All of the above

150. Which of the following ion has maximum number of unpaired electrons

1) Cr^{+3} 2) Ni^{+2}

3) Mn^{+2} 4) Zn^{+2}

151. Krypton (At. No. 36) has the electron configuration [Ar] $4s^2 3d^{10} 4p^6$. The 37th electron will go into which one of the following sub-levels?

1) 4f 2) 4d

3) 3p 4) 5s

152. Which of the following has highest orbital angular momentum?

1) 4s 2) 4p

3) 4d 4) 4f

153. The number of waves made by a Bohr electron in an orbit of maximum magnetic quantum number +2 is:

1) 3 2) 4

3) 2 4) 1

154. The difference in angular momentum associated with the electron in the two successive orbits of hydrogen atom is:

1) h/π 2) h/2π

3) h/2 4) (n-1) h/2π

155. Photoelectric effect can be explained by assuming that light:

1) Is a form of transverse waves

2) Is a form of longitudinal waves

3) Can be polarized

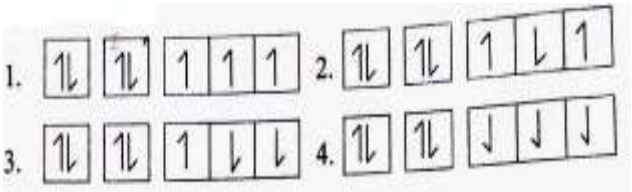
4) Consists of quanta

156. The energy of an electron in the first Bohr orbit of H-atom is -13.6 eV. The possible energy value(s) of the excited state(s) for electrons in Bohr orbits of hydrogen is /are:

1) -3.4 eV 2) -4.2 eV

3) -6.8 eV 4) +6.8 eV

157. Ground state electronic configuration of nitrogen atom can be represented by:



1) 1 only 2) 1,2 only

3) 1, 4 only 4) 2,3 only

158. The electronic configuration of an element is $1s^2 2s^2 2p^6, 3s^2 3p^6 3d^5, 4s^1$. This represents:

1) Excited state 2) Ground state

3) Cationic state d) Anionic state

159. The orbital angular momentum of an electron in 2s-orbital is:

1) $+\frac{1}{2}\frac{h}{2\pi}$ 2) Zero

3) $\frac{h}{2\pi}$ 4) $\sqrt{2}\frac{h}{2\pi}$

160. The number of d-electrons in Ni (At. No.=28) is equal to that of the

1) s and p – electrons in F^-

2) p-electrons in Ar (At. No. =18)

3) d-electrons in Ni^{2+}

4) Total number of electrons in N (At.No.=7)

161. The number of radial nodes of 3s- and 2p-orbitals are respectively:

1) 2, 0 2) 0, 2

3) 1, 2 4) 2, 1

162. In ground state, the radius of hydrogen atom is 0.53 $\dot{A}$. The radius of Li^{2+} ion (z=3) in the same state is:

1) 0.17 $\dot{A}$ 2) 1.06 $\dot{A}$

3) 0.53 $\dot{A}$ 4) 0.265 $\dot{A}$

163. How many d-electrons in Cu^+ (At No. =29) can have the spin quantum number (- ½)?

1) 3 2) 7

3) 5 4) 9

164. The ionization enthalpy of hydrogen atom is 1.312 x 10^6 J mol^{-1}. The energy required to excite the electron in the atom from n=1 to n=2 is

1) 9.84 x 10^5J mol^{-1}

2) 8.51 x 10^5 J mol^{-1}

3) 6.56 x 10^5 J mol^{-1}

4) 7.56 x 10^5 J mol^{-1}

165. The wavelengths of electron waves in two orbits is 3 : 5. The ratio of kinetic energy of electrons will be

1) 25 : 9 2) 5 : 3

3) 9 : 25 4) 3 : 5

166. Mendeleeff corrected the atomic mass of:

1) Be 2) In

3) Au 4) All of these

167. Eka-aluminium and Eka-silicon are known as:
1) Gallium and germanium
2) Aluminium and Silicon
3) Iron and Sulphur
4) Proton and silicon

168. According to Moseley, a straight line graph is obtained on plotting:
1) v vs. Z 2) v^2 vs. Z
3) $\sqrt{v}$ vs. Z 4) $\frac{1}{v}$ vs. Z

169. The maximum number of valence electrons possible for atoms in the second period of the periodic table is
1) 18 2) 10
3) 8 4) 2

170. Which group contains maximum number of elements?
1) 3 2) 5
3) 9 4) 18

171. Maximum number of electrons in the outermost shell of s, p, d and f-block elements are
1) 2, 6, 10, 14 2)2, 8, 10, 2
3) 2, 8, 18, 32 4) 2, 8, 2, 2

172. In the 6^{th} period of periodic table 14 elements are placed in the group-3 of the period. These are known as:
1) Alkali metals
2) Alkaline earth metals
3) Rare gases
4) Rare earths

173. Which of the following pairs has both members from the same period of the periodic table?
1) Na - Ca 2) Na - Cl
3) Ca – Cl 4) Cl - Br

174. Which pair of atomic numbers represents s-block elements?
1) 7, 15 2) 6, 12
3) 9, 17 4) 3, 12

175. In the long form of periodic table the non-metals are placed under:
1) s-block 2) p-block
3) s & p-block 4) d-block

176. The element having 18 electrons in its outermost shell is:
1) $_{28}Ni$ 2) $_{46}Pd$
3) $_{29}Cu$ 4) None

177. In the transition elements, the incoming electron occupies (n -1)d sublevel in preference to:
1) np 2) ns
3) (n – 1)d 4) (n + 1)s

178. Most of the man-made or transuranic (artificially prepared) elements occur:
1) In the actinoid series
2) In the lanthanoid series
3) Among the metalloids
4) Among the non-metals

179. The outer electronic structure of lawrencium (atomic number 103) is:
1) Rn $5f^{13}\ 7s^2 7p^2$ 2) Rn $5f^{13}6d^1 7s^1 7p^2$
3) Rn $5f^{14}7s^1 7p^2$ 4) Rn $5f^{14}6d^1 7s^2$

180. The element with quantum numbers for last e^- n = 2, l = 1, m = 1, s = -1/2 may have the following position in the periodic table:
1) Period-II, p-block 2) Period-II, s-block
3) Period-III, p-block 4) Period-III, s-block