

Date: 08/11/2015

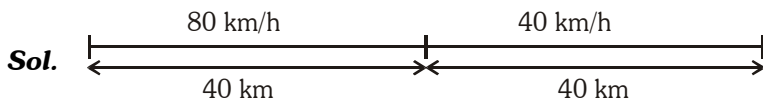
Max. Marks: 100

## SOLUTIONS

Time allowed: 90 mins

1. A car travels 40 kms at an average speed of 80 km/h and then travels 40 kms at an average speed of 40 km/h. The average speed of the car for this 80 km trip is  
 (1) 40 km/h                      (2) 45 km/h                      (3) 48 km/h                      (4) 53 km/h.

Ans. (4)



$$t_1 = \frac{\text{distance}}{\text{speed}} = \frac{40}{80} = 0.5 \text{ hr}$$

$$t_2 = \frac{\text{distance}}{\text{speed}} = \frac{40}{40} = 1 \text{ hr}$$

$$\text{Average speed} = \frac{\text{Total distance}}{\text{Total time}} = \frac{80 \text{ km}}{1.5 \text{ hr}} = 53.33 \text{ km/h} \approx 53 \text{ km/h}$$

2. The term 'mass' refers to the same physical concept as  
 (1) weight                      (2) inertia                      (3) force                      (4) acceleration.

Ans. (2)

Sol. The term mass refers to the same physical concept as inertia.

3. A 5.0 kg object is moving horizontally at 6.0 m/s. In order to change its speed to 10.0 m/s, the net work done on the object must be  
 (1) 40 J                      (2) 90 J                      (3) 160 J                      (4) 20 J.

Ans. (3)

Sol. Work done =  $\Delta KE$

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

$$= \frac{1}{2} \times 5 \times (10^2 - 6^2) = \frac{1}{2} \times 5 \times 64 = 160 \text{ J}$$

4. The momentum of an object at a given instant is independent of its  
 (1) inertia                      (2) speed                      (3) velocity                      (4) acceleration

Ans. (4)

Sol. The momentum of a body is the product of its mass and its velocity at that instant. The momentum of an object at a given instant is independent of its acceleration.

5. The pressure exerted on the ground by a man is greatest when  
 (1) he stands with both feet flat on ground                      (2) he stands flat on one foot  
 (3) he stands on the toes of one foot                      (4) all the above yield the same pressure.

**Ans. (3)**

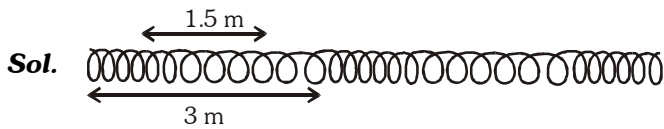
**Sol.** We know that  $P = \frac{F}{A}$

$$P \propto \frac{1}{A} \text{ when } F = \text{constant}$$

**6.** A sound wave has a wavelength of 3.0 m. The distance from a compression centre to the adjacent rarefaction centre is

- (1) 0.75 m                      (2) 1.5 m                      (3) 3.0 m                      (4) 6.0 m.

**Ans. (2)**



**7.** Of the following, the copper conductor that has the least resistance is

- (1) thin, long and hot      (2) thick, short and cool      (3) thick, long and hot      (4) thin, short and cool.

**Ans. (2)**

**Sol.**  $R = \frac{\rho \ell}{A}$

$R \propto \ell$ ,  $R \propto \frac{1}{A}$ ,  $R \propto \rho$  or  $R \propto T$  (for metals), thus for least resistance the length of the conductor should be less, area more and temperature low.

**8.** Four  $20 \Omega$  resistors are connected in series and the combination is connected to a  $20 \text{ V}$  emf device. The potential difference across any one of the resistors is

- (1)  $5 \text{ V}$                       (2)  $2 \text{ V}$                       (3)  $4 \text{ V}$                       (4)  $20 \text{ V}$ .

**Ans. (1)**

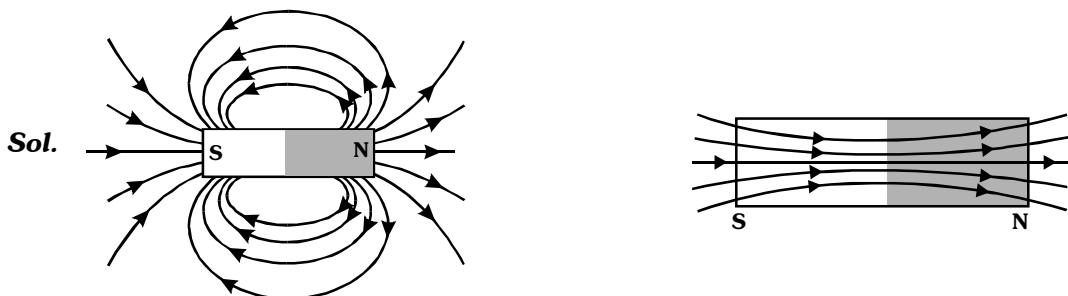
**Sol.** All are connected in series and have a same value of resistance so voltage will divide equally across all resistors.

$$V_1 = V_2 = V_3 = V_4 = \frac{V}{n} = \frac{20}{4} = 5 \text{ V}$$

**9.** The magnetic field lines due to an ordinary bar magnet

- (1) form closed curves  
(2) cross one another near the poles  
(3) are more numerous near the N-pole than near the S-pole.  
(4) do not exist inside the magnet.

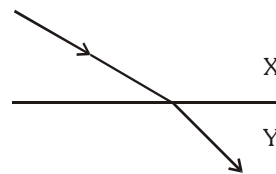
**Ans. (1)**



The magnetic field formed by a bar magnet inside and outside the magnet is shown in the figure above.

10. When light travels from medium X to medium Y as shown

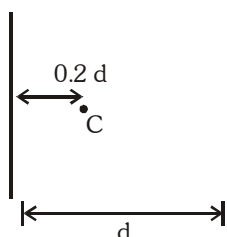
- (1) both the speed and the frequency decrease
- (2) both the speed and the frequency increase
- (3) both the speed and the wavelength decrease
- (4) both the wavelength and the frequency are unchanged.



Ans. (3)

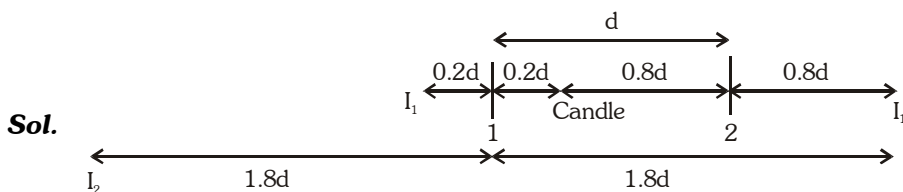
Sol. In the given figure the light ray travels from rarer to denser medium as the light ray bends towards the normal. The speed and the wavelength of the light ray decrease as light ray travels from optically rarer to optically denser medium.

11. A candle C is kept between two parallel mirrors, at a distance 0.2 d from the mirror 1. Here d is the distance between mirrors. Multiple images of the candle appear in both mirrors. How far behind mirror 1 are the nearest two images of the candle in that mirror ?



- (1) 0.2 d, 1.8 d
- (2) 0.2 d, 2.2 d
- (3) 0.2 d, 0.8 d
- (4) 0.2 d, 1.2 d

Ans. (1)



Sol.

Here  $I_1$  is the image of candle in the mirror 1 and  $I_1'$  is the image of candle in the mirror 2.

$I_1$  will be formed at a distance of 0.2 d from the mirror 1.  $I_1'$  will be formed at a distance of 0.8 d from mirror 2.  $I_1'$  will serve as object for the formation of second image in mirror 1. The distance of  $I_1'$  from mirror 1 is 1.8 d. ( $d + 0.8 d$ ). The image  $I_2$  will form at same distance from mirror 1 as is  $I_1'$  i.e. 1.8 d.

12. For a 1 MW wind energy generator, the minimum land area required for establishment of wind energy farm is about

- (1) 100 hectares
- (2) 50 hectares
- (3) 20 hectares
- (4) 2 hectares.

Ans. (4)

Sol. Establishment of wind energy farms require large area of land. For a 1 MW generator, the farm needs about 2 hectares of land.

13. Milk of magnesia is an example of which type of colloid ?

- (1) Gel
- (2) Emulsion
- (3) Sol
- (4) Foam

Ans. (3)

Sol. In milk of magnesia, solid is dispersed in liquid so it is a sol type colloid.

14. The number of gram moles of aluminium ions present in 0.051 g of aluminium oxide is

- (1) 0.001
- (2) 0.051
- (3) 0.102
- (4) 2

Ans. (1)

Sol. Given mass - 0.051g

Molar mass of aluminium oxide -  $Al_2O_3 \Rightarrow 2 \times 27 + 3 \times 16 \Rightarrow 102$  g

Moles of aluminium ions in aluminium oxide =  $\frac{0.051}{102} \times 2 \Rightarrow 0.001$  mole

15. Number of valence electrons in Cl atom is  
(1) 16 (2) 7 (3) 17 (4) 18

**Ans. (2)**

**Sol.** Electronic configuration of  $_{17}\text{Cl} = 2, 8, 7$   
So valence electrons i.e. electrons in last shell are 7.

16. Isotopes of an element have  
(1) the same physical properties (2) different chemical properties  
(3) different number of neutrons (4) different atomic number.

**Ans. (3)**

**Sol.** Isotopes of an element have same chemical properties but different physical properties as they have different mass number due to different number of neutrons.

17. Which of the following hydrocarbons undergoes addition reactions?  
(1)  $\text{C}_2\text{H}_6$  (2)  $\text{C}_3\text{H}_8$  (3)  $\text{C}_3\text{H}_6$  (4)  $\text{CH}_4$

**Ans. (3)**

**Sol.** As alkenes have double bonds so they give addition reaction as their general formula is  $\text{C}_n\text{H}_{2n}$  i.e.  $\text{C}_3\text{H}_6$ .

18. Which of the following statements is not a correct statement about the trends when going from left to right across the periods of periodic table?  
(1) The elements become less metallic in nature (2) The number of valence electrons increases  
(3) The atoms lose their electrons more easily (4) The oxides become more acidic.

**Ans. (3)**

**Sol.** As we move from left to right in the periodic table, non metallic character increases, thus electron loosing tendency decreases.

19. Acetic acid, with the molecular formula  $\text{CH}_3\text{COOH}$  has  
(1) 8 covalent bonds (2) 7 covalent bonds (3) 9 covalent bonds (4) 10 covalent bonds.

**Ans. (1)**

**Sol.** Acetic acid has 8 covalent bonds.

20. An element reacts with oxygen to give a compound with a high melting point. This compound is also soluble in water. The element is likely to be  
(1) calcium (2) carbon (3) silicon (4) iron

**Ans. (1)**

**Sol.** Calcium  
 $2\text{Ca} + \text{O}_2 \longrightarrow 2\text{CaO}$   
 $\text{CaO} + \text{H}_2\text{O} \longrightarrow \text{Ca(OH)}_2$   
[soluble in water]

21. Metals in the middle of the activity series can be easily extracted from their  
(1) Carbonates (2) Sulphides (3) Nitrates (4) Oxides

**Ans. (4)**

**Sol.** Metals in the middle of activity series can be easily extracted from their oxides.

22.  $\text{Pb(s)} + \text{CuCl}_2(\text{aq}) \longrightarrow \text{PbCl}_2(\text{aq}) + \text{Cu(s)}$   
The above reaction is an example of a  
(1) combination reaction (2) neutralisation reaction  
(3) decomposition reaction (4) displacement reaction.

**Ans. (4)**

**Sol.** As Pb has displaced Cu from its aqueous solution, the reaction is displacement.

**23.** Adding an alpha particle to the nucleus of sodium atom produces which new element ?  
(1) Mg (2) P (3) Al (4) Ne

**Ans. (3)**

**Sol.**  ${}_{11}^{23}\text{Na} + {}_2^4\text{He} \longrightarrow {}_{13}^{27}\text{Al}$

**24.** Which among the following cell organelles is able to make its own proteins ?  
(1) Lysosome (2) Golgi apparatus (3) Plastid (4) Endoplasmic reticulum.

**Ans. (3)**

**Sol.** Plastid has their own DNA and Ribosomes. So they can synthesise their own protein, it is also called semi autonomous cell organelles.

**25.** Intercalary meristem is present in.  
(1) at the base of the leaves and both the sides of node  
(2) in the roots  
(3) at the tip of the leaves  
(4) at the shoot apex.

**Ans. (1)**

**Sol.** Intercalary meristem presents at the nodes and internodes and give rise to leaves and branches.

**26.** Which among the following is an example of fungi ?  
(1) Anabaena (2) Euglena (3) Mycoplasma (4) Agaricus.

**Ans. (4)**

**Sol.** Agaricus is an example of Fungi.

**27.** In plants transport of soluble products in the process of photosynthesis occurs in  
(1) xylem (2) phloem (3) both of these (4) none of these.

**Ans. (2)**

**Sol.** By the process of photosynthesis plants prepare their own food in the form of sugar which is transported by phloem.

**28.** Which among the following hormones is associated with wilting of leaves ?  
(1) Abscisic acid (2) Gibberellin (3) Cytokinin (4) Auxin.

**Ans. (1)**

**Sol.** Abscisic acid is also known as stress Hormone, which cause wilting.

**29.** Seed is modification of  
(1) ovary (2) ovule (3) thalamus (4) all of these.

**Ans. (2)**

**Sol.** Seed is developed from ovule.

**30.** How many types of muscle tissue are found ?  
(1) Striated and unstriated (2) Striated and cardiac  
(3) Cardiac and unstriated (4) Striated, unstriated and cardiac.

**Ans. (4)**

**Sol.** In the Animals there are three types of muscles striated, unstriated and cardiac

**31.** Which characters are present in a vertebrate ?  
(1) Notochord, triploblastic, coelomate and bilateral symmetry  
(2) Notochord, diploblastic, coelomate and radial symmetry  
(3) Notochord, triploblastic, acoelomate and bilateral symmetry  
(4) Notochord, triploblastic, acoelomate and radial symmetry.

**Ans. (1)**

**Sol.** Vertebrate are chordate and they have notochord, triploblastic, coelomate and bilateral symmetry.

- 32.** Synapse is  
 (1) gap between two muscle cells (2) gap between two bones  
 (3) gap between two neurons (4) gap between muscle and bone.

**Ans. (3)**

**Sol.** The gap present between two neuron is known as synapse.

- 33.** Regeneration is found in  
 (1) tapeworm (2) leech (3) hydra (4) ascaris.

**Ans. (3)**

**Sol.** Hydra has the power of regeneration.

- 34.** Which of the following groups constitutes a correct food chain ?

- (1) Grass → Rabbit → Snake → Eagle  
 (2) Grass → Goat → Fox → Lion  
 (3) Goat → Grass → Elephant → Snake  
 (4) Grass → Wheat → Frog → Goat.

**Ans. (2)**

**Sol.** The Correct food chain is

Grass → Goat → Fox → Lion

[In this questions (1) option can be correct Grass → Rabbit → Snake → Eagle]

- 35.** Which cell organelle is known as "powerhouse of the cell" ?

- (1) Mitochondria (2) Lysosome (3) Golgi apparatus (4) Endoplasmic reticulum.

**Ans. (1)**

**Sol.** Mitochondria is known as power house of the cell.

- 36.** If  $(1^2 + 2^2 + 3^2 + \dots + 12^2) = 650$ , then the value of

$(2^2 + 4^2 + 6^2 + \dots + 24^2)$  is

- (1) 1300 (2) 2600 (3) 2500 (4) 42250

**Ans. (2)**

**Sol.**  $1^2 + 2^2 + 3^2 + \dots + 12^2 = 650$

So,  $(2^2 + 4^2 + 6^2 + \dots + 24^2)$

$= 2^2 (1^2 + 2^2 + 3^2 + \dots + 12^2)$

$= 2^2 \times (650) = 4 \times 650 = 2600$

- 37.** The square root of  $x^{b^2} x^{b^{2+2ab}} x^{a^2-b^2}$  is

- (1)  $x^{2(a+b)}$  (2)  $x^{\frac{a+b}{2}}$  (3)  $x^{\frac{(a+b)^2}{2}}$  (4)  $x^{a+b}$

**Ans. NA**

**Sol.**  $x^{b^2} x^{b^{2(1+ab)}} x^{a^2-b^2}$

$\Rightarrow x^{\{b^2+b^{2(1+ab)}+a^2-b^2\}}$

$\Rightarrow x^{\{b^{2(1+ab)}+a^2\}} \Rightarrow x^{\{a^2+b^{2(1+ab)}\}}$

None of the given options is correct.

- 38.** If  $(x + 2)$  is a factor of  $2x^3 - 5x + k$ , then the value of k is

- (1) 6 (2) -6 (3) 26 (4) -26

**Ans. (1)**

**Sol.** As  $x + 2$  is a factor, so on putting  $x = -2$  in  $2x^3 - 5x + k$  we get

$2(-2)^2 + -5(-2) + k = 0$

$\Rightarrow -16 + 10 + k = 0$

$k = 6$

39. For which value of  $p$  the following pair of linear equations  $3x + py = 7$ ,  $px + 3y = 15$  will have no solutions?  
 (1)  $\pm 9$  (2)  $\pm 5$  (3)  $\pm 3$  (4)  $\pm 4$ ,

Ans. (3)

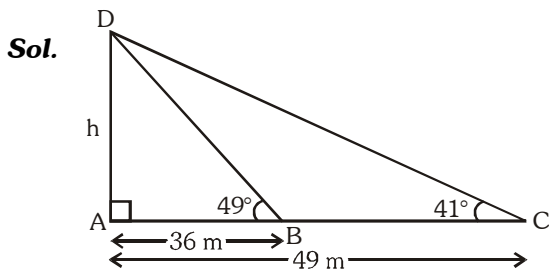
Sol. For no solution we have  $\frac{3}{p} = \frac{p}{3} \neq \frac{7}{15}$

$$\text{So, } p^2 = 9$$

$$p = \pm 3$$

40. A tower is on a horizontal plane. The angles of elevation of top of the tower from two points on a line passing through the foot of the tower at distances 49 m and 36 m are  $41^\circ$  and  $49^\circ$ . The height of the tower is  
 (1) 40 m (2) 42 m (3) 44 m (4) 46 m

Ans. (2)



$$\tan 49^\circ = \frac{h}{36} \quad \dots(i)$$

$$\tan 41^\circ = \frac{h}{49} \quad \Rightarrow \tan (90^\circ - 49^\circ) = \frac{h}{49}$$

$$\Rightarrow \cot 49^\circ = \frac{h}{49} \quad \dots(ii)$$

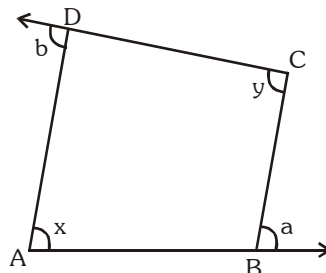
multiply eq. (i) and eq.(ii) , we get

$$\tan 49^\circ \cdot \cot 49^\circ = 1 = \frac{h^2}{36 \times 49}$$

$$h^2 = 36 \times 49$$

$$h = 6 \times 7 = 42 \text{ m}$$

41. Sides AB and CD of a quadrilateral ABCD are extended as in figure. Then  $a + b$  is equal to



(1)  $x+2y$

(2)  $x-y$

(3)  $x+y$

(4)  $2x + y$

Ans. (3)

Sol.  $\angle D = 180^\circ - b$

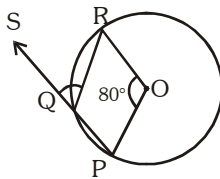
$$\angle B = 180^\circ - a$$

$$\text{So, } \angle A + \angle B + \angle C + \angle D = 360^\circ$$

$$x + 180^\circ - a + y + 180^\circ - b = 360^\circ$$

$$\Rightarrow x + y = a + b$$

42. In the figure O is the centre of the circle and  $\angle POR = 80^\circ$ . Then  $\angle RQS$  is



- (1)  $30^\circ$                                       (2)  $40^\circ$                                       (3)  $140^\circ$                                       (4)  $50^\circ$

**Ans. (2)**

**Sol.** Reflex  $\angle O = 360^\circ - 80^\circ = 280^\circ$

So,  $\angle RQP = \frac{1}{2}$  reflex  $\angle O = 140^\circ$

$\therefore \angle RQS = 180^\circ - 140^\circ = 40^\circ$

43. If every side of a triangle is doubled then a new triangle is formed. The ratio of areas of these two triangles is

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

**Ans. (3)**

**Sol.**  $s = \frac{a + b + c}{2}$

Area  $(A_1) = \sqrt{s(s - a)(s - b)(s - c)}$                                       ... (i)

so, if the sides are doubled, then

new,  $s' = \frac{2a + 2b + 2c}{2} = a + b + c = 2s$

New area  $(A_2) = \sqrt{s'(s' - 2a)(s' - 2b)(s' - 2c)} = 2 \times 2 \sqrt{s(s - a)(s - b)(s - c)}$

$A_2 = 4A_1$                                       (from equation (i))

$\therefore \frac{A_1}{A_2} = \frac{1}{4} \Rightarrow 1 : 4$

44. If the difference of two numbers is 5 and difference of their squares is 300 then sum of the numbers is

- (1) 1500                                      (2) 6                                      (3) 12                                      (4) 60

**Ans. (4)**

**Sol.**  $a - b = 5$                                       ... (i)

and  $a^2 - b^2 = 300$                                       ... (ii)

as  $a^2 - b^2 = (a - b)(a + b)$

$300 = 5 \times (a + b)$                                       From equation (i) and (ii)

$(a + b) = 60$

45. If the equation  $ax^2 + 2x - 2 = 0$  has real and distinct roots, then the value of a is

- (1)  $a > \frac{-1}{2}$                                       (2)  $a \leq \frac{-1}{2}$                                       (3)  $a \geq \frac{-1}{2}$                                       (4)  $a = \frac{-1}{2}$

**Ans. (1)**

**Sol.** For real and distinct roots, Discriminant  $> 0$  or  $D > 0$

So,  $(2)^2 - 4(a)(-2) > 0$

$\Rightarrow 4 + 8a > 0$

$\Rightarrow 4 < -8a$

$a > \frac{-1}{2}$



46. If  $a + b + c = 0$ , then the value of

$$\frac{(a+b)^2}{ab} + \frac{(b+c)^2}{bc} + \frac{(c+a)^2}{ca} \text{ is}$$

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

**Ans. (3)**

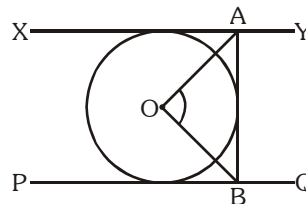
**Sol.**  $a + b + c = 0$

$$\text{then, } \frac{(-c)^2}{ab} + \frac{(-a)^2}{bc} + \frac{(-b)^2}{ac}$$

$$= \frac{c^2}{ab} + \frac{a^2}{bc} + \frac{b^2}{ac}$$

$$= \frac{a^3 + b^3 + c^3}{abc} = \frac{3abc}{abc} = 3 \quad (\text{using identity if } a + b + c = 0 \text{ then } a^3 + b^3 + c^3 = 3abc)$$

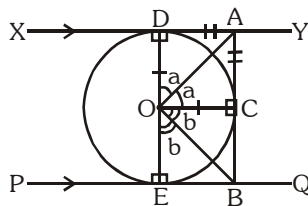
47. In the given figure O is the centre of a circle, XY, PQ, AB are tangents of the circle. If  $XY \parallel PQ$ , then the value of  $\angle AOB$  is



- (1)  $80^\circ$                                       (2)  $90^\circ$                                       (3)  $70^\circ$                                       (4)  $100^\circ$

**Ans. (2)**

**Sol.**



As  $\triangle ODA$  and  $\triangle OCA$  are congruent by SSS.

$$\therefore \angle DOA = \angle COA = a$$

similarly,  $\angle EOB = \angle COB = b$

$$\therefore 2a + 2b = 180^\circ$$

$$a + b = 90^\circ$$

$$\text{i.e. } \angle AOB = 90^\circ$$

48.  $\frac{\cos \theta}{1 - \tan \theta} - \frac{\sin \theta}{\cot \theta - 1}$  is equal to

- (1)  $\sin \theta + \cos \theta$                       (2)  $\cos \theta - \sin \theta$                       (3)  $2 \sin \theta$                               (4)  $\frac{1}{\cot \theta - \sin \theta}$

**Ans. (1)**

**Sol.**

$$\frac{\cos \theta}{1 - \frac{\sin \theta}{\cos \theta}} - \frac{\sin \theta}{\frac{\cos \theta}{\sin \theta} - 1}$$

$$= \frac{\cos^2 \theta}{\cos \theta - \sin \theta} - \frac{\sin^2 \theta}{\cos \theta - \sin \theta}$$

$$= \frac{\cos^2 \theta - \sin^2 \theta}{\cos \theta - \sin \theta} = \cos \theta + \sin \theta$$

**49.** A card is drawn from a well shuffled pack of 52 cards. The probability that card is a red ace is

- (1)  $\frac{1}{13}$                       (2)  $\frac{1}{26}$                       (3)  $\frac{3}{52}$                       (4)  $\frac{1}{2}$

**Ans. (2)**

**Sol.** Number of favourable outcomes = 2

Number of total outcomes = 52

$$\text{so, probability of red ace} = \frac{2}{52} = \frac{1}{26}$$

**50.** Value of  $\tan 20^\circ \tan 40^\circ \tan 50^\circ \tan 70^\circ$  is

- (1) 0                      (2)  $\frac{1}{\sqrt{3}}$                       (3)  $\sqrt{3}$                       (4) 1

**Ans. (4)**

**Sol.**  $\tan 20^\circ \tan 40^\circ \tan 50^\circ \tan 70^\circ$   
 $= \tan(90^\circ - 70^\circ) \tan(90^\circ - 50^\circ) \tan 50^\circ \tan 70^\circ$   
 $= \cot 70^\circ \cot 50^\circ \tan 50^\circ \tan 70^\circ$   
 $= (\cot 70^\circ \tan 70^\circ) (\cot 50^\circ \tan 50^\circ)$   
 $= 1 \times 1 = 1$

**51.** Sum of last two terms of an A.P. is 60. If first term is 11 and common difference is 2, then the number of terms in the A.P. is

- (1) 22                      (2) 20                      (3) 11                      (4) 19

**Ans. (3)**

**Sol.**  $a = 11$

$d = 2$

Given :

$$a + (n - 2) d + a + (n - 1) d = 60$$

$$2a + d[n - 2 + n - 1] = 60$$

$$2(11) + 2(2n - 3) = 60$$

$$2(2n - 3) = 38$$

$$2n - 3 = 19$$

$$2n = 22$$

$$n = 11$$

**52.** If the difference of circumference and diameter of a circle is 60 cm, then the area of the circle is

- (1)  $49 \pi \text{ cm}^2$                       (2)  $14 \pi \text{ cm}^2$                       (3)  $196 \pi \text{ cm}^2$                       (4)  $\frac{49}{4} \pi \text{ cm}^2$

**Ans. (3)**

**Sol.** Given :

$$2\pi r - 2r = 60$$

$$2r \left( \frac{22}{7} - 1 \right) = 60$$

$$2r \left( \frac{15}{7} \right) = 60$$

$$r = 14 \text{ cm.}$$

$$\text{Area} = \pi r^2$$

$$= \pi(14)^2$$

$$= 196 \pi$$

53. If the areas of three adjoining faces of a cuboid are  $a^2$ ,  $b^2$  and  $c^2$  respectively, then the volume of the cuboid is  
 (1)  $a^2b^2c^2$  (2)  $abc$  (3)  $a^3b^3c^3$  (4)  $\sqrt{abc}$

**Ans. (2)**

**Sol.** Given :

$$L \cdot B = a^2 \quad \dots(1)$$

$$B \cdot H = b^2 \quad \dots(2)$$

$$L \cdot H = c^2 \quad \dots(3)$$

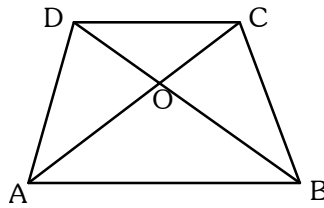
$L \rightarrow$  length;  $B \rightarrow$  breadth;  $H \rightarrow$  height

$$\text{Eq. (1)} \times \text{(2)} \times \text{(3)}$$

$$L^2 B^2 H^2 = a^2 \cdot b^2 \cdot c^2$$

$$\text{Volume} = LBH = abc$$

54. In the given figure ABCD is a trapezium in which  $AB \parallel DC$  and  $AB : DC = 3 : 2$ . The ratio of the areas of  $\triangle AOB$  and  $\triangle COD$  is



(1) 3 : 2

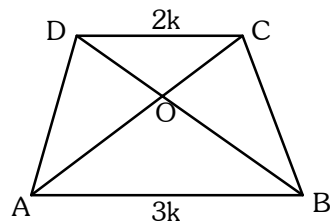
(2) 2 : 3

(3) 4 : 9

(4) 9 : 4

**Asn. (4)**

**Sol.**



$\triangle AOB \sim \triangle COD$  (AA similarity)

$$\frac{\text{area}(\triangle AOB)}{\text{area}(\triangle COB)} = \frac{(3k)^2}{(2k)^2} = \frac{9k^2}{4k^2} = \frac{9}{4}$$

55. If the mean of 5, 9, x, 7, 4, y is 7, then relation between x and y is  
 (1)  $x + y = 42$  (2)  $x + y = 17$  (3)  $x - y = 10$  (4)  $x - y = 42$

**Ans. (2)**

**Sol.** 
$$\frac{5 + 9 + x + 7 + 4 + y}{6} = 7$$

$$x + y + 25 = 7 \times 6$$

$$x + y = 42 - 25$$

$$x + y = 17$$

56. Tithe is  
 (1) religious tax (2) implied tax (3) taille tax (4) feudal tax

**Ans. (1)**

**Sol.** Tithe is religious tax which was one-tenth part of agriculture income.

57. Who was Rasputin?  
 (1) King (2) Monk (3) Revolutionary (4) Rime Minister

**Ans. (2)**

**Sol.** Rasputin was Monk

58. The railway line which was to be constructed between Multan and Sukkur was  
 (1) North Valley Railway (2) Indus Valley Railway  
 (3) Southern Valley Railway (4) West Valley Railway

**Ans. (2)**

**Sol.** Indus Valley Railway constructed between Multan and Sukkur.

**59.** Who adopted the 'Scorched Earth Policy'?

- (1) Portuguese                      (2) French                      (3) Dutch                      (4) German

**Ans. (3)**

**Sol.** 'Scorched Earth Policy' was adopted by Dutch in Indonesia.

**60.** Raikas belong to the state of

- (1) Rajasthan                      (2) Bihar                      (3) Uttar Pradesh                      (4) Karnataka

**Ans. (1)**

**Sol.** Raikas are the pastoralist of Rajasthan.

**61.** Young Italy, a secret society was formed by

- (1) Metternich                      (2) Giuseppe Mazzini                      (3) Bismarck                      (4) Hitler

**Ans. (2)**

**Sol.** Young Italy, a secret society was formed by Giuseppe Mazzini.

**62.** The thinker Confucius belonged to the country

- (1) England                      (2) America                      (3) China                      (4) Japan

**Ans. (3)**

**Sol.** The thinker Confucius belonged to the country China

**63.** Jallianwala Bag incident took place on

- (1) 10th April, 1919                      (2) 13th April, 1919                      (3) 14th April, 1919                      (4) 18th April, 1919

**Ans. (2)**

**Sol.** Jallianwala Bag incident took place on 13th April, 1919

**64.** Dandi is located in

- (1) Gujarat                      (2) Rajasthan                      (3) Maharashtra                      (4) Punjab

**Ans. (1)**

**Sol.** Dandi is located in Gujarat

**65.** The Great Depression began in

- (1) 1927 AD                      (2) 1929 AD                      (3) 1930 AD                      (4) 1931 AD

**Ans. (2)**

**Sol.** The Great Depression began in 1929 AD

**66.** Which island was known as Amindiv whose name was changed in 1973?

- (1) Lakshadweep                      (2) Maldives                      (3) New Moore island                      (4) Car - Nicobar

**Ans. (1)**

**Sol.** Amindiv was the name of Lakshadweep.

**67.** Match List - I with List - II correctly and choose the correct code from the following :

List - I

- (A) Kaveri  
(B) Godavari  
(C) Tapi  
(D) Krishna

List - II

- (i) Nasik  
(ii) Betul  
(iii) Brahmagiri  
(iv) Mahabaleshwar

**Code :**

- |     | <b>A</b> | <b>B</b> | <b>C</b> | <b>D</b> |
|-----|----------|----------|----------|----------|
| (1) | i        | ii       | iii      | iv       |
| (2) | iii      | i        | ii       | iv       |
| (3) | ii       | iii      | i        | iv       |
| (4) | iv       | iii      | ii       | i        |

**Ans. (2)**

**Sol. Rivers Origin point**

Kaveri	Brahmagiri
Godavari	Nasik
Tapi	Betul
Krishna	Mahabaleshwar

68. Stalagmite and Stalactite caves are located in  
(1) Mawsynram (2) Cherrapunji (3) Shimla (4) Jammu and Kashmir

**Ans. (1)**

**Sol. Stalagmite and Stalactite caves are located in Mawsynram**

69. Which state(s) has/have the highest reserved forest ratio?  
(1) Kerala (2) West Bengal (3) Jammu and Kashmir (4) Maharashtra

Choose the correct answer from the codes given below

- (1) Only (2) (2) (1) and (4) (3) (1) and (3) (4) all of these

**Ans. (4)**

70. With reference to water availability per person per year India's rank in the world is

- (1) 131st (2) 133rd (3) 137th (4) 157th.

**Ans. (2)**

71. Roof water harvesting system is a compulsory structure in which state?

- (1) Bihar (2) Meghalaya (3) Tamil Nadu (4) Karnataka

**Ans. (3)**

**Sol. Roof water harvesting system is a compulsory in Tamil Nadu.**

72. Match List - I with List - II correctly and choose the correct code from the following :

List - I

- (1) Waler  
(2) Dahiya  
(3) Khil  
(4) Kuruwa

List - II

- (i) Jharkhand  
(ii) Himalayan region  
(iii) Madhya Pradesh  
(iv) S.E. Rajasthan

**Code :**

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
(1)	i	ii	iii	iv
(2)	iv	iii	i	ii
(3)	ii	i	iii	iv
(4)	iv	iii	ii	i

**Ans. (4)**

73. Rubber is related to which type of vegetation?

- (1) Tundra (2) Tropical rain forest (3) Mountain forest (4) Tropical deciduous forest

**Ans. (2)**

**Sol. Rubber is tropical vegetation.**

74. Koderma mines located in Jharkhand is rich in which minerals?

- (1) Bauxite (2) Mica (3) Iron ore (4) Copper

**Ans. (2)**

**Sol. Koderma mines located in Jharkhand is rich in Mica.**

75. Which of the following states is not connected with Hajira-Vijaypur-Jagdishpur pipeline?

- (1) Madhya Pradesh (2) Maharashtra (3) Gujarat (4) Uttar Pradesh

**Ans. (2)**

**Sol. Maharashtra is not connected with HV J pipeline.**

**76.** Which among the following is not correctly matched?

- |                                   |   |                  |
|-----------------------------------|---|------------------|
| (1) Popular unity                 | — | Salvador Alende  |
| (2) Solidarnosc or solidarity     | — | Lech Pinochet    |
| (3) National League for Democracy | — | Augusto Pinochet |
| (4) Bath party                    | — | Saddam Hussein   |

**Ans. (3)**

**Sol.** National League for Democracy belongs to Aung Sang Suu Chi.

**77.** Identify the correct order regarding the granting of universal adult franchise :

- |  |  |
|--|--|
| (1) Argentina, India, Malaysia, Greece | (2) Malaysia, Greece, India, Argentina |
| (3) India, Argentina, Greece, Malaysia | (4) Greece, Malaysia, India, Argentina |

**Ans. (3)**

**Sol.** India-1950, Argentina-1951, Greece-1952, Malaysia-1955.

**78.** Find out the wrong explanation of functioning of United Nations :

- (1) Who lends money to governments when they need it ? International Monetary Fund (I.M.F.) does so.
- (2) What happens when a country attacks another country in an unjust manner ? The U.N. Security Council, an organ of U.N. is responsible for maintaining peace and security among countries
- (3) The weightage of vote of every member of International Monetary Fund is equal.
- (4) Each permanent member of Security Council has veto power.

**Ans. (3)**

**Sol.** The weightage of vote of every member of International Monetary Fund is not equal.

**79.** Find out the correct explanation :

- (1) Referendum – Only used for a specific government policy.
- (2) Coup – A coup is legal system, in which system the government hands over all rights and powers to the military.
- (3) Martial law – A system of rules, that takes effect when a military authority takes control of the normal administration of justice.
- (4) Communist State – In communist state all political parties have complete liberty to compete for power.

**Ans. (3)**

**Sol.** Martial law – A system of rules, that takes effect when a military authority takes control of the normal administration of justice.

**80.** Pay attention on the following points :

- (A) A democratic government is a better government because it is a more accountable form of government.
- (B) Democracy improves the quality of decision making.
- (C) Democracy provides a method to deal with the differences and conflicts.
- (D) Democracy enhances the dignity of citizens.

Which are the factors involved in comprising Indian democracy ?

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

**Ans. (4)**

**Sol.** All are correct

**81.** Which among the following statements is a moral reason regarding the desirability of power sharing ?

- (1) Power sharing is good because it helps to reduce the possibility of conflict between social groups
- (2) Social conflict often leads to violence and political instability. Hence power sharing is a good way to ensure the stability of political order.
- (3) Tyranny of the majority is not just oppressive for the minority, it often brings ruin to the majority as well.
- (4) A democratic rule involves sharing power with those affected by its exercise and who have to live with its effects.

**Ans. (4)**

**Sol.** A democratic rule involves sharing power with those affected by its exercise and who have to live with its effects. This is moral reason.

**82.** Let us look at some of the key features of federalism :

- (A) There are two or more levels (or tiers) of government.
- (B) Different tiers of government govern the same citizens, but each tier has its own jurisdiction.
- (C) The existence and authority of each tier of government is constitutionally guaranteed.
- (D) All states in the Indian Union have identical powers.

Which facts are correct regarding Indian Federalism:

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

**Ans. (3)**

**Sol.** All states in the Indian Union doesn't have identical powers.

Jammu Kashmir has separate constitution under Article 370.

**83.** Find the correct sequence of languages in the ascending order according to the proportion of speakers as described in 8th Schedule of the Constitution of India :

- (1) Hindi, Marathi, Telugu, Bangla                      (2) Hindi, Bangla, Telugu, Marathi  
(3) Hindi, Telugu, Bangla, Marathi                      (4) Hindi, Bangla, Marathi, Telugu

**Ans. (Bonus)**

**Sol.** Hindi-41.03%, Bangla-8.11%, Telugu-7.19%, Marathi-6.99%

In option (2) these are given in descending order whereas question requires ascending order.

**84.** Match the following and choose the correct answer from the code:

**List - I**

**List-II**

- |  |                                       |
|--|---------------------------------------|
| (A) Power is shared among different organs of government such as the legislature, executive and judiciary    | (i) Community Government              |
| (B) Power is shared among different social groups  | (ii) Horizontal distribution of power |
| (C) The fundamental provisions of the constitution cannot be unilaterally changed by one level of government | (iii) In 1992                         |
| (D) The constitutionalisation of 3rd tier of Indian democratic system  | (iv) Federalism                       |

**Code:**

- |     | <b>A</b> | <b>B</b> | <b>C</b> | <b>D</b> |
|-----|----------|----------|----------|----------|
| (1) | (ii)     | (i)      | (iv)     | (iii)    |
| (2) | (i)      | (ii)     | (iii)    | (iv)     |
| (3) | (i)      | (iii)    | (ii)     | (iv)     |
| (4) | (ii)     | (iv)     | (i)      | (iii)    |

**Ans. (1)**

**Sol.** Taken from Federalism.

**85.** Match the following and choose the correct answer from the given code:

**List - I**

**List-II**

- |                      |                       |
|----------------------|-----------------------|
| (A) Union list       | (i) Computer software |
| (B) State list       | (ii) Banking          |
| (C) Concurrent list  | (iii) Education       |
| (D) Residuary powers | (iv) Police           |

**Code:**

- |     | <b>A</b> | <b>B</b> | <b>C</b> | <b>D</b> |
|-----|----------|----------|----------|----------|
| (1) | (iii)    | (ii)     | (i)      | (iv)     |
| (2) | (ii)     | (iii)    | (iv)     | (i)      |
| (3) | (iii)    | (i)      | (ii)     | (iv)     |
| (4) | (ii)     | (iv)     | (iii)    | (i)      |

**Ans. (4)**

**Sol.** Taken from Federalism.

**86.** Which one of the following is an activity of the tertiary sector?  
(1) Mining (2) Tourism (3) Dairy (4) Agriculture

**Ans. (2)**

**Sol.** Service Industry always come in tertiary sector.

**87.** In which state of India, is Amul Dairy situated?

(1) Rajasthan (2) Bihar (3) Gujarat (4) Karnataka

**Ans. (3)**

**Sol.** Amul is co-operative which operates from Anand, Gujarat.

**88.** The 'National Consumers' Day' is celebrated on

(1) 24th December (2) 24th November (3) 24th September (4) 24th October

**Ans. (1)**

**Sol.** 24th December is celebrated as the National Consumer day as on this day the Indian parliament enacted Consumer Protection Right acts in India.

**89.** National income of any country is divided by its total population, we get

(1) personal income (2) gross domestic product (3) private income (4) per capita income

**Ans. (4)**

**Sol.** Per capita income = National income/total population.

**90.** Among the following which is the method to estimate the poverty line?

(1) Investment method (2) Income method (3) Capital method (4) All of these

**Ans. (2)**

**Sol.** Income method (per capita income) is used for analysing poverty line.

**91** Which of the following statements is correct?

- (1) Centre of curvature of a concave mirror lies in front of it whereas that of convex mirror lies behind the mirror.  
(2) Centre of curvature of a concave mirror lies behind it whereas that of convex mirror lies in front of the mirror.  
(3) Centre of curvature of both concave and convex mirrors lie in front of the mirror.  
(4) Centres of curvature of both concave and convex mirrors lie behind the mirror.

**Ans. (1)**

**Sol.** Centre of curvature of a concave mirror lies in front of it whereas that of convex mirror lies behind the mirror.

**92.** Element X forms a chloride with the formula  $XCl_2$  which is solid with a melting point. X would belong to the same group of periodic table as

(1) Na (2) Mg (3) Al (4) Si

**Ans. (2)**

**Sol.** Magnesium forms  $MgCl_2$ .

**93.** Calculate the number of molecules in 8g  $O_2$ .

(1)  $8 \times 10^{23}$  (2)  $6.02 \times 10^{23}$  (3)  $1.51 \times 10^{23}$  (4) 8

**Ans. (3)**

**Sol.** Number of molecules =  $\frac{\text{Given mass}}{\text{Molar mass}} \times N_A$ .

$$\text{So, Number of molecules} = \frac{8}{32} \times 6.02 \times 10^{23} = 1.51 \times 10^{23}$$

**94.** Which of the following is correct for Fungi?

- (1) Prokaryotic and saprophytic (2) Eukaryotic and autotrophic  
(3) Prokaryotic and autotrophic (4) Eukaryotic and saprophytic

**Ans. (4)**

**Sol.** Fungi are eukaryotic and saprophytic.



**95.** Iodine is essential for the synthesis of which hormone?

- (1) Adrenaline                      (2) Thyroxine                      (3) Insulin                      (4) Oxytocin

**Ans. (2)**

**Sol.** Iodine is essential for synthesis of thyroxine hormone.

**96.** 'Oriental Cricket Club' the first Indian Cricket Club was founded at

- (1) Madras                      (2) Bombay                      (3) Kanpur                      (4) Calcutta

**Ans. (2)**

**Sol.** 'Oriental Cricket Club' the first Indian Cricket Club was founded at Bombay by Parsis.

**97.** Which of the following is not associated with Coriolis force?

- (1) Cyclones                      (2) Ocean currents                      (3) Prevailing winds                      (4) Jet streams

**Ans. N/A**

**Sol.** All are correct

**98.** The local government structure goes right up to the .....level.

- (1) Village                      (2) Ward                      (3) State                      (4) District

**Ans. (4)**

**Sol.** District level → Block level → Village level → Ward level.

**99.** In which state of India maximum fair price shops are run by the co-operatives?

- (1) Maharashtra                      (2) Delhi                      (3) Tamil Nadu                      (4) Gujarat

**Ans. (3)**

**Sol.** Out of all fair price shops running in Tamil Nadu, around 94% are being run by the co-operatives.

**100.** Informal sources of credit do not include

- (1) Moneylenders                      (2) Cooperatives                      (3) Traders                      (4) Friends.

**Ans. (2)**

**Sol.** All the others except co-operative societies are come under informal sources of credit.

\* \* \* \* \*