



# SRI CHAITANYA EDUCATIONAL INSTITUTIONS,INDIA

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SEC : INCOMING JR.AIIMS S60, NEET MPL & MEDICON

DATE : 04-07-2021

SUB : BOTANY

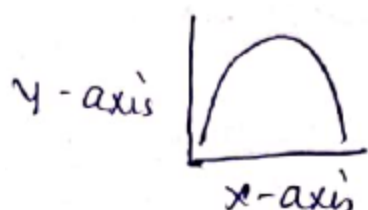
NEET WEEKEEND TEST - 7

Max.Marks : 720

- |  |   |
|--|---|
| <p>1. Enzymes are polymers of</p> <p>(1) Fatty acid</p> <p>(2) Amino acids</p> <p>(3) Hexose sugars</p> <p>(4) Inorganic phosphate</p> <p>2. Enzymes are sensitive to</p> <p>(1) Temperature            (2) pH change</p> <p>(3) Inhibitors                (4) All the above</p> <p>3. Chemical reaction require energy for</p> <p>(1) Oxidation                (2) Entropy</p> <p>(3) Enthalpy                 (4) Activation</p> <p>4. Which is not a character of enzymes</p> <p>(1) Proteinaceous nature</p> <p>(2) Specific in nature</p> <p>(3) Speed up rate of reaction</p> <p>(4) Used up in reaction</p> <p>5. Enzymes are basically made of</p> <p>(1) Nucleic acids            (2) Proteins</p> <p>(3) Fats                        (4) Vitamin</p> <p>6. Combination of Apoenzyme and coenzyme produces</p> <p>(1) Prosthetic group</p> <p>(2) Holoenzyme</p> <p>(3) Enzyme substrate complex</p> <p>(4) Enzyme product complex</p> <p>7. Competitive inhibitor resembles</p> <p>(1) Substrate                (2) Enzyme</p> <p>(3) Product                  (4) All of these</p> <p>8. The protein part of the enzyme is</p> <p>(1) Prosthetic groups</p> | <p>(2) Apoenzyme</p> <p>(3) Holoenzyme</p> <p>(4) Zymogen</p> <p>9. An enzyme brings about</p> <p>(1) Decrease in reaction rate</p> <p>(2) Reaction rate is constant</p> <p>(3) Increase in activation energy</p> <p>(4) Reduction in activation energy</p> <p>10. Ribozyme is made up of</p> <p>(1) Protein</p> <p>(2) Ribonucleic Acids (RNA)</p> <p>(3) Fatty acids</p> <p>(4) Sugars</p> <p>11. Inhibitor of succinic dehydrogenase</p> <p>(1) Succinic acid            (2) Malic acid</p> <p>(3) Malonate                (4) Succinyl CoA</p> <p>12. Which of the following are coenzymes ?</p> <p>(1) NAD                        (2) NADP</p> <p>(3) Cytochrome            (4) 1 &amp; 2</p> <p>13. <math>K_m</math> value of enzyme is substrate concentration at</p> <p>(1) <math>\frac{1}{4} V_{max}</math>                    (2) <math>2 V_{max}</math></p> <p>(3) <math>\frac{1}{2} V_{max}</math>                    (4) <math>4 V_{max}</math></p> <p>14. Lock &amp; Key hypothesis of enzyme action was given by</p> <p>(1) Fischer                    (2) Koshland</p> <p>(3) Buchner                   (4) Kuhne</p> |
|--|---|

15. Most of the enzymes are active in following temperature  
 (1) 45° - 65°C (2) 25°C to 40°C  
 (3) 15° - 20°C (4) 10° - 15°C
16. Enzymes that catalyse oxidation and reduction reaction belong to class  
 (1) Hydrolases  
 (2) Dehydrogenases  
 (3) Lyases  
 (4) Ligases
17. If product has lower energy than substrate, the reaction is  
 (1) Endothermic reaction  
 (2) Exothermic reaction  
 (3) Oxidation reaction  
 (4) Reduction reaction
18. Non-protein organic compound of enzyme is  
 (1) Apoenzyme (2) Holoenzyme  
 (3) Coenzyme (4) Isozyme
19. Turn over number of Carbonic anhydrase  
 (1) 6,00,000/second  
 (2) 6,00,000/minute  
 (3) 6,00,000/hour  
 (4) 200/hour
20. Study the following and identify correct statement regarding cofactors  
 (1) They may be organic or inorganic  
 (2) They may be tightly bound to the apoenzyme  
 (3) They may be loosely bound to the apoenzyme  
 (4) All of the above
21.  $K_m$  value is  
 (1) Threshold value  
 (2) Maximum reaction velocity  
 (3) Near maximum reaction velocity  
 (4) One half of maximum reaction velocity
22. Enzymes isolated from organisms who normally live under extremely high temperatures are \_\_\_\_ and \_\_\_\_ their catalytic power even at high temperature  
 (1) Stable, retain (2) unstable, lost  
 (3) sensitive, retain (4) sensitive, lost
23. Enzyme are preserved in a temporary inactive state  
 (1) in low temperatures  
 (2) high temperatures  
 (3) high  $P^H$   
 (4) low  $P^H$
24. In the absence of carbonic anhydrase enzyme the number of  $H_2CO_3$  molecules formed in an hour are  
 (1) 200 (2) 2000  
 (3) 6000 (4) 6,00,000
25. The number of subclasses included in each class of enzymes  
 (1) 3 to 4 (2) 4 to 8  
 (3) 4 to 13 (4) 13 to 20
26. Enzymes present lysosomes belong to which class of enzymes  
 (1) Class I (2) Class II  
 (3) Class III (4) Class IV
27. The essential chemical components of many co-enzymes are  
 (1) Minerals (2) Hormones  
 (3) Vitamins (4) Proteins
28. The enzyme carbonic anhydrase has accelerated the reaction rate by about  
 (1) 10 thousands times  
 (2) 10 lakhs times

- (3) 10 million times  
(4) 10 billion times
29. How many classes of enzymes are in IUB system
- (1) Two (2) Six  
(3) Eight (4) Ten
30. The molecules on which enzyme act are known as
- (1) Catalysis (2) Products  
(3) Substrates (4) Repressors
31. "All enzymes are proteins" This statement is now modified because of
- (1) Ribozyme (2) Arylsulfase  
(3) Nitroreductase (4) Dehydrogenase
32. The curve given below shows enzymatic activity with reference is pH and temperature.



- | <u>X-axis</u>          | <u>Y-axis</u>      |
|------------------------|--------------------|
| (1) Enzymatic activity | Temperature        |
| (2) Enzymatic activity | pH                 |
| (3) Temperature        | Enzymatic activity |
| (4) Activation energy  | Temperature        |
33. Zn is the cofactor of
- (1) Carboxy peptidase  
(2) carboxylase  
(3) decarboxylase  
(4) carbohydrases
34. Which of the following is not similar between biocatalyst and catalyst
- (1) Lowering of activation energy

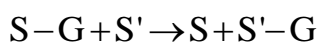
- (2) Both do not initiate reaction  
(3) Both remain unaffected  
(4) Temperature sensitivity
35. According to IUB 'Isomerases' belong to
- (1) Class I (2) Class II  
(3) Class III (4) Class V
- 36.



The above type of reaction is catalysed by an enzyme of \_\_\_\_\_ class

- (1) Class I (2) Class II  
(3) Class III (4) Class IV
37. Enzymes with heme as prosthetic group are
- a) Catalase  
b) Carboxy peptidase  
c) Succinic dehydrogenase  
d) Peroxidase
- (1) a & d (2) a only  
(3) a & b (4) b & c
38. Which is true about conjugated enzyme
- (1) Apoenzyme = Holoenzyme + Coenzyme  
(2) Holoenzyme = Apoenzyme + Coenzyme  
(3) Coenzyme = Apoenzyme + Holoenzyme  
(4) Holoenzyme = Coenzyme = Apoenzyme
39. According to enzyme action
- (1) Substrate induces conformation change in enzyme  
(2) Substrate changes its shape after binding  
(3) Conformational change takes place in substrate  
(4) There is no conformation change in enzyme

40. Name the type of enzyme involved in the following reaction



- (1) Dehydrogenases
- (2) Transferases
- (3) Hydrolases
- (4) Lyases

41. Enzymes catalyzing inter-conversion of positional or geometric isomers belong to class

- (1) Ligases                      (2) Hydrolases
- (3) Isomerases                (4) Lyases

42.  $K_m$  value is dependent on

- (1) Temperature
- (2) Substrate concentration
- (3) Enzyme concentration
- (4) All the above

43. Enzymes catalyzing the linking together of two compounds belong to class

- (1) Hydrolases                (2) Proteases
- (3) Transferases              (4) Ligases

44. The place on enzyme where the substrate binds is called

- (1) Inhibitor
- (2) Modulator
- (3) Active site
- (4) More than one option is correct

45. Enzymes that catalyse endergonic synthesis, coupled with exergonic hydrolysis of ATP are

- (1) Ligases                      (2) Isomerases
- (3) Lyases                        (4) Transferases

46. Cartilage is present in

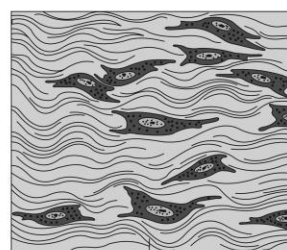
- (I) Tip of nose

(II) Between adjacent bones of the vertebral column

(III) Outer ear joints

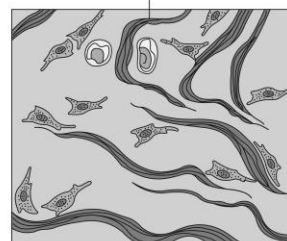
- (1) (I) and (II) only        (2) (II) and (III) only
- (3) (I) and (III) only      (4) (I), (II) and (III)

47. Tissues shown in the given figures (a) and (b) are present in



(a)

Collagen fibre



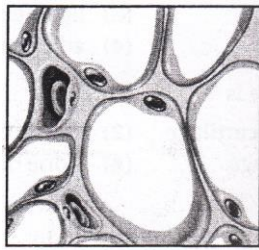
(b)

- (1) Ligament and tendon, respectively
- (2) Tendon and ligament, respectively
- (3) Bone and ligament, respectively
- (4) Tendon and skin, respectively

48. \_\_\_\_\_ has hard and non-pliable ground substance rich in calcium salt and collagen fibres.

- (1) White fibrous tissue
- (2) Bone
- (3) Cartilage
- (4) Yellow fibrous tissue

49. Which character suits to tissue shown in figure?



- (1) Provides insulation  
(2) Stores proteins  
(3) Provides strength  
(4) Provides elasticity
50. Plasma contributes  
(1) 90 – 92 % of blood  
(2) 55% of blood  
(3) 6 - 8% of blood  
(4) 2-3% of blood.
51. Which of the following tissues joins bone to bone ?  
(1) Cartilage (2) Adipose  
(3) Ligament (4) Areolar
52. Dense irregular connective tissue is present in  
(1) Skin (2) Tendon  
(3) Ligament (4) Both (2) and (3)
53. Blood colloidal osmotic pressure is maintained by  
(1) Albumin (2) Globulin  
(3) Fibrinogen (4) Thrombin
54. Haversian canal is found in the bones of  
(1) Mammals (2) Reptiles  
(3) Aves (4) Pisces
55. Hyaline cartilage is found in  
(1) Vocal cords (2) Tracheal rings  
(3) Epiglottis (4) Eustachian tubes
56. Haversian system is present in  
(1) Bone (2) Tendon  
(3) Ligament (4) Cartilage
57. Abnormal rise of RBC count is called  
(1) Anaemia (2) Hematoma  
(3) Polycythemia (4) Erythrocytopenia
58. Major constituent of bone is  
(1) Calcium phosphate  
(2) Magnesium phosphate  
(3) Calcium carbonate  
(4) Sodium chloride
59. Haversian system consists of  
(1) Haversian canal, chondroblasts and lamellae  
(2) Haversian canal, chondrocytes and lacunae  
(3) Haversian canal, lamellae and osteocyte  
(4) Haversian canal, lamellae and osteoblast
60. Strongest cartilage is  
(1) White fibrous cartilage  
(2) Elastic cartilage  
(3) Hyaline cartilage  
(4) Thyroid cartilage
61. All of the following are the functions of blood except  
(1) Immune responses of the body  
(2) Secretion of structural fibres  
(3) Osmotic balance  
(4) Transport of respiratory gases
62. Tendons and ligaments are the examples of  
(1) Bone  
(2) Cartilage  
(3) Dense regular connective tissue  
(4) Dense irregular connective tissue
63. Collagen fibres are secreted by  
(1) Fibroblast cells (2) Mast cells  
(3) Histocytes (4) Macrophages
64. RBCs in human are

- (1) Biconcave and nucleated  
(2) Biconvex and nucleated  
(3) Biconcave and enucleated  
(4) Biconvex and enucleated
65. The most and the least abundant leucocytes are respectively  
(1) Neutrophils and basophils  
(2) Lymphocytes and monocytes  
(3) Lymphocytes and basophils  
(4) Neutrophils and monocytes
66. Blood consists of  
(1) Plasma and WBCs only  
(2) RBCs, WBCs and platelets only  
(3) Plasma and bone marrow  
(4) Plasma, RBCs, WBCs and platelets
67. Skeletal connective tissue includes  
(1) Tendon and neurons  
(2) Blood and lymph  
(3) Adipose and areolar tissue  
(4) Bone and cartilage
68. Which of the following is the hardest tissue in human body ?  
(1) Cartilage  
(2) Fibrous connective tissue  
(3) Bone  
(4) Areolar tissue
69. The cells of connective tissue which produce histamine are  
(1) Fibroblasts (2) Macrophages  
(3) Mast cells (4) Plasma cells
70. Which agranulocytes are responsible for immune response of the body?  
(1) Basophils (2) Neutrophils  
(3) Eosinophils (4) Lymphocytes
71. Serum contains  
(1) Blood without blood cells  
(2) Plasma without clotting factors  
(3) Blood without plasma  
(4) Blood without RBCs
72. Cartilage is also called?  
(1) Gristle (2) Lacunae  
(3) Tendon (4) Ligament
73. Which WBC increases during allergy?  
(1) Acidophil (2) Basophil  
(3) Lymphocyte (4) Neutrophil
74. Glass like cartilage is  
(1) Hyaline cartilage (2) Fibro cartilage  
(3) Calcified cartilage (4) Elastic cartilage
75. Haversian canals which are interconnected by transverse canals known as  
(1) Trabeculae (2) Bidders canals  
(3) Canaliculi (4) Volkmann canals
76. Epiglottis is composed of  
(1) Hyaline cartilage (2) Calcified cartilage  
(3) Both 1 and 2 (4) Elastic cartilage
77. Read the following statements and select the appropriate option  
I) A healthy person has 12 to 16 g of haemoglobin per 100 ml of blood.  
II) The number of platelets in the blood of a normal individual is 1.5 lac to 3.5 lac per  $\text{mm}^3$   
III) Eosinophils are associated with allergic reactions  
(1) Only I is correct  
(2) Only II and III are correct  
(3) Only I and III are correct  
(4) All I, II and III are correct
78. Blubber of whale is an example of  
(1) Areolar tissue (2) Adipose tissue

- (3) Tendon                      (4) Muscular tissue
79. Which granulocytes involved in inflammatory reactions ?  
 (1) Eosinophils                      (2) Basophils  
 (3) Neutrophils                      (4) Monocytes
80. Consider the following three statements and select the appropriate option.  
 I) The plasma without clotting factor is called semen.  
 II) Thymus is called the graveyard of RBCs  
 III) Thrombocytes are the cell fragments produced from megakaryocytes  
 (1) Only I is correct  
 (2) Both I and III are correct  
 (3) Both II and III are correct  
 (4) Only III is correct
81. Which of the following is true for all types of leucocytes ?  
 (1) They are nucleated and long lived  
 (2) They are colourless and relatively more in number  
 (3) They are granulated and phagocytes  
 (4) They are nucleated and generally short lived
82. The most active phagocytic white blood cells are  
 (1) Eosinophils and lymphocytes  
 (2) Neutrophils and monocytes  
 (3) Neutrophils and eosinophils  
 (4) Lymphocytes and macrophages
83. The intercellular material of cartilage is  
 (1) Hollow, pliable and resists compression  
 (2) Solid, not pliable and resists compression  
 (3) Solid, pliable and resists compression  
 (4) Solid, pliable and does not resists
- compression
84. Which of the following is a set of specialized connective tissues ?  
 (1) Areolar and dense  
 (2) Blood and ligament  
 (3) Tendon and muscle  
 (4) Blood and bone
85. The percentage of plasma and formed elements in the blood respectively  
 (1) 40%, 60%                      (2) 45%, 55%  
 (3) 55%, 45%                      (4) 60%, 45%
86. Life span of human RBC is  
 (1) 3 – 4 days                      (2) 10 days  
 (3) 120 days                      (4) 150 days
87. The WBC with large, spherical nucleus and scanty peripheral cytoplasm are  
 (1) Reticulocytes                      (2) Lymphocytes  
 (3) Monocytes                      (4) Mast cells
88. Choose the correctly matched pair  
 (1) Tendon – Specialized connective tissue  
 (2) Cartilage – Vascular connective tissue  
 (3) Adipose tissue – Loose connective tissue  
 (4) Bone – Loose connective tissue
89. Blood plasma consists of 8 – 10 per cent of solutes, in which proteins contribute  
 (1) 6 – 8 per cent                      (2) 8 – 10 per cent  
 (3) 4 – 5 per cent                      (4) 2 – 3 per cent
90. A healthy individual, the total leucocyte count per cubic millimeter of blood under normal conditions is  
 (1) 6000 - 8000                      (2) 7000 - 9000  
 (3) 10000 - 12000                      (4) 11000 - 13000



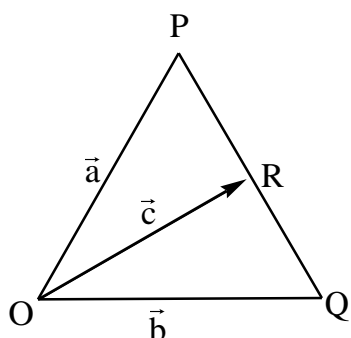
91. A person runs along a circular path of radius 5m. If he completes  $\frac{1}{4}$ th of the circle. Find the magnitude of the displacement vector. How far the person ran

- (1)  $5\sqrt{2}\text{m}, 2.5\pi\text{m}$
- (2)  $10\text{m}, 5\pi\text{m}$
- (3)  $5\pi\text{m}, 10\text{m}$
- (4)  $2.5\pi\text{m}, 5\sqrt{2}\text{m}$

92. A person makes a displacement 200m towards east and then 300m towards north. Find the magnitude and direction of the resultant

- (1)  $223.7\text{m} \tan^{-1} \text{ N of E}$
- (2)  $360.5\text{m} \tan^{-1} \left( \frac{3}{2} \right) \text{ E of N}$
- (3)  $223.7\text{m} \tan^{-1} \left( \frac{3}{2} \right) \text{ N of E}$
- (4)  $360.5\text{m} \tan^{-1} \left( \frac{3}{2} \right) \text{ N of E}$

93. Figure shows three vectors  $\vec{a}, \vec{b}$  and  $\vec{c}$  where R is the midpoint of PQ. Then which of the following relations is correct ?



- (1)  $\vec{a} + \vec{b} = 2\vec{c}$
- (2)  $\vec{a} + \vec{b} = \vec{c}$
- (3)  $\vec{a} - \vec{b} = 2\vec{c}$
- (4)  $\vec{a} - \vec{b} = \vec{c}$

94. If  $\vec{A} = 5\hat{i} - 2\hat{j}$  and  $\vec{B} = -3\hat{i} - 6\hat{j}$  calculate the direction of  $\vec{A} + \vec{B}$

- (1)  $\tan^{-1}(4)$  with +x-axis in clockwise
- (2)  $\tan^{-1}(4)$  with -x-axis in clockwise
- (3)  $\tan^{-1}(4)$  with +x-axis in anticlockwise
- (4)  $\tan^{-1}(4)$  with -x-axis in anticlockwise

95. If two vectors are given by  $\vec{A} = -2\hat{i} + \hat{j} - 3\hat{k}$  and  $\vec{B} = 3\hat{i} + \hat{j} - 3\hat{k}$  is  $2\vec{A} - 3\vec{B} + \vec{C} = 0$  then find  $\vec{C}$

- (1)  $13\hat{i} + \hat{j} - 3\hat{k}$
- (2)  $-13\hat{i} - \hat{j} + 3\hat{k}$
- (3)  $-12\hat{i} - 9\hat{j} + 13\hat{k}$
- (4)  $-12\hat{i} + 9\hat{j} - 13\hat{k}$

96. One of the rectangular components of a force of 40N is 20N. Find the other component

- (1)  $20\sqrt{3}\text{N}$
- (2)  $30\sqrt{3}\text{N}$
- (3)  $5\sqrt{3}\text{N}$
- (4)  $35\sqrt{3}\text{N}$

97. A bus weighing 500 kg on a slope that makes an angle  $60^\circ$  with the horizontal the component of bus weight parallel to the slope is

- (1)  $3500\sqrt{3}\text{N}$
- (2)  $1500\sqrt{3}\text{N}$
- (3)  $2500\sqrt{3}\text{N}$
- (4)  $2500\text{N}$

98. Which one of the following statements is true?

- (1) A scalar quantity is the one that is conserved in a process.
- (2) A scalar quantity is the one that can never take negative values.
- (3) A scalar quantity is the one that does



not vary from one point to another in space.

(4) A scalar quantity has the same value for observers with different orientations of the axes.

99. Which of the following is meaningful ?

- (1) Vector / Vector (2)  $\frac{\text{Scalar}}{\text{Vector}}$   
 (3) Scalar + Vector (4) Vector / Scalar

100. Two vectors P and Q have equal magnitudes of 24 units. These vectors are making angles  $45^\circ$  and  $120^\circ$  with the x-axis respectively their sum is  $\vec{R}$ . Find the X and Y components of  $\vec{R}$ .

- (1)  $(6\sqrt{3}-6)(6+6\sqrt{3})$   
 (2)  $(6\sqrt{3}+6)(6-6\sqrt{3})$   
 (3)  $(12\sqrt{2}+12)(12\sqrt{2}+12\sqrt{3})$   
 (4)  $(12\sqrt{2}-12)(12\sqrt{2}+12\sqrt{3})$

101. Angle made by the vector  $\hat{i} + \sqrt{3}\hat{j}$  with the y-axis is

- (1)  $\frac{\pi}{3}$  (2)  $\frac{\pi}{6}$   
 (3)  $\frac{\pi}{4}$  (4)  $\frac{2\pi}{3}$

102. A fly moves in such a way that it has a displacement of 24 m towards east, 10 m towards north and 4 m vertically upwards. Find the magnitude of its displacement

- (1) 2.63 m (2) 263 m  
 (3) 26.3 m (4) 36.3 m

103. If angle between  $\vec{a}$  and  $\vec{b}$  is  $\frac{\pi}{3}$ , then angle between  $2\vec{a}$  and  $-3\vec{b}$  is

- (1)  $\frac{\pi}{3}$  (2)  $\frac{2\pi}{3}$   
 (3)  $\frac{\pi}{6}$  (4)  $\frac{5\pi}{3}$

104. Consider the quantities, pressure, power, energy, impulse, gravitational potential, electrical charge, temperature, area. Out of these, the only vector quantities are

- (1) Impulse, pressure and area  
 (2) Impulse and elementary area  
 (3) Area and gravitational potential  
 (4) Impulse and pressure

105. The direction cosines of a vector  $\vec{p}$  are

$$\cos \alpha = \frac{4}{5\sqrt{2}}, \cos \beta = \frac{1}{\sqrt{2}}, \cos \gamma = \frac{3}{5\sqrt{2}}$$

then the vector  $\vec{P}$  is

- (1)  $4\hat{i} + \hat{j} + 3\hat{k}$  (2)  $4\hat{i} + 5\hat{j} + 3\hat{k}$   
 (3)  $4\hat{i} - 5\hat{j} - 3\hat{k}$  (4)  $\hat{i} + \hat{j} - \hat{k}$

106. If  $\vec{P} = 5\hat{i} + 2\hat{j} - 3\hat{k}$  its components in XY plane and YZ plane are respectively

- (1)  $\sqrt{13}, 5$  (2)  $5, \sqrt{13}$   
 (3)  $\sqrt{13}, \sqrt{29}$  (4)  $\sqrt{29}, \sqrt{13}$

107. A vectors  $\vec{P}$  and  $\vec{Q}$  are  $2\hat{i} - 3\hat{j} + 5\hat{k}$  and  $5\hat{i} + 2\hat{j} - 3\hat{k}$  respectively find the unit vector parallel to  $\vec{P} + \vec{Q}$

- (1)  $\frac{7\hat{i} - \hat{j} + 2\hat{k}}{\sqrt{54}}$  (2)  $\frac{7\hat{i} + \hat{j} + 2\hat{k}}{\sqrt{54}}$   
 (3)  $\frac{3\hat{i} + 2\hat{j} - \hat{k}}{\sqrt{12}}$  (4)  $\frac{3\hat{i} - 2\hat{j} + \hat{k}}{\sqrt{12}}$

108. A vector  $4\hat{i} + 3\hat{j}$  rotates about its tail through an angle  $53^\circ$  in anticlockwise direction then the new vector is

- (1)  $-4\hat{i} + 3\hat{j}$  (2)  $3\hat{i} - 4\hat{j}$   
 (3)  $5\hat{j}$  (4)  $5\hat{i}$

109. Given  $a + b + c + d = 0$  which of the following statement is incorrect

- (1)  $a, b, c$  and  $d$  must each be a null vector
- (2) the magnitude of  $(a+c)$  equals the magnitude of  $(b+d)$
- (3) the magnitude of  $a$  can never be greater than the sum of the magnitudes of  $b, c$  and  $d$
- (4)  $b + c$  must lie in the plane of  $a$  and  $b$  is  $a$  and  $d$  are not collinear and in the line of  $a$  and  $d$  if they are collinear

110. If  $\vec{A} + \vec{B} = \vec{P}$  and  $\vec{A} - \vec{B} = \vec{Q}$  then  $P^2 + Q^2$  is equal to

- (1)  $A^2 + B^2$
- (2)  $2(A^2 - B^2)$
- (3)  $2(A^2 + B^2)$
- (4)  $4AB$

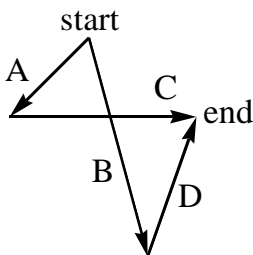
111. A vector is not changed if

- (1) It is rotated through an arbitrary angle
- (2) It is multiplied by an arbitrary scalar
- (3) It is cross multiplied by a unit vector
- (4) It is slid parallel to itself.

112. The component of a vector is

- (1) Always less than its magnitude
- (2) Always greater than its magnitude
- (3) Always equal to its magnitude
- (4) Less than or equal to its magnitude

113. Vector equation for the given diagram



- (1)  $\vec{A} + \vec{C} = \vec{D} + \vec{B}$

$$(2) \vec{A} + \vec{D} = \vec{C} + \vec{B}$$

$$(3) \vec{D} + \vec{C} = \vec{A} + \vec{B}$$

$$(4) \vec{A} + \vec{B} + \vec{C} + \vec{D} = 0$$

114. The expression  $\left( \frac{1}{\sqrt{2}} \hat{i} + \frac{1}{\sqrt{2}} \hat{j} \right)$  is a

- (1) Unit vector
- (2) Null vector
- (3) Vector of magnitude  $\sqrt{2}$
- (4) Scalar

115. The magnitude of a given vector with end points  $(4, -4, 0)$  and  $(-2, -2, 0)$  must be

- (1) 6
- (2)  $5\sqrt{2}$
- (3) 4
- (4)  $2\sqrt{10}$

116. The unit vector along  $\hat{i} + \hat{j}$  is

- (1)  $\hat{k}$
- (2)  $\hat{i} + \hat{j}$
- (3)  $\frac{\hat{i} + \hat{j}}{\sqrt{2}}$
- (4)  $\frac{\hat{i} + \hat{j}}{2}$

117. What are the maximum number of rectangular components of a vector can be split in space and in plane respectively.

- (1) 3, 2
- (2) 3, 3
- (3) 2, 2
- (4)  $\infty, \infty$

118. The x-component of the resultant of several vectors

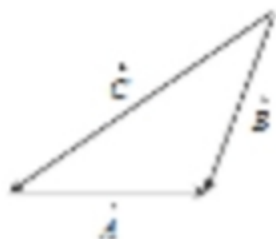
- a) is equal to the sum of the x-components of the vectors
- b) may be smaller than the sum of the magnitudes of the vectors
- c) may be greater than the sum of the magnitudes of the vectors
- d) may be equal to the sum of the magnitude of the vectors

- (1) only a (2) a, b & d  
(3) a, b & c (4) b & d

119. The angle made by the vector  $A = \hat{i} + \hat{j}$  with x-axis is

- (1)  $90^\circ$  (2)  $45^\circ$   
(3)  $22.5^\circ$  (4)  $30^\circ$

120. For the fig.  $\vec{A}$ ,  $\vec{B}$  and  $\vec{C}$

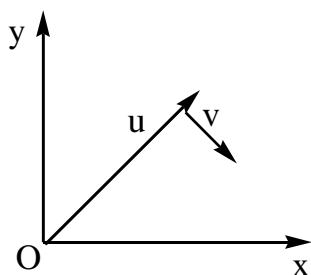


- (1)  $\vec{A} + \vec{B} = \vec{C}$  (2)  $\vec{B} + \vec{C} = \vec{A}$   
(3)  $\vec{C} + \vec{A} = \vec{B}$  (4)  $\vec{A} + \vec{B} + \vec{C} = 0$

121. Two equal forces of 121.3N when they are inclined at an angle  $120^\circ$  then the resultant force will be

- (1) 121.3 N (2) 141.4N  
(3) 11.2N (4) 112.3N

122. Figure shows the orientation of two vectors  $u$  and  $v$  in the XY plane. If  $u = a\hat{i} + b\hat{j}$  and  $v = p\hat{i} + q\hat{j}$



Which of the following is correct ?

- (1) a and p are positive while b and q are negative  
(2) a, p and b are positive while q is negative  
(3) a, q and b are positive while p is

negative

- (4) a, b, p and q are all positive

123. The resultant of two forces cannot exceed

- (1) Average of the forces  
(2) Algebraic sum of the two forces  
(3) Difference of the two forces  
(4) None

124. The resultant of two forces  $2P$  and  $\sqrt{2}P$  is  $\sqrt{10}P$ . The angle between the forces is

- (1)  $30^\circ$  (2)  $45^\circ$   
(3)  $60^\circ$  (4)  $90^\circ$

125. Which of the following sets of forces acting simultaneously on a particle keep it in equilibrium ?

- (1) 5N, 8N, 1N (2) 4N, 7N, 12N  
(3) 2N, 6N, 9N (4) 3N, 5N, 4N

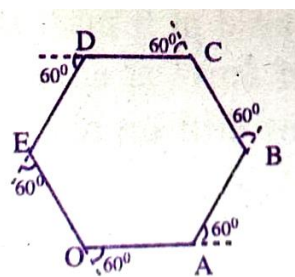
126. The greater and least resultant of two forces are 7N and 3N respectively. If each of the force is increased by 3N and applied at  $60^\circ$ . The magnitude of the resultant is

- (1)  $\sqrt{33.2}N$  (2) 33.2N  
(3) 332N (4) 3.3N

127. If the sum of two unit vectors is also a vector of unit magnitude, the magnitude of the difference of the two unit vectors is

- (1) 1 unit (2) 2 units  
(3)  $\sqrt{3}$ units (4) Zero

128. A person moving on a motor cycle in a ground takes a turn through  $60^\circ$  on his left after every 50m. Then find the magnitude of displacement suffered by him after 9<sup>th</sup> turn



- (1) 100 m                      (2) 50 m  
(3)  $\sqrt{3}m$                       (4) 20 m

129. Associative law is obeyed by

- (1) Addition of vectors  
(2) Subtraction of vectors  
(3) Both 1 and 2  
(4) None

130. The maximum value of magnitude of  $(\vec{A} - \vec{B})$  is

- (1)  $A - B$                       (2)  $A + B$   
(3)  $A^2 + B^2$                       (4)  $A^2 - B^2$

131. The square of the resultant of two forces 4N and 3N exceeds the square of the resultant of the two forces by 12 when they are mutually perpendicular. The angle between the vectors is

- (1)  $30^\circ$                       (2)  $60^\circ$   
(3)  $90^\circ$                       (4)  $120^\circ$

132. What vector must be added to the two vectors  $\hat{i} - 2\hat{j} + 2\hat{k}$  and  $2\hat{i} + \hat{j} - \hat{k}$ , so that the resultant may be a unit vector along x-axis

- (1)  $2\hat{i} + \hat{j} - \hat{k}$                       (2)  $-2\hat{i} + \hat{j} - \hat{k}$   
(3)  $2\hat{i} - \hat{j} + \hat{k}$                       (4)  $-2\hat{i} - \hat{j} - \hat{k}$

133. The angles which a vector  $\hat{i} + \hat{j} + \sqrt{2}\hat{k}$  makes X, Y and Z axes respectively are

- (1)  $60^\circ, 60^\circ, 60^\circ$                       (2)  $45^\circ, 45^\circ, 45^\circ$

- (3)  $60^\circ, 60^\circ, 45^\circ$                       (4)  $45^\circ, 45^\circ, 60^\circ$

134. For two vectors A and B,  $|\vec{A} + \vec{B}| = |\vec{A} - \vec{B}|$

is always true when

- i)  $|\vec{A}| = |\vec{B}| \neq 0$   
ii)  $A \perp B$   
iii)  $|\vec{A}| = |\vec{B}| \neq 0$  and A and B are parallel or anti-parallel  
iv) When either A or B is zero.  
(1) i and ii are true  
(2) ii, iii and iv are true  
(3) i, ii and iii are true  
(4) ii and iv are true

135. Let the angle between two non-zero vectors  $\vec{A}$  and  $\vec{B}$  be  $120^\circ$  and its resultant be  $\vec{C}$ .

- (1) C must be equal to  $|A - B|$   
(2) C must be less than  $|A - B|$   
(3) C must be greater than  $|A - B|$   
(4) C may be equal to  $|A - B|$

136. Considering the chemical properties, atomic weight of the element 'Be' was corrected based on

- (1) Valency                      (2) Configuration  
(3) Density                      (4) Atomic valume


137. Eka silicon is now known as

- (1) Scandium                      (2) Gallium  
(3) Germanium                      (4) Boron

138. In the periodic table, inversion of atomic weights took place in this pair

- (1) Boron - Scandium  
(2) Argon - Potassium  
(3) Hydrogen - Helium  
(4) Beryllium - Boron

139. Which of the following is Dobereiner triad

- (1) Li, Na, K                      (2) Li, K, Rb  
(3) Mg, Sr, Ca                    (4) Cl, I, Br
140. The basis of Mendeleeff's periodic table is \_\_\_\_\_  
(1) Atomic number  
(2) Atomic weight  
(3) Electronic configuration  
(4) Atomic volume
141. Which of the following are called transition triads  
(1) Fe, Co, Ni                      (2) Ru, Rh, Pd  
(3) Os, Ir, Pt                        (4) All the above
142. Electronic configuration of silicon is  
(1)  $[\text{Ne}]3s^23p^4$                     (2)  $[\text{Ne}]3s^23p^3$   
(3)  $[\text{Ne}]3s^23p^1$                     (4)  $[\text{Ne}]3s^23p^2$
143. Which of the following set of quantum numbers is not allowable  
(1)  $n = 3, \ell = 0, m = 0, s = -\frac{1}{2}$   
(2)  $n = 3, \ell = 1, m = 0, s = +\frac{1}{2}$   
(3)  $n = 3, \ell = 1, m = -2, s = +\frac{1}{2}$   
(4)  $n = 3, \ell = 2, m = -1, s = +\frac{1}{2}$
144. The quantum numbers for the differentiating electron of oxygen are \_\_\_\_\_  
(1)  $2, 0, 0, +\frac{1}{2}$                     (2)  $2, 1, -1, -\frac{1}{2}$   
(3)  $3, 0, 0, +\frac{1}{2}$                     (4)  $3, 1, 1, +\frac{1}{2}$
145. The electronic configuration  

 is a violation of

- (1) Hund's rule  
(2) Aufbau's rule  
(3) Pauli's exclusion  
(4) All the above
146. As per the modern periodic law, the physical and chemical properties of elements are periodic functions of their  
(1) Atomic mass  
(2) Electronic configuration  
(3) Atomic weight  
(4) Atomic size
147. Statement – I : Half filled and fully filled subshells are more stable than incompletely filled sub shells  
Statement – II : Half filled and fully filled sub shells have higher exchange energy  
(1) Both statement –I and II are true  
(2) Statement – I is true and statement – II is false  
(3) Both statement – I and II are false  
(4) Statement – I is false and statement – II is true
148. The magnetic moment of  $\text{Fe}^{+3}$  ion is \_\_\_\_\_ B.M  
(1) 4.8                                      (2) 5.9  
(3) 3.9                                      (4) 2.8
149. The number of unpaired electrons in chromium atom are  
(1) 5    (2) 4  
(3) 6    (4) 3
150. The total number of gaseous elements are  
(1) 8    (2) 9  
(3) 10                                        (4) 11
151. Value of  $l = 3$ , then the values of magnetic quantum numbers are

- (1)  $\pm 1, \pm 2, \pm 3$       (2)  $0, \pm 1, \pm 2, \pm 3$   
 (3)  $-1, -2, -3$       (4)  $0, +1, +2, +3$
152. For the  $P_z$  orbital 'm' value is  
 (1)  $-1$       (2)  $+1$   
 (3)  $0$       (4) Any of these
153. A given orbital is labeled by the magnetic quantum number,  $m = -1$ . This can not be  
 (1) s-orbital      (2) p-orbital  
 (3) d-orbital      (4) f-orbital
154. The shape of orbital for which  $l = 1$  is  
 (1) Spherical  
 (2) Dumb-bell  
 (3) Double dumb-bell  
 (4) Circular
155. The maximum number of electrons that a p-orbital can accommodate is  
 (1) 6      (2) 2  
 (3) 10      (4) 14
156. The maximum number of orbitals in the quantum level  $n = 4$  are  
 (1) 4      (2) 9  
 (3) 16      (4) 18
157. The quantum number which is equal for all the d-electrons in an atom is  
 (1)  $l$       (2)  $m$   
 (3)  $s$       (4)  $n$
158. Which of the following is not a possible value of azimuthal quantum number ( $l$ ) for an electron with  $n = 3$  ?  
 (1) zero      (2) 1  
 (3) 2      (4) 3
159. For complete description of an electron in an atom, the number of quantum numbers required is  
 (1) One      (2) Two  
 (3) Three      (4) Four
160. The azimuthal quantum number indicates.... of the orbital  
 (1) Size      (2) Shape  
 (3) Orientation      (4) Spin
161. The spin quantum number has a value of  
 (1)  $+1$   
 (2)  $+1/2$   
 (3)  $-1/2$   
 (4) Either  $+1/2$  or  $-1/2$
162. The correct valence electronic configuration for Cu ( $Z = 29$ ) is  
 (1)  $3d^9 4s^2$       (2)  $3d^{10} 4s^1$   
 (3)  $3d^{10} 4s^2$       (4)  $3d^8 4s^2$
163. Which one of the following pairs of ions have the same electronic configuration  
 (1)  $Cr^{3+}, Fe^{3+}$       (2)  $Fe^{3+}, Mn^{2+}$   
 (3)  $Fe^{3+}, Co^{3+}$       (4)  $Sc^{3+}, Cr^{3+}$
164. The  $(n+l)$  value for 4f-sub shell is  
 (1) 4      (2) 5  
 (3) 6      (4) 7
165. Number of unpaired electrons in the electronic configuration  $1s^2 2s^2 2p^4$  are  
 (1) 2      (2) 3  
 (3) 4      (4) 6
166. The configuration  $1s^2 2s^2 2p^6 3s^2 3p^3$  corresponds to  
 (1) S      (2) P  
 (3) Na      (4) Ar
167. The incorrect electronic arrangement is  
 (1) 2, 8, 13, 1      (2) 2, 8, 8, 1  
 (3) 2, 8, 12, 2      (4) 2, 8, 8, 2

168. Which of the following configuration is not possible
- (1)  $2p^2$  (2)  $3f^7$   
 (3)  $3d^5$  (4)  $4p^6$
169. The highest number of unpaired electrons are present in
- (1) Fe (2)  $Fe^{4+}$   
 (3)  $Fe^{2+}$  (4)  $Fe^{3+}$
170. Which of the following ions is not isoelectronic with  $O^{2-}$
- (1)  $N^{3-}$  (2)  $F^-$   
 (3)  $Ti^+$  (4)  $Na^+$
171. According to aufbau principle, the correct order of energy of 3d, 4s and 4p-orbitals is
- (1)  $4p < 3d < 4s$  (2)  $4s < 4p < 3d$   
 (3)  $4s < 3d < 4p$  (4)  $3d < 4s < 4p$
172. The number of unpaired electrons in  $Fe^{2+}$  ion are
- (1) 1 (2) 0  
 (3) 4 (4) 5
173. In the ground state, an element has 13 electrons in its "M-shell". The element is
- (1) Copper (2) Chromium  
 (3) Nickel (4) Iron
174. No two electrons in an orbital can have parallel spin. This statement emerges from
- (1) Hund's rule  
 (2) Aufbau principle  
 (3) Pauli's exclusion principle  
 (4)  $(n+1)$  rule
175. Which atom has as many 's' electrons as p-electrons
- (1) H (2) Mg (3) Na (4) N
176. The total number of electrons present in all the 's' orbitals, all the 'p' orbitals and all the 'd' orbitals of cesium ion are respectively
- (1) 8, 26, 10 (2) 8, 22, 24  
 (3) 10, 24, 20 (4) 12, 20, 22
177. Which of the following may represent the ground state of nitrogen atom ?
- (1)  $\boxed{\uparrow\downarrow} \boxed{\uparrow\downarrow} \boxed{\uparrow\downarrow\downarrow}$   
 (2)  $\boxed{\uparrow\downarrow} \boxed{\uparrow\downarrow} \boxed{\uparrow\uparrow\uparrow}$   
 (3)  $\boxed{\uparrow\downarrow} \boxed{\uparrow\downarrow} \boxed{\downarrow\downarrow\uparrow}$   
 (4)  $\boxed{\uparrow\downarrow} \boxed{\uparrow} \boxed{\downarrow\uparrow\downarrow\downarrow}$
178. The maximum number of electrons accommodated in all 5f orbitals
- (1) 5 (2) 10  
 (3) 14 (4) 18
179. The electronic configuration  $\boxed{\uparrow\downarrow} \boxed{\uparrow} \boxed{\uparrow\downarrow\downarrow\uparrow}$  is a violation of
- (1) Pauli's exclusion principle  
 (2) Hund's rule of maximum multiplicity  
 (3) Aufbau's rule  
 (4) All the above
180. If the value of principal quantum number is 3, the total possible values for magnetic quantum number will be
- (1) 5 (2) 8  
 (3) 9 (4) 10