1. Which biotic component is present in largest numbers in an ecosystem?

(a) Primary consumer
(b) Tertiary consumer
(c) Secondary consumers
(d) product **[d]**

Explanation –

Producers are the biotic component present in the largest number in an ecosystem.

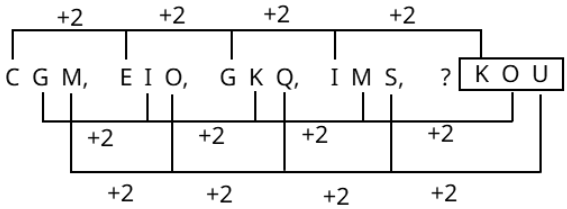
This is because producers, such as plants and algae, make their own food using sunlight. They form the base of the food chain and are the source of energy for all other organisms. In a stable ecosystem, the flow of energy is from bottom to top, which means that the number of producers must be more than primary consumers, primary consumers must be more than secondary consumers.

2. Which of the following options should come in place of the question mark (?) in the given series based on the English alphabetical order?

CGM, EIO, GKQ, IMS, ?

(a) KNY
(b) KOV
(c) KOU
(d) KOX **[c]**

Explanation –



? = KOU

Therefore option (c) is correct.

3. Which of the following is an example of emulsion?

(a) Sponge
(b) Rubber
(c) Face Cream
(d) Foam **[c]**

Explanation –

An emulsion is a mixture of two or more immiscible liquids, in which one liquid is dispersed as tiny droplets within the other. Face creams usually contain oil and water, which do not normally mix. A substance called an emulsifier helps these two liquids form a stable mixture.

Sponge - It is a solid substance with many pores, which may be filled with air or liquid. It is not a colloid.

Rubber - It is a polymer and is in the solid state.

Foam - It is a colloid in which gas is dispersed within a liquid or solid. It is not an emulsion.

4. Which Indian city recorded the highest PM2.5 levels in 2023, making it the most polluted metropolitan area globally?

(a) Greater Noida
(b) Guwahati
(c) Begusarai
(d) New Delhi **[c]**

Explanation –

In 2023, New Delhi was identified as the most polluted capital globally among Indian cities. According to the 2023 World Air Quality Report released by IQAir, Delhi's average annual PM2.5 level was 92.7 micrograms per cubic meter, several times higher than the World Health Organization (WHO) recommendations.

Meanwhile, Begusarai, Bihar was declared the world's most polluted metropolitan area in 2023, with an average PM2.5 level of 118.9 micrograms per cubic meter. This level was almost 20 times higher than the WHO recommendations.

5. A train travelling at a speed of 72 km/h takes 24 sec to cross a pole. What is the length of the train?

(a) 125 m
(b) 480 m
(c) 150 m
(d) 300 m **[b]**

Explanation –

Speed of the train = 72 km/hr

Time taken to cross the pole = 24 sec

$$\text{length of the train} = 72 \times \frac{5}{18} \times 24 \Rightarrow 480 \text{ meter}$$

6. In a certain code language 'Towards the end' is written as 'mb rh gp' and 'end it Here' is written as 'hk mb bl'. How will 'end' be written in that code language?

(a) hk
(b) mb
(c) bl
(d) gp **[b]**

Explanation –

Just as

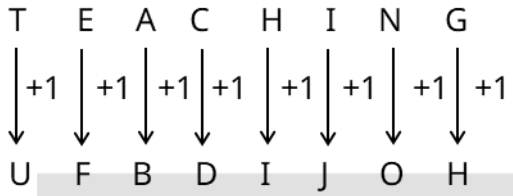
Towards the end → mb rh gp

end it Here → hk mb bl

in the same manner,
end → mb
Therefore option (b) is the correct answer.

7. If each vowel of the word TEACHING is replaced by its next letter in the English alphabetical order and each consonant is replaced by its next letter in the English alphabetical order and then the letters are arranged in the English alphabetical order, then which of the following letter will be fourth from the right in the letter-cluster thus formed?
(a) I
(b) J
(c) F
(d) H **[a]**

Explanation –



arranging them in English alphabetical order –

Hence, I will be at the 4th place from the right.

8. What is the function of xylem?
(a) Transport of proteins
(b) Transport of fats
(c) Transport of water and minerals
(d) Transport of food **[c]**

Explanation –

Vascular Tissues are the tissues that transport various substances, such as water, mineral salts and food, from one place to another in the body of organisms. Mainly two types of transport tissues are found in plants – xylem and phloem.
Xylem is a transport tissue, it is also called wood. Which transports water and dissolved minerals from the roots to the leaves and other aerial parts of the plant. It is a directional transport system, in which water and minerals move mainly upwards. It also provides mechanical support to the plant.
Phloem transports food (sugars) made by photosynthesis in the leaves to other parts of the plant, such as roots, stems and fruiting organs, where they are needed or stored. It is also called phloem

9. Express the expression given below as a perfect square.
$a^2 + 9b^2 + c^2 - 6ab + 6bc - 2ac$
(a) $(a-3b-c)^2$
(b) $(a-3b+c)^2$
(c) $(a+3b+c)^2$
(d) $(a-3b-2c)^2$ **[a]**

Explanation –

$a^2+ab^2+c^2-6ab+6bc-2ac$
according to the formula –
$(a-b-c)^2 = a^2+b^2+c^2-2ab+2bc-2ac$
$(a-3b-c)^2 = a^2+b^2+c^2-6ab+6bc-2ac$
Hence, the value of the expression in the perfect square is $(a-3b-c)^2$.

10. The combined salary of P and Q is Rs 2000. P spends 95% of his salary and Q spends 85% of his salary. If now their savings are equal, then what is the salary of P?
(a) Rs 1250
(b) Rs 500
(c) Rs 1500
(d) Rs 750 **[c]**

Explanation –

Given.
P+Q = Rs 2000
P spends 95% of his salary.
Q spends 35% of his salary.
P and Q have the same savings. So P's income is
P×5% = Q×15%

$$\frac{P}{Q}=\frac{3}{1}$$

$$P = \frac{2000}{4}\times 3 \Rightarrow Rs.1500$$

11. Aruna borrowed a sum of Rs 9000 from Jayshree at 10% annual compound interest rate compounded annually. Find the total amount paid by Aruna after 2 years to pay off all the dues.
(a) Rs 10098
(b) Rs 10890
(c) Rs 10980
(d) Rs 10089 **[b]**

Explanation –

Principal = Rs 9000
Rate = 10%
Time = 2 years
Amount after 2 years =

$$9000\times\frac{110}{100}\times\frac{110}{100} = \text{Rs.}10890$$

Hence, the total amount paid by Aruna to Jayshree was Rs.10890.

12. According to the second law of motion, the rate of change of momentum is proportional to _____.
(a) Inertia
(b) Energy
(c) Force
(d) Displacement **[c]**

Explanation –
According to the second law of motion, the rate of change of momentum is proportional to the force.
Newton's second law of motion states that the rate of change of momentum of an object is directly proportional to the unbalanced force applied on it and this change occurs in the direction of the force. It can be expressed mathematically as -

$F = \frac{dp}{dt}$

Where:
F = applied unbalanced force
P = momentum of the object
t = time
dp / dt = is the rate of change of momentum.

13. Arpita buys 9 oranges and 8 bananas for Rs 276. When the price of one orange is reduced by 10% and the price of one banana remains the same, the price of 5 oranges and 10 bananas becomes Rs 210. Find the initial price of 3 oranges and 4 bananas.
(a) Rs 108
(b) Rs 120
(c) Rs 116
(d) Rs 123 **[a]**

Explanation –
9 oranges + 8 bananas = Rs 276
The price of an orange is increased by 10%. And the price of a banana remains the same.
After that $\left(5\times\frac{90}{100}\right.$ Oranges+10 Bananas) = 210
9x+8y = 276 ..... (i)
4.5x+10y = 210 ..... (ii)
On multiplying equation (i) by 5 and equation (ii) by 4, we get
45x+40y = 1380 ..... (iii)
18x+40y = 840 .... (iv)
On subtracting equation (iv) from equation (iii), we get
27x = 540
x = 20
Putting the value of x in equation (i)
9×20+8y =276
8y = 276−180
8y = 96
y = 12
The cost of 3 oranges and 4 bananas
3×20+4×12 = 60+48=108

14. Justice M Fatima Beevi was the first woman judge to be appointed to the Supreme Court of India in 1989. She died on _____ at the age of 96.
(a) 23 November 2023
(b) 25 November 2023
(c) 26 November 2023
(d) 22 November 2023 **[a]**

Explanation –
Justice M. Fatima Beevi, the first woman judge of the Supreme Court of India, passed away on 23 November 2023. She breathed her last at a private hospital in Kollam district of Kerala at the age of 96. Her demise is an irreparable loss to the Indian judiciary.
Important Information:
Justice Fatima Beevi became the first woman judge to be appointed to the Supreme Court of India in 1989.
She was also the former Governor of Tamil Nadu.
She also served as a member of the National Human Rights Commission.
He was born on 30 April 1927 in Pathanamthitta, Kerala.

15. The length, breadth and height of a closed cubical box are 2.5m, 2m and 90 cm respectively. Find the cost of the canvas required to completely cover the box if the cost of the canvas is Rs 70/m².
(a) Rs 1507
(b) Rs 1348
(c) Rs 1448
(d) Rs 1267 **[d]**

Explanation –
The length, breadth, height of the cubic box are 2.5 m, 2 m, 90 cm/0.9 m respectively.
Cost of canvas = Rs 70/meter²
according to the formula –
surface area of a cubical box = 2(lb+bh+hl)
= 2(2.5×2+2×0.9+0.9+0.9×2.5)
= 2(5+1.8+2.25)
= 2(9.05)
= 18.1 meter²
Total cost of canvas = 70×18.1 ⇒ Rs. 1267

16. In a quadrilateral PQRS, if the sum of angles ∠Q and ∠R is 150° while the ratio of angles ∠P

and R is 4 : 3, then what will be the measure of ∠R?

(a) 90°
(b) 210°
(c) 150°
(d) 120° **[a]**

Explanation –

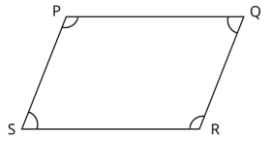
has given it.

In the quadrilateral PQRS

∠Q+∠S = 150°

∠P : ∠R = 4 : 3

Let the angles ∠P and ∠R be 4x and 3x respectively.



∠P+∠R = 360°−∠Q+∠S

∠P+∠R = 360°−150°

∠P+∠R = 210°

$\angle R = \frac{270}{7x} \times 3x$

∠R = 90°

Hence, the value of angle ∠R is 90°.

17. If 'P' means 'x', 'Q' means '÷', 'R' means '-' and 'S' means'+', then what will come in place of question mark '?' in the following equation?
15 P 6 R 11 P 4 S 38 R 41 S 2 P 5 =?

(a) 41
(b) 49
(c) 61
(d) 53 **[d]**

Explanation –

15 P 6 R 11 P 4 S 38 R 41 S 2 P 5 = ?

15 × 6 − 11 × 4 + 38 − 41+ 2 × 5=?

90 − 44 + 38 − 41 +10 = ?

138 − 85 = ?

53 = ?

Therefore option (d) is correct.

18. The kinetic energy of a body of mass 2 kg moving at a constant velocity of 5 m/sec is _____.

(a) 50 Joules
(b) 25 Joules
(c) 10 Joules
(d) 100 Joules **[b]**

Explanation –

The formula to calculate the Kinetic Energy (KE) of a body is as follows:

$KE = \frac{1}{2}mv^2$

Where:

m = mass of the body (in kilograms)

v = velocity of the body (in metres per second)

Given:

m=2 kg

v=5 m/sec

Now we will plug these values into the formula:

$KE = \frac{1}{2} \times 2 \times 5^2 = 25$ Joule

Since 1 joule (Joule) = 1 kg m^2/sec^2, Therefore the kinetic energy is 25 joules.

19. Find the HCF of 450, 1500 and 1650.

(a) 100
(b) 50
(c) 150
(d) 200 **[c]**

Explanation –

HCF of 450, 1500 and 1650

450 = 2×9×25

1500 = 2×2×3×125

1650 = 2×3×5×5×11

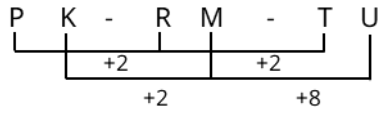
HCF = 2×3×25 = 150

20. Select the triad that follows the same pattern as followed by the two triads given below. Both the triads follow the same pattern.
PK-RM-TU
HC-JE-LM

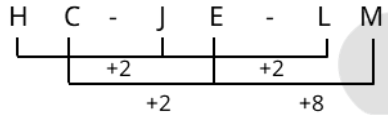
(a) MH-OJ-PR
(b) MG-OJ-QR
(c) MH-OJ-QR
(d) MH-OJ-QS **[c]**

Explanation –

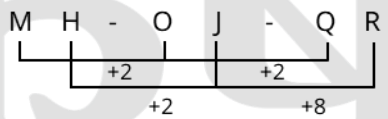
Just as



And



in the same manner

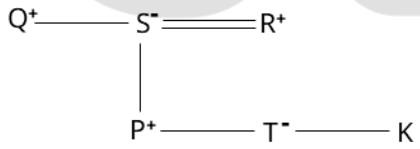


Therefore option (c) is correct.

21. In a certain code language,
A + B means 'A is the mother of B',
A - B means 'A is the brother of B',
A × B means 'A is the wife of B',
A ÷ B means 'A is the father of B',

and A # B means 'A is the daughter of B'.
If 'Q – S + P – T # R ÷ K', then how is P related to K?
(a) sister
(b) brother
(c) mother
(d) father **[b]**

Explanation –



It is clear from the diagram that P is the brother of K.
Hence option (b) is correct.

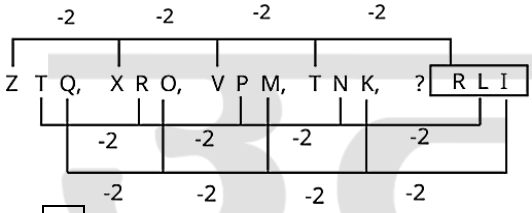
22. In a certain code language, 'ALSO' is written as '8693', and 'SALE' is written as '2836'. How will 'E' be written in that code language?
(a) 9
(b) 8
(c) 2
(d) 3 **[c]**

Explanation –

Just as,
A L S O – 8 6 9 3
S A L E – 2 8 3 6
in the same manner
E = 2
Therefore option (c) is correct.

23. Which of the following options should come in place of the question mark (?) in the given series based on the English alphabetical order?
ZTQ, XRO, VPM, TNK, ?
(a) RML
(b) RLI
(c) RKL
(d) SMK **[b]**

Explanation –



? = RLI
Therefore option (b) is correct.

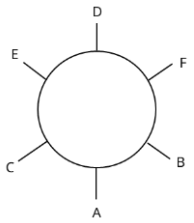
24. What is the total number of prime numbers less than 50?
(a) 13
(b) 15
(c) 17
(d) 14 **[b]**

Explanation –

Total prime numbers less than 50 = 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47
Up: Total prime numbers less than 50 is 15.

25. A, B, C, D, E and F are seated around a circular table facing the centre. Only two persons sit between F and C. D sits immediate right of F. A is the immediate neighbour of B and C. What is the position of E with respect to B?
(a) Second to the left
(b) Immediate to the right
(c) Immediate to the left
(d) Third to the right **[d]**

Explanation –



As per the diagram, position of E with respect to B is 3rd from the right.

26. Carbon in all its allotropes burns in oxygen to give _____.
(a) Carbonic acid
(b) Methane
(c) Carbon dioxide
(d) Carbon monoxide **[c]**

Explanation –

When carbon (whether it's diamond, graphite, or some other allotrope) burns in the presence of oxygen, a chemical reaction occurs in which carbon dioxide (CO_2) is formed. This is a typical combustion reaction:

$$C(s) + O_2(g) \longrightarrow CO_2(g)$$

If oxygen supply is limited, carbon monoxide (CO) may also be formed, but complete combustion always gives carbon dioxide. Carbon dioxide is the only product obtained from complete combustion of carbon.

27. How many molecules of water react with three molecules of iron atom to form Fe_3O_4?
(a) 1
(b) 4
(c) 3
(d) 2 **[b]**

Explanation –

Four molecules of water (H2O) are required to react with three molecules of iron (Fe) to form Fe_3O_4.

The balanced chemical equation of this reaction is asfollows:

$$3Fe(s) + 4\,H_2O(g) \longrightarrow Fe_3O_4(s) + 4H_2(g)$$

It is clear from this equation that 3 atoms of iron react with 4 molecules of water to form one molecule of iron (II,III) oxide Fe_3O_4 and 4 molecules of hydrogen gas.

28. Which of the following terms is used for impurities like clay and sand present in ores?

(a) Hardness of the ore
(b) Flux
(c) Spongy
(d) Gangue **[d]**

Explanation –

Gangue is the term used to describe clay, sand, and other impurities present in mineral ores. These gangue substances must be removed when separating metal from ore.

Hardness of ore refers to the physical property of the ore, not the impurities present in it.

Flux is a substance used in metallurgy to remove impurities or to melt and join metals. It is also called a smelter or flux.

The word 'spongy' is commonly used to describe something that has properties similar to a sponge. It means that which has small holes or pores in it. , Absorbent , Compressible i.e. that gives out when pressed and then returns to its original shape.

29. Find the value of the given expression.

12 + 18 ÷ 3

(a) 18
(b) 22
(c) 12
(d) 10 **[a]**

Explanation –

$\Rightarrow$ 12+18÷3
$\Rightarrow$ 12+6
$\Rightarrow$ 18

30. Sameer has a solid metal ball of 6 cm diameter. He melts it and uses the material to make a solid cylinder. If the diameter of the cylinder is the same as the diameter of the ball, what will be its height?

(a) 8 cm
(b) 4 cm
(c) 6 cm
(d) 4.5 cm **[b]**

Explanation –

Given.

The diameter of the cylinder and the diameter of the ball are the same.

The diameter of the solid metal ball is 6 cm.

The solid metal ball is melted and molded in the shape of a cylinder.

Then the height of the cylinder –

According to the formula –

Volume of the ball = Volume of the cylinder

$\frac{4}{3}\pi r^3 = \pi r^2 h$

$\frac{4}{3}r = h$

$\frac{4}{3}\times\frac{6}{2} = h$

h = 4 cm

31. Which cell's shape keeps changing?

(a) Ovum
(b) Smooth muscle
(c) Amoeba
(d) Nerve cell **[c]**

Explanation –

Amoeba is a unicellular organism known for its ability to change its shape. It projects finger-like extensions from its body, called pseudopods. These pseudopods are used for both movement and for capturing food. Amoeba has no fixed shape and constantly changes its shape.

Ovum:- It has a roughly spherical shape.

Smooth muscle:- Its cells are usually spindle shaped.

Nerve cell:- It has a distinctive star-like structure consisting of a cell body and long axons and dendrites.

32. A car travels a distance of 80 km at a speed of 20 km/h and the next 30 km at a speed of 30 km/h. What is the average speed of the car?

(a) 22 km/h
(b) 30 km/h
(c) 20 km/h
(d) 40 km/h **[a]**

Explanation –

average speed = $\frac{\text{Total Distance}}{\text{Total Time}}$

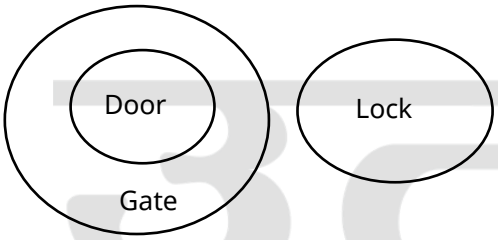
$= \frac{80+30}{\frac{80}{20}+\frac{30}{30}}$

$\Rightarrow \frac{110}{5}$

$\Rightarrow$ 22 km/h

33. Read the statements and conclusions given below carefully. You have to assume that the given statements are true even if they seem to be at variance with commonly known facts and decide which of the given conclusions logically follows from the given statement(s).
Statements:
All doors are gates.
No door is a lock.
Conclusions:
(I) Some locks are gates.
(II) No lock is a door.
(a) Neither conclusion I nor I follows from the statements
(b) Only conclusion I follows from the statements
(c) Both conclusion I and II follow from the statements
(d) Only conclusion I follows from the statements
[d]

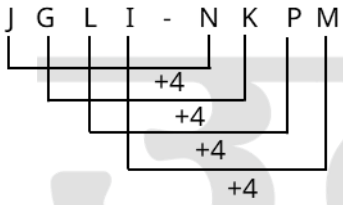
Explanation –



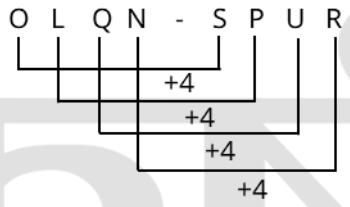
It is clear from the diagram that only conclusion – II follows.

34. JGLI is related to NKPM in a certain way based on the English alphabetical order. In the same way, OLQN is related to SPUR. Following the same logic, LINK is related to which of the following options?
(a) MPRO
(b) PMOR
(c) PMRO
(d) MPOR **[c]**

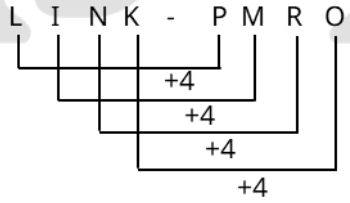
Explanation –
Just as



And



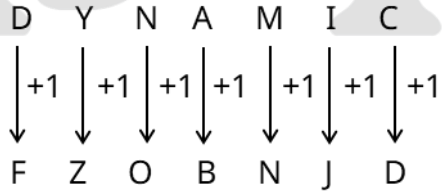
in the same manner



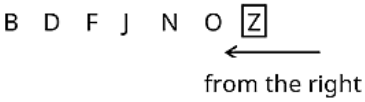
Therefore option (c) is correct.

35. If each letter of the word DYNAMIC is replaced by the letter immediately following it in the English alphabetical order and then the new group of letters thus formed is rearranged according to the English alphabetical order, then which letter will be the first from the right in the new rearranged group of letters?
(a) E
(b) B
(c) D
(d) Z **[d]**

Explanation –



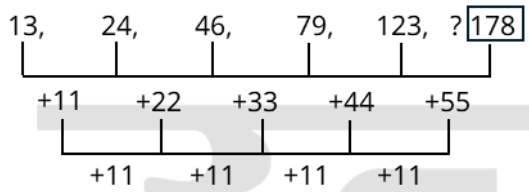
arranging them in English alphabetical order –



It is clear from the diagram that the first letter from the right is Z.

36. Which of the following options should come in place of question mark (?) to complete the given series logically?
13, 24, 46, 79, 123,?
(a) 174
(b) 176
(c) 178
(d) 172 **[c]**

Explanation –



? = 178

37. Every trait of an organism is influenced by which of the following?

(a) Only from maternal DNA
(b) More from paternal DNA than maternal DNA
(c) Only from paternal DNA
(d) Equally from both maternal and paternal DNA

[d]

Explanation –

Each trait of an organism is influenced equally by both maternal and paternal DNA.

An organism receives genetic material (DNA) from both its parents. During fertilization, the sperm (from the father) and the egg (from the mother) fuse to form a zygote. This zygote contains a mixture of DNA from both the parents. Each gene has two alleles, one from the mother and one from the father. These alleles together determine the specific characteristics or traits of the organism. In some traits, one allele may be dominant over the other, while in others both alleles contribute equally.

Therefore, each trait of an organism is influenced by a combination of DNA received from both its mother and father.

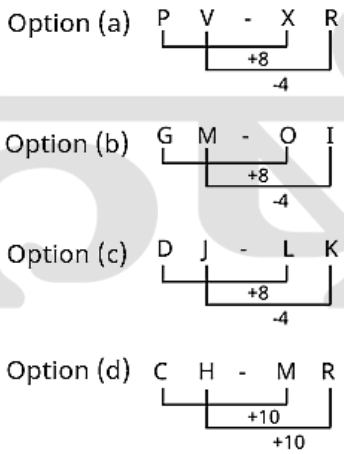
38. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which of the following pair does not belong to that group?

(Note: Odd letter-cluster is not based on the number of consonants/vowels or their position in that letter-cluster.)

(a) PV-XR
(b) GM-OI
(c) DJ-LF
(d) CH-MR

[d]

Explanation –



Hence option (d) is different from other options.

39. There is a tower of 10m between two parallel roads. The angles of depression of the two roads from the top of the tower are 30° and 45° respectively. Approximately how far are the roads from each other?

(a) 27.32 m
(b) 30.82 m
(c) 29.56 m
(d) 26.44 m

[a]

Explanation –

Given.

Height of the tower is 10 m

The angles of depression of the two roads from the top of the tower are 30° and 45° respectively.

$\angle ACB = 30°$

$\angle ADB = 45°$

$\tan 30°$ in ΔABC

$= \frac{AB}{BC} \Rightarrow \frac{1}{\sqrt{3}} = \frac{10}{BC} \Rightarrow BC = 10\sqrt{3}$ meter

$\tan 45°$ in ΔABD

$= \frac{AB}{BD} \Rightarrow 1 = \frac{10}{BD} \Rightarrow BD = 10$ meter

$CD = BC + BD = 10\sqrt{3} + 10 = 10(\sqrt{3}+1) \Rightarrow 10(1.732+1) \Rightarrow 27.32$ meter

40. Which of the following examples shows that there is considerable space between the particles of matter?

(a) Boiling of water
(b) Breaking of iron nail
(c) Burning of incense stick
(d) Potassium permanganate getting evenly distributed in water

[d]

Explanation –

Potassium permanganate is evenly distributed in water.

This example clearly shows that there is enough space between the particles of a substance. When

a crystal of potassium permanganate is put into water, its coloured particles spread in the spaces between the water particles and gradually colour the entire water. If there were no spaces between the water particles, the potassium permanganate particles would not dissolve in it and would not be evenly distributed.

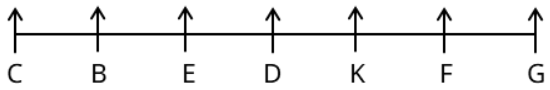
Boiling of water - It shows the change in the state of matter where liquid changes into gaseous state, but it does not directly indicate the space between the particles.

Breaking of an iron nail - It shows the strong force of attraction between the iron particles and not the space between them.

Burning of an incense stick - It is a chemical process in which the particles of incense react with the air particles and produce gases. This indirectly indicates the presence of spaces between the particles, but is not as obvious as the dissolution of potassium permanganate.

41. Seven persons, B, C, D, E, F, G and K are sitting in a straight row facing north. No one is sitting to the right of G. Only three persons are sitting between G and E. Only two persons are sitting between E and F. C is sitting third to the left of D. K is sitting immediate right of D.
How many persons are sitting between B and F?
(a) one
(b) four
(c) two
(d) three **[d]**

Explanation –



It is clear from the diagram that three persons (E, D, K) are sitting between B and F.

42. Read the statements and conclusions given below carefully. Assuming that the given statements are true even if they seem to be at variance with commonly known facts and decide which of the conclusions logically follows from the given statement/statements.
Statements:
Some microphones are speakers.
No speakers are pianos.
Conclusions:
(I) No microphone is a piano.
(II) Some speakers are microphones.
(a) Neither conclusion (1) nor (II) follows from the statements
(b) Both conclusions (I) and (II) follow from the statements
(c) Only conclusion (1) follows from the statements
(d) Only conclusion (II) follows from the statements **[d]**

Explanation –

It is clear from the Venn diagram that only conclusion–II follows.

43. If each letter of the word COINAGE is arranged in the English alphabetical order, then how many letters of the English alphabet will be there between the fourth letter from the left and the third letter from the right in the new letter-cluster thus formed?
(a) two
(b) four
(c) one
(d) five **[c]**

Explanation –

C O I N A G E
arranging them in English alphabetical order –

A C E [G] [I] N O
→ 4th from the left ← 3rd from the right

As per the diagram, only one letter (H) comes between G and I.

44. By selling a pen to a shopkeeper for ₹ 10, he loses $\frac{1}{11}$th of its value. What is the purchase price of a pen?
(a) ₹10
(b) ₹12
(c) ₹11
(d) ₹9 **[c]**

Explanation –

The shopkeeper sold a pen for Rs. 10 and incurred a loss of $\frac{1}{11}$th.

Let the purchase price of the item be 11x. Then the selling price = $11x \times \frac{10}{11} \Rightarrow 10x$

then the cost price of the item = $\frac{10}{10x} \times 11x = Rs.11$

45. When an object is placed in front of a concave mirror of focal length 10 cm, a real image is

formed at a distance of 20 cm in front of the mirror. Here, the distance of the object is ____.

(a) -20 cm
(b) -10 cm
(c) -5 cm
(d) -30 cm **[a]**

Explanation –

Using the mirror formula, we can find the distance of the object: $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$

Where:
f = focal length
v = image distance
u = distance to the object

The focal length (f) of a concave mirror is negative, so f = −10 cm।

Real image is formed in front of the mirror, so distance of image (v) will also be negative, v = −20 cm।

We will now put these values in the mirror formula to find the object distance (u):

$$\frac{1}{-10} = \frac{1}{-20} + \frac{1}{u}$$
$$\frac{1}{u} = -\frac{1}{-20} + \frac{1}{-10}$$
$$\frac{1}{u} = \frac{1}{20} + \frac{1}{-10}$$
$$\frac{1}{u} = -\frac{1}{20}$$
$$u = -20 \text{ cm}$$

46. The first _____ transport aircraft was formally inducted into the Indian Air Force in 2023.

(a) C-295 MW
(b) C-225 MW
(c) C-275 MW
(d) C-250 MW **[a]**

Explanation–

India formally inducted the C-295 MW transport aircraft into the Indian Air Force on 25 September 2023. The aircraft was inducted into the 11th Squadron 'The Rhinos', currently based in Vadodara, Gujarat. The specialty of this aircraft is that it can take off and land even from uncontrolled landing grounds, making it suitable for operations in border areas.

47. Which of the following is the symbol of unit of atomic mass?

(a) ml
(b) g
(c) mg
(d) u **[d]**

Explanation –

'u' stands for the unified atomic mass unit, sometimes called the Dalton (Da). It is used to express atomic and molecular weights, equal to 1/12 the mass of a carbon-12 atom.

- ml is the symbol for millilitre, which is a unit of volume.
- g is the symbol for gram, which is a unit of mass, but not usually used for atomic mass because atoms are too small.
- mg is the symbol for milligram, which is also a unit of mass, but too large for atomic mass.

48. Who among the following has received the Vigyan Ratna Award in the National Science Awards 2024?

(a) Prof. Govindarajan Padmanabhan
(b) Dr. Avesh Kumar Tyagi
(c) Prof. Umesh Varshney
(d) Dr. Anand Ramakrishnan C. **[a]**

Explanation–

The Government of India presented the first National Science Awards (Rashtriya Vigyan Puraskar - RVP) at a ceremony held at Rashtrapati Bhavan on 22 August 2024. In this, Professor Govindarajan Padmanabhan was awarded the Vigyan Ratna Award. He was given this award for his lifetime contribution in the field of biological sciences. He has been a professor of biochemistry at the Indian Institute of Science (IISc), Bengaluru and is famous for his research on malaria parasite.

Other awardees:
Vigyan Ratna Award: Prof. Govindarajan Padmanabhan
Vigyan Shri Award: Dr. Anand Ramakrishnan C. (Agricultural Sciences), Dr. Avesh Kumar Tyagi (Atomic Energy), Prof. Umesh Varshney (Biological Sciences)

49. As of August 2024, who among the following is India's youngest Olympic medalist?

(a) Manu Bhakar
(b) Neeraj Chopra
(c) Lakshya Sen
(d) Aman Sherawat **[d]**

Explanation–

As of August 2024, Aman Sherawat is India's youngest Olympic medallist. He won the bronze medal in men's 57kg freestyle wrestling at the Paris 2024 Olympics, becoming the youngest Indian to win an Olympic medal at the age of 21 years and 24 days. He achieved this feat by breaking the record of PV Sindhu, who won the silver medal at the 2016 Rio Olympics at the age of 21 years, 1 month and 14 days.

50. In a closed circuit, if a charge of 100 coulomb flows for a period of 50 seconds, then the current flowed in the circuit is _____.

(a) 2 A
(b) 5 A
(c) 0.5 A
(d) 0.2 A **[a]**

Explanation –

To calculate the current flowing in the circuit, we use the following formula:

$$I = \frac{Q}{t}$$

Where:
I = Current (in amperes)
Q = Charge flowing (in coulombs)
t = Time (in seconds)
Given:
Q = 100 coulombs
t = 50 seconds
Substitute these values in the formula:

$$I = \frac{100}{50} = 2 \text{ A}$$

Therefore, the current flowing in the circuit is 2 A.

51. The sum of the ages of 5 children born at an interval of 2 years each is 40 years. What is the age of the eldest child?

(a) 12 years
(b) 10 years
(c) 16 years
(d) 14 years **[a]**

Explanation –

Given.
The sum of the ages of 5 children is 40 years.
5 children were born at an interval of two years each.
Let the age of the youngest child be x years.
x+(x+2) + (x+4) + (x+6) + (x+8) = 40
5x+20 = 40
5x = 20
x = 4
Hence, the age of the eldest child = (x+8) $\Rightarrow$ 4+8 $\Rightarrow$ 12 year

52. In the following number-pairs, the second number is obtained by performing certain mathematical operations on the first number. What numbers should come in place of X and Y so that the pattern followed by the two numbers on the left of : is the same as that followed on the right of ::?
(Note: Operations should be performed on whole numbers without breaking the numbers into their constituent digits. Ex. 13- Operations on number 13 such as addition/ subtraction/ multiplying 13 etc. can be performed. Breaking 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)
X : 243 :: 17 : Y
(a) x = 34, Y = 148
(b) X = 31, Y = 169
(c) X = 27, Y = 156
(d) X = 25, Y = 171 **[d]**

Explanation –

Just as,

25 : 243
↓
25×9+18=243

in the same manner

17 : 171
↓
17×9+18=171

Hence, x = 25, y = 171.

53. Choose the correct statement.
(a) Pollination is the transfer of pollen grains from the stamen to the stigma.
(b) Pollination is the visit of insects to the flower.
(c) Pollination is the growth of the pollen tube into the ovule.
(d) Pollination is the germination of pollen grains. **[a]**

Explanation –

- Pollination is the transfer of pollen grains from the stamen to the stigma.
- Insects may assist in the process of pollination, but pollination itself is not the visit of insects to the flower. Insects may carry pollen grains from one flower to another.
- Pollination is the growth of a pollen tube into the ovule. This statement is part of the process of fertilization, not pollination. After pollination, if the pollen grain germinates on the stigma, it forms a pollen tube that grows towards the ovule.
- Germination of pollen grains occurs on the stigma after pollination, if the conditions are favorable. Pollination itself is the transfer of pollen grains.

So, the correct definition of pollination is that it is the transfer of pollen grains from the stamen (male part of the flower where pollen grains are formed) to the stigma (female part of the flower where pollen grains are received).

54. In the following number-pairs, the second number is obtained by performing certain mathematical operations on the first number.

What numbers should come in place of X and Y so that the pattern followed by the two numbers on the left of :: is the same as that followed by the two numbers on the right of ::? (Note: Operations should be performed on whole numbers without breaking the numbers into their constituent digits. Ex. 13- Operations on number 13 such as addition/ subtraction/ multiplying 13 etc. can be performed. Breaking 13 into 1 and 3 and then doing mathematical operations on 1 and 3 is not allowed.)

X : 529 : : 21 : Y

(a) x = 14, Y = 529
(b) x = 11, Y = 625
(c) x = 18, Y = 676
(d) x = 12, Y = 729 **[c]**

Explanation –

Just as,

$18 : 529$

$\downarrow$

$18+5=(23)^2=529$

in the same manner,

$21 : 676$

$\downarrow$

$21+5=(26)^2=676$

Hence, x = 18, y = 676.

55. Two successive discounts of 30% and 35% on a deal are equivalent to a single discount of _____.

(a) 54.5%
(b) 60%
(c) 65%
(d) 55.5% **[a]**

Explanation –

has given it.

Two successive discounts are 30% and 35% respectively.

Single Discount = $x+y-\frac{xy}{100}$

$\Rightarrow 30+35-\frac{30\times35}{100}$

$\Rightarrow 54.5\%$

56. The Federation of International Hockey (FIH) Men's World Cup 2023 was held in _____.

(a) Kochi, Kerala
(b) Patna, Bihar
(c) Rourkela, Odisha
(d) Amravati, Andhra Pradesh **[c]**

Explanation–

• The 2023 Men's FIH Hockey World Cup was the 15th edition hosted by India.
• It was held from 13 January to 29 January 2023 at the Kalinga Stadium in Bhubaneswar and Rourkela in India.
• The quadrennial world championship for men's national field hockey teams is organised by the International Hockey Federation.
• The sixteen national teams were required to register a playing squad of eighteen players and two reserve players.

57. Which two numbers should be interchanged to make the given equation correct?

56 + 18 – 11 × 3 + 4 × (66 ÷ 2) + 22 = 151

(Note: Whole numbers should be interchanged and not the individual digits of the given number.)

(a) 18 and 11
(b) 11 and 22
(c) 3 and 2
(d) 56 and 66 **[b]**

Explanation –

56+18−11×3+4×(66÷2)+22=151

On changing the number from option (b)

56+18−22×3+4×(66÷2)+11 =151

56+18−66+4×33+11=151

56+18−66+132+11=151

217−66 = 151

151 = 151

Therefore option (b) is correct.

58. Which master musician, famous for his work in films like 'Amar Akbar Anthony' and 'Bobby', was awarded the Padma Bhushan on Republic Day 2024?

(a) RD Burman
(b) Pyarelal Sharma
(c) Ilaiyaraaja
(d) Laxmikant Shantaram Kudalkar **[b]**

Explanation–

The Government of India honored Pyarelal Sharma with the prestigious Padma Bhushan award on the occasion of Republic Day on 26 January 2024. He has been a member of the famous composer duo Laxmikant-Pyarelal. The duo composed music for many superhit films, including films like 'Amar Akbar Anthony' and 'Bobby'. The duo gave a new direction to Bollywood music from the 1960s to the 1990s and composed many memorable songs.

59. Jivitputrika festival, which was in the news for an incident in September 2024, is mainly celebrated in which of the following states?

(a) Bihar
(b) Odisha
(c) Gujarat
(d) West Bengal **[a]**

Explanation–

Jivitputrika Vrat, also known as Jitiya Vrat, is observed especially in the state of Bihar. This fast is observed by mothers for the long life and good health of their children. During this fast, women observe Nirjala fast and worship Lord Jimutvahana. This fast is mainly observed in Bihar, Jharkhand, and Eastern Uttar Pradesh.

In September 2024, a tragic incident occurred during this fast in Bihar, in which 46 people died due to floods, including 37 children and 7 women. The incidents took place in various districts of Bihar, such as Patna, Saran, Muzaffarpur, and East Champaran, where women and children went to bathe in water bodies for the fast rituals.

60. What is/are the products formed by the reaction between an acid and a base?

(a) Salt and water
(b) Only water
(c) Salt and hydrogen gas
(d) Only salt **[a]**

Explanation –

The reaction between acid and base produces salt and water. This reaction is also called neutralization reaction.

A general neutralization reaction can be written as follows:

Acid + base ⟶ salt + water

For example, the reaction of hydrochloric acid (HCl) and sodium hydroxide (NaOH) produces sodium chloride (NaCl) (a salt) and water (H_2O):

$HCl(aq)+NaOH(aq)\longrightarrow NaCl(aq)+H_2O(l)$

61. A cause is given below followed by possible effects numbered I, II and III. Read the cause carefully and decide which of the three possible effects can occur?

Cause - City X has been receiving thunderstorms and heavy rains for the last two days. The weather department has forecast more rain in the next 48 hours.

Effect I - The electricity department has decided to increase the tariff by 50 paise per unit in city x.

Effect II - Waterlogging is reported from many areas in city x.

Effect III - Several trees reportedly fell on MG Road last night, injuring at least 12 people.

(a) Only II is a possible effect.
(b) Both I and II are possible effects.
(c) Both II and III are possible effects.
(d) Only I is a possible effect. **[c]**

Explanation –

Impact –II- Waterlogging is reported from many areas of city x. Heavy and continuous rain can definitely cause waterlogging in cities, especially if there is no drainage system. Hence, this is a possible impact.

Impact –III- Reportedly, many trees fell on a road last night, injuring at least 12 people. This is also a possibility.

Hence, both Impact –II and III are possible impacts.

62. A person invests $\frac{1}{3}$ of his income at 7% simple interest, $\frac{1}{4}$ part at 8% simple interest and the remaining part of his income at 10% simple interest. If the total interest received at the end of the year is ₹ 561, what was his original income?

(a) ₹7,500
(b) ₹3,000
(c) ₹4,500
(d) ₹6,600 **[d]**

Explanation –

$\frac{1}{3}$ rd part of the income is invested at 7% simple interest.

$\frac{1}{4}$ th of the income is invested at 8% simple interest.

The remaining part of the income is invested at 10% simple interest.

Total interest = Rs 561

Let the principal be Rs x.

$$\text{Simple Interest} = \frac{\text{Principal amount} \times \text{Time} \times \text{Rate}}{100}$$

$$561 = \frac{\left(x \times 1 \times \frac{1}{3} \times 7\right) + \left(x \times \frac{1}{4} \times 1 \times 8\right) + \left[\left(x - \left(\frac{x}{3} + \frac{x}{4}\right)\right) \times 10\right]}{100}$$

$$561 = \frac{\frac{7x}{3} + 2x + \left[\left(x - \left(\frac{4x + 3x}{12}\right)\right) \times 10\right]}{100}$$

$$561 = \frac{\frac{7x}{3} + \frac{2x}{1} + \frac{25x}{6}}{100}$$

$561\times100=\frac{14x+12x+25x}{6}$

$561\times100\times6 = 51x$

$x = Rs.6600$

63. As per the latest NSSO Consumer Expenditure Survey conducted in 2024, what is the poverty rate in India?

(a) 10%-15%
(b) Less than 5%
(c) Less than 10%
(d) More than 15% **[b]**

Explanation –

According to NITI Aayog CEO BVR Subrahmanyam, the most recent Consumer Expenditure Survey shows that the poverty rate in the country has declined to 5%, reflecting growing prosperity in both rural and urban areas. The National Sample Survey Office (NSSO), under the Ministry of Statistics and Program Implementation, released data on household consumption expenditure for 2022-23, showing a more than two-fold increase in per capita monthly household expenditure compared to 2011-12.

64. What is the average of the first five multiples of 3?

(a) 12
(b) 9
(c) 15
(d) 3 **[b]**

Explanation –

according to question –

First five multiples of 3 = 3, 6, 9, 12, 15

Hence, the average = $\frac{3+6+9+12+15}{5} \Rightarrow 9$

65. In his address regarding Union Budget 2024, the Finance Minister highlighted the key areas to be focused for the coming year. Which of the following areas was emphasized?

(a) Employment, skills, MSME and middle class
(b) Infrastructure, technology, tourism and environment
(c) Agriculture, defence, space and healthcare
(d) Education, sports, culture and entertainment

[a]

Explanation–

Union Finance Minister Nirmala Sitharaman announced a special focus on employment, skills, micro, small and medium enterprises (MSME) and the middle class in the Union Budget 2024. She informed that a provision of Rs 1.48 lakh crore has been made for employment and skill development in this budget, which will provide employment opportunities to 30 lakh youth. In addition, 20 lakh youth will be provided skill training under a package of Rs 2 lakh crore. Along with this, 1000 Industrial Training Institutes (ITIs) will be upgraded under the hub-and-spoke model. Apart from this, loan facility of up to Rs 7.5 lakh will also be provided under the Model Skill Loan Scheme. The aim of these initiatives is to connect the youth with employment and enhance their skills.

66. What determines the pattern of the magnetic field produced by a current flowing through a conductor?

(a) Direction of current
(b) Colour of the conductor
(c) Shape of the conductor
(d) Material of the conductor **[C]**

Explanation –

The pattern of the magnetic field produced by the current flowing through a conductor is determined primarily by the shape of the conductor. For example, a straight conductor produces a circular magnetic field around it, while a solenoid produces a uniform magnetic field resembling a magnetic rod.

Material of conductor - The material does not affect the pattern of the magnetic field, but it affects the strength of the field, which depends on the resistance of the conductor.

Direction of current - The direction of the current affects the direction of the magnetic field, but it does not change the overall pattern.

Color of conductor - The color has no effect on the magnetic field.

67. By which biological process harmful metabolic wastes are removed from our body?

(a) secretion
(b) transportation
(c) defecation
(d) emission **[d]**

Explanation –

The biological process by which harmful metabolic wastes are expelled from our body is called excretion.

Excretion is the process by which toxic and unnecessary substances produced during metabolism are expelled from the body of organisms. The main organs of excretion in the human body are kidneys, lungs, skin and liver.

Secretion - It is the process by which cells or glands secrete certain useful substances (such as

hormones, enzymes). It is different from waste elimination.

Transportation - It is the movement of substances (such as oxygen, nutrients, waste materials) from one part of the body to another. Waste materials are transported to the excretory organs before excretion.

Egestion - It is the process of removing undigested food and solid waste materials from the body. It is different from excretion, in which metabolic wastes are filtered out of the blood.

Therefore, the correct biological process for expelling harmful metabolic wastes is excretion.

68. Seven boxes A, B, C, D, E, F and G are placed one above the other but not necessarily in the same order. A is placed at the second position from the bottom. Only three boxes are placed between E and G. G is not placed at the topmost position. F is placed just above C. C is placed just above E. B is not placed at the fourth position from the top.

How many boxes are placed between C and A?

(a) two
(b) three
(c) one
(d) four **[b]**

Explanation –

1–F
2–C
3–E
4–D
5–B
6–A
7–G

It is clear from the diagram that only three boxes (E,D,B) are placed between C and A.

69. The phenomenon involved in the formation of images by mirrors is_____.

(a) Reflection
(b) Interference
(c) Refraction
(d) Diffraction **[a]**

Explanation –

The main phenomenon involved in the formation of images by mirrors is reflection. When light rays fall on the surface of a mirror, they return back to the same medium. This phenomenon is called reflection of light. The reflecting surface of mirrors is smooth, due to which regular reflection takes place and we see clear images of objects.

70. If the acceleration due to gravity of the Earth is 6 times the acceleration due to gravity of the Moon, then which one of the following statements is correct?

(a) The weight of an object on the Earth is 6 times more than its weight on the Moon.
(b) When we measure the weight of an object on the Earth or the Moon, it is the same.
(c) The weight of an object on the Earth is 2 times more than its weight on the Moon.
(d) The weight of an object on the Moon is 6 times more than its weight on the Earth. **[a]**

Explanation –

The weight of an object is the force of gravity acting on it. Weight is calculated using the following formula:

$W = mg$

Where:

W = weight
m = mass of the object
g = acceleration due to gravity

Given that

acceleration due to gravity of the earth (g_e), acceleration due to gravity of the moon (g_m) is 6 times of, That is: $g_e = 6g_m$

Now, the weight (W_e) of an object on the Earth will be:

$W_e = mg_e = m(6g_m) = 6(mg_m)$

And the weight of the same object on the moon will be (W_m):

$W_m = mg_m$

Therefore, we can see that:

$W_e = 6W_m$

This means that the weight of an object on Earth is 6 times more than its weight on the Moon.

71. The average monthly salary of a person for the months of January, February, March and April is ₹8,000, and the average monthly salary for the months of February, March, April and May is ₹8,500. If his salary for the month of May is ₹6,500, find his salary for the month of January.

(a) ₹4,500
(b) ₹2,500
(c) ₹3,000
(d) ₹5,000 **[a]**

Explanation –

Given.

The average monthly salary for the months of January, February, March and April is Rs 8000.

The monthly salary for February, March, April and May is Rs 8500.

The salary for the month of May is Rs 6500.

Total monthly salary for the months of January, February, March, April and May = 8500×4 ⇒ Rs 34000

Salary for February, March, April = 34000–6500 ⇒ 27500

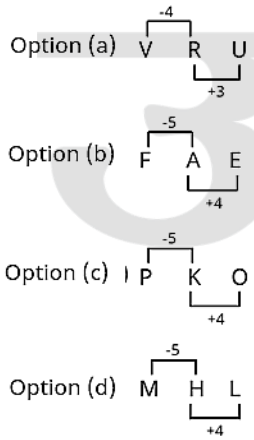
January = (January+February+March+April) – (February+March+April)

Salary for January = 32000–27500 ⇒ Rs 4500

72. Three of the following four letter-clusters are alike in a certain way based on the English alphabetical order and thus form a group. Which of the following letter-cluster does not belong to that group?
(Note: Anomalous letter clusters are not based on the number of consonants/vowels or their position in the letter cluster.)

(a) VRU
(b) FAE
(c) PKO
(d) MHL **[a]**

Explanation –



Hence option (a) is different from other options.

73. If three numbers are in the ratio 5 : 6 : 8 and their sum is 3800, find the largest number.

(a) 1000
(b) 1600
(c) 2000
(d) 1200 **[b]**

Explanation –

Ratio of three numbers = 5 : 6 : 8.

Sum = 3800.

Let those numbers be 5x, 6x, 8x respectively.

So the largest number = $\frac{3800}{19x} \times 8x \Rightarrow 1600$

74. Study the given table and answer the question given below.
The table shows the number of tickets sold through cash and online mode for a cricket match on Friday and Saturday.

Day	Number of tickets sold (cash)	Number of tickets sold (online)
Friday	725	525
Saturday	1000	3000

How many tickets were sold on Friday including cash and online?

(a) 1050
(b) 1350
(c) 1150
(d) 1250 **[d]**

Explanation –

Number of tickets sold using cash on Friday = 725

Number of tickets sold online on Friday = 525

Total tickets sold on Friday = Tickets sold using cash + Tickets sold online

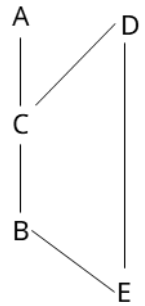
Total tickets sold on Friday = 725 + 525

Total tickets sold on Friday = 1250

75. Town A is located to the north of Town B. Town C is located to the south of Town A. Town D is located to the north-east of Town C. Town E is located to the south of Town D. Town B is located to the north-west of Town E. Town B is located to the south of Town C. What is the position of Town E with respect to Town C?

(a) South-east
(b) North-east
(c) South-west
(d) North-west **[a]**

Explanation –



It is clear from the diagram that Town E is located in the south–east with respect to Town C.