1. Take a living tissue, grind it in trichloroacetic acid using pestle and mortar, and then strain it, you would obtain two fractions: acid-soluble and acid-insoluble fraction. Acid-insoluble fraction does not contains

    1) Polysaccharides   2) nucleic acids

    3) Lipids   4) flavonoids and alkaloids.

2. Which of the following elements is found in negligible amount in living organism?

    1) Silicon   2) Magnesium   3) Iron   4) Sodium

3. Acid soluble pool represents roughly

    1) Polynucleotides   2) Cytoplasmic composition

    3) Protiens   4) Polysaccharides

4. Cytidine is

    1) Homopolymer   2) Nucleoside

    3) Hetero polymer   4) Saturated fatty acid

5. The component present in both nucleotides and nucleosides is

    1) Sugar   2) phosphate

    3) Nitrogenous base   4) both (1) and (3).

6. This biomolecule is correctly characterized

    1) Arachidonic acid – Contains 16 carbons including carboxylic carbon

    2) Vinblastin – Primary metabolite with medicinal property

    3) RUBISCO - Most abundant protein in the biosphere

    4) Insulin – Polymer of fructose

7. Sucrose, a common table sugar, is composed of

    1) glucose + fructose   2) glucose + galactose

    3) fructose + galactose   4) none of these

8. A ribose (but not deoxyribose) nucleotide is

    1) cytosine – pentose sugar – phosphate

    2) guanine – pentose sugar – phosphate

    3) thymine – pentose sugar – phosphate

    4) uracil – pentose sugar – phosphate

9. Which of the following statements is not correct regarding chitin?

1) It is a storage polysaccharide.

2) It is a polymer of N- acetyl glucosamine

3) It is a constituent of arthropod exoskeleton and fungal cell wall.

4) It is a complex carbohydrate

10. In which of the following groups, all the three are examples of polysaccharides

1) Starch, glycogen, cellulose   2) Sucrose, maltose, glucose

3) Glucose, fructose, lactose   4) Galactose, starch, sucrose

11. The amino acid with hydroxyl methyl as its R group is

1)Glycine   2) Alanine   3) Serine   4) Phenylalanine

12. All of the following are nucleosides except

1) Adenosine   2) Cytosine   3) Guano sine   4) Uridine

13. Which of the following is not a polymer

1) Nucleic acid   2) Proteins

3) Polysaccharides   4) Lipids

14. Which of the following is aromatic amino acid

1) Tyrosine   2) Tryptochan   3) Phenylalanine   4) All the above

15. Most abundant component of cell is

1) Protein   2) Water   3) Cellulose   4) Lipid

16. Which of the following is not a proteins

1) Trypsin   2) Collagen   3) Rubisco   4) N-acetyl glucosamine

17. Morphine and Codeine are

1) Peptides   2) Tannins   3) Alkaloids   4) Resin

18. Which of the following pair is monosaccharide

1) Glucose and Fructose   2) Glucose and Sucrose

3) Ribose and maltose   4) Ribose and sucrose

19. Adenine is

1) Purine   2) Pyrimidine   3) Nucleoside   4) Nucleotide

20. Statement 1: Amino acids are amphoteric

Statement 2: All amino acids are necessary for our body

1) Statement 1 & 2 are correct

2) Statement 1 & 2 are wrong

3) Statement 1 is correct & 2 is wrong

4) Statement 1 is wrong & 2 is correct

21. Which is a homopolysaccharide

    1) Pectin   2) Heparin

    3) Hyaluronic acid   4) Inulin

22. Glycogen is

    1) Branched polymer of amino acid

    2) Unbranched polymer of glucose

    3) Branched polymer of Fructose

    4) Branched polymer of glucose

23. Trihydroxy propane is an example for

    1) Derived lipid   2) Conjugated lipid

    3) Simple lipid   4) All of the above

24. Which of the following amino acid is neutral in nature

    1) Glutamic acid   2) Asparatic acid

    3) Valine   4) Lysine

25. Which of the following is a protein hormone

    1) Trypsin   2) Insulin   3) Collagen   4) Antibody

26. Successive glucose residues in a cellulose molecule are linked by

    1) α 1→ 4 glycosidic linkages   2) β 1→4 glycosidic linkages

    3) α 1→ 6 glycosidic linkages   4) β 1→6 glycosidic linkages

27. Which of the following are the biological functions of proteins

    1) Help to protect the body

    2) Transport substances across the cell membrane

    3) Catalyse metabolic reactions

    4) All

28. Thiamine is

    1) Purine   2) Pyrimidine   3) Pentose sugar   4) None of the above

29. Ribose sugar differs from deoxy ribose

    1) by the absence of OH group at 2C atom

    2) by the presence of H atom at 2C atom

    3) by the presence of OH group at 2C atom

    4) None of these

30. Palmitic acid contains ----- number of carbon atoms

    1) 16   2) 18   3) 20   4) 24

31. Basic amino acid among the following is

1) Lysine   2) Histidine   3) Glycine   4) Glutamine

32. Statement 1: ATP is the energy currency of the cell

Statement 2: ATP is a nucleoside

1) Statement 1 & 2 are correct

2) Statement 1 & 2 are wrong

3) Statement 1 is correct & 2 is wrong

4) Statement 1 is wrong & 2 is correct

33. Which of the following is secondary metabolite

1)Trypsin   2) Ricin   3) Arachidonic acid   4) Glycine

34. Sugar in Nucleotide is

1) Triose   2) Pentasaccharide   3) Hexose   4) Pentose

35. Proteins are

1) Polysaccharides   2) Polypeptides

3) Polynucleotides   4) Polyglycol

36. Most abundant organic compound on earth is

1) Protein   2) Cellulose   3) Lipids   4) Steroids

37. Fatty acids with one or more double bonds are

1) Essential   2) Non essential   3) Unsaturated   4) Saturated

38. GLUT- 4 is a

1) Enzyme   2) Hormone

3) Enables glucose transport into cell   4) Sensory reception

39. Chitin is component of cell wall of

1) Fungi   2) Bacteria   3) Algae   4) Angiosperms

40. Average % of carbohydrates in a cell is

1) 10-15   2) 3   3) 2   4) 1

41. Ricin and Abrin belong to which category of secondary metabolites

1) Lectins   2) Essential oils   3) Drugs   4) Toxins

42. Which one of the following organic compound is the main constituent of lecithin

1) Arachidonic acid   2) Phospholipid

3) Cholesterol   4) Phosphoprotein

43. Which of the following is a wrong statement

1) Cellulose is a polysaccharide

2) Uracil is a pyrimidine

3) Glycine is a sulphur containing amino acid

4) Sucrose is a diasaccharide

44. Which of the following is a non reducing carbohydrate

1) Maltose   2) Sucrose   3) Lactose   4) Ribose 5- Phosphate

45. Concanavalin A is an example of

1) Alkaloid   2) Terpenoide   3) Lectin   4) Drug

46. One of the primary characters of chordates is

1) Ganglionated nerve cord   2) Paired nerve cord

3) Solid ventral nerve cord   4) Dorsal hollow nerve cord

47. Which one of the following is not a characteristic feature of all the chordates?

1) Presence of coelom

2) A diaphragm separating thorax from abdomen

3) Dorsal nerve cord

4) Pharyngeal gill slits in the early embryonic stages

48. Vertebral column is derived from

1) Notochord   2) Dorsal nerve cord

3) Ventral Nerve cord   4) Outgrowth of cranium

49. Which one of the following structure is present in all adult vertebrates?

1) Notochord   2) Hepatic portal vein

3) Pharyngeal gill slits   4) Renal portal system

50. Which of the following is a chordate feature, not shared by the non-chordates?

1)Triploblastic body 2)True coelom

3) Bilateral symmetry   4) Notochord

51. Which among them is a characteristic of chordate'?

1) Dorsal heart   2) Gut is dorsal to nerve cord

3) Central nervous system is solid   4) Post anal part (tail) is present

52. The correct classification of Ascida

1) Chordata $\rightarrow$ Protochordata $\rightarrow$ Vertebrata

2) Chordate $\rightarrow$ Protochordata $\rightarrow$ Cephalochordata

3) Chordate $\rightarrow$ Cephalochordatav $\rightarrow$ Vertebrata

4) Chordate $\rightarrow$ Protochordata $\rightarrow$ urochordata

53. Body of the urochordate is enclosed in a

1) Mantle   2) Test Or tunic   3) Shell   4) Shield

54. Which of the following subphylum is a typical chordates ?

1) Cephalochordates   2) Urochordates

3) Tunicata   4) All

55. Excretion by protonephridia with solenocyte is a characteristic of

     1) Branchiostoma   2) Amphioxus   3) Lancelet   4) ALL of these

56. Statement -1 : Cephalochordata bears notochord all along the body throughout the life

     Statement -2 : Urochordata bears vertebral column only in tail region throughout the life

     Then which is correct?

     1) Both statement -1 and statement -2 are correct

     2) Statement -1 is correct, statement -2 is wrong

     3) Statement -1 is wrong, statement-2 is correct

     4) Both statement-1 and statement -2 are wrong

57. Cyclostomata belongs to which division ?

     1) Pisces   2) Agnatha   3) Acraniata   4) Tetrapoda

58. The correct classification of Myxine is

     1) Chordata $\rightarrow$ Craniata $\rightarrow$ Agnatha $\rightarrow$ Cyclostomata

     2) Chordata $\rightarrow$ Acraniata $\rightarrow$ Protochordata $\rightarrow$ Cephalochordata

     3) Chordata $\rightarrow$ Cephalochordata $\rightarrow$ Vertebrata $\rightarrow$ Ostracodermi

     4) Cephalochordata $\rightarrow$ Chordata $\rightarrow$ Vertebrata $\rightarrow$ Ostracodermi

59. The lamprey (Petromyzon) is included in the same taxonomic class as the

     1) Cephalaspis   2) Ambystoma

     3) nepceratodus   4) Hag fish (Myxine)

60. Which of the following statement is not true for Agnatha members ?

     1) They include hag fishes and lampreys

     2) They have notochord throughout their lives

     3) They are known as cyclostomes

     4) They have bony skeletons

61. The larva of Petromyzon is known as

     1) Ammocoete   2) Tornaria   3) Axolotl   4) Bipinnaria

62. Lamprey is

     1) Catadromous   2) Anadromous   3) Both (1) & (2)   4) None of these

63. Catadromous fish migrates from

     1) Sea to river   2) River to sea

   3) River to lakes   4) Deep sea to surface water

64. Teeth in chondrichthyes are modified

1) Placoid scales

2) Cycloid scales

3) Ctenoid scales

4) Ganoid scales

65. Which fish has an electric organ?

1) Torpedo

2) Pristis

3) Trygon

4) Carcharodon

66. Which type of scales are found on the skin of cartilaginous fishes?

1) Ganoid

2) Placoid

3) Ctenoid

4) Cycloid

67. Bony fishes are

1) Marine

2) Fresh water dwelling

3) Estuary dweller

4) All

68. Which of the following belong to class osteichthyes?

a. Sea urchin

b. Sea horse

c. Flying fish

d. saw fish

e. Dog fish

1) b & c

2) a,b & e

3) b & e

4) a,d & e

69. Air bladder is

1) Hydrostatic organ of bony fishes

2) Excretory organs of mammals

3) Respiratory organs of birds

4) Respiratory organ of reptiles

70. All of them are characteristics of urochordates, except

1) These are only marine

2) Open type of circulatory system

3) Cranium is absent 4) Development is direct

71. Branch of biology dealing with study of fishes is

1) Piscology

2) Ornithology

3) Ichthyology

4) Torpedology

72. Read the following statements and find out the correct statement.

a. Urinary bladder is absent in fishes

b. In bony fishes Gillslits covered by operculum

c. In cartilaginous fishes air bladder absent

d. Electric organs are modified muscles

1) b & d

2) a & c

3) b only

4) a,b,c & d

73. The fish which shows parental care is

1) Hippocampus

2) Gambusia

3) Labeo

4) Scoliodon

74. Heart in amphibians is

1) Two – chambered with one auricle and one ventricle

2) Three –chambered with two auricles and one ventricle

3) Three- chambered with one auricle and two ventricles

4) Four- chambered with two auricles and two ventricles

75. Which of the feature is not present in amphibian?

1) Scales are present

2) Most of them have two pairs of limbs for locomotion

3) Eyes have eyelids

4) Organisms are cold-blooded

76. Which of the following is true for all amphibians ?

1) All have tail   2) Excretion by kidneys

3) Alimentary canal and urinary and reproductive tracts open into different chambers to the exterior

4) Heart is three –chambered with two ventricles

77. Study of amphibian is ?

1)Batrachology   2) Ichthyology   3) Ornithology   4) Mammology

78. Living fossil reptile is ?

1) Snakes   2) Crocodile   3) Sphenodon   4) Turtle

79. Which among the following has four chambered heart?

1) Vipera   2) Crocodilus   3) Testudo   4) hemidactylus

80. Which among the following is an exception of possessing three- chambered heart?

1) Alligator   2) Testudo   3) Chelone   4) Bungarus

81. Which among them has moderately long and pointed snout is very aggressive and dangerous for man?

1) Crocodile   2) Alligator   3) Gavialis   4) Salamandra

82. Read the following statement and choose the correct characteristic feature of Aves.

1) Skin of birds have glands

2) Air sacs help in excretion

3) Heart is having three auricle and one ventricle

4) Preen gland is present at the base of tail

83. Choose the option which comprises of oviparous animals.

1) Ostrich, eagle, whale   2) Bat, Pigeon, crow

3) Parrot, vulture, sparrow   4) Kite, platypus, kangaroo

84. Largest living flightless bird is

1) Eagle   2) Kiwi   3) Humming bird   4) Ostrich

85. All of the following Avian characters are correct, except

1) Bones do not have bone marrow

2) Scales are present only in the hindlimbs region

3) In females, right ovary is atrophied

4) Beak possesses homodont teeth

86. Tail vertebrae of birds are fused to form

1) Pygostyle   2) Coccyx   3) Urostyle   4) Synsacrum

87. Aves are

1) Ammonotelic   2) Uricotelic   3) Ureotelic   4) Both (1) & (3)

88. A mammal which lays eggs instead of giving birth to offspring is

1) Rabbit   2) Macropus

3) Duck-billed platypus   4) Whale

89. Point out the mammalian characters

1) Diaphragm, four-chambered heart, lungs

2) Hairy skin,viviparity , feathers

3) Fins, gills, viviparity

4) Neural gland, gills, four-chambered heart

90. The following statement regarding mammals are correct except

1) Cloaca is Present   2) External ear pinna present

3) Non-nucleated RBC   4) Excrete urea

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

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

92. A boy standing at the top of a tower of 20 m height drops a stone. Assuming $g = 10m/s^2$, the velocity with which it hits the ground is

1) 10 m/s   2) 20 m/s   3) 40 m/s   4) 5 m/s

93. Two bodies 'A' (of mass 1 kg) and 'B' (of mass 3kg) are dropped from heights of 16m and 25 m respectively. The ratio of the time taken by them to reach the ground is

1) 4/5   2) 5/4   3) 12/5   4) 5/12

94. A ball is thrown vertically upward. It has a speed of 10 m/s when it has reached one half of its maximum height. How high does the ball rise? $\left(g = 10m/s^2\right)$

1) 10m   2) 5m   3) 15m   4) 20m

95. A body dropped from a height 'h' with initial velocity zero, strikes the ground with a velocity 3 m/s. Another body of same mass dropped from the same height 'h' with an initial velocity of 4 m/s. The final velocity of second mass, with which it strikes the ground is

1) 5 m/s 2) 12 m/s 3) 3 m/s 4) 4 m/s

96. A body dropped from top of a tower fall through 40m during the last two seconds of its fall. The height of tower is $(g = 10m/s^2)$

1) 60m 2) 45m 3) 80m 4) 50m

97. A bus is moving with a speed of 10 m/s on a straight road. A scooterist wishes to overtake the bus in 100 sec. If the bus is at a distance of 1 km from the scooterist, with what speed should the scooterist chase the bus?

1) 40 m/s 2) 25 m/s 3) 10 m/s 4) 20 m/s

98. A ball is thrown vertically upwards. Assuming the air resistance to be constant and considerable

1) The time of ascent $\geq$ the time of descent

2) The time of ascent < the time of descent

3) The time of ascent > the time of descent

4) The time of ascent = the time of descent

99. Velocity – time curve for a body projected vertically upwards is

1) Parabola 2) Ellipse 3) Hyperbola 4) Straight line

100. If an iron ball and a wooden ball of the same radius are released from a height 'h' in vacuum, the time taken by both of them to reach ground will be

1) Unequal 2) Exactly equal 3) Roughly equal 4) Zero

101. A body is projected vertically upward from the surface of the earth, then the velocity – time graph is

3)

4)
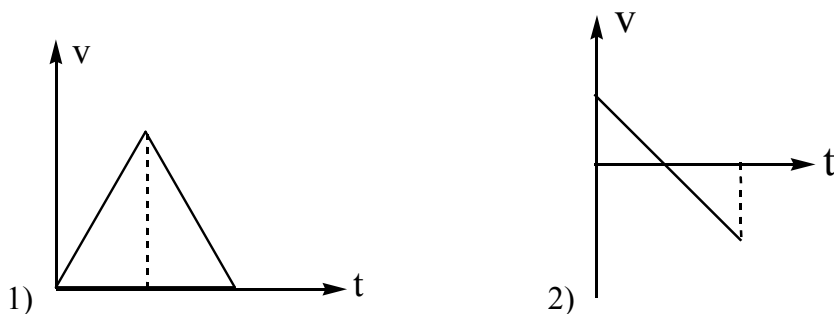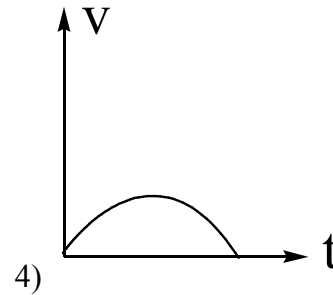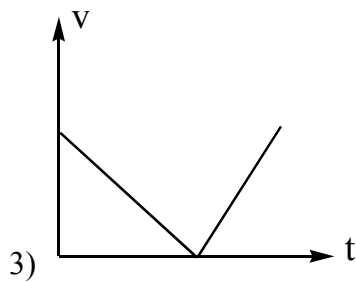
102. A motorcycle is moving with a velocity 80 kmph ahead of a car moving with a velocity of 65 kmph in the same direction. What is the relative velocity of the motorcycle with respect to the car

1) 15 kmph 2) 20 kmph 3) 25 kmph 4) 145 kmph

103. When a ball is thrown up vertically with velocity V_0 it reaches a maximum height of 'h'. If one wishes to triple the maximum height then the ball should be thrown with velocity

1) $\sqrt{3}V_0$ 2) $3V_0$ 3) $9V_0$ 4) $\frac{3}{2}V_0$

104. A stone is dropped from the top of a tower and travels 24.5m in the last second of its journey. The height of the tower is

1) 44.1 m 2) 49 m 3) 78.4 m 4) 72 m

105. Two balls X and Y are thrown from top of tower one vertically upward and other vertically downward with same speed. If time taken by them to reach the ground is 6 sec and 2 sec respectively. Then the initial speed of each ball is $\left(g=10m/s^2\right)$

1) 15 m/s 2) 20 m/s 3) 25 m/s 4) 10 m/s

106. A body falls from 80m. Its time of descent is $\left(g=10m/s^2\right)$

1) 3 sec 2) 4 sec 3) 5 sec 4) 6 sec

107. At the maximum height of a body thrown vertically up

1) velocity is not zero but acceleration is zero

2) acceleration is not zero but velocity is zero

3) both acceleration and velocity are zero

4) both acceleration and velocity are not zero

108. A stone projected vertically up with velocity 'v' from the top of a tower reaches the ground with velocity '2v'. The height of the tower is

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

109. A stone is thrown vertically up from a bridge with velocity 3 m/s. If it strikes the water under the bridge after 2 sec, the bridge is at a height of $\left(g = 10m/s^2\right)$

1) 26 m   2) 14 m   3) 7 m   4) 20 m

110. A body is thrown up with a velocity 29.4 m/s. Distance travelled in the last second of upward motion is

1) 2.3 m   2) 6 m   3) 9.8 m   4) 4.9 m

111. A body is projected up with a velocity 50 m/s. After one second, if acceleration due to gravity disappears then body

1) floats in air

2) continue to move up with constant velocity

3) continue to move up with constant acceleration

4) goes up and falls down

112. A body falls freely from a height 'h'. Its average velocity when it reaches ground is

1) $\sqrt{gh}$ 2) $\sqrt{\dfrac{gh}{2}}$ 3) $\sqrt{2gh}$ 4) $g\sqrt{h}$

113. A body is projected vertically up with a velocity 'v' and after some time it returns to the point from which it was projected. The average velocity and average speed of the body for the total time of flight are

1) $\dfrac{v}{2}$ and $\dfrac{v}{2}$ 2) 0 and $\dfrac{v}{2}$ 3) 0 and 0   4) $\dfrac{v}{2}$ and 0

114. A balloon rises from rest with a constant acceleration g/8. A stone is released from it when it has risen to height 'h'. The time taken by the stone to reach the ground is

1) $4\sqrt{\dfrac{h}{g}}$ 2) $2\sqrt{\dfrac{h}{g}}$ 3) $\sqrt{\dfrac{2h}{g}}$ 4) $\sqrt{\dfrac{g}{h}}$

115. A stone falls freely from the top of a tower. It covers 36% of the total height in the last second before striking the ground level. The height of the tower is $\left(g = 10m/s^2\right)$

1) 50 m   2) 75 m   3) 100 m   4) 125 m

116. A ball is thrown upwards with a speed 'u' from a height 'h' above the ground. The time taken by the ball to hit the ground from point of zero velocity is

1) $\sqrt{2h/g}$ 2) $\sqrt{8h/g}$ 3) $\dfrac{\sqrt{u^2 + 2gh}}{g}$ 4) $\dfrac{u}{g} + \sqrt{\dfrac{2h}{g}}$

117. A body is thrown up with a velocity 40 m/s. At the same time another body is dropped from a height 40 m. Their relative acceleration after 1.3 seconds is

1) 4g   2) g/2   3) 2g   4) zero

118. A body is thrown up with a velocity 'v'. It reaches maximum height 'h'. If its velocity of projection is doubled the maximum height it reaches is

1) 4h   2) h   3) 2h   4) 3h

119. A body is thrown vertically up from the ground. It reaches the maximum height of 500 m in 10 sec. What time it will take to reach the ground from maximum height?

1) 5 sec   2) 10 sec   3) 15 sec   4) 20 sec

120. A stone is dropped into a well of 20 m deep. Another stone is thrown downward with velocity 'v' one second later. If both stones reach water surface in the well simultaneously, v is equal to $\left(g = 10 m/s^2\right)$

1) 30 m/s   2) 15 m/s   3) 20 m/s   4) 10 m/s

121. A body is dropped from a height 122.5m. If it is stopped after 3 seconds and again released, the further time of descent is

1) 2 sec   2) 3 sec   3) 4 sec   4) 5 sec

122. A body is projected vertically up with velocity 'u'. It reaches a point in its path at times t_1 and t_2 seconds from the time of projection then $t_1 + t_2$ is

1) $\dfrac{2u}{g}$ 2) $\dfrac{u}{g}$ 3) $\sqrt{\dfrac{2u}{g}}$ 4) $\sqrt{\dfrac{u}{g}}$

123. A body is projected vertically upward direction from the surface of earth. If upward direction is taken as positive then acceleration of body during its upward and downward journey are respectively

1) positive, negative   2) negative, negative

3) positive, positive   4) negative, positive

124. A body is projected vertically upward with speed 40 m/s. The distance travelled by body in the first second of downward journey is $\left(g = 9.8 m/s^2\right)$

1) 4.9 m   2) 9.8m   3) 12.4 m   4) 19.6 m

125. A body is thrown vertically upwards and takes 5 seconds to reach maximum height. The distance travelled by the body will be same in

1) 1st and 10th second   2) 2nd and 8th second

3) 4th and 6th second   4) Both (2) and (3)

126. A balloon starts rising from ground from rest with an upward acceleration $2 m/s^2$. After 1 sec, a stone is dropped from it. The time taken by stone to strike the ground is nearly

1) 0.3 sec   2) 0.7 sec   3) 1 sec   4) 1.4 sec

127. Which of the following displacement – time graph represents two moving objects P and Q with zero relative velocity

1)

2)

3)

4)
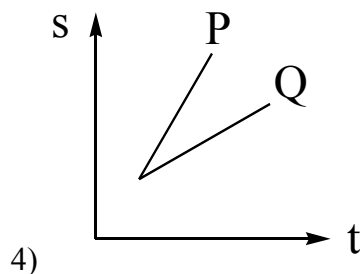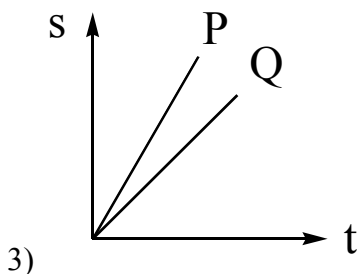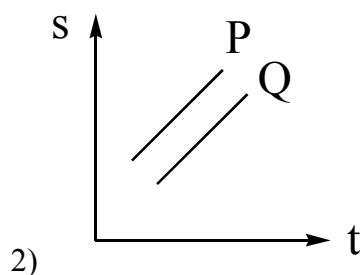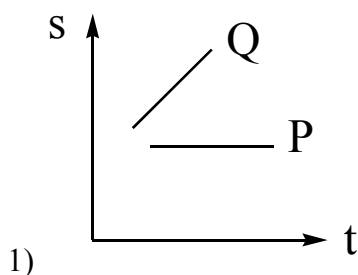
128. Two balls are projected upward simultaneously with speeds 40 m/s and 60 m/s. Relative position of second ball with respect to first ball at time t = 5 sec is

1) 20 m   2) 80 m   3) 100 m   4) 120 m

129. A ball is dropped from a height 'h' above ground. Neglect air resistance, its velocity 'v' varies with its height 'y' above the ground as

1) $\sqrt{2g(h-y)}$ 2) $\sqrt{2gh}$ 3) $\sqrt{2gy}$ 4) $\sqrt{2g(h+y)}$

130. A train of 150 m length is going towards north at a speed of 10 m/s. A bird is flying at 5 m/s parallel to the track toward south. The time taken by the bird to cross the train is

1) 10 sec   2) 15 sec   3) 30 sec   4) 12 sec

131. Two trains each of length 100 m moving parallel towards each other at speed 72 km/hr and 36 km/hr respectively. In how much time will they cross each other?

1) 4.5 sec   2) 6.67 sec   3) 3.5 sec   4) 7.25 sec

132. A ball is dropped by a boy in an elevator moving upward with acceleration 'a'. The acceleration of ball with respect to (Take upward direction +ve)

1) boy is –g   2) boy is –(g+a)   3) ground is –g   4) both (2) and (3)

133. A ball is thrown upward with speed 10 m/s from the top of the tower reaches the ground with a speed 20 m/s. The height of the tower is $\left(g=10m/s^2\right)$

1) 10m   2) 15m   3) 20m   4) 25m

134. A ball dropped from the top of tower falls first half height of tower in 10 sec. The total time spent by ball in air is $\left(g=10m/s^2\right)$

1) 14.14 sec   2) 15.25 sec   3) 12.36 sec   4) 17.36 sec

135. When a particle is thrown vertically upwards, its velocity at one third of its maximum height is $10\sqrt{2}m/s$. The maximum height attained is $\left(g=10m/s^2\right)$

1) $20\sqrt{2}m$ 2) 30m   3) 15m   4) 12.8m

136. Which of the following relates to photons both as wave motion and as a stream of particles?

1) Interference   2) $E=mc^2$ 3) Diffraction   4) $E=h\nu$

137. Electromagnetic radiation (Photon) with highest wavelength result when an electron in the hydrogen atom falls from n = 5 to:

1) n = 1   2) n = 2   3) n = 3   4) n = 4

138. For an electron if the uncertainty in velocity is Δv, the uncertainty in its position (Δx) is given by

1) $\dfrac{hm}{4\pi\Delta v}$ 2) $\dfrac{4\pi}{hm\Delta v}$ 3) $\dfrac{h}{4\pi m\Delta v}$ 4) $\dfrac{4\pi m}{h\Delta v}$

139. The wave number of first line Balmer series of hydrogen is 15200 cm^{-1}. The wave number of first Balmer line of Li^{2+} ion is

1) 15,200 cm^{-1} 2) 60,800 cm^{-1} 3) 76,000 cm^{-1} 4) 136,800 cm^{-1}

140. Uncertainty in position and momentum of a particle are equal. Then uncertainty in velocity is given as

1) $\sqrt{\dfrac{h}{\Pi}}$ 2) $\dfrac{h}{\Pi}$ 3) $\dfrac{1}{2m}\sqrt{\dfrac{h}{\Pi}}$ 4) $\sqrt{\dfrac{h}{2m\Pi}}$

141. What transition in the hydrogen spectrum would have the same wavelength as the Balmer transition, n = 4 to n = 2 in the He^+ spectrum?

1) n = 4 to n = 1   2) n = 3 to n = 2   3) n = 3 to n = 1   4) n = 2 to n = 1

142. The de Broglie wavelength of a tennis ball of mass 60 g moving with a velocity of 10 meters per second is approximately

1) 10^{-31} metres   2) 10^{-16} metres   3) 10^{-25} metres   4) 10^{-33} metres

143. An electron falls from the 8th orbit in a hydrogen atom. The spectral line of longest wavelength in the Brackett series is from

1) 5th orbit   2) 6th orbit   3) 4th orbit   4) 7th orbit

144. If uncertainty in the position of an electron is zero, the uncertainty in its momentum would be

1) zero   2) $<h(4/\pi)$ 3) $>h(4\pi)$ 4) infinite

145. The uncertainty in the position of an electron $(mass = 9.1 \times 10^{-28} g)$ moving with a velocity of $3.0 \times 10^4 cm \, S^{-1}$ accurate upto 0.011% will be

1) 1.92 cm   2) 7.68 cm   3) 0.175 cm   4) 3.84 cm

146. Number of waves made by a Bohr electron in one complete revolution in its fourth orbit is

1) 2   2) 3   3) 4   4) 0

147. Hamiltonian operator is the sum of two energy operators. These are

1) Mechanical and potential   2) Kinetic and mechanical

3) Kinetic and potential   4) Thermal and potential

148. When the electron of 5th orbit jumps into the first orbit the number of spectral lines produced in hydrogen spectrum is

1) 5   2) 10   3) 20   4) 1

149. What is the wavelength of a car with a mass of $1.3 \times 10^4 g$ moving at a speed of $1.0 \times 10^3 cm/sec$? $(Planck's \text{ constant } 6.63 \times 10^{-27} erg \text{ sec.})$

1) $5 \times 10^{-18} cm$ 2) $5 \times 10^{-30} cm$ 3) $5 \times 10^{-34} cm$ 4) $5 \times 10^{-38} cm$

150. From Lyman series to pfund series in H – atom, the frequency value

1) Increases   2) Decreases   3) Does not change   4) Doubled

151. If the shortest wavelength of H atom in Lyman series is x, the longest wavelength in Balmer series of He^+ is

1) 9x/5   2) 36x/5   3) x/4   4) 5x/9

152. A cricket ball of 0.5kg is moving with a velocity of 100m per sec. The wavelength associated with its motion is

1) $\dfrac{1}{100} m$ 2) $6.6 \times 10^{-14} m$ 3) $1.32 \times 10^{-35} m$ 4) $6.6 \times 10^{-28} m$

153. Which of the following is responsible to rule out the existence of definite paths or trajectories of electrons?

1) Pauli's exclusion principle

2) Heisenberg's uncertainty principle

3) Hund's rule of maximum multiplicity

4) Aufbau principle

154. The uncertainities in the velocities of two particles x and y are 0.03 and 0.01 m/sec respectively. The mass of x is twice that of y. The ratio of uncertainities in their position is

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

155. $\Psi^2 = 0$ represents

1) a node   2) an orbital   3) angular wave function   4) wave function

156. Calculate the wavelength (in nanometer) associated with a proton moving at $1.0 \times 10^3 \, ms^{-1}$

     1) 0.032 nm   2) 0.40 nm   3) 2.5 nm   4) 14.0 nm

157. What is wave length of a photon that is associated with 100 eV energy

     1) 1.228×10^{-9} m   2) 1.228×10^{-10} m   3) 1.228×10^{-12} m   4) 1.228×10^{-8} m

158. The wavelength of electron in the first orbit of H atom 'x'. Then the circumference of the 5th orbit is

     1) 5x   2) 12.5 x   3) 25 x   4) x/5

159. Which is the de – Broglie equation:

     1) $h = p\lambda$ 2) $h = p\lambda^{-1}$ 3) $h = \lambda p^{-1}$ 4) $h = p + \lambda$

160. The radius of first Bohr's orbit of 'H' atom is x, then de Broglie wavelength of e^{-n} in 4th orbit is

     1) $2\pi x$ 2) $4\pi x$ 3) $16\pi x$ 4) $8\pi x$

161. An electron travels with a velocity of xms^{-1}. For a proton to have the same de – Broglie wavelength, the velocity will be approximately:

     1) $\dfrac{1840}{x}$ 2) $\dfrac{x}{1840}$ 3) 1840x   4) x

162. The deBroglie's wavelength of a particle inversely proportional to the square root of

     1) Kinetic energy   2) momentum   3) energy   4) All

163. How many number of visible lines observed, when electronic transition observed from 6th orbit to 1st orbit

     1) 4   2) 5   3) 15   4) 6

164. A spectral line with $\lambda = 4938 A^0$ belongs Hydrogen atom in the series of

     1) visible   2) ultraviolet   3) near IR   4) Far IR

165. The uncertainties in the position and velocity of particle are 10^{-10} m and 5.27×10^{-24} m/s respectively. The mass of particle is

     1) 1 kg   2) 10 kg   3) 0.1 kg   4) 0.01 kg

166. If an electron is traveling at 200 m/s within 1 m/s uncertainty, what is the theoretical uncertainty in its position in μm (micrometer)?

     1) 14.5   2) 0.28   3) 0.58   4) 1.14

167. Statement 1 : It is impossible to determine the exact position and exact momentum of an electron simultaneously.

Statement 2 : The path of an electron in atom is clearly defined.

1) Statement 1 and Statement 2 are true

2) Statement 1 is false but Statement 2 is true

3) Statement 1 is true but Statement 2 is false

4) Statement 1 and Statement 2 are false

168. If the wavelength of the electron is numerically equal to distance travelled by it in one second then the correct relation is

1) $\lambda = \dfrac{h}{p}$
2) $\lambda = \dfrac{h}{m}$
3) $\lambda = \sqrt{\dfrac{h}{p}}$
4) $\lambda = \sqrt{\dfrac{h}{m}}$

169. If the kinetic energy of an electron is increased by 4 times ,then resultant, the wave length of de Broglie wave associated with it would become

1) Four times
2) ½ times
3) Two times
4) ¼ times

170. When the electron in the 'H' atom jumps from the fifth orbit to the second orbit, the spectral line emitted is found in ……… region.

1) visible
2) ultraviolet
3) Near IR
4) Far IR

171. The quantum number not obtained from the Schrodinger's wave equation is :

1) n
2) l
3) m
4) s

172. The correct Schrodinger's wave equation for electron with E as total energy and V as potential is

1) $\dfrac{\partial^2 \Psi}{\partial x^2} + \dfrac{\partial^2 \Psi}{\partial y^2} + \dfrac{\partial^2 \Psi}{\partial z^2} + \dfrac{8\pi m}{h^2}(E-V)\Psi = 0$
2) $\dfrac{\partial^2 \Psi}{\partial x^2} + \dfrac{\partial^2 \Psi}{\partial y^2} + \dfrac{\partial^2 \Psi}{\partial z^2} + \dfrac{8\pi^2}{mh^2}(E-V)\Psi = 0$

3) $\dfrac{\partial^2 \Psi}{\partial x^2} + \dfrac{\partial^2 \Psi}{\partial y^2} + \dfrac{\partial^2 \Psi}{\partial z^2} + \dfrac{8\pi^2 m}{h^2}(E-V)\Psi = 0$
4) $\dfrac{\partial^2 \Psi}{\partial x^2} + \dfrac{\partial^2 \Psi}{\partial y^2} + \dfrac{\partial^2 \Psi}{\partial z^2} + \dfrac{8\pi m^2}{h}(E-V)\Psi = 0$

173. The transition of electron in H atom that will emit maximum energy is

1) $n_3 \to n_2$
2) $n_4 \to n_3$
3) $n_5 \to n_4$
4) $n_6 \to n_5$

174. For an electron whose positional un-certainty is $1.0 \times 10^{-10} m$, the uncertainty in the component of the velocity in $m\ s^{-1}$ will be

1) 5.8×10^5
2) 10^9
3) 10^2
4) 10^{15}

175. The de – Broglie wavelength of an electron in an orbit represented by the diagram is
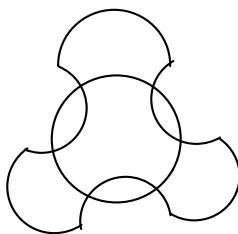
1) 10 A^0 2) 3.33 A^0 3) 20 A^0 4) 13.33 A^0

176. Statement 1 : Hydrogen has only one electron in its orbit but produces several spectral lines

    Statement 2 : There are many excited energy levels available in a sample of Hydrogen gas

    Then the correct answer is

    1) Both Statement 1 and Statement 2 are true and Statement 2 is the correct explanation of Statement 1

    2) Both Statement 1 and Statement 2 are true and Statement 2 is not the correct explanation of Statement 1

    3) Statement 1 is true but Statement 2 is false

    4) Statement 1 is false but Statement 2 is true

177. De – Broglie's concept is applicable to

    1) Proton   2) A stone   3) A car   4) Aero plane

178. The wave number of first emission line of hydrogen atomic spectrum in the Balmer series appears at (R = Rydberg constant)

    1) $\dfrac{5R}{36}cm^{-1}$ 2) $\dfrac{3R}{4}cm^{-1}$ 3) $\dfrac{7R}{144}cm^{-1}$ 4) $\dfrac{9R}{400}cm^{-1}$

179. If λ_p and λ_e denote the de – Broglie wavelength of proton and electron after they are accelerated from rest through the same potential difference, then

    1) $\lambda_e = \lambda_p$ 2) $\lambda_e < \lambda_p$ 3) $\lambda_e > \lambda_p$ 4) $\lambda_e = \lambda_p / 2$

180. To which electronic transition between Bohr orbits in hydrogen, the second line in the Balmer series belongs?

    1) $3 \rightarrow 2$ 2) $4 \rightarrow 2$ 3) $5 \rightarrow 2$ 4) $6 \rightarrow 2$