

TOPIC :

Physics : Vectors (Application on Addition & Subtraction of vectors ; Dot product, Cross product etc.)

Chemistry : Titration of (Acid, base, Redox reaction)

Botany : **Monera** : Mycoplasma, Rickettsiae, Chlamydia, Actinomycetes, BGA

Zoology : Phylum Porifera; Phylum Cnidaria

PHYSICS

1. Given that P is a point on a wheel rolling on a horizontal ground. The radius of the wheel is R. Initially if the point P is in contact with the ground the wheel rolls through half the revolution. What is the displacement of point P?
 - (1) $R\sqrt{\pi^2 + 1}$
 - (2) $R\sqrt{\pi^2 + 4}$
 - (3) πR
 - (4) $2\pi R$
2. A parallelogram is formed with \vec{a} and \vec{b} as the sides. Let \vec{d}_1 and \vec{d}_2 be the diagonals of the parallelogram then $a^2 + b^2 =$
 - (1) $(d_1^2 + d_2^2)/2$
 - (2) $(d_1^2 - d_2^2)/2$
 - (3) $d_1^2 + d_2^2$
 - (4) $d_1^2 - d_2^2$
3. If a unit vector is represented by $0.5\hat{i} + 0.8\hat{j} + c\hat{k}$ the value of c is
 - (1) 1
 - (2) $\sqrt{0.11}$
 - (3) $\sqrt{0.01}$
 - (4) 0.39
4. What is the dot product of two vectors of magnitude 3 and 5, if angle between them is 60° ?
 - (1) 5.2
 - (2) 7.5
 - (3) 8.4
 - (4) 8.6
5. What vector must be added to the sum of two vectors $2\hat{i} - \hat{j} + 3\hat{k}$ and $3\hat{i} - 2\hat{j} + 2\hat{k}$ so that the resultant is a unit vector along Z axis
 - (1) $-5\hat{i} + 3\hat{j} - 4\hat{k}$
 - (2) $5\hat{i} + \hat{k}$
 - (3) $3\hat{j} + \hat{k}$
 - (4) $-3\hat{j} + \hat{k}$
6. The angles which the vector $\vec{A} = 3\hat{i} + 6\hat{j} + 2\hat{k}$ makes with the co-ordinate axes are
 - (1) $\cos^{-1} \frac{3}{7}, \cos^{-1} \frac{6}{7}$ and $\cos^{-1} \frac{2}{7}$
 - (2) $\cos^{-1} \frac{4}{7}, \cos^{-1} \frac{5}{7}$ and $\cos^{-1} \frac{3}{7}$
 - (3) $\cos^{-1} \frac{3}{7}, \cos^{-1} \frac{4}{7}$ and $\cos^{-1} \frac{1}{7}$
 - (4) none of the above
7. If \vec{a} and \vec{b} are two vectors then the value of $(\vec{a} + \vec{b}) \times (\vec{a} - \vec{b})$ is
 - (1) $2(\vec{a} \times \vec{b})$
 - (2) $-2(\vec{b} \times \vec{a})$
 - (3) $\vec{b} \times \vec{a}$
 - (4) $\vec{a} \times \vec{b}$
8. The component of vector $\vec{A} = 2\hat{i} + 3\hat{j}$ along the vector $\hat{i} + \hat{j}$ is
 - (1) $\frac{5}{\sqrt{2}}$
 - (2) $10\sqrt{2}$
 - (3) $5\sqrt{2}$
 - (4) 5
9. 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) 120°
 - (2) 60°
 - (3) 90°
 - (4) 150°
10. The value of x for $\vec{a} = 9\hat{i} - x\hat{j} + 2\hat{k}$ is perpendicular to $\vec{b} = 2\hat{i} + x\hat{j} + 8\hat{k}$
 - (1) 6
 - (2) 4
 - (3) 2
 - (4) zero
11. Minimum number of unequal vectors which can give zero resultant are
 - (1) two
 - (2) three
 - (3) four
 - (4) more than four
12. In CH_4 molecule, there are four C - H bonds. If two adjacent bonds are in $\hat{i} + \hat{j} + \hat{k}$ and $\hat{i} - \hat{j} - \hat{k}$ direction, then find the angle between these bonds
 - (1) $\sin^{-1}\left(\frac{-1}{3}\right)$
 - (2) $\cos^{-1}\left(\frac{1}{3}\right)$
 - (3) $\sin^{-1}\left(\frac{1}{3}\right)$
 - (4) $\cos^{-1}\left(\frac{-1}{3}\right)$
13. Two vectors \vec{A} and \vec{B} have magnitude 3 each. $\vec{A} \times \vec{B} = -5\hat{k} + 2\hat{i}$. Find angle between A and B
 - (1) $\cos^{-1} \frac{\sqrt{29}}{9}$
 - (2) $\tan^{-1}\left(\frac{-5}{2}\right)$
 - (3) $\sin^{-1}\left(\frac{2}{5}\right)$
 - (4) $\sin^{-1}\left(\frac{\sqrt{29}}{9}\right)$
14. A particle moving eastwards with 5ms^{-1} . In 10 s the velocity changes to 5ms^{-1} northwards. The average acceleration in this time is
 - (1) $\frac{1}{\sqrt{2}}\text{ms}^{-2}$ towards Northeast
 - (2) $\frac{1}{2}\text{ms}^{-2}$ towards North
 - (3) $\frac{1}{\sqrt{2}}\text{ms}^{-2}$ towards Northwest
 - (4) Zero

15. If a vector $2\hat{i} + 3\hat{j} + 8\hat{k}$ is perpendicular to the vector $4\hat{j} - 4\hat{i} + \alpha\hat{k}$ then the value of α is

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

16. If the angle between the vectors \vec{A} and \vec{B} is θ , the value of the produce $(\vec{B} \times \vec{A}) \cdot \vec{A}$ equals

- (1) $BA^2 \sin \theta$ (2) $BA^2 \cos \theta \sin \theta$
 (3) $BA^2 \cos \theta$ (4) Zero

17. If $\vec{A} \cdot \vec{B} = \vec{B} \cdot \vec{C}$ then

- (1) $\vec{A} = \vec{C}$ always (2) $\vec{A} \neq \vec{C}$ always
 (3) \vec{A} may not be equal to \vec{C}
 (4) None of these

18. Rain is falling vertically with 3ms^{-1} and a man is moving due North with 4ms^{-1} . In which direction he should hold the umbrella to protect himself from rains?

- (1) 37° North of vertical (2) 37° South of vertical
 (3) 53° North of vertical (4) 53° South of vertical

19. A man is moving on his bike with 54kmh^{-1} . He takes a u-turn in 10 s and continues to move with the same velocity. find average acceleration during this time

- (1) 3.0ms^{-2} (2) 1.5ms^{-2}
 (3) 0 (4) -1.5ms^{-2}

20. A man starts from O moves 500 m turns by 60° and moves 500 m again turns by 60° and moves 500 m and so on. Find the displacement after (i) 5th turn, (ii) 3rd turn

- (1) 500 m, 1000m (2) 500 m, $500\sqrt{3}$ m
 (3) 1000 m, $500\sqrt{3}$ m (4) None of these

21. A man running on a horizontal road at 8ms^{-1} finds rain falling vertically. If he increases his speed to 12ms^{-1} , he finds that drops make 30° angle with the vertical. Find velocity of rain with respect to the road.

- (1) $4\sqrt{7}\text{ms}^{-1}$ (2) $8\sqrt{2}\text{ms}^{-1}$
 (3) $7\sqrt{3}\text{ms}^{-1}$ (4) 8ms^{-1}

22. Which of the following cannot be in equilibrium?

- (1) 10N, 10N, 5N (2) 5N, 7N, 9N
 (3) 8N, 4N, 13N (4) 9N, 6N, 5N

23. $\vec{A} = 3\hat{i} + 4\hat{j} + 2\hat{k}$, $\vec{B} = 6\hat{i} - \hat{j} + 3\hat{k}$. Find a vector parallel to \vec{A} whose magnitude is equal to that of \vec{B}

- (1) $\sqrt{\frac{46}{29}}(3\hat{i} + 4\hat{j} + 2\hat{k})$ (2) $\sqrt{\frac{46}{29}}(6\hat{i} - \hat{j} + 3\hat{k})$
 (3) $\sqrt{\frac{29}{46}}(3\hat{i} - 4\hat{j} + 2\hat{k})$ (4) None of these

24. A particle moves in the x - y plane under the action of a force \vec{F} such that the value of its linear momentum p at any instant is $p = 2(\cos t\hat{i} + \sin t\hat{j})$. The angle θ between F and p is

- (1) 60° (2) 45°
 (3) 30° (4) 90°

25. The position vector of a particle is $\vec{r} = a[\cos \omega t\hat{i} + \sin \omega t\hat{j}]$. The velocity of the particle is

- (1) parallel to position vector
 (2) directed towards origin
 (3) directed away from origin
 (4) perpendicular to position vector

26. A force $6\hat{i} + 3\hat{j} + \hat{k}$ Newton displaces a particles from A (0,3,2) to B(5,1,6). Find the work done

- (1) 10 J (2) 22 J
 (3) 32 J (4) 41 J

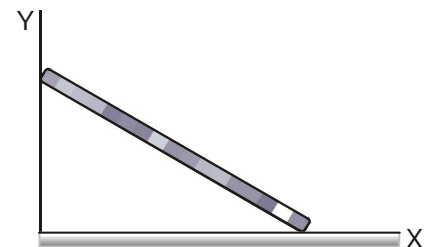
27. The resultant of two forces equal in magnitude is equal to either of two vectors in magnitude. Find the angle between the forces

- (1) 60° (2) 45°
 (3) 90° (4) 120°

28. A man goes 100 m North then 100 m East and then 20 m North and then $100\sqrt{2}$ South West. Find the displacement

- (1) 20 m West (2) 20 m East
 (3) 20 m North (4) 20 m South

29. The rod shown in figure starts slipping. Find the speed of lower end if the speed of upper end is $\sqrt{3}$ m/s when it makes an angle 30° with the x-axis.



- (1) 2 m/s
 (2) 3 m/s
 (3) -3 m/s
 (4) -2 m/s

30. A boat which has a speed of 5kmh^{-1} in still water crosses a river of width 1 km along the shortest possible path in 15 minutes. The speed of the river in kmh^{-1} is

- (1) 1 (2) 3
 (3) 4 (4) $\sqrt{41}$

31. When mass is rotating in a plane about a fixed point, its angular momentum is directed along
 (1) the axis of rotation
 (2) line at an angle of 45° to the axis of rotation
 (3) the radius (4) the tangent to the orbit
32. When two vectors \vec{A} and \vec{B} of magnitude a and b are added, the magnitude of the resultant vector is always
 (1) greater than $(a + b)$
 (2) not greater than $(a + b)$
 (3) equal to $(a + b)$ (4) less than $(a + b)$
33. Identify the vector quantity
 (1) Heat (2) Angular momentum
 (3) Time (4) Work
34. Which of the following quantities is a scalar?
 (1) Magnetic moment
 (2) Acceleration due to gravity
 (3) Electric field (4) Electrostatic potential
35. The rectangular components of force 5 dyne are
 (1) 3 and 4 dyne (2) 2.5 and 2.5 dyne
 (3) 1 and 2 dyne (4) 2 and 3 dyne
36. Moment of inertia is
 (1) Vector (2) Scalar
 (3) Phasor (4) Tensor
37. A mosquito flies from the hole in a mosquito net top corner diametrically opposite. If the net is $3 \times 2 \times 2$ m then the displacement of the mosquito is
 (1) $\sqrt{13}m$ (2) $\sqrt{17}m$
 (3) $\sqrt{11}m$ (4) None of these
38. Two forces of magnitude 7 N and 5 N act on a particle at an angle θ to each other, θ can have any value. The minimum magnitude of the resultant force is
 (1) 12 N (2) 8 N
 (3) 2 N (4) 5 N
39. If $\vec{A} = \vec{B} + \vec{C}$ and the magnitudes of \vec{A} , \vec{B} and \vec{C} are 5, 4 and 3 units, respectively, then the angle between \vec{A} and \vec{C} is
 (1) $\pi/2$ (2) $\sin^{-1}(3/4)$
 (3) $\cos^{-1}(3/5)$ (4) $\cos^{-1}(4/5)$
40. A man is walking due east at the rate of 4 km hr^{-1} and the rain is falling at an angle of 30° east of vertical with a velocity of 6 km hr^{-1} . The velocity of the rain relative to the man will be
 (1) 5 km hr^{-1} (2) 7.118 km hr^{-1}
 (3) 8.718 km hr^{-1} (4) 10 km hr^{-1}
41. The resultant of two equal forces is double of either of the force. The angle between them is
 (1) 0° (2) 60°
 (3) 90° (4) 120°
42. Maximum and minimum magnitudes of the resultant of two vectors of magnitudes P and Q are in the ratio $3 : 1$. Which of the following relations is true?
 (1) $PQ = 1$ (2) $P = 2Q$
 (3) $P = Q$ (4) None of these
43. What is the projection of \vec{P} on \vec{Q} ?
 (1) $\vec{Q} \cdot \vec{P}$ (2) $\hat{P} \cdot \hat{Q}$
 (3) $\vec{P} \cdot \vec{Q}$ (4) $\vec{P} \cdot \hat{Q}$
44. There are N co-planar vectors each of magnitude V . Each vector is inclined to the preceding vector at angle $2\pi/N$. What is the magnitude of their resultant?
 (1) Zero (2) V/N
 (3) V (4) NV
45. Three vectors A , B and C satisfy the relation $\vec{A} \cdot \vec{B} = 0$ and $\vec{A} \cdot \vec{C} = 0$. The vector A is parallel to
 (1) $\vec{B} \cdot \vec{C}$ (2) \vec{B}
 (3) \vec{C} (4) $\vec{B} \times \vec{C}$
46. What is the angle between $\hat{i} + \hat{j} + \hat{k}$ and \hat{i} ?
 (1) $\pi/2$ (2) $\pi/4$
 (3) $\pi/6$ (4) None of these
47. To a person going east in a car with a velocity of 25 km hr^{-1} , a train appears to move towards north with a velocity of $25\sqrt{3} \text{ km/hr}$. The actual velocity
 (1) 5 km hr^{-1} (2) 25 km hr^{-1}
 (3) 50 km hr^{-1} (4) 53 km hr^{-1}
48. The area of a Δ formed with sides $5i + 3j - k$ and $3i + 2j - k$ is
 (1) $\sqrt{6}$ (2) $\sqrt{3}$
 (3) $\sqrt{\frac{3}{2}}$ (4) $\sqrt{\frac{5}{2}}$
49. The length of seconds hand in a watch is 1 cm. The change in velocity of its tip in 15 seconds is
 (1) Zero (2) $\left(\frac{\pi}{15\sqrt{2}}\right) \text{ cms}^{-1}$
 (3) $\left(\frac{\pi}{15}\right) \text{ cms}^{-1}$ (4) $\left(\frac{\pi\sqrt{2}}{15}\right) \text{ cms}^{-1}$
50. A vector of magnitude α is rotated through angle θ . What is the magnitude of the change in the vector?
 (1) $2\alpha \sin\theta$ (2) $2\alpha \cos\theta$
 (3) $2\alpha \sin(\theta/2)$ (4) $2\alpha \cos(\theta/2)$

CHEMISTRY

51. Titration error is
(1) The difference between the end point volume and the equivalence point volume
(2) Due to the least count of the burette and pipette
(3) Due to the error of the person doing titrations
(4) All of these
52. When potassium permanganate is titrated against ferrous ammonium sulphate, the equivalent weight of potassium permanganate is
(1) Molecular weight/10 (2) Molecular weight/5
(3) Molecular weight/2 (4) Molecular weight
53. A titration in which a reagent is added to a solution containing the analyte, and the excess reagent remaining after its reaction with the analyte is determined by a titration is known as
(1) Reverse titration (2) Delayed titration
(3) Back titration (4) Complete titration
54. 1.25g of a solid dibasic acid is completely neutralised by 25 ml of 0.25 molar $\text{Ba}(\text{OH})_2$ solution. Molecular mass of the acid is
(1) 100 (2) 150
(3) 120 (4) 200
55. A graph showing the progress of a titration as a function of the volume of titrant added is known as
(1) Graphical titration (2) Volume curve
(3) Function graph (4) Titration curve
56. The first visual indicator used for acid base titration was
(1) Phenolphthalein (2) Methyl orange
(3) Methyl red (4) Litmus
57. 250 ml of a sodium carbonate solution contains 2.65 grams of Na_2CO_3 . If 10 ml of this solution is diluted to one litre, what is the concentration of the resultant solution (mol. wt. of $\text{Na}_2\text{CO}_3 = 106$)
(1) 0.1 M (2) 0.001 M
(3) 0.01 M (4) 10^{-4} M
58. What quantity of ammonium sulphate is necessary for the production of NH_3 gas sufficient to neutralize a solution containing 292 g of HCl ? [HCl = 36.5; $(\text{NH}_4)_2\text{SO}_4 = 132$; $\text{NH}_3 = 17$]
(1) 272 g (2) 403 g
(3) 528 g (4) 1056 g
59. The solution of sulphuric acid contains 80% by weight H_2SO_4 . Specific gravity of this solution is 1.71. Its normality is about
(1) 18.0 (2) 27.9
(3) 1.0 (4) 10.0
60. 0.16g of dibasic acid required 25 ml of decinormal NaOH solution for complete neutralisation. The molecular weight of the acid will be
(1) 32 (2) 64
(3) 128 (4) 256
61. How many grams of caustic potash required to completely neutralise 12.6gm HNO_3 ?
(1) 22.4 KOH (2) 1.01 KOH
(3) 6.02 KOH (4) 11.2 KOH
62. A 50.0 ml sample of citrus drink requires 20 ml of 0.05 M NaOH to reach the phenolphthalein end point. Calculate the normality of citric acid in it
(1) 0.05 (2) 0.125
(3) 0.02 (4) 0.2
63. Which of these would require the maximum volume of 0.1 M NaOH to reach the phenolphthalein end point?
(1) 10 ml 0.1 M CH_3COOH
(2) 10 ml 0.1 M HCl
(3) 10 ml 0.05 M H_2SO_4
(4) All will require the same volume of NaOH
64. A titration in which the reaction between the analyte and titrant is an oxidation/reduction reaction is known as
(1) Redox titration (2) Oxidation titration
(3) Reduction titration (4) Displacement titration
65. Titration of Mohr salt with which of these does not require an indicator?
(1) KI_3 (2) KMnO_4
(3) H_2O_2 (4) All of these
66. Which of these is not an oxidizing agent used in titrations?
(1) KMnO_4 (2) $(\text{NH}_4)_2[\text{Ce}(\text{NO}_3)_6]$
(3) Oxalic acid (4) $\text{K}_2\text{Cr}_2\text{O}_7$
67. Which of these compounds can be used as a primary standard to standardise NaOH as well as KMnO_4 ?
(1) Mohr salt (2) Oxalic acid
(3) Potassium dichromate (4) Sodium carbonate
68. An aqueous solution of 6.3 g of oxalic acid, which is dibasic (molecular mass = 126) is prepared in 250 ml of the solution. 10 ml of this solution required x ml of 0.1 N KOH. x would be
(1) 40 ml (2) 30 ml
(3) 20 ml (4) 10 ml

69. 100 ml of a mixture of NaOH and Na₂SO₄ is neutralised by 10 ml of 0.5 M H₂SO₄. The amount of NaOH in 100 ml solution is
 (1) 0.2 g (2) 0.4 g
 (3) 0.6 g (4) 0.8 g
70. A 5 molar solution of H₂SO₄ is diluted from 1 litre to 10 litres. the normality of the solution will be
 (1) 1.0 N (2) 2.0 N
 (3) 0.5 N (4) 10 N
71. An aqueous solution containing 0.10 g KIO₃ (Formula wt = 214) and an excess of KI was acidified with HCl. The liberated I₂ consumed 45.0 mL of thiosulphate. The molarity of sodium thiosulphate solution is,

$$\text{IO}_3^- + 5\text{I}^- + 6\text{H}^+ \rightarrow 3\text{I}_2 + 3\text{H}_2\text{O}$$

 (1) 0.062 M (2) 0.0313 M
 (3) 0.126 M (4) 0.252 M
72. H₃PO₄ is a tribasic acid and one of its salts is NaH₂PO₄. What volume of 1M NaOH should be added to 12g NaH₂PO₄ (mol. wt. 120) to exactly convert it into Na₃PO₄?
 (1) 100 cc (2) 300 cc
 (3) 200 cc (4) 80 cc
73. Which of these is not a primary standard for redox reactions?
 (1) Mohr salt (2) Oxalic acid
 (3) Potassium permanganate
 (4) Potassium dichromate
74. 0.45 gm of acid of mol. wt. 90 is neutralised by 20 ml of 0.5 N caustic potash. The basicity of the acid is
 (1) 1 (2) 2
 (3) 3 (4) 4
75. The indicator used in titration of Iodine with Na₂S₂O₃ is
 (1) AgNO₃ (2) Starch
 (3) Diphenyl amine
 (4) No indicator is required
76. If 5 ml of 1M NaOH is neutralized by 15ml of oxalic acid, the normality of oxalic acid is
 (1) 0.066 (2) 0.04
 (3) 0.2 (4) None of these
77. The no. of moles of KMnO₄ that will be needed to react completely with one mole of ferrous oxalate in acidic solution is
 (1) 3/5 (2) 2/5
 (3) 4/5 (4) None of these
78. The reaction

$$\text{Cl}_2 + \text{S}_2\text{O}_3^{2-} + \text{OH}^- \rightarrow \text{SO}_4^{2-} + \text{Cl}^- + \text{H}_2\text{O}$$

 starting with 0.15 mole Cl₂, 0.010 mole S₂O₃²⁻ and 0.30 mole OH⁻, mole of Cl₂ left in solution
 (1) 0.11 (2) 0.01
 (3) 0.04 (4) 0.09
79. A sample of FeSO₄ and FeC₂O₄ dissolved in H₂SO₄. The complete oxidation of sample required 8/3 equivalent of KMnO₄. After oxidation, the reaction mixture was reduced by Zn. On again oxidation by KMnO₄ required $\frac{5}{3}$ equivalent. The mole ratio of FeSO₄ and FeC₂O₄ is
 (1) $\frac{3}{7}$
 (2) $\frac{7}{3}$
 (3) $\frac{5}{7}$
 (4) $\frac{7}{5}$
80. 200 ml solution of H₂O₂ liberates 50.8 gm of iodine from an acidified KI solution. The strength of H₂O₂ solution in terms of volume strength
 (1) 5.6 V (2) 22.4 V
 (3) 44.8 V (4) 11.2 V
81. Which of these is indirect titration?
 (1) Determination of Cu⁺ using Na₂S₂O₃ and KI
 (2) Determination of alkalinity of water using HCl
 (3) Standardization of KMnO₄ using Mohr salt
 (4) All of these
82. 12.53 ml of 0.051 M SeO₂ reacted with 25.52 ml of 0.1 M CrSO₄ solution. In the reaction Cr²⁺ was oxidised to Cr³⁺. The oxidation state to which selenium was converted is
 (1) 3 (2) +2
 (3) 1 (4) 0
83. The volume of 3M HNO₃ required to oxidise 8 gram Fe²⁺ is (HNO₃ + Fe²⁺ → Fe³⁺ + NO + H₂O)
 (1) 8 ml (2) 16 ml
 (3) 32 ml (4) 64 ml
84. A sample is treated with HCl in presence of phenolphthalin. It required 25 ml of HCl. On adding methyl orange indicator, further, it required 30 ml of same HCl The sample is
 (1) NaOH + Na₂CO₃ (2) Na₂CO₃
 (3) Na₂CO₃ + NaHCO₃ (4) NaHCO₃

85. A sample of KClO_3 and KCl is dissolved in 100 ml water. 50 ml of this solution is treated with SO_2 to convert KClO_3 into KCl and total KCl is converted into 0.1435 gm of AgCl using excess of AgNO_3 if milli equivalent of SO_2 consumed is 3. The molar ratio of KClO_3 and KCl in the sample is
 (1) 1 : 3 (2) 2 : 3
 (3) 4 : 1 (4) 1 : 1
86. 0.84g of metal carbonate was completely neutralized by 40mL of $\text{N}/2 \text{H}_2\text{SO}_4$. The equivalent weight of metal will be -
 (1) 84 (2) 42
 (3) 12 (4) 30
87. What is the value of carbonate hardness of water sample, if 100mL of it took 5.00mL of 0.09N HCl solution
 (1) 4.50mg eq/L
 (2) 477.00 mg eq/L
 (3) 0.042 mg eq/L
 (4) 1.80 mg eq/L
88. What volume of 0.1M H_2SO_4 is needed to completely neutralize 40mL of 0.2M NaOH solution
 (1) 10mL (2) 40mL
 (3) 20mL (4) 80 mL
89. For the complete neutralization of 100mL. of 0.2N NaOH , what weight of hydrated oxalic acid would be required-
 (1) 0.45g (2) 0.90g
 (3) 1.08g (4) 1.26g
90. 20mL of HCl solution requires 19.85mL of 0.01 M NaOH solution for complete neutralization. The molarity of HCl solution is
 (1) 0.0099 (2) 0.099
 (3) 0.99 (4) 9.9
91. 25 mL of a solution of $\text{Ba}(\text{OH})_2$ on titration with a 0.1 M solution of HCl gave a titre value of 35 mL. The molarity of barium hydroxide solution was
 (1) 0.07
 (2) 0.14
 (3) 0.28
 (4) 0.35
92. To neutralize completely 20 mL of 0.1 M aqueous solution of phosphorus acid (H_3PO_3), the volume of 0.1 M aqueous KOH solution required is :
 (1) 60 mL (2) 20 mL
 (3) 40 mL (4) 10 mL
93. 0.59 g of a dibasic acid is completely neutralized by 100 c.c. of $\frac{\text{N}}{10} \text{NaOH}$ solution. What is the molecular weight of the acid
 (1) 59 (2) 118
 (3) 29.5 (4) 11.8
94. The oxidation state of sulphur in $\text{K}_2\text{S}_2\text{O}_8$ is
 (1) 7 (2) 8
 (3) 6 (4) 4
95. 1g metal carbonate requires 200ml of 0.1 N HCl for complete neutralization. What is the equivalent weight of metal carbonate
 (1) 50 (2) 40
 (3) 20 (4) 100
96. 50ml of 0.1N KMnO_4 solution is required to completely oxides 0.225g of anhydrous oxalic acid. Find out the equivalent weight of oxalic acid.
 (1) 90 (2) 45
 (3) 126 (4) 63
97. 3.92g ferrous ammonium sulphate (FAS) consumes 50 ml of $\frac{\text{N}}{10} \text{KMnO}_4$. What is the percentage purity of the sample of FAS-
 (1) 50% (2) 78.4%
 (3) 80% (4) 39.2%
98. 1.7g of ammonium salt was treated with excess of NaOH . The ammonia released in the process neutralizes 100 c.c. solution of $\frac{\text{N}}{5} \text{H}_2\text{SO}_4$. What is the percentage of ammonia in the salt -
 (1) 17% (2) 20%
 (3) 25% (4) 34%
99. In an experiment 10ml of AgNO_3 (0.1N) solution is added to 20ml of decinormal HCl . After the precipitation of AgCl , excess of HCl is titrated with decinormal NaOH solution. What is the volume of NaOH used in the titration
 (1) 10ml (2) 20ml
 (3) 5ml (4) 30ml
100. 250ml of the solution contains 7.35g of dibasic acid 25ml of this solution requires 15ml of N - NaOH solution for complete neutralization Equivalent and molecular weight of acid would be respectively
 (1) 49, 98 (2) 63, 126
 (3) 32, 64 (4) 50, 100

BOTANY

101. The main function of elementary bodies in mycoplasma is
(1) Reproduction (2) Respiration
(3) Secretion (4) Food storage
102. Whose colonies look like fried eggs on solid culture media ?
(1) Mycoplasma (2) L-form bacteria
(3) Bacteria (4) Fungus
103. The reserve food material in B.G.A. is
(1) Starch (2) Floridean starch
(3) Cyanophycean starch (4) Mannitol
104. Which of the following are obligate parasites found inside arthropods ?
(1) Chlamydia (2) Mycoplasmas
(3) Rickettsia (4) BGA
105. Jokers of plant kingdom are
(1) Mycoplasmas because of showing polymorphism
(2) Mycoplasmas because of showing sensitivity to antibiotics
(3) Mycoplasmas because of showing pleomorphism
(4) Chlamydia because of forming elementary bodies
106. Smallest mycoplasma is
(1) *M. gallisepticum* (2) *M. hominis*
(3) *M. pneumoniae* (4) *M. laidlawii*
107. What is false about Mycoplasma
(1) Smallest unicellular organism
(2) Obligate parasite
(3) Non motile (4) Absence of cell wall
108. Mycoplasmas differ from viruses in that they are sensitive to-
(1) Penicillin (2) Tetracyclines
(3) Sugars (4) Amino acids
109. Which of the following resemble bacteria ?
(1) Red algae (2) Brown algae
(3) Blue-green algae (4) Green algae
110. Chromatic adaptation is a phenomenon seen in BGA. It is also called as
(1) Bells phenomenon (2) Gauses phenomenon
(3) Bergeys reaction (4) Gaidukov's phenomenon
111. Little leaf of brinjal is caused by
(1) Virus (2) Fungus
(3) Mycoplasma (4) Bacteria
112. Which is not present in mycoplasma ?
(1) 70 S ribosomes (2) DNA
(3) Mesosomes (4) Cell membrane
113. Cyanobacteria associated with protists are called
(1) Bacteriophage (2) Cyanellae
(3) Zooxanthellae (4) Pusules
114. *Aulosira fertiliziana* is important in
(1) genetic engineering (2) as bioherbicide
(3) as biofertiliser (4) as antibiotic
115. In prokaryotes photosynthesis is accomplished in ?
(1) Cell membrane (2) mitochondria
(3) Cytoplasm (4) Chloroplast
116. Which of the following is present in prokaryotes ?
(1) Nucleoid (2) NM
(3) Chromosome (4) Chloroplast
117. Which billiprotein pigments is present in B.G.A.?
(1) Phycocyanin (2) Phycoerythrin
(3) Allophycocyanin (4) All of them
118. *Trichodesmium erythraeum* give
(1) rise to red snow ball phenomenon
(2) colour to red sea
(3) colour to black sea (4) us maximum antibiotics
119. DNA of Mycoplasma is always ?
(1) Circular and single stranded
(2) Linear and single stranded
(3) circular and double stranded
(4) Linear and double stranded
120. Most primitive are
(1) Archaeobacteria (2) Dinoflagellate
(3) Virus (4) Bacteria
121. *Mycoplasma* is
(1) Gram positive (2) Gram negative
(3) Some species are gram positive
(4) None of the above
122. Which can be included in Actinomycetes ?
(1) *Streptomyces* (2) *Myxobacter*
(3) *Flexobacter* (4) All of them
123. Archeobacteria are found in.?
(1) Favourable condition of environment
(2) Adverse conditions of environment
(3) All the places
(4) In fresh water
124. Which is not a name of B.G.A.?
(1) Cyanobacteria (2) Myxophyceae
(3) Prokaryotic algae (4) Myxobacteria
125. The mycoplasma, spirochaetes and rickettsia have
(1) DNA (2) DNA and RNA
(3) Ribosomes (4) all of these
126. Nuclear material without nuclear membrane is observed in
(1) Mycoplasmas and green algae
(2) Cyanobacteria and red algae
(3) Bacteria and cyanobacteria
(4) Bacteria and green algae

127. The *Mycoplasma* multiply asexually by
 (1) Fusion and endospore
 (2) Budding and endospore
 (3) Budding and fission
 (4) Budding and cyst formation
128. *Mycoplasma* differs from bacteria in absence of
 (1) Cell membrane (2) Ribosomes
 (3) Cell wall (4) DNA
129. New kingdom monera was made by
 (1) Haeckle (2) Stanier
 (3) Dougherty (4) Whittaker
130. Prokaryotes do not have histones but they have polyamines type of basic proteins are present to
 (1) Neutralize DNA (2) Acidify DNA
 (3) Basify DNA (4) none
131. Genophore is :
 (1) A single stranded DNA
 (2) RNA and histone proteins
 (3) A single molecule of double stranded circular DNA
 (4) Any DNA and histone proteins
132. Mycolic acid is present in cell wall of pathogen causing
 (1) Cholera (2) Diphtheria
 (3) Tuberculosis (4) Tetanus
133. Maximum antibiotics have been prepared from
 (1) Archaeobacteria (2) Actinomycetes
 (3) Myxobacteria (4) Rickettsia
134. Who got Nobel prize for discovery of **streptomycin**?
 (1) Pasteure (2) Waksman
 (3) Robert Koch (4) Salc & Sebin
135. Which is not true about archaeobacteria?
 (1) They are living fossils
 (2) They are most primitive bacteria
 (3) They occur in adverse environmental conditions
 (4) They have cell wall made of peptidoglycans
136. Cyanobacteria are
 (1) Chemoautotrophs (2) Chemoheterotrophs
 (3) Photoheterotrophs (4) Photoautotrophs
137. Which do not have flexible cell wall?
 (1) Spirochaetes (2) Myxobacteria
 (3) Actinomycetes (4) Chlamydia
138. Trachoma of the eye is caused by
 (1) Lyngbya (2) Rickettsiae
 (3) Chlamydia (4) Mycoplasma
139. Which is a group of pleomorphic microbes?
 (1) Mycoplasma, Rickettsiae & *Rhizobium*
 (2) Chlamydia, Rickettsiae & *Rhizobium*
 (3) Chlamydia, Mycoplasma & *Rhizobium*
 (4) Archaeobacteria, Mycoplasma & *Rhizobium*
140. Which of the following does not exhibit sexual reproduction?
 (a) Actinomycetes (b) Archaeobacteria
 (c) Myxobacteria (d) Rickettsiae
 (1) a & b (2) a, b & c
 (3) a, b & d (4) all a, b, c & d
141. Which is a group of archaeobacteria?
 (1) *Methanobacterium*, *Methanococcus*,
Halobacterium, *Thermoproteus*
 (2) *Methanobacterium*, *Methanococcus*,
Rhodomicrobium, *Thermoproteus*
 (3) *Salmonella*, *Methanococcus*, *Halobacterium*,
Thermoproteus
 (4) *Methanococcus*, *Helobacterium*, *Thermoproteus*,
Salmonella
142. Cell wall of actinomycetes is made of
 (1) Muramic acid, lipids & Pseudomurein
 (2) Muramic acid, lipids, waxes & mycolic acid
 (3) Pseudomurein, mycolic acid, lipopolysaccharides
 (4) Peptidoglycan, lipopolysaccharides, Muramic acid
143. Which are not affected by penicillin?
 (1) Mycoplasma, Archaeobacteria, 'L' forms
 (2) Mycoplasma, Rickettsiae, 'L' forms
 (3) Rickettsiae, Myxobacteria, 'L' forms
 (4) Archaeobacteria, Myxobacteria, 'L' forms
144. Bovine pleuropneumonia is caused by
 (1) Rickettsiae (2) Mycoplasma
 (3) Sphaeroplast (4) Chlamydia
145. Rickettsiae caused diseases are
 (1) Q-fever, typhus, Trench fever
 (2) Psittacosis, Influenza, typhus
 (3) Witches broom, Influenza, Psittacosis
 (4) Witches broom, Q-fever, Psittacosis
146. In animals mycoplasma grows in
 (1) Epithelial tissue (2) Connective tissue
 (3) Muscular tissue (4) Nervous tissue
147. Now according to ICBN Mycoplasma are put in ?
 (1) Mollicutes (2) Schizomycetes
 (3) B.G.A. (4) Akaryota
148. In cyanophyceae, flagella are
 (1) Absent (2) Present
 (3) Present in gamete stage only
 (4) Present in zoospores only
149. Hormogonia help in reproduction of
 (1) *Cladophora* (2) Bacteria
 (3) Archaeobacteria (4) Cyanobacteria
150. Heterocysts, specialised for nitrogen fixation, occur in certain
 (1) Red algae (*Batrachospermum*)
 (2) Green algae (*Spirogyra*)
 (3) Blue-green algae (*Anabaena*)
 (4) Brown algae (*Laminaria*)

169. A characteristic type of asexual reproduction by internal budding in certain sponges is called
 (1) Regeneration (2) Conjugation
 (3) Gemmulation (4) None of these
170. Which one is given as a gift in Japan?
 (1) *Euspongia* (2) *Euplectella*
 (3) *Spongilla* (4) *Sycon*
171. The most primitive nervous system is found in
 (1) *Hydra* (2) *Amoeba*
 (3) Sponge (4) Earthworm
172. Ephyra larva belongs to
 (1) *Edwardsia* (2) *Obelia*
 (3) *Aurelia* (4) *Hydra*
173. Which of the following animals has a nervous system but no brain?
 (1) *Amoeba* (2) *Hydra*
 (3) Cockroach (4) Earthworm
174. Nematocysts of *Hydra* are important for
 (1) Catching and paralysing preys
 (2) Only paralysing preys
 (3) Only locomotion
 (4) Testing the quality of food
175. Phylum porifera is classified on the basis of
 (1) Locomotory structures
 (2) Reproduction
 (3) Feeding
 (4) Skeletal elements
176. Parazoa includes
 (1) Parasitic protozoans (2) Digenetic trematodes
 (3) Marine scyphozoans (4) Sponges
177. Cells from which cnidoblasts of *Hydra* are derived
 (1) Sensory (2) Nerve
 (3) Epithelio-muscular (4) Interstitial cells
178. The beaded processes of sensory cells in *Hydra* make synapses with processes of
 (1) Nerve cells
 (2) Interstitial cells
 (3) Epithelio-muscular cells
 (4) Nutritive-muscular cells
179. What structure in *Hydra* functionally correspond to pseudopodia of *Amoeba* in regard to feeding?
 (1) Nematocysts
 (2) Ectodermal cells
 (3) Mouth
 (4) Some endodermal cells
180. Which of the following is a scyphozoan
 (1) *Alcyonium* (2) *Antepethos*
 (3) *Adamsia* (4) *Aurelia*
181. Poisonous substance found in nematocysts of *Hydra* occur in
 (1) Hypnotoxin (2) Haematin
 (3) Heparin (4) Thrombin
182. The epithelio-muscular cells of *Hydra* in
 (1) Gastrodermis (2) Epidermis
 (3) Both (4) None of these
183. The mesoglea of *Hydra* is
 (1) Only fibrous
 (2) Only cellular
 (3) Partly cellular and partly fibrous
 (4) Neither cellular nor fibrous
184. Which of the following statement is false
 (1) Sponges are mostly marine
 (2) All cestodes are endoparasites
 (3) *Hydra* shows beginning of nervous system
 (4) *Obelia* is solitary & sessile
185. Digestion of food in *Hydra* is
 (1) Extracellular
 (2) Intracellular
 (3) First extracellular and then intercellular
 (4) Parasitic
186. Which of the following sponge has a definite body shape ?
 (1) *Spongilla* (2) *Euplectella*
 (3) *Hyalonema* (4) *Euspongia*
187. Brain coral is
 (1) *Corallium*
 (2) *Gorgonia*
 (3) *Meandrina* (4) *Tubipora*
188. Locomotion is not connected with mating in
 (1) Earthworm (2) *Hydra*
 (3) Cockroach (4) Sponge
189. Symbiotic relationship with Hermit crab *Eupagurus* is shown by
 (1) *Adamsia* (2) *Acropora*
 (3) *Antipathes* (4) *Millipora*
190. The needle-like process of a cnidocyte is called
 (1) Lasso (2) Nematocysts
 (3) Cnidocil (4) Trichocyst

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191. Tentacles of *coelenterates* help in
 (1) Food capture (2) Locomotion
 (3) Defence (4) All of these
192. Largest nematocyst of *Hydra is*
 (1) Penetrant (2) Volvent
 (3) Holotrichous isorhiza (4) Atrichous isorhiza
193. Correct order of complexity of canal system is
 (1) Ascon–Sycon–Leucon
 (2) Rhagon–Sycon–Leucon
 (3) Sycon–Leucon–Ascon
 (4) Sycon–Leucon–Rhagon
194. Sensory organs Rhopalium are found in
 (1) *Hydra* (2) *Aurelia*
 (3) *Plysalia* (4) *Vellela*
195. Sea anemone belongs to the class
 (1) Schyphozoa (2) Hydrozoa
 (3) Coelenterata (4) Anthozoa
196. Which of the coral is solitary?
 (1) *Acropora* (2) *Corallium*
 (3) *Fungia* (4) *Tubipora*
197. Portuguese-Man-of-War is a
 (1) Colonial, monomorphic coelenterate
 (2) Polymorphic coelenterate
 (3) Coral (4) Sea Anemone
198. Which one of these is a calcareous sponge?
 (1) *Leucosolenia* (2) *Hyalonema*
 (3) *Euspongia* (4) *Euplectella*
199. Which of the following pairs is not correctly matched?
 (1) Amoebocyte : Transport food to nonfeeding cells
 (2) Collar cells : Movement of water and filtering food
 (3) Osculum : Control of water entry
 (4) Spicules : Skeletal supporting element
200. In sponges prosopyle is:
 (1) Contractile element at the osculum
 (2) Small canal which connects incurrent canal with radial canal
 (3) Cells which form lining of spongocoel
 (4) Cell at the opening of incurrent canal

b G b G b G b

TEST NO. : 2**ANSWERS**

1. (2)	41. (1)	81. (3)	121. (2)	161. (4)
2. (1)	42. (2)	82. (4)	122. (1)	162. (4)
3. (2)	43. (4)	83. (1)	123. (2)	163. (2)
4. (2)	44. (1)	84. (3)	124. (4)	164. (3)
5. (1)	45. (4)	85. (4)	125. (4)	165. (2)
6. (1)	46. (4)	86. (3)	126. (3)	166. (4)
7. (1)	47. (3)	87. (1)	127. (3)	167. (4)
8. (1)	48. (3)	88. (2)	128. (3)	168. (3)
9. (1)	49. (2)	89. (4)	129. (3)	169. (3)
10. (1)	50. (3)	90. (1)	130. (1)	170. (2)
11. (2)	51. (4)	91. (1)	131. (3)	171. (1)
12. (4)	52. (2)	92. (3)	132. (3)	172. (3)
13. (4)	53. (3)	93. (2)	133. (2)	173. (2)
14. (3)	54. (4)	94. (3)	134. (2)	174. (1)
15. (2)	55. (4)	95. (1)	135. (4)	175. (4)
16. (4)	56. (1)	96. (2)	136. (4)	176. (4)
17. (3)	57. (2)	97. (1)	137. (4)	177. (4)
18. (3)	58. (3)	98. (2)	138. (3)	178. (1)
19. (1)	59. (2)	99. (1)	139. (1)	179. (1)
20. (1)	60. (3)	100. (1)	140. (4)	180. (4)
21. (1)	61. (4)	101. (1)	141. (1)	181. (1)
22. (3)	62. (3)	102. (1)	142. (2)	182. (3)
23. (1)	63. (4)	103. (3)	143. (1)	183. (1)
24. (4)	64. (1)	104. (3)	144. (2)	184. (1)
25. (4)	65. (2)	105. (3)	145. (1)	185. (3)
26. (3)	66. (3)	106. (4)	146. (1)	186. (2)
27. (4)	67. (2)	107. (2)	147. (1)	187. (3)
28. (3)	68. (1)	108. (2)	148. (1)	188. (2)
29. (2)	69. (2)	109. (3)	149. (4)	189. (1)
30. (2)	70. (1)	110. (4)	150. (3)	190. (3)
31. (1)	71. (1)	111. (3)	151. (3)	191. (4)
32. (2)	72. (2)	112. (3)	152. (3)	192. (1)
33. (2)	73. (3)	113. (2)	153. (2)	193. (1)
34. (4)	74. (2)	114. (3)	154. (3)	194. (2)
35. (1)	75. (2)	115. (3)	155. (2)	195. (4)
36. (4)	76. (4)	116. (1)	156. (1)	196. (3)
37. (2)	77. (1)	117. (4)	157. (2)	197. (2)
38. (3)	78. (1)	118. (2)	158. (3)	198. (1)
39. (3)	79. (2)	119. (4)	159. (3)	199. (3)
40. (3)	80. (4)	120. (1)	160. (3)	200. (2)