Unproctored - Mock CAT 8
Answers and Explanations
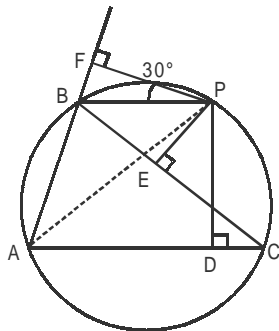
1	a	2	a	3	d	4	a	5	d	6	d	7	a	8	c	9	c	10	b
11	a	12	c	13	b	14	a	15	c	16	b	17	a	18	b	19	d	20	b
21	a	22	c	23	b	24	d	25	a	26	c	27	b	28	d	29	a	30	b
31	b	32	c	33	a	34	d	35	b	36	c	37	c	38	d	39	b	40	b
41	c	42	c	43	c	44	d	45	d	46	d	47	b	48	b	49	a	50	d
51	c	52	d	53	b	54	d	55	b	56	d	57	a	58	c	59	d	60	b

1. a Number of faces in a cube = 6
Side of cube = a (suppose)

$\Rightarrow$ Area of a circle on a face $= \dfrac{\pi a^2}{4}$

B = Cube of sum of the areas of all the circles $= \left(\dfrac{6\pi a^2}{4}\right)^3$

Diagonal of cube $= \sqrt{3}a$

Square of volume of sphere drawn by taking the diagonal as

diameter $= \left[\dfrac{4}{3}\pi\left(\dfrac{\sqrt{3}}{2}a\right)^3\right]^2 = A$

$\Rightarrow$ ratio $= \dfrac{\dfrac{16}{9}\pi^2 \cdot \dfrac{3^3}{4^3}}{\dfrac{6^3}{4^3}\cdot \pi^3} = \dfrac{2}{9\pi}$.

2. a Given that $4w = xyz \Rightarrow w = \dfrac{xyz}{4}$

$\Rightarrow 4x = \left(\dfrac{xyz}{4}\right) \times (yz) \Rightarrow yz = 4$

$\therefore w = x$

Since, $yz = 4 \Rightarrow y = \dfrac{4}{z}$.

Putting this value of y in the equation $4z = wxy$, we get that
$z^2 = wx = w^2 = x^2$.
$\Rightarrow w = x = z$.
$\Rightarrow y = 1, 2$ or 4.
Case I: $y = 2$

$\therefore (w + x + y - z)^2 = (2 + 2 + 2 - 2)^2 = 16$.

Case II: $y = 4$

$\therefore (w + x + y - z)^2 = (1 + 1 + 4 - 1)^2 = 25$.

Case III: $y = 1$

$\therefore (w + x + y - z)^2 = (4 + 4 + 1 - 4)^2 = 25$.

3. d Let after N steps all four numbers in group P become equal to
'a'. Sum of these four numbers will be '4a' which must be an
even number. **(conclusion I)**
Sum of the four numbers initally present in group P
$= 1 + 2 + 3 + 1 = 7$
As in each step, 1 is added to any two numbers in group P,
we can say that at the end of each step the overall sum will
be $7 \rightarrow 9 \rightarrow 11...$
We can see that this sum will always be an odd number.
This clearly contradicts conclusion I.
So, achieving four equal numbers in group P is never possible.

4. a Given that

$\dfrac{1}{x} + \dfrac{1}{y} + \dfrac{1}{z} = \dfrac{1}{x+y+z}$

$\Rightarrow \dfrac{xy + yz + zx}{xyz} = \dfrac{1}{(x+y+z)}$

$\Rightarrow (xy + yz + zx)(x + y + z) = xyz$
$\Rightarrow x^2y + zx^2 + xy^2 + zy^2 + yz^2 + xz^2 + 2xyz = 0$
$\Rightarrow (x + y)(y + z)(z + x) = 0$
Hence, k is 0.

5. d Let the radius of the original sphere be R
and let the number of identical cones be n.

So, $\dfrac{4}{3}\pi R^3 = n \times \left(\dfrac{\pi}{3}(R)^2 \times R\right)$

$\Rightarrow n = 4$

$\Rightarrow$ volume of smaller sphere $= \dfrac{\pi}{3}R^3$

$\Rightarrow$ radius of smaller sphere $= \left(\dfrac{R^3}{4}\right)^{\frac{1}{3}} = \dfrac{R}{(2)^{\frac{2}{3}}}$

$\Rightarrow \dfrac{\text{surface area of smaller sphere}}{\text{Surface area of larger sphere}} = \dfrac{R^2}{\dfrac{4}{2^{\frac{4}{3}}}} \times \dfrac{1}{R^2} = 1 : 2^{\frac{4}{3}}$.

6. d Let 'x' be the quantity of solution taken from beaker A and 'y'
be the quantity of solution taken from beaker B.
Quantity of methanol in beaker C

$= \left(\dfrac{x}{6}\right) + \left(\dfrac{2y}{8}\right) = \dfrac{(4x + 6y)}{24}$.

Quantity of phenyl in beaker C

$= \left(\dfrac{2x}{6}\right) + \left(\dfrac{5y}{8}\right) = \dfrac{(8x + 15y)}{24}$.

Quantity of ethanol in beaker C

$= \left(\dfrac{3x}{6}\right) + \left(\dfrac{y}{8}\right) = \dfrac{(12x + 3y)}{24}$.

Required Ratio $= (4x + 6y) : (8x + 15y) : (12x + 3y)$
If $x = y = 1$, then required ratio $= 10 : 23 : 15$. So, option (a) is
possible.

If $x = \left(\dfrac{1}{4}\right)$ and $y = \left(\dfrac{1}{15}\right)$, then required ratio $= 7:15:16$.

So, option (b) is possible.

If $x = \left(\dfrac{1}{2}\right)$ and $y = \left(\dfrac{1}{6}\right)$, then required ratio $= 6:13:13$.

So, option (c) is possible.

If $x = \left(\dfrac{1}{8}\right)$ and $y = \left(\dfrac{1}{15}\right)$, then required ratio $= 9:20:17$.

So only option (d) is not possible.

7. a Initially Pipe A is opened:
Time taken till the tank is half filled with water = 2 hrs.
Then Pipes A and C both are open:
Time taken from the instant pipe C is opened till pipe B is

opened $= \dfrac{(4 \times 3)}{4(4-3)} = 3$ hrs.

Pipes A, B and C are open:
Time taken from the instant pipe B is opened till the tank is

completely filled $= \dfrac{(3 \times 5 \times 4 \times 3)}{4(12 + 15 - 20)} = \dfrac{45}{7}$ hrs.

Total time taken to completely fill the tank

$= 2 + 3 + \dfrac{45}{7} = \dfrac{80}{7} = 11\dfrac{3}{7}$ hrs.

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8. c According to the statements given in the question we can write here

$S = a_1 + a_2 + a_3 + \ldots\ldots\ldots + a_n$ ...(i)

Since $a_2, a_3, a_4 \ldots\ldots a_{n-1}$ are the arithmetic means of first three consecutive terms, next three consecutive terms(starting with a_2) etc.

$\therefore S_2 = a_2 + a_3 + a_4 + \ldots\ldots\ldots + a_{n-1}$ ...(ii)

Also, $S_1 = \dfrac{a_1 + a_2}{2} + \dfrac{a_2 + a_3}{2} + \ldots\ldots \dfrac{a_{n-1} + a_n}{2}$

$\Rightarrow S_1 = \dfrac{1}{2}[a_1 + 2(a_2 + a_3 + \ldots\ldots a_{n-1}) + a_n]$ ...(iii)

Note that in equation (i) if a_1 and a_n are excluded, then the rest of the series is nothing but 'S_2'.

Therefore, we can write the series as

$S = a_1 + S_2 + a_n \Rightarrow a_1 + a_n = S - S_2$ ...(iv)

$S_1 = \dfrac{1}{2}[a_1 + 2S_2 + a_n] \Rightarrow \dfrac{1}{2}(a_1 + a_n) = S_1 - S_2$ ...(v)

From (iv) and (v), we have
$S = 2S_1 - S_2 = 2 \times 1375 - 690 = 2060$.

9. c Largest sub-multiple of 840 is 420.
Now $420 = 2^2 \times 3 \times 5 \times 7$
So those three numbers can be 3, 140 and 420.
So, the maximum possible sum can be 563.
All the other combinations will lead to a lower sum.

10. b

Total points including the vertices = 13
Out of these 13 points,
5 points on side AB (including B and A) are collinear.
7 points on side CA (including C and A) are collinear.
4 points on side BC (including B and C) are collinear.

Thus, total triangles possible $^{13}C_3 - {}^5C_3 - {}^7C_3 - {}^4C_3 = 237$.

Out of these triangles, we should exclude those triangles which do not share the vertices A or B or C.

Such triangles = $^{13-3}C_3 - {}^{5-2}C_3 - {}^{7-2}C_3 - 0 = 109$

We should also exclude the triangle ABC itself.
Hence, the required number of triangles
= 237 − 109 − 1= 127.

11. a

Draw $PQ \perp AB$.

$\dfrac{2\pi}{3} = \dfrac{\pi \times 4^2}{2 \times 4 \times DE}$

$\Rightarrow DE = 3$ units $= CF$.

$\therefore CE = \sqrt{CD^2 + DE^2} = 5$ units

Let $CQ = x$ units

$\therefore QB = CB - CQ = (4 - x)$ units

$\triangle CPQ \sim \triangle CEF$

$\therefore \dfrac{CP}{CE} = \dfrac{CQ}{CF}$

$\therefore \dfrac{4}{5} = \dfrac{x}{3}$

$\therefore x = \dfrac{12}{5}$ units.

$\therefore QB = \dfrac{8}{5}$ units

Also,

$\Rightarrow \dfrac{PQ}{EF} = \dfrac{CP}{CE} \Rightarrow PQ = \dfrac{CP}{CE} \times EF = \dfrac{4}{5} \times 4 = \dfrac{16}{5}$ units.

$PB = \sqrt{PQ^2 + QB^2} = \sqrt{\dfrac{256}{25} + \dfrac{64}{25}} = \dfrac{8\sqrt{5}}{5}$ units.

12. c $P = (222)_X = 2X^2 + 2X + 2$ and
$Q = (222)_Y = 2Y^2 + 2Y + 2$
It is given that $P - Q = 28$.
$\Rightarrow 2X^2 + 2X + 2 - 2Y^2 - 2Y - 2 = 28$

$\Rightarrow X^2 + X - Y^2 - Y = 14 \Rightarrow \left(X + \dfrac{1}{2}\right)^2 - \left(Y + \dfrac{1}{2}\right)^2 = 14$

$\Rightarrow (X + Y + 1)(X - Y) = 14$
Therefore, the values of X and Y are (7, 6) and (4, 2) in that order.
But Y cannot be equal to 2 as there exists a number 222 in base Y and digit '2' does not exist in base 2.
$\Rightarrow X = 7, Y = 6$ and $(Q - X) = 79$.

13. b $f(f(x^{g(10)})) = \log \log x^{10} = \log(10 \log x)$

$f(f(x^{g(9)})) = \log \log x^{1/9} = \log\left(\dfrac{1}{9} \log x\right)$

$\vdots$

$f(f(x^{g(1)})) = \log \log x^{1/1} = \log\left(\dfrac{1}{1} \log x\right)$

$\Rightarrow \log(10 \log x) - \log\left(\dfrac{1}{9} \log x\right) + \log(8 \log x) - \ldots\ldots - \log(\log x)$

$= \log\left(\dfrac{10 \log x \cdot 8 \log x \cdot 6 \log x \cdot 4 \log x \cdot 2 \log x}{\dfrac{1}{9} \log x \cdot \dfrac{1}{7} \log x \cdot \dfrac{1}{5} \log x \cdot \dfrac{1}{3} \log x \cdot \log x}\right) = \log(10!)$.

14. a

Let ∠BAC = α , ∠BPD = β and ∠DPC = x
(Join AP and AFPD will be a cyclic quadrilateral as
∠F = ∠D = 90°
∴ α + 30° + β = 180°   ... (i)
and ABPC is a cyclic quadrilateral
∴ α + β + x = 180°   ... (ii)
Subtracting (ii) and from (i) we get ∴ ∠DPC = 30°
x = 30°.

For questions 15 and 16:
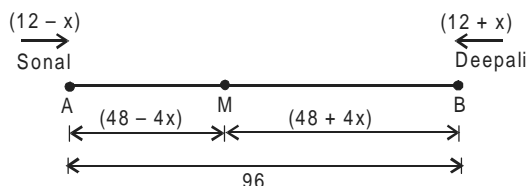
Let the speed of the stream be x kmph during the high tide and y kmph during the low tide. Suppose Sonal and Deepali met at the point 'M' for the first time.
Evidently speed of Sonal from A to M is (12 − x) kmph and speed of Deepali from B to M is (12 + x) kmph.
So, their relative speed is (12 − x) + (12 + x) = 24 kmph.
So they will meet for the first time after 4 hours.
So, Deepali will take 3 hrs 12 mins and Sonal will take 4 hrs

$34\frac{2}{7}$ mins to reach their respective destinations after their

first meeting. Immediately after the first meeting, speed of Deepali will become (12 − y) kmph and speed of Sonal will become (12 + y) kmph.

3 hrs 12 mins = $\frac{16}{5}$ hrs and 4 hrs $34\frac{2}{7}$ mins

= $\frac{32}{7}$ hrs. ∴ $\frac{16}{5}(12-y)+\frac{32}{7}(12+y)=96$

At this stage we can look at the options and may put them one-by-one in the equation mentioned above. We can find that y = 2 satisfies the equation.

Otherwise we can say that $\left(\frac{2}{7}-\frac{1}{5}\right)y = 6-12\left(\frac{2}{7}+\frac{1}{5}\right)$

or $\frac{3}{35}y = \frac{210-(120+84)}{35}$

or 3y = 6
or y = 2.

15. c

16. b When Sonal reaches point B, Deepali on her way back from A to B has already covered

$= (12+2)\times 1 \text{ hr } 22\frac{2}{7}\text{min}=14\times1\frac{13}{35}=\frac{96}{5}$ km.

Distance of Deepali from point B when Sonal was at point B

$= 96-\frac{96}{5}=\frac{4\times96}{5}$ km.

Relative speed after this instant, when they are approaching each other once again
= (12 + 2) + (12 − 2) = 24 km/hr.
∴ Time taken from this instant till they meet for the 2nd time

$\frac{4\times96}{5}\times\frac{1}{24}=\frac{16}{5}$ hrs.

∴ Distance of the point where they met for the second time from where Deepali originally started

$= 10\times\frac{16}{5}$ = 32 kms.

For questions 17 and 18:
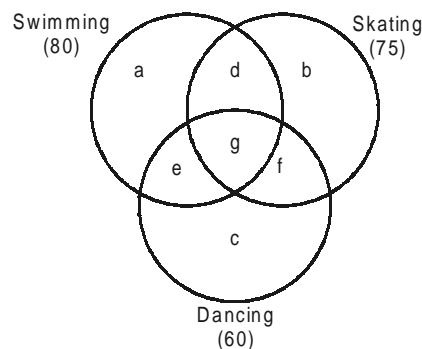
Half of the class = 100 students
⇒ a + b + c = 100 and d = f + 10.
Here,
a + d + e + g = 80
b + d + f + g = 75
c + e + f + g = 60
Adding all of the equations,
⇒ (a + b + c) + 2(d + e + f) + 3g = 215
⇒ 100 + 2(d + e + f) + 3g = 215.
Let (d + e + f) = S
⇒ 2S + 3g = 115, where S is greater than or equal to 10.
(because d = f + 10).

17. a Students who enrolled for at least one of the three activities =
(a + b + c) + (d + e + f) + g = 100 + S + g
Thus, we have to minimise the above value.
If 2S + 3g = 115,
2S + 2g = 115 −g

$\Rightarrow(S+g)=\frac{115-g}{2}$

$\Rightarrow 100 + (S+g) = 100 + \frac{115-g}{2}$.

To minimise 100 + (S + g), we have to maximise 'g' so that the expression in the right hand side is minimum.
Thus, 2S + 3g = 115 and S ≥ 10.

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$\Rightarrow$ maximum value of g = 31, when S would be equal to 11.
Therefore, the minimum value = 100 + 31 + 11 = 142.

18. b Students enrolled for exactly 2 activities = S.
If 2S + 3g = 115, maximum value of S would be 56, when g = 1.

19. d 10 cards of each suit will be remaining. First card can be chosen from any of the 40 cards in 40 different ways. Second card of same suit can be chosen in 9 different ways and proceeding in this manner, the fourth card of the same suit can be chosen in 7 different ways.
Total number of ways of drawing first card = 40,
Second card = 39, Third card = 38, Fourth card = 37.
$\therefore$ Required Probability

$$= \frac{40 \times 9 \times 8 \times 7}{40 \times 39 \times 38 \times 37} = \frac{9 \times 8 \times 7}{39 \times 38 \times 37} = \frac{3 \times 4 \times 7}{13 \times 19 \times 37}.$$

20. b Following are the two cases that are possible.

Case I:
P = Q.
There are 9 such ordered pairs (P, Q).

Case II:
P = 4, 6 or 8 and Q = 4, 6 or 8.
There are 6 such ordered pairs (P, Q).
Therefore, there are 9 + 6 = 15 such ordered pairs (P, Q).

For questions 21 to 25:
From the given statements 1, 2 and 3; Germany, Portugal, Italy, France and Costa Rica are in group X. Netherlands, Chile, Jamaica and Ukraine are in group Y.
From statement 4, Portugal is in group X. So Ecuador and Poland are also in group X and England is in group Y.
From Statement 6, Ecuador is in group X. So Argentina is also in group X.

Group X: France, Portugal, Italy, Argentina, Germany, Ecuador, Costa Rica and Poland
Group Y: England, Brazil, Ukraine, Bolivia, Chile, Jamaica, Japan and Netherlands.

By combining all the information, we can get the following table of teams with their match number (first = 1 ... eighth = 8).

Group X	Argentina	Ecuador		Costa Rica		Portugal		Germany
Match #	1	2	3	4	5	6	7	8
Group Y						Jamaica		Chile

21. a

22. c Three cases are possible
Case I:

Group X	Argentina	Ecuador		Costa Rica	Italy	Portugal		Germany
Match #	1	2	3	4	5	6	7	8
Group Y	England		Bolivia	Brazil	Netherlands	Jamaica		Chile

Case II:

Group X	Argentina	Ecuador	Poland	Costa Rica	Italy	Portugal		Germany
Match #	1	2	3	4	5	6	7	8
Group Y	England	Bolivia	Brazil		Netherlands	Jamaica		Chile

Case III:

Group X	Argentina	Ecuador	France	Costa Rica	Italy	Portugal		Germany
Match #	1	2	3	4	5	6	7	8
Group Y	England	Bolivia	Brazil		Netherlands	Jamaica		Chile

Hence, Brazil can play against France, Poland or Costa Rica.

For questions 23 to 25:

Three cases are possible (Assuming that the Netherlands played the 5th match).

Case I:

Group X	Argentina	Ecuador	France	Costa Rica	Italy	Portugal	Poland	Germany
Match #	1	2	3	4	5	6	7	8
Group Y			Bolivia	Brazil	Netherlands	Jamaica	England	Chile

Case II:

Group X	Argentina	Ecuador	France	Costa Rica	Italy	Portugal	Poland	Germany
Match #	1	2	3	4	5	6	7	8
Group Y			Bolivia	Brazil	Netherlands	Jamaica	Ukraine	Chile

Case III:

Group X	Argentina	Ecuador	France	Costa Rica	Italy	Portugal	Poland	Germany
Match #	1	2	3	4	5	6	7	8
Group Y			Bolivia	Brazil	Netherlands	Jamaica	Japan	Chile

Note: We can have three more such cases, if the 'Netherlands-Italy' match is the 7th. Still, possible opponents of Poland would be England, Japan and Ukraine.

23. b   Poland can play against 3 possible teams (England, Japan and Ukraine).

24. d   As evident from the cases England can play against either Poland or Argentina or Ecuador.

25. a   Brazil definitely plays against Costa Rica in the fourth match.

For questions 26 to 30:

As per the information given, the following can be concluded, where the possible list of locks unlocked by Devendra on each of the eight days is given in "grey".

Day 1	L1	L7	L8	L4	L11			L4
Day 2	L3	L15	L14	L12	L8			L12
Day 3	L2	L7	L15	L9	L10			L7
Day 4	L15	L13	L10	L3	L6			L3
Day 5	L2	L15	L9	L10	L5		L15	L9
Day 6	L13	L6	L1	L8	L10			L1
Day 7	L14	L11	L8	L2	L13	L8	L2	L13
Day 8	L5	L6	L10	L14	L11			

Out of the locks unlocked by him, the number of locks of 6 levers is less than the number of locks of 8 levers.

L1	8 levers	L7	6 levers	L13	8 levers
L2	6 levers	L8	10 levers	L14	6 levers
L3	10 levers	L9	6 levers	L15	8 levers
L4	8 levers	L10	10 levers		
L5	10 levers	L11	10 levers		
L6	6 levers	L12	10 levers		

Also, out of L15 and L9, one lock has definitely been unlocked by Devendra.

Out of L8, L2 and L13, one lock has definitely been unlocked by Devendra.

Out of L5, L6, L10, L14 and L11, one lock has definitely been opened by Devendra.

L 15	L9		L8	L2	L13
8 levers	6 levers		10 levers	6 levers	8 levers
	L5	L6	L10	L14	L 11
	10 levers	6 levers	10 levers	6 levers	10 levers

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The levers of the locks definitely unlocked by Devendra are as follows.

L1	L3	L4	L7	L12
8 levers	10 levers	8 levers	6 levers	10 levers

26. c   On five days, i.e. Day 1, Day 2, Day 3, Day 4 and Day 6 it can be uniquely determined which lock has been unlocked by Devendra.

27. b   For the aggregate number of levers to be minimum out of the locks unlocked by him, the number of locks having six levers has to be less than the number of locks having eight levers. Hence, the only possible case is

Day 5	Day 7	Day 8
8 levers	8 levers	6 levers

For questions 28 to 30:
Given that after Day 8 Devendra finds that the aggregate number of levers of all the locks that he has unlocked is more than 64 but not more than 68.
Therefore, the aggregate number of levers of the locks unlocked on Day 5, Day 7 and Day 8 has to be greater than 22 but not more than 26. The following cases are possible

		Day 5	Day 7	Day 8		
	Case 1	8	6	10		24
	Case 2	8	8	10		26
	Case 3	6	8	10		24
Not Possible	Case 4	6	10	10		26
	Case 5	8	10	6		24

Case 4 is not possible because out of the locks unlocked by him, the number of locks of 6 levers is less than the number of locks of 8 levers.

28. d   Out of the given locks, it cannot be confirmed which one was unlocked by Devendra.

29. a   If L9 is not unlocked, then L15 is definitely unlocked by Devendra on Day 5 and also L8 is unlocked by Devendra on Day 7. This confirms that it is Case 5. The lock that has 6 levers from the choices available on Day 8 is either L6 or L14. So, one out of these two locks is definitely unlocked by Devendra.

30. b   If out of the locks unlocked by him, the number of locks of 10 levers is less than the number of locks of 8 levers, then the only feasible case is Case 2. So, the lock unlocked on Day 7 is L13.

For question 31 to 35:
Let the total number of Linen shirts manufactured by all the given companies = X.

Therefore, the number of Linen shirts manufactured by the companies P, Q, R and S is $\frac{X}{4}, \frac{X}{4}, \frac{X}{5}$ and $\frac{3X}{10}$ respectively.

Therefore, the total number of shirts manufactured by the companies P, Q, R and S is $\frac{5X}{6}, \frac{5X}{4}, \frac{4X}{3}$ and $\frac{6X}{5}$ respectively.

31. b   Therefore the total number of shirts manufactured by the company Q is the second largest.

32. c   Assume that the total number of Linen shirts manufactured by all the companies is 100.

Therefore, the total number of Linen shirts manufactured by the companies P, Q, R and S is 25, 25, 20 and 30 respectively. The following table lists down the number of shirts of each type of cloth manufactured by each of the companies, when the total number of Linen shirts manufactured is 100.

Company	Silk	Cotton	Linen	Khadi	Polyester	Total
P	15	20	25	10	13.33	83.33
Q	37.5	25	25	18.75	18.75	125
R	40	28	20	16	29.33	133.33
S	22.8	19.2	30	24	24	120

Therefore, for the number of shirts of each type of cloth to be an integer we need to convert all the fractional values in the table to integers.
In order to do so, we need to multiply the entries for P with 3, the entries for Q with 4, the entries for R with 3 and the entries for S with 5. So, if we multiply all the entries with the l.c.m of 3, 4, 3 and 5, that will do the needful.

Minimum possible number of shirts manufactured by all the companies = (83.33 + 125 + 133.33 + 120) × (3 × 4 × 5) = 27700.

33. a   Given that the difference between the profit generated by both the companies is Rs.15000.
From the explanation given above, the number of shirts

manufactured by the companies Q and S is $\frac{5X}{4}$ and $\frac{6X}{5}$

respectively.
Difference in the profit generated by the two companies

Q and S will give $\frac{5X}{4} - \frac{6X}{5} = \frac{X}{20} = \frac{15000}{10} = 1500.$

$\Rightarrow X = 3 \times 10^4$

Difference between the number of Poleyster shirts manufactured by the companies P and R is

$\left(\frac{22}{100} \times \frac{4X}{3}\right) - \left(\frac{16}{100} \times \frac{5X}{6}\right) = \frac{4X}{25} = \frac{\left(4 \times 3 \times 10^4\right)}{25} = 4800.$

34. d   Let the profit per Khadi shirt and per Cotton shirt be 3y and 4y respectively.
Assume that the company R manufactures 400 shirts.
So, total profit generated by selling Khadi shirts will be 48 × 3y = 144y and the total profit generated by selling Cotton shirts will be 84 × 4y = 336y.
Required ratio is 7:3.

35. b   Referring to the table given in solution of question 32, it can be concluded that only statement II is correct.

36. c   Option (a) can be inferred from the first paragraph as well as second paragraph where Andrew Simms points out that "there is a risk that the world economy will be kick-started again, without learning the lessons of the "consumption explosion". This clearly suggests that the consumption levels will most definitely not fall down. Option (b) can be inferred from the fifth paragraph. The 'yawning gap' between consumption levels of poorest people and the rich are mentioned. This is justified by the example of the energy consumption by an American vs a Tanzanian. Option (c) is the best choice because the third paragraph mentions "if we bankrupt critical ecosystems no amount of government spending will bring them back"; it is not necessary that a thing which cannot be restored cannot be conserved. Finance many not be able to restore critical ecosystems but it might help in conserving them. Option (d) can be inferred from the first three lines of the passage where the author blames the rich nations for putting the world under ecological debt and its consequences. This is reinforced in the fifth paragraph- 'Just 7% of the global population produces 50% of greenhouse gas emissions.'

37. c   Option (a) refers to 'a point of no return' whereas the 8th paragraph refers to nations that have crossed the bearable limit of consumption levels. The given option suggests these nations will never be able to fix this problem whereas this is not suggested anywhere in the passage. Option (b) refers to the habit of consuming resources at a high rate. This option fails to recognize that such a habit is common only to a few nations. Earlier in the passage, the report mentions the difference between the consumption levels of a Tanzanian and an American. Option (c) clearly explains the motive behind referring to 'wasteful over-consumption'. The last paragraph clearly explains that such wasteful over- consumption is not sustainable. Option (d) cannot be verified from the passage because the author does not suggest anywhere that one will definitely lead to the next.

38. d   Option (a) is incorrect because throughout the passage the main point of the author is to explain that some nations' lifestyles have gone into 'wasteful over-consumption' and this rate of consumption is unaffordable by the planet. Hence, this option goes against the views that are expressed in the passage. Option (b) is incorrect because it isn not suggested anywhere. Nef argues that even if the consumption levels of the poor increase, they will fail to improve the quality of life beyond a point. Option (c) is incorrect because even though reducing the ecological debt is author's main concern and the overall impact of focusing on qualitative improvements will lead to lessening of the ecological debt; this is not the reason why author refers to focusing on qualitative improvements. Option (d) is the best choice because the passage explains in the 6th paragraph that consumption's ability to improve life is limited; it provides short-term gains only. When consumption becomes over-consumption, it stops improving the qualitative aspect of life. Hence human beings should shift their focus to more qualitative improvements in life.

39. b   Option (a) cannot be conclusively inferred as the author lauds various aspects of Rowlings work but as regards criticism- the author is mild and guarded in his approach and not entirely explicit. Although, the author uses the terms 'equal-opportunity appropriator' with reference to Rowling, he in no way means to accuse Rowling. Moreover the tone of the author is not derogatory. So plagiarism would be an excessive label. Option (c) is incorrect. The author does not feel that the instances having real world underpinnings are laughably childish. In fact as evidenced in the 1st paragraph, the author only notes that Rowling acknowledged Hermione's preparations (made before launching into a particularly dangerous offensive) as laughably childish. Option (d) is also incorrect. Refer to the lines "…she may leave you quibbling over her seemingly inexhaustible stock of narrative coincidences, but you brush aside these concerns because you care about the characters." So the element of love and care in Rowling's book is quite predominant over the effect created by the narratives. Option (b) is correct. In the first para, the author discusses the negative points of the book. Refer to the lines "Another factor that eats considerably into the element of danger is that practically every move of Voldemort's is sensed comfortably ahead-of-time by Harry, thanks to his psychically-connected scar." So the 'scar-factor' eats into the danger or reduces the effect of danger.

40. b   Option (a) is incorrect. We do not know whether the appropriations or the other works go into the intricacies of human relationships though the book may have gone into human relationships. Option (c) is incorrect. It is not only the evil empire which has real world underpinnings. The book has real world underpinnings. Option (d) is incorrect as the initial lines of the passage state that 'the story of a group of rebels seeking to bring down an evil empire' is not new to pop culture storytelling. It is the real world underpinnings which make the story different. Option (b) is correct and apt to represent what the author feels about 'Deathly Hallows'.

41. c   Option (a) is excessive as although the author is respectful towards Rowling's work, but to say that the author is enthralled or influenced, is an incorrect inference. Options (b) and (d) are insufficient to reflect the tonality of the passage. Refer to the opening lines of second paragraph "... not to say *Deathly Hallows* is anything less than a nail-biting read. A rescue operation inside the Ministry of Magic is thrillingly written, and the climactic battle is a real rouser". In these lines, we see that author's tone is admiring. Also read, 3rd paragraph, where the author touches the lacking facets of the book, "...Rowling may leave you dissatisfied with the ..." and suggests us to brush aside these concerns drawing our attention towards our liking for the characters. Thus, it can be concluded that the author's tone is analytical. He likes to examine things very carefully.

42. c   Option (a) is not the right answer as the purpose of nihilism is not to establish itself after replacing the current social system. Option (b) is not the correct answer, as nihilism cannot be equated with delusion. Option (c) is the correct answer. The lines from the first paragraph clearly state "the nihilist discovers that all values are baseless and that reason is impotent. "Every belief, every considering something-true," Nietzsche writes, "is necessarily false because there is simply no true world". This makes option (c) as the closest definition of nihilism by the author. Option (d) is not the answer. Nihilism no doubt opposes the social organization, but we don't have any information to classify nihilism as an anarchist doctrine.

43. c   Option (a) is not the correct answer as Nihilism was not the primary reason for the collapse of the civilizations. Spengler in his study noticed that the patterns of nihilism were present as a conspicuous feature of collapsing civilizations but these patterns cannot be claimed to be the primary reason for the fall of these civilizations. Option (b) is not the correct answer. The opinion in the option statement is opinion of Eugene Rose. We cannot be sure that nihilism will definitely lead to a cold and inhuman world. Option (c) is the correct answer. From the lines "This collapse of meaning, relevance, and purpose will be the most destructive force in history, constituting a total assault on reality and nothing less than the greatest crisis of humanity," option (c) can be inferred. Option (d) is not

the correct answer as we have no information to infer that eastern doctrines use meditation and *tantra* for withdrawal from the world.

44. d   Option (a) is not the correct answer. It talks about the basic values of nihilism. It emphasizes the redundancy of everything including that of the consciousness. Option (b) is not the correct choice. It appears to be a statement by a Nihilist. The Nihilist has expressed that there are people who are not willing to accept the ideas of nihilism. Option (c) is also talking about the core ideas and tenets of nihilism. It talks about the non-existence of the world and the inherent satire of a Nihilist. Option (d) is the correct answer as it rejects the basic tents of the nihilism. It clearly says that everything is something and not nothing.

45. d   Option (a) is incorrect because the modifier 'acting as a facilitator or go-between' modifies the subject - the broker who is the weak link. The word 'between' has been used correctly in the sentence. Option (b) has one error. Even though the subject - broker - has been placed correctly, the word 'among' has been used incorrectly. 'Among' could have been used if the communication were with one another within a group or if the sentence referred to more than two parties. However, if there is one-to-one correspondence, use "between" even when more than two people, places or things are being discussed. For example, "There is significant disagreement on this issue between Germany, France and Austria." Option (c) has three errors. Firstly, the subject has not been moved to its correct place - right next to the modifier. Secondly, the word 'among' has been used incorrectly. Thirdly, the pronoun 'this' should be used in place of 'that person' because 'this' is used for something or someone closest to the thought of the speaker. Since the broker has been mentioned, it is clear that the speaker is talking about this person. Option (d) is grammatically correct.

46. d   Option (a) contains two errors. First, the use of 'together' with the word 'collaborate' is redundant. The word means to work together. Hence, it is unnecessarily used in the sentence. Second, there is a condition that is set in the given sentence. Therefore, the word 'if' should replace 'when'. Option (b) contains two errors. First, the conditional form 'if' should be used in place of 'when'. Second it uses they for the collective noun 'Faculty members association' which is being represented as a single unit. Option (c) contains one error - the error of redundancy. There is no need to use 'together' with 'collaborate' because it means to work together. When we remove 'together' from the sentence, the meaning of the sentence is not altered. Option (d) contains no error.

47. b   Option (a) is incorrect because the paragraph pertains to the evolution and impact of "offshore" capitalism whereas this option refers to how things were before the onset of this new order. Option (b) is the best choice because the author mentions the factors that enabled the evolution of 'offshore' capitalism - offshore tax benefits and financialising of everyday assets -which led to a major impact on world economies. This 'offshore wizardry' had its impact on world economies. From discussing the evolution of 'offshore' capitalism, the paragraph moves onto its impact on the world. Option (c) is incorrect because, it goes away from the subject: it does not seem to be a factor that enabled the evolution of offshore capitalism. Option (d) refers to the final effect of 'offshore' capitalism whereas the paragraph is still explaining how 'offshore' capitalism evolved and shaped the markets and economies. Hence, this statement does not fit in the given context.

48. b   Option (a) is incorrect because the paragraph discusses the inability of the modern industrial society to remove gender-based inequality and then moves onto discuss the inability of the legal system. This option deals with the inability of the industrial setup whereas the paragraph has already moved onto the next point. Hence, it is incorrect. Option (b) is the best choice because it strictly pertains to 'equality' within the purview of the legal system and how the law is unable to translate 'legal provisions' regarding equality into action. Note the keywords - 'legal provisions' and 'equality on paper' given in the last line of the paragraph. Option (c) does not fit in this context because it refers to what is needed (a complete revolution in thinking) in society today whereas the paragraph refers to the inability of the industrial system and the legal system in altering gender-based inequalities in society. Option (d) does not fit because it has been already established in the paragraph that women have been proving their worth in society by doing the same work that men do. This statement pertains to the undying spirit of women whereas the paragraph has moved onto discuss the inability of the legal system.

49. a   Option (a) is the best choice because there is no grammatical error in the given sentence. Option (b) is incorrect because there is a subject -verb agreement error. 'The closing of illegal shops….' is singular, so 'requires' is appropriate here. In the sentence the relative pronoun 'who' should be used for persons and not 'which'. Option (c) uses the future continuous tense; however, the sentence establishes that these illegal shops and buildings have already been built. So, the action has completed in the past. Therefore, the use of future continuous tense is inappropriate. Option (d) contains a subject-verb agreement error, 'requires' should be used here. Also, it uses the future perfect continuous tense which is inappropriate in this case. This suggests that the builders have not yet constructed these illegal shops but, the construction will be in progress and will end in the future.

50. d   Option (a) is incorrect because an incorrect tense is used here. The word 'comes' should be 'came' because the sentence refers to events in the past. Option (b) uses the past tense correctly in the first part of the sentence but then uses present perfect continuous 'has been working' instead of the past perfect continuous tense 'had already started'. Option (c) is incorrect because the first part of the sentence uses the past tense but the second part 'comes' uses the present tense. Option (d) is the best choice because it uses the past tense appropriately.

51. c   The paragraph refers to the nature, types and targets of old joke tales. '**A**' refers to certain characteristics that were mocked in these jokes. **E** follows as it narrows down to focusing on one type of jokes - stupidity. Then, **D** is an example of the types of jokes in Estonia. Also the keywords mentioned in **E** 'different regions' leads to the example of Estonia in **D**. **DCB** becomes a mandatory sequence since these three pertain specifically to Estonia and the paragraph moves (from general nature and types of jokes) to specific 'targets' of these jokes like Foreigners. The pronoun 'their' used in **B** refers to the 'foreigners' given in **C**.

52. d   The paragraph studies laughter both as a communicative factor and as a stylistic device in narratives. It deals with laughter as an expression of emotions in narratives. A is a conclusive opinion about laughter which can be understood in many ways and may not always function as a reaction to humour. This idea is carried forward in **C** which is obvious as it uses the pronoun 'it' for laughter. **B** explains how narrators can underline their perspective by using various tools of language. **D** suggests how this perspective can be studied. The pronoun

'this' is used for 'the standpoint'. Also, humour, irony etc mentioned in **D** connects with the tools - direct comments etc mentioned in **B**. **E** concludes the paragraph (note the keyword -thus) by referring to the important role of laughter in narration.

53. b   Note that the paragraph moves from research in 'conflict settings' to 'training' for research. **A** introduces the importance of health research in conflict settings. **E** follows as it explains what is meant by 'conflict settings' and why is it difficult to conduct research in such settings. **D** refers to those who conduct research and what they should reflect upon before starting this process. The keyword 'conflict settings' mentioned in E connects with 'such settings' in **D**. **C** follows **D** as it explains how the quality of such research can be improved. The keyword 'training' makes **CB** a mandatory pair. While **C** explains the need for training in a broader use, **B** explains how exactly that can be used to further the cause of health research in conflict settings.

54. d   The relationship between 'Vicissitude' and 'Stagnation' is of antonyms. One of the meanings of 'Vicissitude' is the quality or state of being changeable; mutability. Similarly, 'diffidence' which means unassertiveness is an antonym of 'assertiveness'. 'Vexation' means an act of harassing or vexing. 'Chagrin' means disquietude or distress of mind caused by humiliation, disappointment or failure. 'Mortification' is a sense of humiliation and shame caused by something that wounds one's pride or self-respect. Mortification' also stands for the cause of such humiliation or shame. 'Naivete' is a naive remark or action. 'Ingenue' is a naive girl or a young woman. It also stands for the stage role of an ingenue or an actress playing such a role.

55. b   Option (a) is unworthy of being chosen, as the idiomatic expression "like something the cat dragged in" means to look very shabby, worn, exhausted, or abused. Option (c) is also ineligible, as the idiomatic expression " like a cat on a hot tin roof" is to be nervous and unable to keep still. Option (d) is also inept to be chosen, as if someone is "like a bump on a log" he/she is completely inert and does not react in a useful or helpful way to the activities happening around him/her. Only option (b) is in line with the purport of the given sentence(s). "**like the cat who swallowed the canary"** means displaying a self-satisfied grin. It is used to talk about a person who appears self-satisfied or smug, especially while concealing something mischievous, prohibited, or private. The phrases "I won him" and "gloating over..." convey that the lady discussed in above question had just had a great success. She appears smug and very satisfied while concealing something private or somewhat unacceptable.

56. d   Option (a) may look close but it is not a sure-fire solution to the question and is rather a bit unverifiable opinion which cannot be the logical extension of the given paragraph. We do not have any data given in the paragraph to substantiate the certainty claimed by option (a) that the oceans are not at all a source but only a sink of carbon from the atmosphere. The recent CO2 increase in the atmosphere could be due to human activities or oceans or any other untouched reason like fossil fuel burning and deforestation. The question, "Where could such a huge amount have come from?" remains unanswered in the given text although the paragraph moves on the subject of discussion: the repercussions of the carbon spike. Moreover in option (a) and the paragraph itself, we see that the fact that oceans are acting sinks of carbon does not negate or eliminate the possibility that they cannot be the source of the same. Option (b) talks about oceans and does not pair with the last line of the paragraph and goes adrift from the course of discussion. Option (c) is negated as although it elaborates on the environmental change caused by industrial revolution and Anthropocene, but fails to further the discussion on the repercussions of the carbon spike. As the last line of the given paragraph talks about the "long tail" of the Anthropocene and option (d) elaborates the same, it can be easily glued to the paragraph. Hence, option (d) is the obvious continuation of the given text.

57. a   Only pair **A** exhibits synonymous relation 'Turpitude' means inherent baseness. 'Depravity' means a corrupt act or practice. **B** fails to have such a relationship. 'Sentience' refers to a feeling or sensation as distinguished from perception and thought. 'Cognizance' means knowledge or awareness.

58. c   Both the pairs demonstrate a synonymous relationship. 'Stolid' means having or expressing little or no sensibility. 'Phlegmatic' means having or showing a slow and stolid temperament. 'Heretical' refers to something or someone characterized by departure from accepted beliefs or standards : unorthodox.

59. d   None of the pairs have a synonymous relationship. 'Arch' means principal or chief. It also stands for mischievous or saucy. 'Arcane' means difficult to understand. 'Eclectic' means selecting what appears to be best in various doctrines, methods, or styles or something composed of element drawn from various sources. 'Esoteric' means designed for or understood by the specially initiated alone.

60. b   'Titillate' is to excite pleasurably. 'Titivate' is to make smart or spruce. 'Sarcastic' implies an intentional inflicting of pain by deriding, taunting, or ridiculing. 'Sardonic' is a synonym of sarcastic; 'sardonic' means derisively mocking or disdainfully or skeptically humorous.