RRB ALP Exam-Day Question Paper (Major Pattern Changes)

Q.1 In a certain code language, 'LEAF" is written as 'OGDH', and 'TREE' is written as "WTHG'. How will 'STEM' be written in that language?

A. UVHO
B. VUHN
C. VVHO
D. UVGH

Answer: C

Sol: **Given:**
LEAF → OGDH, TREE → WTHG
STEM → ?

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

Logic: Alphabetical pattern +3, +2, +3, +2 follow.
LEAF → OGDH
L + 3 → O
E + 2 → G
A + 3 → D
F + 2 → H
TREE → WTHG
T + 3 → W
R + 2 → T
E + 3 → H
E + 2 → G
Apply same pattern to **STEM → ?**
S + 3 → **V**
T + 2 → **V**
E + 3 → **H**
M + 2 → **O**
So, **STEM → VVHO**
Thus, the correct option is: (c)

Q.2 Which of the following letter-clusters should replace # and % so that the pattern and relationship followed between the letter-cluster pair on the left side of :: is the same as that on the right side of ::?
 # : NQP :: HKJ : %

A. # = QTO, % = EEG
B. # = YTS, % = EUG
C. # = OMS, % = ERG
D. # = QTS, % = EHG

Answer: D

Sol: **Given:**
: NQP :: HKJ : %

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

Logic: each letter moves 3 steps backward in the English alphabet.

Observe the relationship between # and NQP.
Check option QTS → NQP.
Q −3 → N
T −3 → Q
S −3 → P
Now apply the same logic to HKJ.
H −3 → E
K −3 → H
J −3 → G

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Thus, % = EHG.
Hence, **# = QTS and % = EHG** satisfy the given relationship.
Thus, correct option is (d).

Q.3 If the third proportional of 32 and 24 is x, then what is the value of x?

A. 17
B. 16
C. 18
D. 20

Answer: C

Sol: **Given:**
First number $= 32$
Second number $= 24$
Third proportional $= x$
Concept Used:
Third proportional
Formula Used:
If $a : b = b : c$, then $c = \frac{b^2}{a}$
Solution:
$x = \frac{24^2}{32}$
$= \frac{576}{32}$
$= 18$
Final Answer:
$\boxed{18}$

Q.4 Select the pair which follows the same pattern as that followed by the two set of pairs given below. Both pairs follow the same pattern.
ICK : KEF
HDW : JFR

A. RFM : TIH
B. VJF : XLA
C. KLR : MNN
D. GGP : IJK

Answer: B

Sol: **Given**

ICK : KEF and HDW : JFR.

Logic: In each pair, first two letters move forward by two places, third letter moves backward by five places. (first letter +2, second letter +2, third letter −5)

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

For ICK : KEF

I +2 = K, C +2 = E, K −5 = F

For HDW : JFR

H +2 = J, D +2 = F, W −5 = R

Check options:

A) RFM : TIH

R +2 = T (correct), F +2 ≠ I (wrong), M −5 = H (correct) → pattern not fully followed

B) VJF : XLA

V +2 = X, J +2 = L, F −5 = A → **pattern fully followed**

C) KLR : MNN

K +2 = M, L +2 = N, R −5 ≠ N → third letter does not match

D) GGP : IJK

G +2 = I (correct), G +2 ≠ J (wrong), P −5 = K (correct)

Thus, correct option is (b).

Q.5 **If 1 is added to each even digit and 1 is subtracted from each odd digit in the number 7521432, what will be the sum of digits which are second from left and third from right in the new number thus formed?**

A. 9
B. 6
C. 10
D. 8

Answer: A

Sol: **Given**: 7521432

Add 1 to each even digit and subtract 1 from each odd digit.

7 (odd) → 7 − 1 = 6

5 (odd) → 5 − 1 = 4

2 (even) → 2 + 1 = 3

1 (odd) → 1 − 1 = 0

4 (even) → 4 + 1 = 5

3 (odd) → 3 − 1 = 2

2 (even) → 2 + 1 = 3

New formed number: 6, 4, 3, 0, 5, 2, 3

Second from the left = 4

Third from the right = 5

Add: 4 + 5 = **9**

So, **9** will be the sum of digits which are second from left and third from right in the new number thus formed.

Thus, correct option is (a).

Q.6 **Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster DOES NOT belong to that group?**
(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

A. IPVX
B. SZEH
C. GNSV
D. NUZC

Answer: A

Sol:

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

Logic: First letter +7, Second letter +5 and Third letter +3 in alphabetically.
Step-by-step:
A) I→P (+7), P→V (+6), V→X (+2) **Irregular**
B) S→Z (+7), Z→E (+5), E→H (+3) **Follow pattern**
C) G→N (+7), N→S (+5), S→V (+3) **Follow pattern**
D) N→U (+7), U→Z (+5), Z→C (+5) **Follow pattern**
Only **IPVX** breaks the pattern.
So, odd one out is: **IPVX**
Final Correct Option: **(A)**

Q.7 If the 6-digit number N01M22 is divisible by 11, then which of the options below can give a possible correct relation between M and N?

A. M – N = 1
B. M + N = –1
C. M – N = 5
D. M = N

Answer: A

Sol: **Given**
Number: N01M22
Divisible by 11
Formula Used
Divisibility rule of 11: Difference between sum of digits at odd places and sum of digits at even places must be 0 or a multiple of 11.
Solution
Number: N 0 1 M 2 2
Places (from right):
Odd places (1st, 3rd, 5th): 2, M, 0
Even places (2nd, 4th, 6th): 2, 1, N
Sum of digits at odd places = 2 + M + 0 = M + 2
Sum of digits at even places = 2 + 1 + N = N + 3
Difference = (Sum of odd places) - (Sum of even places)
Diff = (M + 2) - (N + 3)
Diff = M - N - 1
For divisibility by 11, Diff must be 0 or 11.
Case 1: M - N - 1 = 0
M - N = 1
Case 2: M - N - 1 = 11
M - N = 12 (Not possible for single digits)
So, the relation is M - N = 1
Final Answer
So the correct answer is (a)

Q.8 A cylindrical rod has an outer curved surface area of 1800 cm^2. If the length of the rod is 52 cm, then the outer radius (in cm) of the rod, correct to two places of decimal, is:
Take π = 22/7.

A. 6.32
B. 5.51
C. 5.37
D. 6.69

Answer: B

Sol: **Given:**
Curved surface area $= 1800$
$h = 52$
$\pi = \frac{22}{7}$
Concept Used:
Surface area of cylinder
Formula Used:
$\text{CSA} = 2\pi rh$
Solution:
$2 \times \frac{22}{7} \times r \times 52 = 1800$

$\frac{2288}{7}r = 1800$

$$r = \frac{1800 \times 7}{2288}$$

$$r = \frac{12600}{2288}$$

$r \approx 5.50524$

Final Answer:

5.51

Q.9 **The average weight of 8 men is decreased by 3 kg when one of them whose weight is 56 kg is replaced by a new man. What is the weight of the new man?**

A. 30 kg
B. 36 kg
C. 34 kg
D. 32 kg

Answer: D

Sol: **Given:**

Number of men = 8

Decrease in average weight = 3 kg

Weight of the replaced man = 56 kg

Formula Used:

$$\text{Average} = \frac{\text{Sum of weights}}{\text{Number of men}}$$

Sum of weights = Average× Number of men

Solution:

Since the average weight of 8 men decreased by 3 kg,

the total decrease in weight is 8 × 3 = 24 kg.

The total weight decreased because the new man's weight was less than the weight of the replaced man.

Weight of new man = Weight of replaced man - Total decrease in weight

Weight of new man = 56 kg - 24 kg = 32 kg

Therefore, the weight of the new man is 32 kg.

Option (D) is right.

Q.10 **A sum, when invested at 10% simple interest per annum, amounts to ₹2640 after 2 years. What is the simple interest (in ₹) on the same sum at the same rate of interest in 1 year?**

A. ₹220
B. ₹110
C. ₹880
D. ₹440

Answer: A

Sol: **Given:**

Amount after 2 years = ₹2640

Rate of interest = 10%

Time = 2 years

Formula Used:

Simple Interest (SI) = $\frac{P \times R \times T}{100}$

Where P is the principal, R is the rate and T is the time.

Principal = Amount - SI (rearranged as needed)

Solution:
Let the principal be P

SI for 2 years = $\frac{P \times 10 \times 2}{100}$

$= \frac{P \times 20}{100}$

$= \frac{P}{5}$

Amount = P + $\frac{P}{5}$

$\frac{6P}{5} = 2640$

P = $\frac{2640 \times 5}{6}$ = ₹2200

Now, SI for 1 year:

SI = $\frac{2200 \times 10 \times 1}{100}$ = ₹220

Q.11 **During a sale 50% of the goods are sold at 45% profit, 30% of the remaining goods are sold at 27% profit and the still remaining goods are sold at a loss of 43%. If there is an overall profit of x%, then what is the value of x?**

A. 10
B. 11.5
C. 12
D. 13

Answer: B

Sol: **Given:**
50% goods sold at 45% profit

30% of remaining (i.e., 30% of 50% = 15% of total) sold at 27% profit

Remaining 100 − 50 − 15 = 35% sold at 43% loss

Formula Used:

$$\text{Overall Profit \%} = \frac{\sum(\text{Cost fraction} \times \text{Profit/Loss \%})}{\text{Total cost fraction}}$$

Solution:
Let total cost = 100.

First part: 50% goods → profit = 45 → gain = $50 \times 0.45 = 22.5$

Second part: 15% goods → profit = 27 → gain = $15 \times 0.27 = 4.05$

Third part: 35% goods → loss = 43 → loss = 35 $\times (-0.43) = -15.05$

Net gain/loss = 22.5 + 4.05 - 15.05 = 11.5

Overall Profit % = $\frac{11.5}{100} \times 100 = 11.5$

Q.12 **The marked price of a desk is ₹7,725, which is 25% above the cost price. It is sold at a discount of 4% on the marked price. Find the profit percentage.**

A. 21%
B. 19%
C. 20%
D. 22%

Answer: C

Sol: **Given:**

Marked Price (MP) = ₹7,725

MP is 25% above Cost Price (CP)

MP = 1.25 × CP

Discount on MP = 4%

Selling Price (SP) = 0.96 × MP

Formula Used:

$$\text{Profit } \% = \frac{\text{SP} - \text{CP}}{\text{CP}} \times 100$$

Solution:

CP= $\frac{7725}{1.25} = 7725 \times \frac{4}{5}$ =₹6180

SP = $0.96 \times 7725 = ₹7416$

Profit=7416 - 6180 = ₹1236

$\text{Profit } \% = \frac{1236}{6180} \times 100$=20%

Alternate Method:

Net effect from CP to SP = (+25%) then (-4%):

25 + (-4) + $\frac{25 \times (-4)}{100} = 21 - 1 = +20\%$

So profit% = (20%).

Q.13 **A bus travelling at 36 km/hr completes a journey in 5 hours. What should be its speed to cover the same distance in 10 hours?**

A. 17 km/hr
B. 18 km/hr
C. 22 km/hr
D. 9 km/hr

Answer: B

Sol: **Given :**

Speed of bus = 36 km/hr

Time taken = 5 hours

New time = 10 hours

Formula Used :

Distance = Speed × Time

Speed = Distance ÷ Time

Solution :

Distance covered =

$36 \times 5 = 180 \text{ km}$

Required speed to cover 180 km in 10 hours:

$\frac{180}{10} = 18 \text{ km/hr}$

Q.14 **What will come in the place of the question mark '(?)' in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?**
31 ÷ 15 − 1017 × 9 + 22 = ?

A. 558
B. 552
C. 554
D. 556

Answer: D

Sol: **Given:** 31 ÷ 15 − 1017 × 9 + 22 = ?

Sign + ×

Interchanged Sign - ÷

Logic: BODMAS

Operation preference wise	Symbol
Brackets	$[], , ()$
Orders, of	$(power), \sqrt{(root)}, of$
Division	$\div$
Multiplication	$\times$
Addition	$+$
Subtraction	$-$

New Equation: 31 × 15 + 1017 ÷ 9 - 22 = ?

31 × 15 + 113 - 22 = ?

465 + 113 - 22 = ?

578 - 22 = ?

? = 556

Thus, the correct option is **(D) 556**

Q.15 **In a certain code language, 'rough and ready' is coded as 'mo hp km' and 'road is rough' is coded as 'tx km bn'. How is 'rough' coded in the given language?**

A. hp
B. tx
C. bn
D. km

Answer: D

Sol: **Given**

"rough and ready" → "mo hp km"

"road is rough" → "tx km bn"

rough and ready →mo hp km

road is rough →tx km bn

So, code of 'rough' is '**km**'.
Thus, the correct option is (d).

Q.16 **Each of A, B, C, D, E, F, and G has an exam on a different day of a week starting from Monday and ending on Sunday of the same week. A has an exam on Tuesday. Exactly three people have exams between A and D. F's exam is immediately after G's exam. Only one person has an exam between B and F. C has an exam before both B and E. E does not have an exam on Saturday or Sunday. How many people have exams after C?**

A. 3
B. 5
C. 4
D. 6

Answer: D

Sol: **Given:**
A on Tuesday.
Exactly three between A and D → D = Saturday.
F immediately after G (consecutive, G then F).
Exactly one person between B and F.
C before both B and E.
E not on Saturday or Sunday.
According to the given information, arrangements will be:

Day	People
Monday	C
Tuesday	A
Wednesday	E
Thursday	G
Friday	F
Saturday	D
Sunday	B

As per the table, 6 people have exams after C.
Thus, the correct option is **(D) 6.**

Q.17 **If ₹10,000 becomes ₹12,100 in 2 years at compound interest compounded annually, what is the annual percentage rate of compounding?**

A. 10
B. 12
C. 8
D. 9

Answer: A

Sol: **Given:**
Principal P = ₹10,000
Amount after 2 years A = ₹12,100
Compounded annually

Formula Used:
Compound Interest formula:
$A = P(1+r)^t$

Solution:

$$(1+r)^2 = \frac{A}{P}$$

$$(1+r)^2 = \frac{12100}{10000} = 1.21$$

$$1 + r = \sqrt{1.21} = 1.1$$

$$r = 1.1 - 1 = 0.1 = 10\%$$

Q.18 If the median of a data is 46.36 less than its mode, then the median of the data exceeds its mean by ____. (Use the empirical formula)

A. 20.83
B. 23.18
C. 19.14
D. 18.76

Answer: B

Sol:

Given

Median is 46.36 less than Mode

Formula Used

$\text{Mode} = 3\text{Median} - 2\text{Mean}$

Solution

$\text{Mode} = \text{Median} + 46.36$
$\text{Median} + 46.36 = 3\text{Median} - 2\text{Mean}$
$46.36 = 2\text{Median} - 2\text{Mean}$
$46.36 = 2(\text{Median} - \text{Mean})$
$\text{Median} - \text{Mean} = \frac{46.36}{2} = 23.18$

Final Answer

23.18

Q.19 Train A leaves station M at 8:00 a.m. and reaches station N at 3:00 p.m. on the same day. Train B leaves station N at 10:00 a.m. and reaches station M at 3:00 p.m. on the same day. Find the time when Trains A and B meet.

A. 5:46 a.m.
B. 12:05 p.m.
C. 11:14 a.m.
D. 6: 47 a.m.

Answer: B

Sol:

Given:
Train A travels from 8:00 a.m. to 3:00 p.m.
Train B travels from 10:00 a.m. to 3:00 p.m.
Concept Used:
Relative speed
Formula Used:
Distance = Speed × Time
Solution:
Time taken by A = 7 hours
Time taken by B = 5 hours
Let distance = D
Speed of A = $\frac{D}{7}$, Speed of B = $\frac{D}{5}$
Let meeting be t hours after 10 a.m.
$\frac{D}{7}(t+2) + \frac{D}{5}t = D$

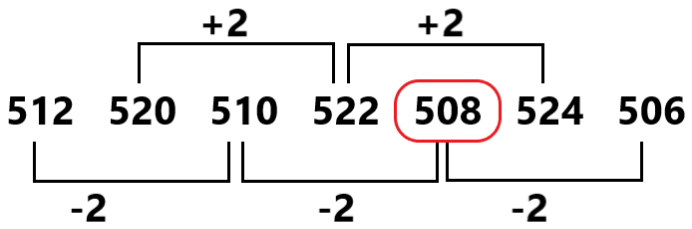
$$\frac{t+2}{7}+\frac{t}{5}=1$$
$$5(t+2)+7t=35$$
$$12t=25$$
$$t=\frac{25}{12}\text{ hours}=2\text{ h }5\text{ min}$$
Final Answer:
12:05p.m.

Q.20 What should come in place of the question mark (?) in the given series?
512 520 510 522 ? 524 506

A. 520
B. 505
C. 521
D. 508

Answer: D

Sol: **Given:**
512 520 510 522 ? 524 506
Let's check:



So, the missing number is: **508**
Thus, the correct option is: (d)

Q.21 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 letter-cluster pair DOES NOT belong to that group?
(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

A. WE – CJ
B. FN – LS
C. CK – JP
D. JR – PW

Answer: C

Sol:

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

Logic: In the group, 1st letter shifts +6 and 2nd letter shifts +5.
Step-by-step:
A) W→C (+6), E→J (+5)
B) F→L (+6), N→S (+5)
C) C→J **(+7)**, K→P (+5) **Does not follow**
D) J→P (+6), R→W (+5)
So, odd one out is: **CK – JP**
Final Correct Option: (C)

Q.22 A question is followed by two statements numbered I and II. You have to decide whether the data provided in the statements are sufficient to answer the question.
Read both the statements and select the most appropriate answer.
Five trees J, R, S, U, and Z are of different heights. Which among them is the tallest tree?
(I) Only three trees are taller than S. U is shorter than S.
(II) R is taller than J. J is taller than Z.

A. Both statements I and II together are NOT sufficient to answer the question
B. Both statements I and II together (and not statement I alone or statement II alone) are sufficient to answer the question
C. Data in Statement II alone is sufficient to answer the question while data in statement I is not
D. Data in Statement I alone is sufficient to answer the question while data in statement II is not

Answer: B

Sol: **Given:**
Five trees J, R, S, U, Z are of different heights.
Statement I: Only three trees are taller than S. U is shorter than S.
Only three trees are taller than S
U is shorter than S
Tallest could be J or R or Z.
So, _ > _ > _ > S > U → not sufficient.
Statement II: R is taller than J. J is taller than Z.
R is taller than J, J is taller than Z → R > J > Z.
No information about S and U.
So, R > J > Z → not sufficient.
Combining (I) and (II):
So: R > J > Z > S > U.
Here, R is taller than everyone.
Thus, the correct option is **(B) Both together, but neither alone sufficient.**

Q.23 Based on the following table, what is the average number of screws manufactured in the unit over the given 6 months?

Months	No. of screws manufactured, in thousand
Jan	200
Feb	300
Mar	250
Apr	250
May	250
Jun	250

A. 200
B. 250
C. 300
D. 150

Answer: B

Sol: **Given:**
Monthly production (in thousand): 200, 300, 250, 250, 250, 250

Formula Used:

$$\text{Average} = \frac{\text{Sum of observations}}{\text{Number of observations}}$$

Solution:

Sum = 200 + 300 + 250 + 250 + 250 + 250 = 1500 (thousand)

Number of months = 6

$$\text{Average} = \frac{1500}{6} = 250 \text{ (thousand)}$$

Q.24 If 35% of k is 20 less than 1200% of 25, then k is:

A. 780
B. 760
C. 840
D. 800

Answer: D

Sol: **Given:**
35% of k is 20 less than 1200% of 25

Formula Used:
$x\%$ of $y = \frac{x}{100} \times y$

Solution:
1200% of $25 = \frac{1200}{100} \times 25 = 300$
35% of $k = 300 - 20 = 280$
$\frac{35}{100}k = 280$
$k = \frac{280 \times 100}{35}$
$k = 800$

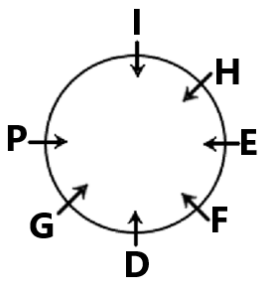
Final Answer:
800

Q.25 D, E, F, G, H, I and P are sitting around a circular table facing the centre of the table. Only four people sit between D and P when counted from the right of D. D sits third to the left of H. G sits third to the left of E. I is an immediate neighbour of both P and H. How many people sit between F and I when counted from the right of F?

A. One
B. Four
C. Three
D. Two

Answer: D

Sol: **Given**:
D, E, F, G, H, I and P are sitting around a circular table facing the centre of the table.
Only four people sit between D and P when counted from the right of D.
D sits third to the left of H.
G sits third to the left of E.
I is an immediate neighbour of both P and H.
From the given information seating arrangement will be.



Two people sit between F and I when counted from the right of F.
Thus, correct option is (d).

Q.26 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 letter-cluster pair DOES NOT belong to that group?
(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

A. NU – PX

B. KR – NU
C. EL – GO
D. AH – CK

Answer: B

Sol:

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

Logic: First letter **+2**, second letter **+3**
Option A: **NU – PX**
N(14) → P(16) = **+2**
U(21) → X(24) = **+3**
Option B: **KR – NU**
K(11) → N(14) = **+3**
R(18) → U(21) = **+3**
Pattern: **+3, +3** (different)
Option C: **EL – GO**
E(5) → G(7) = **+2**
L(12) → O(15) = **+3**
Option D: **AH – CK**
A(1) → C(3) = **+2**
H(8) → K(11) = **+3**
So, odd one out is: **KR – NU**
Thus, the correct option is: (b)

Q.27 **A vendor bought lemons at 7 for ₹1. How many lemons must he sell for ₹1 to gain 75%?**

A. 8
B. 4
C. 5
D. 6

Answer: B

Sol: **Given:**
The vendor buys lemons at 7 for ₹1.

The vendor wants to gain 75% profit.

Formula Used:

$$\text{S.P.} = \text{C.P.} \times \left(1 + \frac{\text{Profit Percentage}}{100}\right)$$

Solution:

Cost Price (C.P.) of 1 lemon = ₹ $\frac{1}{7}$ per lemon

Selling Price (S.P.) for a 75% profit:

S.P. = $\frac{1}{7} \times 1.75 = \frac{1.75}{7}$ = ₹ 0.25 per lemon

Number of lemons to sell for ₹1 = $\frac{1}{0.25}$ = 4

Thus, The vendor must sell 4 lemons for ₹1 to gain a 75% profit

---

Q.28 In a certain code language, 'PICKLE' is written as 'KRXPOV'. How will 'TURNIP' be written as in that language?

A. GFIMRK
B. FHELQJ
C. FEHLQJ
D. GFMRIK

Answer: A

Sol: **Given**: 'PICKLE' is written as 'KRXPOV'

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

Logic: Opposite letters are given of corresponding letters.
P $\rightarrow$ K, I $\rightarrow$ R, C $\rightarrow$ X, K $\rightarrow$ P, L $\rightarrow$ O, E $\rightarrow$ V
Similarly,
T $\rightarrow$ **G**, U $\rightarrow$ **F**, R$\rightarrow$ **I**, N $\rightarrow$ **M**, I $\rightarrow$ **R**, P $\rightarrow$ **K**
So, the code of **TURNIP** is **GFIMRK**.
Thus, correct option is (a).

Q.29 Which of the following letter-clusters should replace # and % so that the pattern and relationship followed between the letter-cluster pair on the left side of :: is the same as that on the right side of :: ?
 # : XTR :: LHF : %

A. # = DTX, % = FBZ
B. # = DZX, % = FBZ
C. # = UZX, % = FBZ
D. # = DZX, % = FBO

Answer: B

Sol: **Given:**
: XTR :: LHF : %

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

Logic: Each letter -6 in alphabetically.
Option A: # = DTX, % = FBZ
 # = DTX
D -6 → X
T -0 → T
X -6 → R
% = FBZ
L -6 → F
H -6 → B
F -6 → Z
Option B: # = DZX, % = FBZ
 # = DZX
D -6 → X
Z -6 → T
X -6 → R
% = FBZ
L -6 → F
H -6 → B
F -6 → Z
Pattern follow.
Thus, the correct option is: (b)

Q.30 In a certain code language, ROTARY is written as 65. How will CONSCIENCE be written as in that language?

A. 170

B. 150
C. 180
D. 160

Answer: C

Sol: **Given:**
ROTARY → 65
CONSCIENCE → ?

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

Logic: The sum of the opposite letters = 2nd number.
ROTARY → 65
R → I = 9
O → L = 12
T → G = 7
A → Z = 26
R → I = 9
Y → B = 2
Sum = 9 + 12 + 7 + 26 + 9 + 2 = 65
CONSCIENCE → ?
C → X = 24
O → L = 12
N → M = 13
S → H = 8
C → X = 24
I → R = 18
E → V = 22
N → M = 13
C → X = 24
E → V = 22
Sum = 24 + 12 + 13 + 8 + 24 + 18 + 22 + 13 + 24 + 22 = **180**
Thus, the correct option is **(c) 180**

Q.31 **A, B, C, D, E and F live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on, till the topmost floor is numbered 6. C lives on a floor that is a prime number. The product of floors on which C and B live is 8. E lives immediately above F. The sum of floors on which B and D live is 7. How many people live between A and D?**

A. 1
B. 4
C. 3
D. 2

Answer: A

Sol: **Given**:
A, B, C, D, E and F live on six different floors of the same building.
The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on, till the topmost floor is numbered 6.
C lives on a floor that is a prime number.
The product of floors on which C and B live is 8.
E lives immediately above F.
The sum of floors on which B and D live is 7.
From the given information arrangement will be.

FloorsPersons

6 E

5 F

4 B

3	D
2	C
1	A

1 people live between A and D.
Thus, correct option is (a).

Q.32 **Vimal ranked 19th from the top and 24th from the bottom in his class. How many students are there in his class?**

A. 43
B. 40
C. 41
D. 42

Answer: D

Sol: **Given**:
Vimal's rank from the top = 19
Vimal's rank from the bottom = 24

Apply the total formula
Total students=(Rank from top)+(Rank from bottom)−1
=19+24−1
=42
The correct answer is: (d) 42

Q.33 Simplify: $3\left(\left(\frac{7}{3}\right)x^2 - 22x + 19\right) - 7(x^2 + 9x - 14)$

A. –129x – 155
B. –129x + 155
C. 129x + 155
D. 129x – 155

Answer: B

Sol: **Given:**
Expression: $3\left(\frac{7}{3}x^2 - 22x + 19\right) - 7(x^2 + 9x - 14)$
Formula Used:
Distribution Law and combining like terms.
Solution:
Multiplying the terms:
$3 \times \frac{7}{3}x^2 - 3 \times 22x + 3 \times 19 - 7 \times x^2 - 7 \times 9x - 7 \times (-14)$
Simplifying each term:
$7x^2 - 66x + 57 - 7x^2 - 63x + 98$
Grouping like terms:
$(7x^2 - 7x^2) + (-66x - 63x) + (57 + 98)$

$= 0 - 129x + 155$

$= -129x + 155$

Q.34 **A tangent is drawn from point P to a circle with centre O. The radius of the circle is 7 cm, and the distance from point P to the centre O is 25 cm. What is the length of the tangent from point P to the point of tangency?**

A. 24 cm
B. 27 cm
C. 31 cm
D. 21 cm

Answer: A

Sol: **Given:**

Radius of circle r = 7 cm

Distance from external point to center OP = 25 cm

Formula Used:

For tangent to a circle:

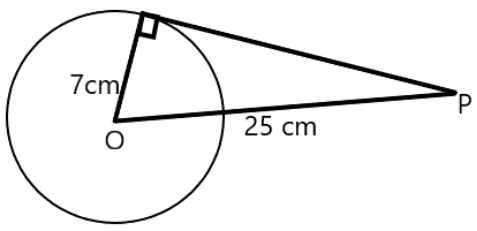
$OP^2 = OT^2 + PT^2$

where OT = r

PT = $\sqrt{OP^2 - OT^2}$

Solution:

Let the tangent length be PT.



PT = $\sqrt{25^2 - 7^2} = \sqrt{625 - 49} = \sqrt{576} = 24$

Length of tangent PT = 24 cm

Q.35 **This question is based on the five, three-digit numbers given below.**
(Left) 823 664 309 431 175 (Right)
(Example- 697 – First digit = 6, second digit = 9 and third digit = 7)
(NOTE: All operations to be done from left to right.)
What will be the resultant if the first digit of the highest number is added to the third digit of the lowest number?

A. 13
B. 16
C. 12
D. 14

Answer: A

Sol: **Given:**

Numbers: 823, 664, 309, 431, 175

Highest number = 823

Lowest number = 175

First digit of the highest number (823) = 8

Third digit of the lowest number (175) = 5

Resultant = 8 + 5 = **13**

Thus, correct option is (A).

Q.36 **What should come in place of the question mark (?) in the given series?**
21, 24, 33, 48, 69, 96 ?

A. 116
B. 138
C. 141
D. 129

Answer: D

Sol: **Given:** 21, 24, 33, 48, 69, 96, ?
Logic: Differences are in A.P.: +3, +9, +15, +21, +27, so next difference = +33.
21 + 3 = 24
24 + 9 = 33
33 + 15 = 48
48 + 21 = 69
69 + 27 = 96
96 + 33 = 129
So, **? = 129**
Thus, the correct option is **(D) 129**

Q.37 **The total surface area of a solid hemisphere is 166.32 sq cm, find its curved surface area?**

A. 55.44 sqcm
B. 110.88 sq cm
C. 221.76 sq cm
D. 196.96 sq cm

Answer: B

Sol: **Given:**

The total surface area of a solid hemisphere is 166.32 sq cm.

Formula Used:

The total surface area of a solid hemisphere is the sum of the curved surface area and the base area.

Total Surface Area (TSA) of a hemisphere = $3\pi r^2$

Curved Surface Area (CSA) of a hemisphere = $2\pi r^2$

Base area of the hemisphere = πr^2

Solution:

Let the radius of the hemisphere be r

The formula for the total surface area is:

$3\pi r^2 = 166.32$

$3 \times 3.1416 \times r^2 = 166.32$

$3 \times r^2 = 166.32$

$r^2 = \frac{166.32}{9.4248} = 17.64$

$r = \sqrt{17.64} = 4.2\,\text{cm}$

Now, curved surface area (CSA):

Curved Surface Area (CSA) hemisphere = $2\pi r^2$

$= 2 \times 3.1416 \times 17.64$

$= 110.8\,\text{sq cm}$

The curved surface area of the hemisphere is 110.8 sq cm

Q.38 If $a : b = \frac{3}{2} : \frac{7}{3}$ and $b : c = \frac{1}{5} : \frac{1}{7}$ then find a : b : c.

A. 14 : 9 : 10
B. 9 : 14 : 10
C. 10 : 9 : 14
D. 4 : 5 : 7

Answer: B

Sol: **Given:**

$a : b = \frac{3}{2} : \frac{7}{3}$

$b : c = \frac{1}{5} : \frac{1}{7}$

Solution:

$a : b = \frac{3}{2} : \frac{7}{3} = \frac{3}{2} \div \frac{7}{3} = \frac{3}{2} \times \frac{3}{7} = \frac{9}{14} \implies a : b = 9 : 14.$

$b : c = \frac{1}{5} : \frac{1}{7} = \frac{1}{5} \div \frac{1}{7} = \frac{7}{5} \implies b : c = 7 : 5.$

Equalize b: LCM(14,7) = 14.

From a : b = 9 : 14.

From b : c = 7 : 5, multiply by 2 $\implies$ b : c = 14 : 10.
Therefore, a : b : c = 9 : 14 :10.

Q.39 Find the value of $3\frac{1}{2}+4\frac{3}{4}-5\frac{3}{8}+2\frac{1}{4}-3\frac{1}{8}$

A. 2
B. 4
C. 3
D. 5

Answer: A

Sol: **Given:**
$3\frac{1}{2}+4\frac{3}{4}-5\frac{3}{8}+2\frac{1}{4}-3\frac{1}{8}$
Solution:
$3\frac{1}{2}=\frac{7}{2}=\frac{28}{8}$

$4\frac{3}{4}=\frac{19}{4}=\frac{38}{8}$

$5\frac{3}{8}=\frac{43}{8}$

$2\frac{1}{4}=\frac{9}{4}=\frac{18}{8}$

$3\frac{1}{8}=\frac{25}{8}$
$\frac{28}{8}+\frac{38}{8}-\frac{43}{8}+\frac{18}{8}-\frac{25}{8}$
$=\frac{28+38-43+18-25}{8}$
$=\frac{16}{8}$
$=2$

Q.40 **Five boxes, A, B, C, D, and E are kept in a vertical arrangement. Only one box is kept below box C. There are two boxes kept between boxes D and C. Box E is kept at the second place from the top. Only two boxes are kept above box A. Which box is kept at the bottom?**

A. Box D
B. Box C
C. Box E
D. Box B

Answer: D

Sol: **Given**:
Five boxes, A, B, C, D, and E are kept in a vertical arrangement.
Only one box is kept below box C.
There are two boxes kept between boxes D and C.
Box E is kept at the second place from the top.
Only two boxes are kept above box A.
From the given information arrangment will be.

OrderBoxes

5 D

4 E

3 A

2 C

1 B

B box is kept at the bottom.
Thus, correct option is (d).

Q.41 What is the mode of the data given below? [Give your answer correct to 2 decimal places.]

Age in years	15-25	25-35	35-45	45-55	55-65	65-75	75-85
No. of patients	31	34	13	19	30	28	29

A. 23.58
B. 17.36
C. 39.33
D. 26.25

Answer: D

Sol: **Given:**
Modal class $= 25–35$
$l = 25, h = 10$
$f_1 = 34, f_0 = 31, f_2 = 13$
Concept Used:
Mode of grouped data
Formula Used:
$$\text{Mode} = l + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times h$$
Solution:
$$\text{Mode} = 25 + \frac{34 - 31}{2(34) - 31 - 13} \times 10$$
$$= 25 + \frac{3}{24} \times 10$$
$$= 25 + 1.25$$
$$= 26.25$$
Final Answer:
26.25

Q.42 Below are given statements followed by some conclusions. You have to take the given statements to be true even if they seem to be at variance with the commonly known facts and then decide whichs of the grven conclusione logically follow(s) from the given statements
Statement:
1. All caps are books.
2. All books are pens.
Conclusions:
I. Some caps are not pens.
II. Some pens are caps.

A. Only conclusion II follows.
B. Only conclusion I follows.
C. Neither I nor II follows.

D. Either I or II follows.

Answer: A

Sol: **Statement**:
1. All caps are books.
2. All books are pens.

From the given statements possible Venn diagram will be.

Conclusions:
I. Some caps are not pens. (**False**, we just concluded that all caps are pens, so saying some are not contradicts the statement).
II. Some pens are caps. (**True**, all caps are books and all books are pens, so that means some pens are also caps).
So, **Only conclusion II follows.**
Thus, correct option is (a).

Q.43 **In this question, a question is followed by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and select the most appropriate answer.**
Question:
Among 5 students, F, A, K, E and D each having a different height, which student is the shortest?
Statements:
I. A is shorter than E. K is shorter than F.
II. K is taller than A.

A. Data in statement I alone is sufficient to answer the question while data in statement II is not
B. Data in statements I and II together are NOT sufficient to answer the question
C. Data in statement II alone is sufficient to answer the question while data in statement I is not
D. Data in statements I and II together (and not statement I alone or statement II alone) are sufficient to answer the question

Answer: B

Sol: **Question**:
Among 5 students, F, A, K, E and D each having a different height, which student is the shortest?
Statements:
I. A is shorter than E. K is shorter than F. **(Not sufficient)**
A < E and K < F
We know only two partial comparisons, and nothing about D. We can't determine who is shortest.
II. K is taller than A. **(Not sufficient)**
K > A
Only one comparison. We still don't know about F, E, or D.
Combining (I) and (II):
From (I): A < E, K < F
From (II): K > A → So order among A, K, F, E (partial) is:
A < K < F and A < E
D is still unrelated.
We still can't find the shortest, because D's height is unknown. Even together, not sufficient.
So, **Data in statements I and II together are NOT sufficient to answer the question**.
Thus, correct option is (b).

Q.44 **The curved surface area of a right circular cone is 4335π cm^2, and the diameter of its base is 102 cm. Find the height (in cm) of the cone.**

A. 68
B. 64
C. 63
D. 69

Answer: A

Sol: **Given:**
$\text{Curved surface area of cone } = 4335\pi \text{cm}^2$
$\text{Diameter of base } = 102\text{cm}$
Formula Used:
$\text{CSA} = \pi rl$

$h = \sqrt{l^2 - r^2}$

Solution:

$r = \frac{102}{2} = 51$

$\pi \times 51 \times l = 4335\pi$

$51l = 4335$

$l = \frac{4335}{51} = 85$

$h = \sqrt{85^2 - 51^2}$

$h = \sqrt{7225 - 2601}$

$h = \sqrt{4624}$

$h = 68$

Final Answer:

68

Q.45 A vertical stick 14 m long, casts a shadow 5 m long on the ground. At the same time, a tower casts a shadow of 44.5 m long on the ground. The height of the tower is ____.

A. 124.6 m
B. 128.8 m
C. 130.3 m
D. 122.2 m

Answer: A

Sol: **Given:**

Height of the stick = 14 m

Length of the shadow of the stick = 5 m

Length of the shadow of the tower = 44.5 m

Concept Used:

The problem involves similar triangles. The height of the stick and its shadow form one triangle, and the height of the tower and its shadow form another triangle.

The ratio of the height to the length of the shadow will be the same for both.

Formula Used:

Using the property of similar triangles:

$$\frac{\text{Height of stick}}{\text{Length of shadow of stick}} = \frac{\text{Height of tower}}{\text{Length of shadow of tower}}$$

Solution:

Let the height of the tower be h.

$\frac{14}{5} = \frac{h}{44.5}$

$h = \frac{44.5}{5} \times 14$

$h = 8.9 \times 14 = 124.6$

Thus, The height of the tower is 124.6 meters.

Q.46 The LCM of the numbers 12.8 and 0.004 is:

A. 12.8
B. 128
C. 1.28
D. 0.128

Answer: A

Sol: **Given:**
Numbers = 12.8 and 0.004
Formula Used:
LCM of decimals = LCM of numerators ÷ HCF of denominators
Solution:
12.8 = 128 ÷ 10
0.004 = 4 ÷ 1000
LCM = (LCM of 128 and 4) ÷ (HCF of 10 and 1000)
LCM of 128 and 4 = 128
HCF of 10 and 1000 = 10
LCM = 128 ÷ 10
LCM = 12.8

Q.47 **If + means −, − means ×, × means ÷, and ÷ means +, what will come in place of the question mark (?) in the following equation?**
45 – 2 ÷ 9 + 16 × 8 = ?

A. 80
B. 87
C. 97
D. 100

Answer: C

Sol: **Given**: 45 – 2 ÷ 9 + 16 × 8 = ?

Given Sign+ - ×÷

New Sign - ×÷+

Using **BODMAS** rule.

Operation preference wise	Symbol
Brackets	$[], , ()$
Orders, of	$(power), \sqrt{}(root), of$
Division	$\div$
Multiplication	$\times$
Addition	$+$
Subtraction	$-$

New equation: 45 × 2 + 9 - 16 ÷ 8 = ?
45 × 2 + 9 - 2 = ?
90 + 9 - 2 = ?
99 - 2 = ?
? = **97**
Thus, correct option is (c).

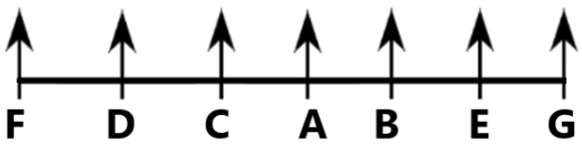
Q.48 **Seven people A, B, C, D, E, F and G are sitting in a row, facing the north. No one sits to the right of G. Only four people sit between E and F. C sits fifth from the right end of the row. B sits to the immediate right of A but left of E. How many people sit to the right of D?**

A. Four
B. Three
C. Two
D. Five

Answer: D

Sol: **Given:**
Seven people A, B, C, D, E, F and G are sitting in a row, facing the north.
No one sits to the right of G.
Only four people sit between E and F.
C sits fifth from the right end of the row.
B sits to the immediate right of A but left of E.

From the given information seating arrangement will be:



So, **Five** people sit to the right of D.
Thus, the correct option is: (d)

Q.49 Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.
(Note: All numbers are single digit numbers only.)
(Left) € & % & 5 6 3 1 © 1 4 6 @ £ @ $ 8 8 £ 8 % 1 (Right)
How many such numbers are there, each of which is immediately preceded by a symbol and also immediately followed by a symbol?

A. 2
B. 3
C. 0
D. 1

Answer: D

Sol: **Given**: (Left) € & % & 5 6 3 1 © 1 4 6 @ £ @ $ 8 8 £ 8 % 1 (Right)
Logic: Symbol | Number | Symbol

(Left) € & % & 5 6 3 1 © 1 4 6 @ £ @ $ 8 8 £ 8 % 1 (Right)

1 numbers are there, each of which is immediately preceded by a symbol and also immediately followed by a symbol.
Thus, correct option is (d).

Q.50 Find the simple interest (in ₹) on ₹4,000 at 6.75% per annum rate of interest deposited on 21 February 2024 and withdrawn on 22 April 2024.

A. ₹45
B. ₹43
C. ₹46
D. ₹44

Answer: A

Sol: **Given:**

$\text{Principal } (P) = Rs.4000$

$\text{Rate of interest } (R) = 6.75\% \text{ per annum}$

$\text{Date of deposit} = 21 \text{ February } 2024$

$\text{Date of withdrawal} = 22 \text{ April } 2024$

Concept Used:
Simple Interest based on exact number of days (leap year)
Formula Used:

$$\text{Simple Interest} = \frac{P \times R \times T}{100}$$

Solution:

$2024 \text{ is a leap year } => 366 \text{ days}$

Number of days:

$\text{Feb } (22 \text{ to } 29) = 8 \text{ days}$

$\text{March} = 31 \text{ days}$

$\text{April } (1 \text{ to } 22) = 22 \text{ days}$

$\text{Total days } = 8 + 31 + 22 = 61 \text{ days}$

$$T = \frac{61}{366}$$

$$\text{Simple Interest} = \frac{4000 \times 6.75 \times 61}{100 \times 366}$$

$$= \frac{270 \times 61}{366}$$

$$\approx 45$$

Final Answer:

$\boxed{Rs.45}$

Q.51 In a certain code language, 'YOUR' is coded as '5683' and 'UNIT' is coded as '2519'. What is the code for 'U' in the given code language?

A. 5
B. 8
C. 9
D. 2

Answer: A

Sol: **Given**:

In a certain code language, 'YOUR' is coded as '5683' and 'UNIT' is coded as '2519'.

Y O (U) R = (5) 6 8 3

(U) N I T = 2 (5) 1 9

So, the code of **U** is **5**.

Thus, correct option is (a).

Q.52 A train of length 490 m overtakes a man moving at a speed of 9 km/hr (in the same direction) in 12 seconds. How much time (in seconds) will it take this train to completely cross another train that has is 500 m long, moving in the opposite direction at a speed of 42 km/hr?

A. 25
B. 36
C. 18
D. 32

Answer: C

Sol: **Given:**

Length of first train (L_1) = 490 m

Speed of man = 9 km/hr

Time to overtake man = 12 s

Length of second train $(L_2) = 500$ m

Speed of second train = 42 km/hr

Direction of trains = **opposite**

Formula Used:

$\text{Speed} = \dfrac{\text{Distance}}{\text{Time}}$

For opposite direction:

$\text{Relative Speed} = \text{Speed}_1 + \text{Speed}_2$

Solution:

$9 \text{ km/hr} = \dfrac{9 \times 5}{18} = 2.5 \text{ m/s}$

Relative distance covered while overtaking man = length of train = 490 m

Relative speed:

$\text{Train speed} - 2.5 = \dfrac{490}{12}$

Train speed - 2.5 = 40.83

$\text{Train speed} = 43.33 \text{ m/s}$

Convert second train speed to m/s

$42 \text{ km/hr} = \dfrac{42 \times 5}{18} = 11.67 \text{ m/s}$

Relative speed (opposite direction)

43.33 + 11.67 = 55 m/s

Total distance to be crossed

490 + 500 = 990 m

$$\text{Time} = \frac{990}{55} = 18 \text{ seconds}$$

Q.53 Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the statements.

Statements:

All warriors are politicians.

All leaders are knights.

Some knights are warriors.

Conclusions:

(I) Some warriors are leaders.

(II) Some politicians are knights.

A. Only conclusion (II) follows.

B. Only conclusion (I) follows.

C. Both conclusions (I) and (II) follow.

D. Neither conclusion (I) nor (II) follows.

Answer: A

Sol: **Given:**

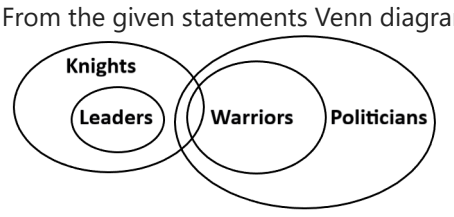
Statements:

All warriors are politicians.

All leaders are knights.

Some knights are warriors.

From the given statements Venn diagram will be:



Conclusions:

(I) Some warriors are leaders. **Does not Follows -** Leaders are only a **subset of knights**, but we are not told that the overlapping part (warriors) includes leaders.

(II) Some politicians are knights. **Follows -** All warriors are politicians. Some knights are warriors. So, the knights that are also warriors are **automatically politicians.**

So, Only conclusion (II) follows.

Thus, the correct option is: (a)

Q.54 In a certain code language, 'LOST' is coded as '6832' and 'SALT' is coded as '2136'. What is the code for 'A' in the given code language?

A. 3

B. 6

C. 1

D. 2

Answer: C

Sol: **Given:**

In a certain code language, 'LOST' is coded as '6832' and 'SALT' is coded as '2136'.

L O S T = 6 8 3 2

S A L T = 2 1 3 6

So, the code of **A** is **1**.

Thus, correct option is (c).

Q.55 If J is coded as N, R is coded as V and X is coded as B, then how will you code JOY?

A. NOB
B. NRA
C. NSC
D. NSA

Answer: C

Sol: **Given:**
J is coded as N,
R is coded as V
X is coded as B,
JOY is coded as ?

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

Logic: Each letters are increasing by + 4 positions.
J + 4 → N + 4 = R + 4 → V + 4 = X + 4 → B.
Applying the same logic to **JOY**:
J + 4 → N, O + 4 → S, Y + 4 → C
Thus, **JOY** is coded as **NSC**.
Thus, the correct answer **(C) NSC.**

Q.56 What should come in place of the question mark (?) in the given series based on the English alphabetical order?
CXS EZU GBW IDY ?

A. FKA
B. KFA
C. FAK
D. KAF

Answer: B

Sol: **Given:** CXS, EZU, GBW, IDY, ?
Logic: Each letter increased by +2 places in English alphabet.

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

1st letters:
C + 2 = E
E + 2 = G
G + 2 = I
I + 2 = **K**
2nd letters:
X + 2 = Z
Z + 2 = B
B + 2 = D
D + 2 = **F**
3rd letters:
S + 2 = U
U + 2 = W
W + 2 = **Y**
Y + 2 = A
So**, ? = KFA**
Thus, the correct option is **(B) KFA**.

Q.57 Each of P, Q, R, S, T, U and V has an exam on a different day of a week starting from Monday and ending on Sunday of the same week. P has an exam on Thursday. T has an exam immediately before P, and V has an exam immediately after P. Only 3 people have an exam between U and Q. R has an exam immediately after Q. How many people have an exam between Q and S?

A. 3
B. 1
C. 2
D. 4

Answer: D

Sol: **Given:**
Days: Monday to Sunday (7 days), each of P, Q, R, S, T, U, V has one exam.
P has an exam on Thursday.
T immediately before P .
V immediately after P .
Exactly 3 people between U and Q.
R immediately after Q → R .
According to the given information, Arrangements will be:

Day	Exam
Monday	S
Tuesday	U
Wednesday	T
Thursday	P
Friday	V
Saturday	Q
Sunday	R

As per the table, there are 4 people have an exam between Q and S.
Thus, the correct option is **(D) 4.**

Q.58 If $\sin B = \frac{\sqrt{3}}{2}$, then find the value of $\left(\sqrt{3}\csc B + \sec B - 4\right)$.

A. 3
B. $\sqrt{3}$
C. 0
D. 2

Answer: C

Sol: **Given:**
$\sin B = \frac{\sqrt{3}}{2}$
Solution:
From $\sin B = \frac{\sqrt{3}}{2}$, we know that
$B = 60^\circ$
Now find the required trigonometric ratios:
$\csc B = \frac{1}{\sin B} = \frac{1}{\sqrt{3}/2} = \frac{2}{\sqrt{3}}$
$\sec B = \frac{1}{\cos B} = \frac{1}{1/2} = 2$
Substitute in the given expression:
$\sqrt{3}\csc B + \sec B - 4$
$= \sqrt{3}\left(\frac{2}{\sqrt{3}}\right) + 2 - 4$
$= 2 + 2 - 4$
$= 0$

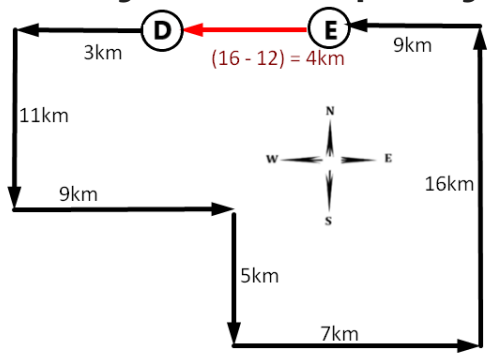
Answer:
$\boxed{0}$

Q.59 Mr. C starts from Point D and drives 3 km towards the west. He then takes a left turn, drives 11 km, turns left and drives 9 km. He then takes a right turn and drives 5 km, turns left drives 7 km. He then takes left turn, drives 16 km. He takes a final left turn drives 9 km and stops at Point E. How far (shortest distance) and towards which direction should he drive in order to reach Point D again? (All turns are 90 degrees turns only unless specified.)

A. 2 km towards the East
B. 4 km towards the West
C. 2 km towards the West
D. 4 km towards the South

Answer: B

Sol: **Given:**
Mr. C starts from Point D and drives 3 km towards the west.
He then takes a left turn, drives 11 km, turns left and drives 9 km.
He then takes a right turn and drives 5 km, turns left drives 7 km.
He then takes left turn, drives 16 km.
He takes a final left turn drives 9 km and stops at Point E.
From the given information path diagram will be:



So, he drive **4 km towards the West** in order to reach Point D again.
Thus, the correct option is: (b)

Q.60 The simplified value of $72 \div \left[\frac{12}{6} \times (3+9-(5+5-(2+5)))\right]$ is:

A. 6
B. 4
C. 8
D. 3

Answer: B

Sol: **Given:**
$72 \div \left[\frac{12}{6} \times (3+9-(5+5-(2+5)))\right]$

Concept Used:

Operation preference wise	**Symbol**
Brackets	$[\,], \{\,\}, (\,)$
Orders, of	^{x} (power), $\sqrt{}$ (root), of
Division	$\div$
Multiplication	$\times$
Addition	$+$
Subtraction	$-$

Solution:

$72 \div [2 \times (3+9-(5+5-7))]$

$=72 \div [2 \times (3+9-(10-7))]$

$=72 \div [2 \times (3 + 9 - 3)]$

$=72 \div [2 \times 9]$

$=72 \div 18 = 4$

Q.61 CSVG is related to GOZC in a certain way based on the English alphabetical order. In the same way, KKDY is related to OGHU. To which of the given options is SCLQ related, following the same logic?

A. VZPL
B. WYPM
C. WZOL
D. XYQN

Answer: B

Sol: **Given:**
CSVG → GOZC
KKDY → OGHU
Find for SCLQ → ?
Logic: (+4, −4, +4, −4)

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

CSVG → GOZC
C +4 → G
S −4 → O
V +4 → Z
G −4 → C
KKDY → OGHU
K +4 → O
K −4 → G
D +4 → H
Y −4 → U
Similarly,
SCLQ → ?
S +4 → W
C −4 → Y
L +4 → P
Q −4 → M
So,
SCLQ → WYPM
Thus, correct option is (b).

Q.62 In a certain code language, 'RIPPLE' is written as '762248', and 'PREACH' is written as '278391'. How will 'CHAIR' be written in that language?

A. 93176
B. 91367
C. 91673
D. 91637

Answer: B

Sol: **Given:** 'RIPPLE' is written as '762248', and 'PREACH' is written as '278391'.
Logic: Each letter of the given words is coded as an individual code number.
R⟶7; I⟶6; P⟶2; L⟶4; E⟶8; A⟶3; C⟶9; H⟶1
Using these codes, get the code for 'CHAIR' -
C⟶9; H⟶1; A⟶3; I⟶6; R⟶7
So, '**CHAIR**' is coded as '**91367**'.
Thus, the correct answer is (**b**).

Q.63 **Seven boxes, A, B, C, D, E, F and G, are kept one above the other but not necessarily in the same order. Only two boxes are kept below C. Only one box is kept above A. Only one box is kept between A and E. B is kept immediately above F. D is kept at some place below G. How many boxes are kept above B?**

A. 4
B. 5
C. 3
D. 2

Answer: B

Sol: **Given:**
Seven boxes, A, B, C, D, E, F and G, are kept one above the other but not necessarily in the same order.
Only two boxes are kept below C.
Only one box is kept above A.
Only one box is kept between A and E.
B is kept immediately above F.
D is kept at some place below G.
From the given information arrangement will be:

Position	Box
1	G
2	A
3	D
4	E
5	C
6	B
7	F

So, **Five (5)** boxes are kept above B.
Thus, the correct option is: (b)

Q.64 **In an election between two candidates 92% of the registered voters cast their vote and 20% of the votes polled were found invalid. Winning candidate got 75% of the valid votes and won the election by a margin of 322 votes. How many voters were registered?**

A. 875
B. 3123
C. 873
D. 877

Answer: A

Sol: **Given:**
Percentage of voters who voted $= 92\%$
Invalid votes $= 20\%$ of votes polled
Winning candidate got $= 75\%$ of valid votes
Margin of victory $= 322$ votes
Concept Used:
Election vote percentage and margin calculation
Formula Used:
Margin $=$ (Difference in vote share) $\times$ (Valid votes)
Solution:
Let total registered voters $= x$
Votes polled $= 92\%$ of $x = 0.92x$

Valid votes = 80% of $0.92x$

$= 0.736x$

Winning candidate's votes = 75% of $0.736x$

$= 0.552x$

Losing candidate's votes = 25% of $0.736x$

$= 0.184x$

Margin of victory

$= 0.552x - 0.184x$

$= 0.368x$

$0.368x = 322$

$x = \frac{322}{0.368}$

$x = 875$

Final Answer:

$\boxed{875}$

Q.65 **A trader offers a 10% discount on the marked price and provides 3 articles free for every 12 articles purchased, thereby earning a profit of 20%. Find the percentage by which the marked price is increased above the cost price, correct to two decimal places.**

A. 66.67%
B. 62.36%
C. 61.25%
D. 65.86%

Answer: A

Sol: **Given:**

· Discount on marked price = 10%

· Free articles offered = 3 for every 12 purchased

· Profit earned = 20%

Formula Used:

Discount = $\frac{Free Article}{Total Article} \times 100$

when two discount are given then effective discount = a + b + $\frac{ab}{100}$

Solution:

First discount = 10%

Second discount = $\frac{3}{15} \times 100$ = 20%

Effective discount = 10% + 20% - $\frac{10 \times 20}{100}$%

= 30% - 2 %

= 28%

$\frac{CostPrice}{MarkedPrice} = \frac{100 - discount}{100 + profit}$

= $\frac{100 - 28}{100 + 20}$

$= \frac{72}{120}$

Then he marked price is increased above the cost price,

$= \frac{(120 - 72)}{72} \times 100$

$= \frac{48}{72} \times 100$

= 66.67%

Q.66 **Adipose tissue stores -**

A. Carbohydrate
B. Protein
C. Fat
D. Adrenalin

Answer: C

Sol: The correct answer is (c) Fat.
· Adipose tissue is a type of connective tissue that primarily stores fat.
· It functions as an energy reserve, provides insulation to the body, and helps cushion and protect organs.
· The fat stored in adipose tissue can be broken down to release energy when the body needs it.
Explanation of Other Options:
· Carbohydrate: Carbohydrates are stored in the liver and muscles in the form of glycogen, not in adipose tissue.
· Protein: Protein is not stored in adipose tissue; it is used for building and repairing tissues in the body.
· Adrenalin: Adrenaline is a hormone secreted by the adrenal glands, not stored in adipose tissue.

Q.67 **Which type of tissue forms the outer layer of the skin?**

A. Connective tissue
B. Epithelial tissue
C. Nervous tissue
D. Muscle tissue

Answer: B

Sol:
The correct answer is (b) Epithelial tissue.
· **Epithelial tissue** forms the outer layer of the skin, known as the epidermis.
· It serves as a protective barrier against environmental hazards, such as pathogens, chemicals, and physical injury.
· This tissue type is composed of closely packed cells with minimal extracellular matrix, providing a continuous, protective surface.
· Epithelial tissue also plays a role in absorption, secretion, and sensation.
Other Option Detail:
· Connective tissue supports and binds other tissues.
· Nervous tissue transmits electrical impulses.
· Muscle tissue is responsible for movement.

Q.68 **Which of the following is a disproportionation reaction?**

A. $2Na + Cl_2 \rightarrow 2NaCl$
B. $Zn + HCl \rightarrow ZnCl_2 + H_2$
C. $Cu + HNO_3 \rightarrow Cu(NO_3)_2 + NO_2 + H_2O$
D. $Cl_2 + H_2O \rightarrow HCl + HOCl$

Answer: D

Sol: **The correct answer is (D) $Cl_2 + H_2O \rightarrow HCl + HOCl$**

Explanation:

- A **disproportionation reaction** is a redox reaction in which **the same element is simultaneously oxidised and reduced** in a single reaction.
- In the reaction **$Cl_2 + H_2O \rightarrow HCl + HOCl$**, chlorine ($Cl_2$) is both reduced (to HCl) and oxidised (to hypochlorous acid, HOCl).
- Thus, chlorine undergoes two different oxidation number changes at the same time – a key feature of disproportionation.
- Such reactions are common for **halogens** like Cl, Br, and I because they exist in multiple oxidation states.

Information Booster:

- Oxidation number of Cl in Cl_2 = 0.
- In HCl, Cl has oxidation state –1 (reduction).
- In HOCl, Cl has oxidation state +1 (oxidation).
- Disproportionation mostly happens in compounds/elements that lie in the **middle of an oxidation series**.
- Other examples: $2H_2O_2 \rightarrow 2H_2O + O_2$ and $3ClO^- \rightarrow 2Cl^- + ClO_3^-$.

Additional Knowledge:

- **(A) $2Na + Cl_2 \rightarrow 2NaCl$** – Normal redox reaction; Cl is reduced, Na oxidised (no disproportionation).
- **(B) $Zn + HCl \rightarrow ZnCl_2 + H_2$** – Metal–acid reaction; Zn oxidised and H^+ reduced.
- **(C) $Cu + HNO_3 \rightarrow Cu(NO_3)_2 + NO_2 + H_2O$** – Copper is oxidised, nitrogen reduced (not disproportionation).

Q.69 **The reactions in which oxidation and reduction occur simultaneously are called _____.**

A. Feral reactions
B. Redox reactions
C. Demug reactions
D. Kerol reactions

Answer: B

Sol: Redox is a chemical reaction in which the oxidation states of atoms are changed. Any such reaction involves both a reduction process and a complementary oxidation process, two key concepts involved with electron transfer processes.

Q.70 **Which of the following statements is INCORRECT?**

A. Transparent soaps are made by dissolving the soap in ethanol and then evaporating the excess solvent.
B. Generally sodium soaps are softer to the skin than potassium soaps.
C. Synthetic detergents are mainly classified into three categories.
D. Cetyltrimethylammonium bromide is a popular cationic detergent and is used in hair conditioners.

Answer: B

Sol: The correct answer is (b) Generally sodium soaps are softer to the skin than potassium soaps.

- Sodium soaps are **hard soaps**, while potassium soaps are **soft soaps**.
- Therefore, the given statement is incorrect.
- Other statements correctly describe soaps and detergents.

Information Booster:

- Sodium soaps are used for bathing and washing bars.
- Potassium soaps are used in liquid soaps and shaving creams.
- Synthetic detergents are classified as **anionic, cationic, and non-ionic**.
- Transparent soaps contain glycerol and alcohol.

Additional Knowledge:

- Cationic detergents are used as fabric softeners and hair conditioners.
- Detergents work well even in hard water.

Q.71 **The method of separation of soluble solids from liquid constituents is called:**

A. Evaporation
B. Filtration
C. Distillation
D. Sedimentation

Answer: C

Sol: The correct answer is **(c) Distillation**

Explanation:

• Distillation is the process used to **separate a soluble solid from a liquid** or **two liquids** based on their **different boiling points**.

• The liquid mixture is heated to form vapors of the component with a lower boiling point, which are then cooled and condensed to collect the pure liquid.

• It helps in obtaining both the **pure liquid (distillate)** and **solid residue**. • This method is widely used in laboratories and industries, including water purification and alcohol production.

Information Booster:

• Principle – Difference in boiling points of components.

• Apparatus used – Distillation flask, condenser, thermometer, and receiver.

• Common use – Purification of water and separation of alcohol from water.

• Type – Physical separation method.

• Invented around the 1st century AD, improved in the 8th century by Arab chemists.

Additional Knowledge:

• **Evaporation** – Used when only the solid is required; the liquid is lost.

• **Filtration** – Separates **insoluble solids** from liquids (e.g., sand and water).

• **Sedimentation** – Allows heavier solid particles to settle at the bottom (e.g., muddy water).

• Distillation is also used in the **petroleum industry** to refine crude oil into components like petrol and

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Q.72 **The image for a plane mirror is:**

A. virtual and laterally inverted
B. real and laterally vertical
C. real and vertical
D. virtual and laterally vertical

Answer: A

Sol: The correct answer is **(A) virtual and laterally inverted**

Explanation:

• A **plane mirror** always forms an image that is **virtual**, meaning the light rays **do not actually meet** at the image location but appear to diverge from it.

• The image is **laterally inverted**, i.e., the left and right sides are **reversed**.

• The image is **upright** and of the **same size** as the object, and it appears **behind the mirror** at a distance equal to the object's distance in front of it.

Information Booster:

• **Distance of image:** Equal to the object distance from the mirror.
• **Upright nature:** The image remains vertical, not inverted top-to-bottom.
• Plane mirrors do **not converge or diverge light**, unlike curved mirrors.
• Used in **periscopes, dressing mirrors, and rear-view mirrors**.
• Light rays follow the **law of reflection**: angle of incidence = angle of reflection.

Additional Knowledge:

• **Virtual image:** Cannot be projected on a screen.
• **Lateral inversion**: The image reverses **left and right**, e.g., writing appears mirrored.
• Curved mirrors can form **real or virtual images** depending on the object's position relative to the focal point.

Q.73 **The book In the Margins of Empire: A History of India's Chicken's Neck, released in January 2026, is written by:**

A. Tikender Panwar
B. Akhilesh Upadhyay

C. Chetan Singh Solanki
D. Him-eesh Madaan

Answer: B

Sol:

The correct answer is **(b) Akhilesh Upadhyay**

Explanation:

· **Akhilesh Upadhyay** authored the book "**In the Margins of Empire: A History of India's Chicken's Neck**", released in **January 2026**.
· The book provides a historical and geopolitical reckoning of the **Siliguri Corridor**, commonly known as the "**Chicken's Neck**".
· This corridor is a narrow strip of land that connects India's **Northeast** to the rest of the country.
· Upadhyay explores how this strategic margin was shaped by **empire, partition, and modern politics**.
· It is considered essential reading for understanding **India's border history** and regional security.

Information Booster:

· The **Siliguri Corridor** is approximately 22 kilometers wide and is bordered by Nepal, Bhutan, and Bangladesh.
· It is one of the most **strategically sensitive** zones in South Asia.

Additional Knowledge:

· **Tikender Panwar** (Option a): Authored **"City Limits"**, focusing on urban planning and political awakening, released in January 2026.
· **Chetan Singh Solanki** (Option c): Wrote **"Climate Change 2100"**, released in the same period.
· **Him-eesh Madaan** (Option d): Wrote **"The Manifestation Blueprint"**, a self-help/purpose-driven book.

Q.74 **Which of the following players was named the Men's Player of the Year at the All India Football Federation (AIFF) Awards in May 2025?**

A. Gurpreet Singh Sandhu
B. Sandesh Jhingan
C. Sunil Chhetri
D. Subhasish Bose

Answer: D

Sol:

The correct answer is (d) Subhasish Bose

Explanation:

· Subhasish Bose was awarded the Men's Player of the Year at the AIFF Awards held in May 2025.
· He earned this honour for his consistent and outstanding performances in domestic as well as international football during the evaluation period.
· Subhasish Bose is known for his defensive solidity, versatility, and leadership qualities, particularly as a left-back/centre-back.
· His performances in the Indian Super League (ISL) and contributions to the Indian national football team played a key role in securing this recognition.
· The AIFF Awards are the highest annual football honours in India, presented by the All India Football Federation to acknowledge excellence in the sport.

Information Booster:

· The AIFF Awards celebrate achievements across men's, women's, youth football, coaching, and refereeing categories.
· Subhasish Bose has represented clubs like ATK Mohun Bagan, one of India's most successful football teams.
· Defensive players being recognised highlights the growing emphasis on all-round performance, not just goal-scoring.

Additional Knowledge (Information about incorrect options):

Gurpreet Singh Sandhu (Option a)

· Renowned Indian goalkeeper and former recipient of AIFF honours, but not the 2025 Men's Player of the Year.

Sandesh Jhingan (Option b)

· A key defender for India; however, he did not receive this specific award in 2025.

Sunil Chhetri (Option c)

· India's most celebrated footballer and multiple-time AIFF award winner, but not the recipient in May 2025.

Q.75 **In 2025, which state mandated a Child Protection Policy in all residential schools and hostels, covering anti-bullying, anti-drug measures, grievance redressal, and staff training?**

A. Maharashtra
B. Uttar Pradesh
C. Tamil Nadu
D. Karnataka

Answer: D

Sol: The correct answer is **(D) Karnataka**

Explanation:

• The Karnataka government issued a comprehensive Child Protection Policy in early 2025 to ensure the safety of students in residential institutions.
• The policy mandates strict anti-bullying protocols and regular sensitization of staff regarding child rights and safety.

Information Booster:

• This move aligns with the National Commission for Protection of Child Rights (NCPCR) guidelines to provide a safe environment for children in hostels.

Additional Knowledge:

• Tamil Nadu (Option C): Often leads in school health programs but Karnataka was the specific state to mandate this comprehensive residential policy in 2025.