

Date: 06/11/2016

Max. Marks: 100

SOLUTIONS

Time allowed: 90 mins

51. A satellite having circular orbit about the earth has a kinetic energy E_x . What is the minimum amount of energy to be added so that it escapes from the earth.

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

Ans. (4)

Sol. Kinetic energy of satellite = $E_x = \frac{1}{2} mv^2$

$$E_x = \frac{GMm}{2r} \quad \because \left[\frac{GMm}{r^2} = \frac{mv^2}{r} \right] = v = \sqrt{\frac{GM}{r}}$$

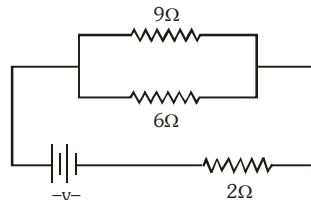
$$\text{Potential energy of satellite} = -\frac{GMm}{r}$$

$$\text{Total energy of satellite} = \frac{GMm}{2r} - \frac{GMm}{r} = -\frac{GMm}{r}$$

$$W = 0 - \left(-\frac{GMm}{r} \right) = \frac{GMm}{r} = 2E_x$$

so the min energy to be added is E_x so that it escapes to from Earth.

52. If power dissipated in the 9Ω resistor in the circuit is 36 watt. The potential difference across the 2Ω resistor is-

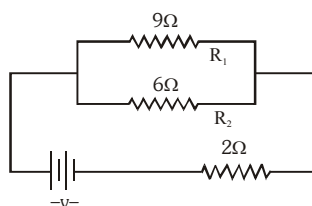


- (1) 4 volt (2) 8 volt (3) 10 volt (4) 2 volt

Ans. (3)

Sol. $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$

$$R = \frac{R_1 R_2}{R_1 + R_2} = \frac{9 \times 6}{15} = \frac{18}{5} \Omega$$



Voltage across 9Ω resistance
Power across $9\Omega = 36 W$

$$P = \frac{V^2}{R} \Rightarrow 36 = \frac{V^2}{9} \Rightarrow 36 \times 9 = V^2$$

$$V = 18 V$$

This voltage is across equivalent resistance R .

$$V = IR \Rightarrow 18 = I \times \frac{18}{5} \Rightarrow I = 5A$$

Voltage across 2Ω resistance

$$V = IR \Rightarrow V = 5 \times 2 \Rightarrow = 10 V$$

53. A ball is released from the top of tower of height h meter. It takes T seconds to reach the ground. What is the position of the ball at $T/3$ second ?

- (1) $\frac{h}{9}$ m from ground
 (2) $\frac{7h}{9}$ m from the ground
 (3) $\frac{8h}{9}$ m from ground
 (4) $\frac{17h}{9}$ m from the ground

Ans. (3)

Sol. $+h = -\frac{1}{2} gT^2 \quad \dots(1)$

Let be the distance covered in time $\frac{T}{3}$

$-h' = -\frac{1}{2} g\left(\frac{T}{3}\right)^2 \quad \dots(2)$

Dividing (1) & (2)

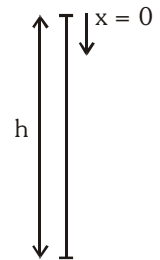
$$\frac{h}{h'} = \frac{\frac{1}{2} gT^2}{\frac{1}{2} g \frac{T^2}{9}}$$

$h = 9h'$

$h' = \frac{h}{9}$

But this is the height calculated from the top of the tower

\therefore Distance from the ground is $h - \frac{h}{9}$
 $= \frac{8h}{9}$



54. A particle undergo uniform circular motion. About which point on the plane of the circle will the angular momentum of the particle remains conserved.

- (1) Centre of the circle
 (2) On the circumference of circle
 (3) Inside the circle
 (4) Outside the circle

Ans. (1)

Sol. Angular momentum

$L = mvr$

r is equal for centre of the circle.

Angular momentum L will remain conserved only about the centre of the circle.

55. A body has mass 100 kg, what work has to done to increase its velocity from 2m/s to 6m/s.

- (1) 100 J
 (2) 200 J
 (3) 1600 J
 (4) 600 J

Ans. (3)

Sol. Work done = change in K.E

$= \frac{1}{2} mv^2 - \frac{1}{2} mu^2$

$\frac{1}{2} m(v^2 - u^2)$

$m = 100 \text{ kg}, v = 6 \text{ m/s}, u = 2 \text{ m/s}$

$W = \frac{1}{2} \times 100(36 - 4)$

$= \frac{1}{2} \times 100 \times 32 = 1600 \text{ J}$

56. 1 dioptre is the power of a lens whose focal length is
 (1) 2m (2) 1m (3) 3m (4) 1.5 m

Ans. (2)

Sol. $P = \frac{1}{f}$

$$1 = \frac{1}{f}$$

$$f = 1\text{m}$$

57. The essential difference between AC generator and DC generator is -

- (1) DC generator will generate a higher voltage.
 (2) AC generator will generate a higher voltage.
 (3) AC generator has slip rings while DC generator has a commutator.
 (4) AC generator has electric magnet where as DC generator has permanent magnet.

Ans. (3)

Sol. The slip rings are used in AC generator therefore option (3) is the answer.

58. A bullet of mass 60 gm moving with the velocity of 500 m/s is brought to rest in 0.01 sec. Its impulse will be

- (1) 40 Ns (2) -30 Ns (3) -20 Ns (4) +30 Ns

Ans. (2)

Sol. Force = $\frac{\text{Change in momentum}}{\text{time taken}}$

$$= \frac{mv - mu}{t}$$

$$= \frac{m(v - u)}{t}$$

$$= \frac{60}{1000} \frac{(0 - 500)}{0.01}$$

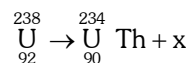
$$\text{Force} = \frac{6}{100} \times \frac{-500}{0.01} = \frac{-30}{0.01}$$

$$\text{Impulse} = \text{force} \times \text{time}$$

$$= \frac{-30}{0.01} \times 0.01$$

$$= -30 \text{ Ns.}$$

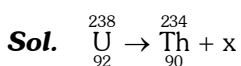
59. The radioactive decay of Uranium into Thorium is represented by equation.



What will be x?

- (1) electron (2) proton (3) alpha particle (4) neutron

Ans. (3)



$$x = {}_2^4\text{He} = \alpha \text{ particle}$$

60. Two bobs of masses 1 kg and 2 kg are suspended from a rigid support by threads of length 4 m and 1 m respectively. Find the ratio of their time period.

- (1) 4 (2) 8 (3) 2 (4) 12

Ans. (3)

Sol. $T = 2\pi\sqrt{\frac{\ell}{g}}$

$$T_1 = 2\pi\sqrt{\frac{\ell_1}{g}} = 2\pi\sqrt{\frac{4}{g}}$$

$$T_2 = 2\pi\sqrt{\frac{\ell_2}{g}} = 2\pi\sqrt{\frac{1}{g}}$$

$$\frac{T_1}{T_2} = \frac{2\pi\sqrt{\frac{4}{g}}}{2\pi\sqrt{\frac{1}{g}}} = \frac{2}{1}$$

61. An electron and proton enter a magnetic field with equal velocities. Which one of them experiences more force.

- (1) Electron (2) Proton
(3) It cannot be predicted (4) Both experiences same force

Ans. (4)

Sol. $F = qvB \sin\theta$

\therefore Both electron and proton will experience same force (magnitude).

62. Where should an object be placed in front of convex lens to get a real image of the same size of the object

- (1) At the principal focus of the lens
(2) At twice the focal length
(3) At infinity
(4) Between optical centre of the lens and its principal focus

Ans. (2)

Sol. By property of centre of curvature, if an object is placed in the front of the convex lens at a distance twice its focal length, a real image is formed at the same distance behind the lens and it is of the same size as that of object. To

verify we can use $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$.

63. The value of 45°C temperature in Fahrenheit will be

- (1) 118°F (2) 113°F (3) 120°F (4) 115°F

Ans. (2)

Sol. $F = \frac{9}{5}C + 32$

C = 45°C given

$$F = \frac{9}{5} \times 45 + 32$$

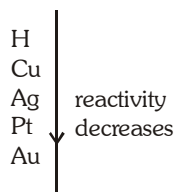
$$= 81 + 32$$

$$= 113^\circ\text{F}$$

- 64.** You are given a solution of AgNO_3 which of the following do you think cannot displace, Ag from AgNO_3 , solution.
 (1) Magnesium (2) Zinc (3) Gold (4) Copper

Ans. (3)

Sol. Reactivity order of metals.



less reactive element cannot displace more reactive element from its solution.

- 65.** The atomic number of four elements A, B, C, D are 6, 8, 10, 12 respectively. The two elements which can react to form an ionic bond are-
 (1) A and D (2) B and C (3) A and C (4) B and D

Ans. (4)

Sol. Ionic bond a bond which is formed between metals and non-metals by complete transfer of electrons.

Atomic number (8) – O

Atomic number (12) – Mg



MgO is a ionic compound

- 66.** Out of the following pair of compounds the unsaturated compounds are-
 (1) C_2H_6 and C_4H_6 (2) C_6H_{12} and C_5H_{12} (3) C_4H_6 and C_6H_{12} (4) C_2H_6 and C_4H_{10}

Ans. (3)

Sol. Unsaturated compounds having general formula C_nH_{2n} or $\text{C}_n\text{H}_{2n-2}$

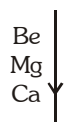
$\text{C} = 4 \Rightarrow \text{C}_4\text{H}_6$

$\text{C} = 6 \Rightarrow \text{C}_6\text{H}_{12}$

- 67.** Which of following set of elements is written in order of their increasing metallic character?
 (1) Mg, Al, Si (2) C, O, N (3) Na, Li, K (4) Be, Mg, Ca

Ans. (4)

Sol. Metallic characters increases when we move in group from top to bottom.



- 68.** Which of the following statements are correct about properties of colloids?
 (a) A colloid is a Homogeneous mixture.
 (b) The size of particles of a colloid is too small to be individually seen by naked eye.
 (c) Colloids are big enough to scatter a beam of light passing through it & make its path visible.
 (1) a, b, c are correct (2) b and c are correct
 (3) a and b are correct (4) a and c are correct

Ans. (2)

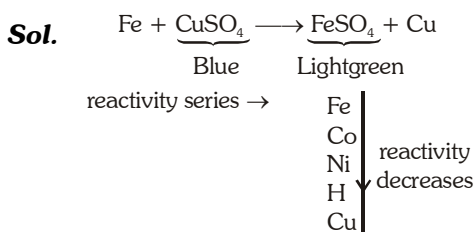
Sol. Colloidal solution is heterogeneous in nature.

69. Assertion (A) : When we dip Iron nail into CuSO_4 Solution the colour of solutions changes.

Reason (R) : Copper is less reactive than iron.

- (1) Both A and R are correct but R is not correct reason for A
- (2) Both A and R are correct, R is correct reason for A.
- (3) A is correct and R is incorrect.
- (4) A is incorrect and R is correct.

Ans. (2)

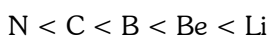


70. Arrange the Li, Be, B, C, N elements according to increasing order of atomic radii.

- (1) $\text{N} < \text{C} < \text{B} < \text{Be} < \text{Li}$
- (2) $\text{C} < \text{Li} < \text{N} < \text{Be} < \text{B}$
- (3) $\text{Li} < \text{Be} < \text{B} < \text{C} < \text{N}$
- (4) $\text{B} < \text{Be} < \text{Li} < \text{C} < \text{N}$

Ans. (1)

Sol. When we move left to right in a period atomic radii decreases.



71. Elements A, B, C having positions in periodic table-

Group 16

B

Group 17

A

C

- (a) A is a metal
 - (b) C is smaller in size as compared to B
 - (c) Element A gives negatively charged ion
- (1) a, b and c are correct
 - (2) only b and c are correct
 - (3) only b is correct
 - (4) a and c are correct

Ans. (2)

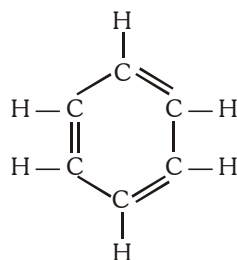
Sol. (a) Element A is halogen. It is not metal.
 (b) When we move left to right in a period atomic radii decreases $\text{C} < \text{B}$
 (c) Element A is non-metal so it forms negatively charged ion.

72. Which of the following is having maximum double bonds-

- (1) Propanone
- (2) Benzene
- (3) Propene
- (4) Propanol

Ans. (2)

Sol. Benzene has 3 double bonds in alternate order.



73. Carbon atom in graphite is combined with how many other carbon atoms-

- (1) 1 (2) 2 (3) 3 (4) 4

Ans. (3)

Sol. In graphite, carbon atoms are arranged in a hexagonal pattern in parallel planes. In a layer of graphite each carbon atom is strongly bonded to three carbon atoms by covalent bonds.

74. A solution contains 58.5 gm of common salt in 360 gm of water calculate the total number of protons in solution.

- (1) $21 \times 6.023 \times 10^{23}$ (2) $22.8 \times 6.023 \times 10^{23}$ (3) $200 \times 6.023 \times 10^{23}$ (4) $228 \times 6.023 \times 10^{23}$

Ans. (4)

Sol. $n_{\text{NaCl}} = \frac{58.5}{58.5} = 1 \text{ mole}$

$$n_{\text{H}_2\text{O}} = \frac{360}{18} = 20 \text{ mole}$$

$$\begin{aligned} \text{Total number of protons} &= 28N_A + 20 \times 10N_A \\ &= 228N_A \\ &= 228 \times 6.023 \times 10^{23} \end{aligned}$$

75. A solution of calcium hydroxide is used for white washing walls. After two to three days of white washing, walls start shining due to formation of compound.

- (1) CaO (2) CaCO₃ (3) CaSO₄ (4) Ca(HCO₃)₂

Ans. (3)

Sol. $\text{Ca(OH)}_2 + \text{CO}_2 \longrightarrow \text{CaCO}_3 + \text{H}_2\text{O} \uparrow$

76. Which mass of O₂ (Oxygen molecule) will contain the same number of molecules as 2.5 moles of Cl₂?

- (1) 180 gm (2) 100 gm (3) 71 gm (4) 80 gm

Ans. (NA)

Sol. $N = 2.5N_A$

$$n = \frac{N}{N_A} = \frac{\text{mass}}{\text{molecular mass}}$$

Molecular mass of O₂ = 32

$$\frac{2.5N_A}{N_A} = \frac{\text{mass}}{32}$$

mass of O₂ = 80 g.

No such option is correct.

77. Which one of the following statement is true?

- (1) In humans there are two pairs of sex chromosome.
(2) A child who inherits an x chromosome from father will be a boy.
(3) A child who inherits an y chromosome from father will be a girl.
(4) A child who inherits an x chromosome from father will be a girl.

Ans. (4)

Sol. Sex chromosome which comes from the father to child, determine the sex of child because the chromosome comes from mother to child is always x. If x chromosome comes from the father to child then sex chromosome in child will be xx (girl child). If y chromosome comes from the father to child then sex chromosome in child will be xy (boy child).

78. The Pancreas secretes pancreatic juice which contains _____ enzyme for digesting proteins.
 (1) Lipase (2) Amylase (3) Zymase (4) Trypsin

Ans. (4)

Sol. Trypsin enzyme is for digestion of protein in pancreas.

79. Involuntary actions including blood pressure, salivation and vomiting are controlled by-
 (1) Cerebellum (2) Pons (3) Cerebrum (4) Medulla

Ans. (4)

Sol. Hind part of the brain medulla oblongata controls the involuntary actions.

80. The correct pathway of blood in circulatory system is

- (1) Auricles → Ventricles → Arteries → Veins
- (2) Ventricles → Auricles → Veins → Arteries
- (3) Ventricles → Veins → Arteries → Auricles
- (4) Veins → Ventricles → Arteries → Auricles

Ans. (1)

Sol. Deoxygenated blood enters from right atrium to right ventricle. Then from right ventricle to lungs through pulmonary artery and from lungs to left atrium through pulmonary vein.

81. Heart muscle cells are

- (1) Round, unbranched, uninucleate
- (2) Non cylindrical, branched and uninucleate
- (3) Cylindrical, unbranched and multi nucleate
- (4) Cylindrical, branched and uniunucleate

Ans. (4)

Sol. The involuntary cardiac muscles show rhythmic contraction and relaxation through out the life and are cylindrical, branched and uninucleate.

82. Which of the following is the correct features of 'Lymph'?

- (1) It is similar to the plasma of blood, colourless and contains less protein.
- (2) Similar to the WBC of blood, colourless and contain more protein.
- (3) Similar to the RBC of blood and red in colour.
- (4) It contains more fat.

Ans. (1)

Sol. Lymph is a yellowish fluid which contains blood plasma along with WBC, lack RBC's and have some proteins.

83. Match the item in coloum-I with those in column-II and select the correct choice.

Column-I	Column-II
(A) Food chain	(1) Elephant
(B) Food web	(2) Jackal
(C) Herbivore	(3) Series of organism feeding on one another
(D) Carnivore	(4) Inter linked food chain

- (1) A-3 ; B-4 ; C-1 ; D-2 (2) A-2 ; B-1 ; C-3 ; D-4 (3) A-1 ; B-2 ; C-3 ; D-4 (4) A-4 ; B-3 ; C-2 ; D-1

Ans. (1)

Sol. Food chain is series of organism feeding on one another.

Food web is inter linked food chain.

Elephant is herbivore.

Jackal is carnivore.

84. Which of the following is not a part of the female reproductive system in human beings?
 (1) Ovary (2) Uterus (3) Vasdeferens (4) Fallopian tube

Ans. (3)

Sol. Ovaries fallopian tubes, uterus, cervix and vagina are the parts of female reproductive system. Vasdeferens is not the part of female reproductive system. It is a part of male reproductive system.

85. _____ smoothens bone surface at joints and is also present in the nose, ear, trachea & larynx.
 (1) Tendons (2) Ligament (3) Areolar tissues (4) Cartilage

Ans. (4)

Sol. Cartilage is present in nose, ear, trachea and larynx.

86. Which of the following plant group bear naked seeds and usually perennial, evergreen and woody are
 (1) Pteridophyta (2) Gymnosperm (3) Bryophyte (4) Angiosperms

Ans. (2)

Sol. Gymnosperms bear naked seeds and usually perennial, evergreen and woody.

87. The site for complete digestion of carbohydrates, proteins and fats is
 (1) Large intestine (2) Stomach (3) Small intestine (4) Mouth

Ans. (3)

Sol. Digestion and absorption of food is completed in small intestine.

88. Which of the following are characteristic features of cells of Meristematic tissues
 (1) Actively dividing cells with dense cytoplasm, thick cell wall and prominent nuclei.
 (2) Actively dividing cells with dense cytoplasm, thin cell wall and no vacuoles.
 (3) Actively dividing cells with little cytoplasm, thin cell wall and prominent nuclei.
 (4) Actively dividing cells with thin cytoplasm, thin cell wall and no vacuoles.

Ans. (2)

Sol. Meristematic tissue is an undifferentiated tissue which have the power of division.

89. Potato and runners of grass is an example of
 (1) Homologous organs (2) Analogous organs (3) Vestigial organs (4) Atavism

Ans. (1)

Sol. Potato and runners of grass both are stems, therefore, are considered as homologous organs.

90. Which of the following are sensitive to sulphur dioxide
 (1) Algae (2) Lichens (3) Mosses (4) Ferns

Ans. (2)

Sol. Lichens (algae + fungus) is used as a pollution indicators as it is sensitive to sulphur dioxide.

91. If $\frac{37}{13} = 2 + \frac{1}{x + \frac{1}{y + \frac{1}{z}}}$

Where x, y, z are integers, then the value of x + y + z is

(1) 6 (2) 8 (3) 7 (4) -2

Ans. (2)

Sol. $\frac{37}{13} = 2 + \frac{1}{x + \frac{1}{y + \frac{1}{z}}} = 2 + \frac{11}{13} = 2 + \frac{1}{11}$

$\therefore x + \frac{1}{y + \frac{1}{z}} = \frac{13}{11} = 1 + \frac{2}{11} = 1 + \frac{1}{\frac{11}{2}} \Rightarrow x = 1$

$\therefore y + \frac{1}{z} = \frac{11}{2} = 5 + \frac{1}{2}$

$\therefore y = 5, z = 2$

$\therefore x + y + z = 1 + 5 + 2 = 8$

- 92.** If $\sin x = \cos^2 x$, then the value of $\cos^2 x (1 + \cos^2 x)$ will be
 (1) 1 (2) 0 (3) 2 (4) -1

Ans. (1)

Sol. $\cos^2 x (1 + \cos^2 x) = \sin x (1 + \sin x) = \sin x + \sin^2 x = \cos^2 x + \sin^2 x = 1$

- 93.** If α and β are roots of $a(x^2 - 1) + 2bx = 0$ and the quadratic equation whose roots are $2\alpha - \frac{1}{\beta}$ and $2\beta - \frac{1}{\alpha}$ is $px^2 + qx + r = 0$ then $p + q + r$ is equal to
 (1) $2b$ (2) $6a - 8b$ (3) $6b - 8a$ (4) 0

Ans. (3)

Sol. $a(x^2 - 1) + 2bx = 0 \Rightarrow ax^2 + 2bx - a = 0$

$$\alpha + \beta = \frac{-2b}{a}; \alpha\beta = -1$$

$$\left(2\alpha - \frac{1}{\beta}\right) + \left(2\beta - \frac{1}{\alpha}\right) = 2(\alpha + \beta) - \left(\frac{1}{\alpha} + \frac{1}{\beta}\right) \Rightarrow \frac{-4b}{a} - \frac{2b}{a} = \frac{-6b}{a}$$

$$\left(2\alpha - \frac{1}{\beta}\right) \left(2\beta - \frac{1}{\alpha}\right) = 4\alpha\beta - \frac{1}{\alpha} - \frac{1}{\beta} + \frac{1}{\alpha\beta} \Rightarrow -9$$

$$\text{Required equation} \Rightarrow x^2 - \left(-\frac{6b}{a}\right)x - 9 = 0$$

On equating $p = a$, $q = 6b$, $r = -9a$

$$p + q + r = a + 6b - 9a = 6b - 8a$$

- 94.** If S_n denotes the sum of first n terms of an AP, then the value of $[(S_{3n} - S_{3n-1}) - (S_{2n} - S_{2n-1})]$ will be
 (1) $S_n - S_{n-1}$ (2) nd (3) 0 (4) $S_{3n} - S_n$

Ans. (2)

Sol. $(S_{3n} - S_{3n-1}) - (S_{2n} - S_{2n-1})$
 $= a_{3n} - a_{2n} = a + (3n - 1)d - a - (2n - 1)d = nd$

- 95.** Two dice are thrown at the same time and product of numbers appearing on them is noted. Probability that the product is less than 9 will be

- (1) $\frac{1}{36}$ (2) $\frac{4}{9}$ (3) $\frac{17}{36}$ (4) $\frac{2}{9}$

Ans. (2)

Sol. Product

1	(1, 1)
2	(1, 2), (2, 1)
3	(1, 3), (3, 1)
4	(1, 4), (4, 1), (2, 2)
5	(1, 5), (5, 1)
6	(1, 6), (6, 1), (2, 3), (3, 2)
7	×
8	(2, 4), (4, 2)

$$\therefore P(E) = \frac{16}{36} = \frac{4}{9}$$

- 96.** If arithmetic mean of numbers $x_1, x_2, x_3, x_4, \dots, x_n$ is \bar{x} than arithmetic mean of numbers $ax_1 + b, ax_2 + b, ax_3 + b, \dots, ax_n + b$ where a and b are constants, will be

- (1) \bar{x} (2) $na\bar{x} + nb$ (3) $a\bar{x}$ (4) $a\bar{x} + b$

Ans. (4)

Sol. $x_1 + x_2 + \dots + x_n = n\bar{x}$

$$\frac{(ax_1 + b) + (ax_2 + b) + \dots + (ax_n + b)}{n} = a\bar{x} + b$$

97. The average score of boys in class X in an exam is 71 and that of the girls in that class is 73. If the average score of class X in that exam is 71.8 find the ratio of number of boys to number of girls in that class.

- (1) 1 : 2 (2) 2 : 1 (3) 2 : 3 (4) 3 : 2

Ans. (4)

Sol. Boys $\rightarrow x$, total marks of boys = 71x

girls $\rightarrow y$, total marks of girls = 73y

total marks = 71.8 (x + y) = 71x + 73y

$$0.8x = 1.2y$$

$$\frac{x}{y} = \frac{3}{2}$$

98. The altitude of an equilateral triangle is p cm. The area of this triangle is

- (1) $p^2 \text{ cm}^2$ (2) $\frac{\sqrt{3}}{2} p^2 \text{ cm}^2$ (3) $\frac{p^2}{\sqrt{3}} \text{ cm}^2$ (4) $\frac{\sqrt{3}}{4} p^2 \text{ cm}^2$

Ans. (3)

Sol. $\frac{\sqrt{3}}{2} \times \text{side} = p$

$$\text{side} = \frac{2p}{\sqrt{3}}$$

$$\text{Area} = \frac{\sqrt{3}}{4} \times \frac{4p^2}{3} = \frac{p^2}{\sqrt{3}}$$

99. The sum of all two digit natural numbers which are divisible by 7 is

- (1) 743 (2) 700 (3) 728 (4) 735

Ans. (3)

Sol. 14, 21, 28, ..., 98

$$98 = 14 + (n - 1) 7$$

$$\frac{84}{7} = n - 1 \Rightarrow n = 13$$

$$\text{sum} = \frac{13}{2} (14 + 98)$$

$$= \frac{13}{2} (112)$$

$$= 728$$

100. The difference between two numbers 1365. When the larger number is divided by the smaller number, the quotient is 6 and remainder is 15. Find the smaller number.

- (1) 240 (2) 270 (3) 295 (4) 300

Ans. (2)

Sol. x, x + 1365

$$x + 1365 = x(6) + 15$$

$$1350 = 5x$$

$$x = 270$$

101. If 75% of a number is added to 75, then the result is number itself. The number is

- (1) 50 (2) 60 (3) 300 (4) 400

Ans. (3)

Sol. Let number be x

$$75\% \text{ of } x + 75 = x$$

$$x \times \frac{3}{4} + 75 = x$$

$$75 = \frac{x}{4}$$

$$x = 300$$

102. Find the product of $\sqrt[3]{3}, \sqrt[4]{3}, \sqrt[12]{243}$

- (1) $\sqrt{3}$ (2) 3 (3) $\sqrt[12]{3}$ (4) $\sqrt[4]{3}$

Ans. (2)

Sol. $(3)^{1/3} \times (3)^{1/4} \times (243)^{1/12}$
 $= (3^4)^{1/12} \times (3^3)^{1/12} \times (3^5)^{1/12}$
 $= (3^{12})^{1/12} = 3$

103. The sum of the ages of 5 children born at the intervals of 3 years each is 50 years. What is age of youngest child?

- (1) 4 years (2) 8 years (3) 10 years (4) 12 years

Ans. (1)

Sol. $x + (x + 3) + (x + 6) + (x + 9) + (x + 12) = 50$
 $5x = 20$
 $x = 4$

104. Which of the following trains is the fastest?

- (1) 25 m/sec (2) 1500 m/min (3) 90 km/sec (4) 100 km/sec

Ans. (4)

Sol. 100000 m per second

105. If $y = 5$, then what is the value of $10y \sqrt{y^3 - y^2}$?

- (1) $50\sqrt{2}$ (2) 100 (3) $200\sqrt{5}$ (4) 500

Ans. (4)

Sol. $10 \times 5 \sqrt{125 - 25}$
 $= 50 \times 10 = 500$

106. The mean of $1^2, 2^2, 3^2, 4^2, 5^2, 6^2, 7^2$, is

- (1) 10 (2) 20 (3) 30 (4) 40

Ans. (2)

Sol. $\frac{1^2 + 2^2 + \dots + 7^2}{7} = \frac{7(7+1)(14+1)}{6 \times 7} = \frac{7 \times 8 \times 15}{42} = 20$
 $\Sigma n^2 = \frac{n(n+1)(2n+1)}{6} = 1^2 + 2^2 + \dots + n^2$

107. Simplify : $3\sqrt{2} + \sqrt[4]{64} + \sqrt[4]{2500} + \sqrt[5]{8}$

- (1) $11\sqrt{2}$ (2) $11\sqrt[3]{2}$ (3) $\sqrt[3]{2}$ (4) $11\sqrt{4}$

Ans. (1)

Sol. $3\sqrt{2} + \sqrt{8} + \sqrt{50} + \sqrt{2}$
 $= 3\sqrt{2} + 2\sqrt{2} + 5\sqrt{2} + \sqrt{2}$
 $= 11\sqrt{2}$

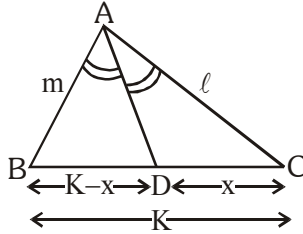
108. AD is bisector of $\angle A$ of $\triangle ABC$, which meets side BC at D. If $BC = K$ cm, $CA = \ell$ cm, and $AB = m$ cm, then the length of DC (in cm) is

- (1) $\frac{K\ell}{m+\ell}$ (2) $\frac{K(m+\ell)}{\ell}$ (3) $\frac{Km}{m+\ell}$ (4) $\frac{K(m+\ell)}{m}$

Ans. (1)

Sol. Let DC be x cm

$$\begin{aligned} \therefore \frac{AB}{AC} &= \frac{BD}{DC} \\ \frac{m}{\ell} &= \frac{K-x}{x} \\ mx &= \ell K - \ell x \\ x(m+\ell) &= \ell K \\ x &= \frac{\ell K}{m+\ell} \end{aligned}$$



109. If area of a sector of circle bounded by an arc of length 5π cm is equal to 20π cm² then its radius (in cm) is

- (1) 12 cm (2) 16 cm (3) 8 cm (4) 10 cm

Ans. (3)

Sol. $\ell = 5\pi$, $A = 20\pi$

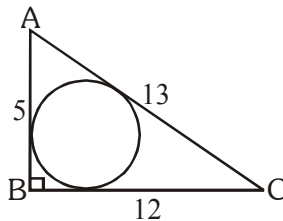
$$\begin{aligned} A &= \frac{\ell r}{2} \\ 20\pi &= \frac{5\pi \times r}{2} \\ r &= 8 \end{aligned}$$

110. In right angled triangle $\triangle ABC$, $\angle B = 90^\circ$, $AB = 5$ cm, $BC = 12$ cm, then the area of incircle of this triangle ABC will be

- (1) 4π cm² (2) 2π cm² (3) 13π cm² (4) 17π cm²

Ans. (1)

$$\begin{aligned} r &= \frac{\text{Area}}{\text{semi perimeter}} \\ &= \frac{\frac{1}{2} \times 12 \times 5}{\frac{1}{2}(5+12+13)} \\ &= \frac{60}{30} = 2 \\ \therefore \text{Area} &= \pi r^2 = 4\pi \end{aligned}$$



111. Why was the Vietnam war called the first television war?

- (1) Brought home stories from soldiers (2) Led to increase in sale of television sets
(3) Battle scenes were shown on daily news (4) Television was invented

Ans. (3)

Sol. Vietnam war was called the first television war

112. Who said these lines "whether I am a Hindu, a Mohammedan, a Parsi, a Christian or of any other creed, I am above all an Indian. Our country is India, Our Nationality is Indian?"

- (1) Dada Bhai Naoroji (2) Surenderanath Banerjee
(3) Gopal Krishna Gokhale (4) Pherozeshah Mehta

Ans. (1)

Sol. These lines were said by Dada Bhai Naoroji.

113. Under which ruler sculpture of four lions was built on Sarnath's Pillar ?
(1) Samudragupta (2) Ashoka (3) Chandragupta (4) Harshavardhana

Ans. (2)

Sol. Under Ashoka the sarnath pillar was constructed.

114. Who was the first Viceroy of India ?
(1) Lord Clive (2) Warren Hastings (3) Lord William Bentinck (4) Lord Canning

Ans. (2)

Sol. Warren Hastings was the first Viceroy of India.

115. To whom, Guru Gobind Singh Ji had written Zafarnama ?
(1) Babur (2) Aurangzeb (3) Humayun (4) Jahangir

Ans. (2)

Sol. Guru Gobind Singh Ji had written Zafarnama to Aurangzeb.

116. During India's freedom struggle which one of the following led to the first 'All India Hartal' ?
(1) Protest against Jaillanwala Bagh Massacre (2) Protest against Rowlatt Act
(3) Trial of Mahatma Gandhi (4) Arrival of Simon Commission

Ans. (2)

Sol. Rowlatt Act led to the first 'All India Hartal'.

117. In 1878 the Vernacular Press Act was modelled on the
(1) French Press Laws (2) British Press Laws
(3) Irish Press Laws (4) Scottish Press Laws

Ans. (3)

Sol. Vernacular Press Act was modelled on the Irish Press Laws.

118. Who was the famous Sultan of Lodhi Dynasty ?
(1) Sikander Lodhi (2) Ibrahim Lodhi
(3) Dilawar Khan Lodhi (4) Daulat Khan Lodhi

Ans. (1)

Sol. Sikander Lodhi was the famous Sultan of Lodhi Dynasty.

119. When was Nazi Party founded?
(1) 1917 (2) 1918 (3) 1920 (4) 1909

Ans. (3)

Sol. Nazi Party was founded in 1920.

120. Who had started Masand system ?
(1) Guru Har Rai Ji (2) Guru Angad Dev Ji (3) Guru Nanak Dev Ji (4) Guru Ramdas Ji

Ans. (4)

Sol. Masand system was started by Guru Ramdas Ji.

121. "Who said these words, 'Tremble, therefore, tyrants of the world' ?
(1) Robert Darnton (2) James Lackington
(3) Louise/Sebastien Mercier (4) Thomas Paine

Ans. (3)

Sol. Louise/Sebastien Mercier said these words.

122. Which among the following does not belong to the list of leading sugarcane producing states ?
(1) Uttar Pradesh (2) Andhra Pradesh
(3) Madhya Pradesh (4) Maharashtra

Ans. (3)

Sol. Madhya Pradesh does not belong to the list of leading sugarcane producing states.

123. In which Union Territory maximum area is under forest ?

- (1) Dadra and Nagar Haveli (2) Andaman and Nicobar Islands
(3) Delhi (4) Puducherry

Ans. (2)

Sol. Andaman and Nicobar Islands has maximum area under forest.

124. Which agent causes the formation of V-shaped valley ?

- (1) snow (2) wind (3) birds and animals (4) water

Ans. (4)

Sol. water causes the formation of V-shaped valley.

125. What type of soil is also known as 'Tea soil'?

- (1) mountain soil (2) marshy soil (3) desert soil (4) saline and alkaline soil

Ans. (1)

Sol. mountain soil is also known as 'Tea soil'.

126. Which of the following state has the highest density of roads?

- (1) Goa (2) Jammu and Kashmir
(3) Kerala (4) Haryana

Ans. (3)

Sol. Kerala has the highest density of roads.

127. What is the extent of 'Tropical Heat Zone' ?

- (1) $23\frac{1}{2}^{\circ}$ North to $23\frac{1}{2}^{\circ}$ South (2) $23\frac{1}{2}^{\circ}$ North to $66\frac{1}{2}^{\circ}$ North
(3) $23\frac{1}{2}^{\circ}$ South to $66\frac{1}{2}^{\circ}$ South (4) $66\frac{1}{2}^{\circ}$ North to $66\frac{1}{2}^{\circ}$ South

Ans. (1)

Sol. $23\frac{1}{2}^{\circ}$ North to $23\frac{1}{2}^{\circ}$ South is the extent of 'Tropical Heat Zone'.

128. For which of the following industry, 'Dhariwal' is famous as an important centre/place.

- (1) Cotton Textile Industry (2) Woolen Industry (3) Jute Industry (4) Silk Industry

Ans. (2)

Sol. 'Dhariwal' is famous as an important centre/place for woollens.

129. Which of the major port of India is located in Sundarbans Delta?

- (1) Kandla (2) Mumbai (3) Chennai (4) Haldia

Ans. (4)

Sol. Haldia is located in Sundarbans Delta.

130. Which of the following place is influenced by retreating or eastern monsoon ?

- (1) Amritsar (2) Chennai (3) Mumbai (4) Shimla

Ans. (2)

Sol. Chennai is influenced by retreating or eastern monsoon.

131. Which of the following states are the major producer of copper ?

- (1) Rajasthan and Madhya Pradesh (2) Odisha and Rajasthan
(3) Maharashtra and Gujarat (4) Madhya Pradesh and Gujarat

Ans. (1)

Sol. Rajasthan and Madhya Pradesh are the major producer of copper.

132. Hyderabad is the capital of which state?

- (1) Telangana (2) Andhra Pradesh (3) Karnatka (4) Tamilnadu

Ans. (1)

Sol. Hyderabad is the capital of both Telangana and Andhra Pradesh.

133. Who gave idea to establish the 'Lok Adalat?
(1) Sh. P. N. Bhagwati (2) Dr. B.R. Ambedkar (3) Sh. Lal Bahadur Shastri (4) Dr. T.N. Sheshan

Ans. (1)

Sol. Sh. P. N. Bhagwati gave idea to establish the 'Lok Adalat.

134. Which words were included in preamble of Indian constitution by 42nd amendment in 1976?

- (1) Directive Principles (2) Democratic and Republic
(3) We the people of India (4) Socialist, secular and unity of country

Ans. (4)

Sol. Socialist, secular and unity of country were included in preamble of Indian constitution by 42nd amendment in 1976.

135. Which fundamental right is considered as the 'Pillar of Democracy'?

- (1) Right to equality (2) Right to religious freedom
(3) Right to freedom (4) Right to constitutional remedies

Ans. (3)

Sol. Right to freedom is considered as the 'Pillar of Democracy.

136. How many members does Punjab send for Lok Sabha and Rajya Sabha?

- (1) Lok Sabha - 13 Rajya Sabha-7
(2) Lok Sabha - 7 Rajya Sabha-13
(3) Lok Sabha - 117 Rajya Sabha-245
(4) Lok Sabha - 545 Rajya Sabha-12

Ans. (1)

Sol. Lok Sabha - 13, Rajya Sabha-7

137. Which rights are not given to foreigners?

- (1) Economic Rights (2) Social Rights (3) Political Rights (4) Civil Rights

Ans. (3)

Sol. Political Rights are not given to foreigners.

138. Who is the chairman of the Rajya Sabha?

- (1) Speaker (2) Vice-President (3) President (4) Prime-Minister

Ans. (2)

Sol. Vice-President is the chairman of the Rajya Sabha

139. Who can transfer a Governor from one state to another ?

- (1) Prime-Minister (2) Parliament (3) President (4) Supreme Court

Ans. (3)

Sol. President can transfer a Governor from one state to another.

140. Which Indian Leader gave the idea of two nations nation before independence ?

- (1) Mahatma Gandhi (2) Jawahar Lal Nehru (3) Liyakat Ali (4) Mohd. Ali Jinah

Ans. (4)

Sol. Mohd. Ali Jinah is the Indian Leader who gave the idea of two nations nation before independence.

141. How many countries are the member of U.N.O. (United Nations) at present ?

- (1) 193 (2) 150 (3) 51 (4) 182

Ans. (1)

Sol. 193 countries are the member of U.N.O. (United Nations) at present.

142. India opposes strongly

- (1) United Nations (2) World peace
(3) Racialism and Apartheid policy (4) Common Wealth of Nations

Ans. (3)

Sol. India opposes Racialism and Apartheid policy.

143. Which equation is true ?

$$(1) \text{ Real Wages} = \frac{\text{Price Index}}{\text{Money Wages}} \times 100$$

$$(2) \text{ Real Wages} = \frac{\text{Money Wages}}{\text{Price Index}} \times 100$$

$$(3) \text{ Real Wages} = \frac{\text{Money wages} \times \text{Price Index}}{100}$$

$$(4) \text{ Real Wages} = \frac{\text{Money Wages}}{\text{Price Index}}$$

Ans. (2)

144. Economic activities are not related to

- (1) Production, consumption and work of House wife.
- (2) Production, consumption and exchange.
- (3) Production, exchange and distribution.
- (4) Consumption, exchange and distribution.

Ans. (1)

Sol. Economic activities are not related to Production, consumption and work of House wife.

145. Socialist Economy has features

- (A) Govt. Control
- (B) Collective ownership
- (C) Competition
- (D) Freedom of market forces
- (E) Social welfare

Which one is true

- (1) A, B and C
- (2) A, B and D
- (3) A, B and E
- (4) B, C and D

Ans. (3)

Sol. Govt. Control, Collective ownership, Social welfare are the features of socialist economy.

146. On the basis of ownership types of Economics are

- (1) Developed, mixed & capitalistic
- (2) Capitalistic, developed and socialistic
- (3) Mixed, developed and under developed
- (4) Socialistic, capitalistic and mixed

Ans. (4)

Sol. Socialistic, capitalistic and mixed.

147. In India which one is not an indicator of level of economic development

- (1) Per capita income
- (2) Expectation of life
- (3) Population
- (4) Literacy rate

Ans. (3)

Sol. Population is not an indicator of level of economic development.

148. How many banks were nationalised by Govt. of India 1980 ?

- (1) 12
- (2) 14
- (3) 7
- (4) 8

Ans. (4)

Sol. 8 banks were nationalised by Govt. of India 1980.

149. Which of the following organisation looks after the credit needs of Agriculture and Rural Development in India ?

- (1) FCI
- (2) IDBI
- (3) NABARD
- (4) ICAR

Ans. (3)

Sol. NABARD looks after the credit needs of Agriculture and Rural Development in India.

150. When there is investment made in the form of education training medical care the population becomes.

- (1) working capital
- (2) human capital
- (3) fixed capital
- (4) capital growth

Ans. (2)

Sol. When investment is made in the form of education training medical care the population becomes human capital.