This is the actual copy of CAT – 2001.
This is sixth in the series of selected actual copy CAT papers over the last 10-year period. These CAT papers are expected to give you a taste of the real thing and is an important part of the preparation process.

FLT – 9

Answers & Explanations

1	c	**2**	a	**3**	a	**4**	d	**5**	a	**6**	c	**7**	b	**8**	a	**9**	d	**10**	a
11	a	**12**	d	**13**	a	**14**	c	**15**	d	**16**	d	**17**	d	**18**	d	**19**	a	**20**	d
21	c	**22**	b	**23**	d	**24**	c	**25**	b	**26**	a	**27**	c	**28**	c	**29**	a	**30**	c
31	c	**32**	a	**33**	a	**34**	c	**35**	a	**36**	b	**37**	c	**38**	d	**39**	b	**40**	b
41	c	**42**	d	**43**	d	**44**	b	**45**	a	**46**	b	**47**	b	**48**	c	**49**	b	**50**	b
51	a	**52**	d	**53**	c	**54**	b	**55**	d	**56**	c	**57**	a	**58**	c	**59**	d	**60**	a
61	d	**62**	c	**63**	b	**64**	c	**65**	d	**66**	c	**67**	d	**68**	a	**69**	d	**70**	a
71	a	**72**	c	**73**	a	**74**	d	**75**	b	**76**	a	**77**	d	**78**	d	**79**	b	**80**	b
81	a	**82**	c	**83**	d	**84**	b	**85**	c	**86**	a	**87**	d	**88**	c	**89**	d	**90**	c
91	c	**92**	c	**93**	a	**94**	a	**95**	d	**96**	c	**97**	b	**98**	b	**99**	a	**100**	b
101	d	**102**	b	**103**	d	**104**	b	**105**	b	**106**	a	**107**	c	**108**	b	**109**	a	**110**	c
111	c	**112**	a	**113**	b	**114**	a	**115**	d	**116**	d	**117**	d	**118**	b	**119**	a	**120**	d
121	c	**122**	d	**123**	a	**124**	a	**125**	c	**126**	b	**127**	d	**128**	b	**129**	a	**130**	c
131	c	**132**	c	**133**	c	**134**	b	**135**	b	**136**	c	**137**	b	**138**	c	**139**	d	**140**	b
141	c	**142**	b	**143**	b	**144**	b	**145**	b	**146**	d	**147**	a	**148**	c	**149**	a	**150**	c

	Question number	Total questions	Total attempted	Total correct	Total wrong	Net Score	Time Taken
QA	1 to 50	50					
EU + RC	51 to 100	50					
DI + DS + AR	101 to 150	50					
Total		150					

Analysis of FLT – 9

Overview:

FLT 9 is the exact replica of **CAT - 2001**. It was not a very difficult paper as far as Quant and DI is concerned, for English a selective approach has to be followed as there is more number of inferential questions. Time management is very important in such a paper as losing time anywhere invites extra pressure to perform. Therefore don't dwell into anything, first do what you know the best.

The section break up is as follows:

Section Number	Topics	Number of Questions	Suggested Time	Possible Attempts
I	QA	50	40 min	26-28
II	EU + RC	50	40 min	32+
III	DI + AR	50	40 min	28+
Total		**150**	**120 min**	**86-90**

Section I: Quantative Aptitude

Must have attempted the following questions in the two rounds:

Round 1: 1, 2, 3, 4, 5, 12, 13, 18, 24, 27, 31, 34, 37, 40, 41, 43, 45, 49, 50 **(20 Questions)**

Round 2: 7, 8, 9, 10, 11, 14, 15, 16, 17, 19, 21, 22, 26, 29, 30, 33, 35, 36, 38-39, 42, 44, 47, 48 **(24 Questions)**

Questions that could have been done by taking values are : 4, 27, 40

Questions 38-39 may or may not be attempted according to ones comfort with averages.

Questions to be left unattempted as they are lengthier in terms of calculations and words are 6, 20, 23, 25, 32, 44 **(6 Questions)**

The questions in round 1 and 2 may vary according to ones preferences and comfort level with particular topics.

Topic	Number of questions	Topic	Number of questions
Arithmetic	**21**	**Algebra**	**10**
Number System	8	Equations and Inequalities	7
Percentages, SI, CI and PLD	6	Progressions	1
Ratio & Proportion, Mixtures	2	Functions	0
TSD/Time and Work	5	Maxima and Minima	2
Geometry	**9**	**P &C, Probability**	**2**
Plane Geometry	7	**Reasoning Based**	**4**
Mensuration	1	**Miscellaneous**	**4**
Coordinate + Graphs +Trigo.	1	**Total**	**50**

Section II: English Usage & Reading Comprehension

Type of questions	Number of questions	Remarks
English Usage	**20**	
Dictionary Meaning	5	Easy
Para jumbles	5	Time Consuming, be selective
Sentence Completion	5	Easy-Medium
Antonyms	5	Easy
Reading Comprehension	**30**	
Distinctions due to race (650 words)	5	All Inferential Questions, Medium Difficult
Development of young children (525 words)	5	3 Fact based questions, 2 inferential, Medium
Billie Holiday (650 words)	4	Inferential close option choices, Slightly Tough
Narratives (700 words)	6	Mix of Inference and direct Qs. , Medium- Easy
Democracies (900 words)	6	3 inferential, 1 vocab based 2 fact based , Average
Science Big Bang (600 words)	4	4 fact based , Easy

The passages are decently lengthy therefore selection has to be made according to the area of interest (psychology, politics, science, Behaviorism etc.)

Section III: Data Interpretation

Data Type	Number of questions (Number of Sets)
Data Interpretation	**23 (6 sets)**
Tables	8 (2 Sets)
Bar Graphs	9 (2 Sets)
Pie Charts	3 (1 Set)
Case-let (Diagram)	3
Data Sufficiency	**7**
Analytical Reasoning	**20**
Total	**50**

Following could be the order of selection for two rounds strategy:
Round 1: Set 1(101–104), Set 2 (105–108) (Simple counting based problems if one doesn't scare with the size of table), Set 4 (115–117), DS (121–127)

Round 2: Set 3 (109–114), Set 5 (118–120), Set 6 (128–130)
Otherwise cautious selection of sets will be sufficient enough to crack the section.
Since some question were counting based.

As for Analytical reasoning set 135–136, 137–139 must be cracked. Also 147–150 if one is comfortable with sets. Remaining single questions can be left is time doesn't permits.

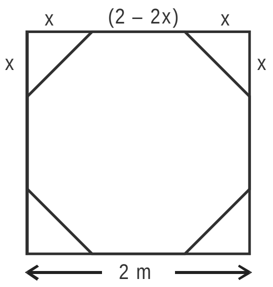
Overall Analysis: In CAT - 2001, the cut off for the various section is as follows :
QA – 16, EU & RC – 23 and DI – 22 with a total cut off of 70+.

1. Let the marks scored in five subjects be 6x, 7x, 8x, 9x and 10x (on a scale of 1).
Average score = 60%

$$\Rightarrow \frac{6x+7x+8x+9x+10x}{5} = \frac{60}{100} \Rightarrow 8x = 0.6$$

$\Rightarrow x = 0.075$
So the marks are 0.45, 0.525, 0.6, 0.675 and 0.75.
Number of times the marks exceed 50% is 4.

2.



Let the length of the edge cut at each corner be x m. Since the resulting figure is a regular octagon,

$$\therefore \sqrt{x^2+x^2} = 2-2x \Rightarrow x\sqrt{2} = 2-2x$$

$$\Rightarrow \sqrt{2}\,x\,(1+\sqrt{2}) = 2 \Rightarrow x = \frac{\sqrt{2}}{\sqrt{2}+1}$$

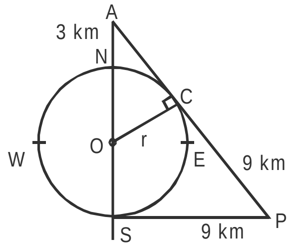
3. Use the answer choices and the fact that:
Odd × Odd = Odd
Odd × Even = Even
Even × Even = Even

4. $x > 5$, $y < -1$
Use answer choices.
Take x = 6, y = –6. We see none of the statements (1, 2 and 3) is true. Hence the correct option is (d).

5. First light blinks after 20 s.
Second light blinks after 24 s.
They blink together after LCM of 20 and 24 = 120 s = 2 min. Hence, the number of times they blink together in an hour = 30.

6. Since he has to put minimum 120 oranges and maximum 144 oranges, i.e. 25 oranges need to be filled in 128 boxes with same number of oranges in the boxes.
There are 25 different possibilities if there are 26 boxes, at least 2 boxes contain the same number of oranges (i.e. even if each of the 25 boxes contains a different number of oranges, the 26th must contain one of these numbers).
Similarly, if there are 51 boxes at least 3 boxes contain the same number of oranges.
Hence at least 6 boxes have same number of oranges for 128 boxes.

7.



ΔAPS and ΔAOC are similar triangles.
Where OC = r

$$\therefore \frac{r}{r+3} = \frac{9}{\sqrt{81 + (2r + 3)^2}}$$

Now use the options. Hence, the diameter is 9 km.

8. Let BC = y and AB = x.
Then area of ΔCEF = Area(ΔCEB) – Area(ΔCFB)

$$= \frac{1}{2}\cdot\frac{2x}{3}\cdot y - \frac{1}{2}\cdot\frac{x}{3}\cdot y = \frac{xy}{6}$$

Area of ABCD = xy
$\therefore$ Ratio of area of ΔCEF and area of ABCD is

$$\frac{xy}{6} : xy = \frac{1}{6}$$

9. Work done in one day by A, B, C and D are

$\frac{1}{4}, \frac{1}{8}, \frac{1}{16}$ and $\frac{1}{32}$ respectively.

Using answer choices, we note that the pair of B and C does $\frac{3}{16}$ of work in one day; the pair of A and D does $\frac{1}{4}+\frac{1}{32}=\frac{9}{32}$ of the work in one day.

Hence, A and D take $\frac{32}{9}$ days.

B and C take $\frac{16}{3}=\frac{32}{6}$ days.

Hence, the first pair must comprise of A and D.

10. Let the four-digit number be abcd.
a + b = c + d ... (i)
b + d = 2(a + c) ... (ii)
a + d = c ... (iii)
From (i) and (iii), b = 2d
From (i) and (ii), 3b = 4c + d
$\Rightarrow 3(2d) = 4c + d$
$\Rightarrow 5d = 4c$

$\Rightarrow c = \frac{5}{4}d$

Now d can be 4 or 8.
But if d = 8, then c = 10 not possible.
So d = 4 which gives c = 5.

11. Amount of money given to X
$= 12 \times 300 + 12 \times 330 + ... + 12 \times 570$
$= 12[300 + 330 + ... + 540 + 570]$
$= 12 \times \frac{10}{2}[600 + 9 \times 30] = 52200$
Amount of money given to Y is
$6 \times 200 + 6 \times 215 + 6 \times 230 + 6 \times 245 + ...$ to 20 terms
$= 6[200 + 215 + 280 ... 485]$
$= 6 \times \frac{20}{2}[400 + 19 \times 15]$
$= 6 \times 10[400 + 285]$
$= 60 \times 685 = 41100$
$\therefore$ Total amount paid = 52200 + 41100 = Rs. 93,300.

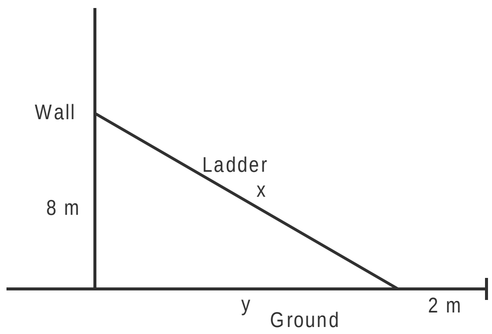
12. Let the number be x.
Increase in product = 53x – 35x = 18x
$\Rightarrow 18x = 540 \Rightarrow x = 30$
Hence new product = 53 × 30 = 1590.

13. Let x be the total number of people the college will ask for donations.
$\therefore$ People already solicited = 0.6x
Amount raised from the people solicited
= 600 × 0.6x = 360x
Now 360x constitutes 75% of the amount.
Hence, remaining 25% = 120x
$\therefore$ Average donation from remaining people
$= \frac{120x}{0.4x} = 300.$

14. The value of y would be negative and the value of x would be positive from the inequalities given in the question.
Therefore, from (a), y becomes positive. The value of xy^2 would be positive and will not be the minimum.
From (b) and (c), x^2y and 5xy would give negative values but we do not know which would be the minimum.
On comparing (a) and (c), we find that
$x^2 < 5x$ in $2 < x < 3$.
$\therefore x^2y > 5xy$ [Since y is negative.]
$\therefore$ 5xy would give the minimum value.

15. Let $y = n^3 - 7n^2 + 11n - 5$
At n = 1, y = 0
$\therefore (n - 1)(n^2 - 6n + 5)$
$= (n - 1)^2 (n - 5)$
Now $(n - 1)^2$ is always positive.
Now for n < 5 the expression gives a negative quantity.
Therefore, the least value of n will be 6.
Hence m = 6.

16.



Let the length of the ladder be x feet. We have
$8^2 + y^2 = x^2$ and $(y + 2) = x$
Hence, $64 + (x - 2)^2 = x^2$
$\Rightarrow 64 + x^2 - 4x + 4 = x^2$
$\Rightarrow 68 = 4x \Rightarrow x = 17$

17. Let there be x mints originally in the bowl.
Sita took $\frac{1}{3}$, but returned 4. So now the bowl has
$\frac{2}{3}x + 4$ mints.
Fatima took $\frac{1}{4}$ of the remainder, but returned 3.
So the bowl now has $\frac{3}{4}\left(\frac{2}{3}x + 4\right) + 3$ mints.
Eshwari took half of remainder that is
$\frac{1}{2}\left[\frac{3}{4}\left(\frac{2}{3}x + 4\right) + 3\right]$
She returns 2, so the bowl now has
$\frac{1}{2}\left[\frac{3}{4}\left(\frac{2}{3}x + 4\right) + 3\right] + 2 = 17 \Rightarrow x = 48$

Short cut:
Since Sita was the first person to pick and she picks up $\frac{1}{3}$ of the mint, but if you see the options, none of the option is a multiple of 3.

18. In 30 years from 1971 to 2001, number of odd days
= 30 + (8 from leap years) = 38 and $38 \equiv 3 \bmod 7$
So December 9, 1971 is Sunday – 3 days
= Thursday

19. The product of 44 and 11 is 484.
If base is x, then 3411
$= 3x^3 + 4x^2 + 1x^1 + 4 \times x^0 = 484$
$\Rightarrow 3x^3 + 4x^2 + x = 480$
This equation is satisfied only when x = 5.

So base is 5.
In decimal system, the number 3111 can be written

$3 \times 5^3 + 1 \times 5^2 + 1 \times 5^1 + 1 \times 5^0 = 406$

20. Let x be rate of Rahul, and y be the rate of current in mph.

$$\frac{12}{x-y} - \frac{12}{x+y} = 6 \Rightarrow \frac{y}{x^2-y^2} = \frac{1}{4}$$

$$\Rightarrow y = \frac{x^2-y^2}{4} \quad \text{... (i)}$$

When Rahul doubles his rowing rate, then we have

$$\frac{12}{2x-y} - \frac{12}{2x+y} = 1 \Rightarrow \frac{2y}{4x^2-y^2} = \frac{1}{12}$$

$$\Rightarrow y = \frac{4x^2-y^2}{24} \quad \text{... (ii)}$$

Hence, from (i) and (ii), we have $2x^2 = 5y^2$

Putting $x^2 = \frac{5}{2}y^2$ in (i), we get $y = \frac{\frac{3}{2}y^2}{4} \Rightarrow y = \frac{8}{3}$.

21. Let 'x' be the number of males in Mota Hazri.

	Chota Hazri	Mota Hazri
Males	x – 4522	x
Females	2(x – 4522)	x + 4020

x + 4020 – 2(x – 4522) = 2910 $\Rightarrow$ x = 10154

$\therefore$ Number of males in Chota Hazri = 10154 – 4522
= 5632

22. Let the number of students in classes X, Y and Z be a, b and c respectively. Then
Total of X = 83a
Total of Y = 76b
Total of Z = 85c

And $\frac{83a + 76b}{a+b} = 79$, i.e. 4a = 3b

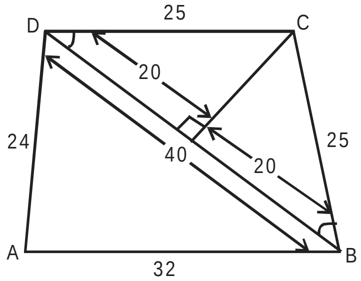
Also $\frac{76b + 85c}{b+c} = 81$, i.e. 4c = 5b

Hence, b = $\frac{4}{3}a$, c = $\frac{5}{4}b = \frac{5}{4} \times \frac{4}{3}a = \frac{5}{3}a$

Average of X, Y and Z = $\frac{83a + 76b + 85c}{a+b+c}$

$$= \frac{83a + 76 \times \frac{4}{3}a + 85 \times \frac{5}{3}a}{a + \frac{4}{3}a + \frac{5}{3}a} = \frac{978}{12} = 81.5$$

23.



CE = $\sqrt{25^2 - 20^2} = 15$

(Since DBC is isosceles triangle.)
Assume ABCD is a quadrilateral
where AB = 32 m, AD = 24 m, DC = 25 m, CB = 25 m and $\angle DAB$ is right angle.
Then DB = 40 m because ΔADB is a right-angled triangle and DBC is an isosceles triangle.

So area of Δ ADB = $\frac{1}{2} \times 32 \times 24 = 384$ sq. m

Area of Δ BCD = $2 \times \frac{1}{2} \times 15 \times 20 = 300$ sq. m

Hence area of ABCD = 384 + 300 = 684 sq. m

24. Let the total number of pages in the book be n.

Let page number x be repeated. Then $\sum_{i=1}^{n} i + x = 1000$

$$\frac{n(n+1)}{2} + x = 1000$$

Thus, $\frac{n(n+1)}{2} \le 1000$ gives n = 44

Since $\frac{n(n+1)}{2} = 990$ (for n = 44).

Hence x = 10.

25. If Shyam takes 1 min for every 3 steps, then he takes $\frac{1}{3}$ min for every step.

For 25 steps, he takes $\frac{25}{3}$ min, i.e. 8.33 min.

So Vyom takes $\frac{1}{2}$ min for every step.

For 20 steps, he takes $\frac{20}{2}$ min, i.e. 10 min.

Difference between their time = 1.66 min.
Escalator takes 5 steps in 1.66 min and difference in number of steps covered = 5
Speed of escalator is 1 step for 0.33 min,
i.e. 3 steps per minute.

If escalator is moving, then Shyam takes 25 steps and escalator also takes 25 steps.
Hence, total number of steps = 50.

26. Let the cost of 1 burger, 1 shake and 1 fries be x, y and z.
Then

$3x + 7y + z = 120$ ... (i)
$\underline{4x + 10y + z = 164.5}$ ... (ii)
$x + 3y = 44.5$ ... (iii) (ii – i)

Multiplying (iii) by 4 and subtracting (ii) from it, we find
$2y - z = 13.5$ ...(iv)
Subtracting (iv) from (iii), we get $x + y + z = 31$.

27. Take a = b = c = d = 1.

28. Let 't' be the time taken for all three together, then

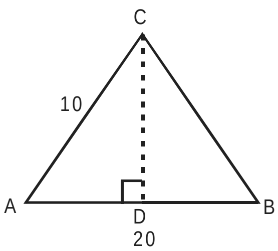
$$\frac{1}{t+6} + \frac{1}{t+1} + \frac{1}{2t} = \frac{1}{t}$$

Solving the above equation, we get

$3t^2 + 7t - 6 = 0$ or $t = \frac{2}{3}$ hr

= 40 min

29.



Let's assume AB be the longest side of 20 unit and another side AC is 10 unit. Here CD $\perp$ AB.

Since area of $\Delta ABC = 80 = \frac{1}{2} AB \times CD$

So $CD = \frac{80 \times 2}{20} = 8$. In ΔACD; $AD = \sqrt{10^2 - 8^2} = 6$

Hence DB = 20 – 6 = 14.

So $CB = \sqrt{14^2 + 8^2} = \sqrt{196 + 64} = \sqrt{260}$ unit

30. Let the 6th and the 7th terms be x and y.
Then 8th term = x + y
Also $y^2 - x^2 = 517$
$\Rightarrow (y + x)(y - x) = 517 = 47 \times 11$
So $y + x = 47$
$y - x = 11$
Taking y = 29 and x = 18, we have 8th term = 47,
9th term = 47 + 29 = 76 and 10th term = 76 + 47 = 123.

31. Fresh grapes contain 10% pulp.
$\therefore$ 20 kg fresh grapes contain 2 kg pulp.
Dry grapes contain 80% pulp.
$\therefore$ 2 kg pulp would contain

$$\frac{2}{0.8} = \frac{20}{8} = 2.5 \text{ kg dry grapes}$$

32. Total time taken by B to cover 60 km

$$= \frac{60}{50}\text{hr} = \frac{6}{5}\text{hr}$$

It stops at station C for $\frac{1}{4}$ hr.

Now in $\left(\frac{6}{5} + \frac{1}{4}\right)$hr train X travels

$$70 \times \frac{29}{20} = 101.5 \text{ km}$$

This means they do not cross each other by the time train Y finishes its stop at station C.
Let they meet after t hr.

Then $70t + 50(t - \frac{1}{4}) = 180 \Rightarrow t = \frac{192.5}{120}$ hr

Distance from A will be $(70 \times \frac{192.5}{120})$ km

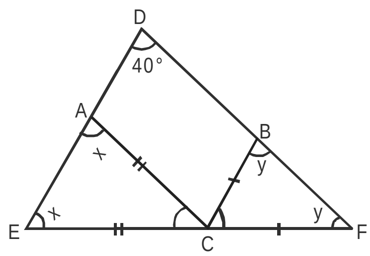
= 112 km approximately

33. Let the highest number be n and x be the number erased.

Then $\dfrac{\frac{n(n+1)}{2} - x}{(n-1)} = 35\frac{7}{17} = \frac{602}{17}$.

Hence, n = 69 and x = 7 satisfy the above conditions.

34.



Here $\angle ACE = 180 - 2x$, $\angle BCF = 180 - 2y$
and $x + y + 40° = 180°$ (In ΔDEF)
So $x + y = 140°$
So $\angle ACB = 180° - \angle ACE - \angle BCF$
$= 180° - (180° - 2x) - (180° - 2y)$
$= 180° - 2(x + y)$
$= 180° - 2 \times 40°$
$= 100°$

35. In first updown cycle, the reduction price is Rs. 441. According to this, (b) and (d) are removed. Now we have to analyse (c), if the original price is Rs. 2,500, then after first operation, the price will be
2500 – 441= Rs. 2,059. In second operation, it will come down to around Rs. 400. So the value is not equivalent to Rs. 1,944.81.
Hence, option (a) is the answer.

36. Let L be length in metres of the race which A finishes in t seconds.

Speed of A = $\frac{L}{t}$ m/s

Speed of B = $\frac{L-12}{t}$ m/s

Speed of C = $\frac{L-18}{t}$ m/s

Time taken by B to finish the race = $\frac{L}{(L-12)/t}$ s

$= \left(\frac{L}{L-12}\right)t$ s

In this time, C covers (L – 8) m

$$\left(\frac{L-18}{t}\right)\left(\frac{L}{L-12}\right)t = L-8$$

$\Rightarrow L = 48$ m

37. x + y = 1 and x > 0 y > 0

Taking x = y = $\frac{1}{2}$, value of

$$\left(x+\frac{1}{x}\right)^2+\left(y+\frac{1}{y}\right)^2=\left(2+\frac{1}{2}\right)^2+\left(2+\frac{1}{2}\right)^2$$

$$=\frac{25}{4}+\frac{25}{4}=\frac{25}{2}$$

It can be easily verified as it is the least value by using second derivative test.

Questions 38 and 39:

$BA=\frac{r_1+r_2}{n_1}$, $MBA_2=\frac{r_1+r_2}{n_1+n_2}$ and

$$MBA_1=\frac{r_1}{n_1}+\frac{n_2}{n_1}\max\left\{0,\frac{r_2}{n_2}-\frac{r_1}{n_1}\right\}$$

From BA and MBA_2, we get $BA \geq MBA_2$ because $n_1+n_2 \geq n_1$.

From BA and MBA_1, we get $BA \geq MBA_1$ because

$$\frac{r_1}{n_1}+\frac{r_2}{n_1}\geq\frac{r_1}{n_1}+\frac{r_2}{n_1}\times\frac{n_2}{r_2}\max\left\{0,\frac{r_2}{n_2}-\frac{r_1}{n_1}\right\}.$$

Now from MBA_1 and MBA_2, we get

$$\frac{r_1}{n_1}+\frac{r_2}{n_1}\times\frac{n_2}{r_2}\max\left\{0,\frac{r_2}{n_2}-\frac{r_1}{n_1}\right\}\geq\frac{r_1}{n_1+n_2}+\frac{r_2}{n_1+n_2}.$$

38. From the above information, $BA \geq MBA_1 \geq MBA_2$

None of these is the right answer.

39. BA = 50 where there is no incomplete innings means

$r_2 = n_2 = 0 \Rightarrow \frac{r_1}{n_1}=50$

$$MBA_1=\frac{r_1}{n_1}+\frac{n_2}{n_1}\max\left[0,\left(\frac{r_2}{n_2}-\frac{r_1}{n_1}\right)\right]$$

$$= 50+\frac{1}{n_1}\max\left[0,\left(\frac{45}{1}-50\right)\right]$$

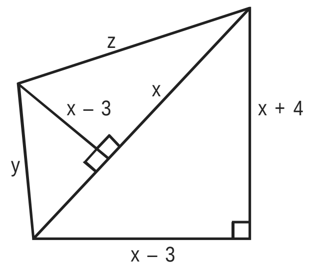
$$= 50 + 0 = 50$$

$$BA=\frac{r_1+r_2}{n_1}=\frac{50n_1+45}{n_1}=50+\frac{45}{n_1}>50$$

$$MBA_2=\frac{r_1+r_2}{n_1+n_2}=\frac{50n_1+45}{n_1+1}=50-\frac{5}{n+1}$$

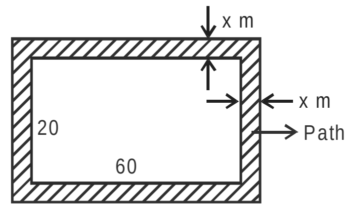
Hence, BA will increase, MBA_2 will decrease.

40.



We can find the value of x, using the answer choices given in the question. We put (a), (b), (c) and (d) individually in the figure and find out the consistency of the figure. Only (b), i.e. 11 is consistent with the figure.

41.



Let width of the path be x metres.
Then area of the path = 516 sq. m

$\Rightarrow$ (60 + 2x)(20 + 2x) – 60 × 20 = 516

$\Rightarrow$ 1200 + 120x + 40x + 4x² – 1200 = 516

$\Rightarrow 4x^2 + 160x - 516 = 0 \Rightarrow x^2 + 40x - 129 = 0$

Using the answer choices, we get x = 3.

42. $a = b^2 - b, b \geq 4$
$a^2 - 2a = (b^2 - b)^2 - 2(b^2 - b)$
$= (b^2 - b)(b^2 - b - 2)$
Using different values to $b \geq 4$ and we find that it is divisible by 15, 20, 24.
Hence all of these is the right answer.

43. Number of one-rupee coins = 158.
Possible arrangements of coins are listed as 1, 2, 4, 8, 16, 32, 64 and 31.
$\therefore$ Number of arrangements = 8.
So the least number of bags required = 8.

44. From II, b = 2d
Hence, b = 10, d = 5 or b = 4, d = 2
From III, e + a = 10 or e + a = 4
From I, a + c = e or e – a = c
From III and I, we get 2e = 10 + c or 2e = 4 + c

$\Rightarrow e = 5 + \frac{c}{2}$ ... (i)

or $e = 2 + \frac{c}{2}$ ... (ii)

From (i), we can take c = 2, 4, 6, 10.
For c = 2, e = 6
c = 4, e = 7 (Not possible)
c = 6, c = 8 (Not possible)
c = 10, e = 10 (Not possible since both c and e cannot be 10)
From (ii), we have c = 2, 4, 6, 10.
For c = 2, e = 3 (Not possible)
c = 4, e = 4 (Not possible)
c = 6, e = 5 (Possible)
c = 10, e = 7 (Not possible)
Considering the possibility from B that c = 6 and e = 5 means e + a = 4
$\Rightarrow$ a = –1 (Not possible)
Hence, only possibility is b = 10, d = 5, c = 2, e = 6.
e + a = 10 $\Rightarrow$ a = 4

45. Equation of quadratic equation is
$ax^2 + bx + c = 0$
$x^2 + bx + c = 0$
First roots = (4, 3)

Sum of the roots $= \frac{-b}{a} = -7 \Rightarrow b = 7$.

Product of the roots $= \frac{c}{a} = 12 \Rightarrow c = 12$.

$\therefore$ Equation formed $x^2 - 7b + 12 = 0$ ... (i)
Another boy gets the wrong roots (2, 3).

$\therefore$ Sum of the roots $= \frac{-b}{a} = -5 \Rightarrow b = 5$.

Product of the roots $= \frac{c}{a} = 6 \Rightarrow c = 6$.

Equation formed $x^2 - 5b + 6 = 0$ ... (ii)
$x^2 + b'x + c_1 = 0$
$b' = 2 + 3$
$\therefore c = 6$

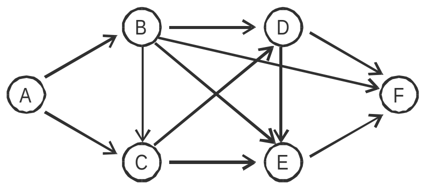
Hence, $x^2 - 7x + 6 = 0$
$\Rightarrow x^2 - 6x - x + 6 = 0$
$\Rightarrow x(x - 6) - 1(x - 6) = 0$
$\Rightarrow (x - 6)(x - 1) = 0$
$\therefore x = 6, 1$
Hence, the actual roots = (6, 1).

Alternate method:
Since constant = 6[3 × 2] and coefficient of x = 7 [–4x – 3x]
Since quadratic equation is
x^2 – (Sum of roots)x + Product of roots = 0 or
$x^2 - 6x + 7 = 0$
Solving the equation (x – 6)(x – 1) = 0 or x = (6, 1).

46. Let the number of five-rupee, two-rupee and one-rupee coins be x, y and z respectively.
x + y + z = 300
5x + 2y + z = 960
<u>5x + y + 2z = 920</u>
y – z = 40

And x + 2y = 340
Use the answer choices now.
If x = 140, y = 100 and z = 60, this satisfies all the given conditions.

47.



The number of distinct routes from A to F are listed below.

(1) ABDF	(2) ACEF	(3) ABF
(4) ABEF	(5) ACDF	(6) ABCDEF
(7) ACDEF	(8) ABDEF	(9) ABCDF
(10) ABCEF		

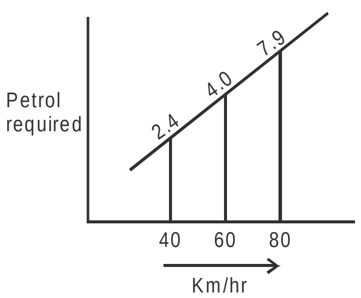
Hence there are 10 way to reach F from A.

48. The last two digits can be 12, 16, 24, 32, 36, 52, 56, and 64, i.e. 8 possibilites

Remaining digits can be chosen in ${}^4P_3 = 24$ ways.

Hence, total number of such five-digit numbers = 24 × 8 = 192.

49.



60 km/hr is travelled in 4 L petrol (from the graph).
$\therefore$ 1 L is required for 15 km, i.e. for 15 km, 1 L petrol is required.

For 200 km, $\frac{200}{15}$ = 13.33 L is required.

50. The fuel consumption at various speeds would be

$\frac{200}{40} \times 2.5 = 12.5$ L

$\frac{200}{80} \times 7.9 = 19.75$ L

$\frac{200}{60} \times 4 = 13.33$ L

If Manasa travels at 40 km/hr, the total consumption would be 12.5 L. Hence Manasa has to decrease the speed.

51. A-H: Here 'exceed' would mean 'flowing beyond' the 'banks' (physical boundaries).
B-F: Here their accomplishments 'were superior to' the expectation.
C-E: It is difficult for us to 'comprehend' the infinite mercy of God.
D-G: He 'crossed limits' when he embezzled from the fund.

52. A-E: We see smoke and 'deduce' that there must be a fire.
B-F: The listener makes all sorts of guesses about the 'utterance'.
C-G: 'You' can be sure from 'the long wait' that the person is definitely inclined to meet 'him'.
D-H: She had distanced herself from the debate but for a perfunctory question, thereby 'hinting' that she was not exactly excited by the debate.

53. A-G: The wines have been preserved for a long time so as to 'age' it.
B-E: He has settled down in his 'old age'.
C-H: The soil in the Gangetic plains are 'rich' with the flow of time.
D-F: The violin tunes were 'rich and pleasant'.

54. A-F: She felt 'lightened' when she kicked off her shoes.
B-H: The victims were given relief 'aid'.
C-G: Playing cards is a welcome 'relief' (break) from the routine.
D-E: The sentry got 'relief' from his shift when the next guard appeared.

55. A-F: He wanted to defend himself to 'get rid of' the social stigma attached to him.
B-H: Water had to be purified of unwanted ingredients by distillation.
C-E: The opposition was unceremoniously dumped.
D-G: Drugs that empty the bowels have a bad effect on the brain.

56. Very easy. Like life. E is the general observation. 'India' and 'regional' in A leave less room for doubt. DB strikes a pair with 'office'. Enough?

57. You may like to start with D, but notice that DE or DF do not sound plausible. Hence, F is the assertion. D retorts with 'How F?'. E obliges. Watch out for the 'so-but-now' sequence in BAC.

58. Only E can start this paragraph, work it out. AC follows in (a) and (c). B with 'but' is the point of inflexion and D ends the paragraph on an optimistic note.

59. Only B or A can possibly start the paragraph. A has a better chance with 'universal' followed by B with 'areas'. Also note that DE adds credence to (d) with 'when to pass' and 'assessment of political situation'.

60. A difficult one, but one can take solace in the fact that BC is a mandatory pair with 'calculable' and 'only uncontrolled applications (exceptions to B).

61. It's choice (d). You don't write reports or stories or books for tools, but 'obituaries' — yes, as tools do get obsolete. Also 'practices' do not wither or trade or die away, but they do fade away with time.

62. You do not add or figure two attributes, but you do combine them into one. 'Appear' again is too abrupt when you are discerning a personality, 'emerges' would be more appropriate, as when you develop a photograph. Remember *Jaane Bhi Do Yaaron*?

63. Now just take a look at this sentence, something actually happened, and there is 'her face', so what we would like to know is whether the event registered itself on her face. Now this can be evident only from her reaction, which is 'expressed' through her facial expression!

64. When you read about the British Labour Movement, you do expect something more formal than 'weird' or 'moving' or 'gloomy', hence 'significant'.

65. We can eliminate (a) as being 'subordinate' is nothing to boast of; again, the 'current' intellectuals cannot be 'ancestors'. 'The world' does not go with 'cliques'. (d) fits the universal context of the sentence.

66. A specious argument sounds true but is actually false. 'Credible' has a positive note against the other three choices.

67. To obviate is to make something unnecessary, this meaning is elucidated in (a), (b) and (c). 'Bolster' on the other hand strengthens the cause of driving personal cars.

68. Easy. (b) (c) and (d) actually mean something that is no longer in use. (a) talks about prevailing practices.

69. 'Parsimonious' means to be very sparing in quantity, this meaning is subscribed to in (a), (b) and (c). 'Altruistic' has got little in common with 'parsimonious'.

70. To say that war is a remedy for the burgeoning population problem is to speak flippantly. (b), (c) and (d) convey this light tone. Jovian relates to the planet Jupiter.

71. The reference is to an open discussion of the caste issue on a global platform.

72. An inverted representation hardly furthers the cause of the forsaken, it is kept under the wraps of the 'virtual beliefs'.

73. Only A and E can qualify as per sentence 1 of the passage.

74. Paragraph 2 amply justifies this answer.

75. Refer to the sentences, "All subsequent distinctions are 'constructed' ones', and 'those findings deny genetic differences between 'races' ... environmental factors impinge on gene-function."

76. A mono-syllabic word has only one syllable. So it can have only one onset. A phenome, according to the passage, can be 'initial' and 'final'.

77. Phoneme appears to emerge at around the age of 5 or 6.

78. (a), (b), and (c) are all covered under 'phonological deficit'.

79. The Treiman and Zudowski experiment showed that '4 and 5-year-old children found the onset-rime version ... significantly easier ... only the 6-year-old ... were able to perform both versions ... with an equal level of success'.

80. Refer to the sentence in paragraph 2 — 'rimes correspond to rhymes in single-syllabus words'.

81. Billie Holiday would survive for her 'voice', that of a great blues singer.

82. Situations would have got far worse had Billie Holiday not died in her middle age.

83. Billie Holiday did not welcome suffering in her life, refer to the sentence 'suffering was her profession; she did not accept it'.

84. Billie Holiday was fortunate to have 'the best musicians of the 1930s to accompany her — notably Teddy Wilson, Frankie Newton and Lester Young ...'

85. Refer to the part — 'Each of the temporal frames as a different focus, and by shifting them Kurosawa is able to ... and the consequent erosion of Dersu's way of life.

86. Refer to the part 'The film itself ... opening by Dersu's grave'. Besides (a) can be easily inferred from the second paragraph.

87. Refer to the part '... nostalgic, melancholy ruminations ... the film celebrates the timelessness of Dersu's wisdom'.

88. Refer to the part 'first section of the film ... delineate the code of ethics by which Dersu lives and which permits him to survive in these conditions'.

89. Refer to the part 'Dersu first appears ... Arseniev watches him closely and does not share their derisive response ... Kurosawa frames Arseniev by himself, sitting on the other side of the fire from his soldiers ... he writes in his diary ...'

90. Refer to the part 'Kurosawa defines the world of the film initially upon a void, a missing presence'.

91. Simple. Refer blindly 2to the part '... the greater the urge for change in a society, the stronger the appeal of a dynamic leadership ...'

92. A conservative is one who is in favour of preserving existing customs and is against innovation. Refer to the part 'A dynamic leadership seeks to free itself from the constraints of existing rules ...'

93. Refer to the parts — 'In a world preoccupied with scientific rationality ... a system based on an impersonal rule of law ...' and '... democracy ... can only whet people's appetite for real or substantive equality'. C cannot be inferred as we are not really comparing like to like, and traditional music, dance and drama can still exist within the precincts of a modern society.

94. Refer to the part — 'The age of democracy would, in his view, be an unheroic age; there would not be room ... for either heroes ...'

95. Refer to the part — 'But a system governed solely by impersonal rules can at best ensure order and stability; it cannot ... formal equality will be replaced by real equality ...'

96. A can be inferred, refer to the part — 'Democracy rests on two different principles ... the principle of equality before the law ... the leadership principle ... one principle cannot be promoted without some sacrifice of the other... ' D can be inferred, refer to the part — 'their continued preoccupation with plans and schemes ... to bridge the gap between the ideal of equality and the reality which is so contrary to it ... leadership with a measure of charisma ...' B and C venture too far by using the words 'disadvantages' and 'limitations' respectively which have no contextual relevance.

97. Refer to the part — 'Dark Age ... the ignorance of astronomers about that period'.

98. Refer to the part — 'The main problem that plagued previous efforts to study the Dark Age ... these events took place over 13 billion years ago ...'

99. Refer to the part — 'Recently, some members ... announced their discovery of the four most distant quasars known ... all the new quasars are terribly faint ... peering at them through ... Keck telescopes in Hawaii. These are the world's largest ...'

100. Refer to the part — 'The fog prolonged the period of darkness until the heat from the first stars and quasars had the chance to ionize the hydrogen ... the fog lifted ...'

101. Count only those lays for which any size of yellow coloured fabric is produced.
They are lay number
1, 3, 4, 6, 7, 8, 9, 11, 12, 15, 21, 24, 25, 27
Hence, 14 is the answer.

102. Count those lays for which extra-extra large fabric is produced of any colours, i.e. count the lay numbers for which at least one of XXL from 3 colours is non-zero.
They are lay number 7, 8, 9, 10, 11, 12, 13, 14, 15, 21, 22, 23, 24, 25, 26, 27 .
Hence, 16 is the answer.

103. Again count lay number for which at least one of the XXL from yellow and white are non-zero.
Lay number 7, 8, 9, 10, 11, 12, 13, 14, 15, 21, 23, 24, 25, 26, 27.
Hence, 15 is the answer.

104. The varieties for which there is surplus gives the answer. There are 4 such varieties.

105. Put a decimal after the first two digit in the passengers column and it wil give the figure in millions.
In that case we have only 5 international airports of type A having more than 40 million passengers.
They are in serial number 1, 2, 3, 5, 9.
Rest all 'A' type is below 40 million.

106. There are only six airports of USA among the top 10 busiest airports. They are in serial number 1, 2, 3, 5, 9, 10.

Hence, $\frac{6}{10} \times 100 = 60\%$

107. We have to calculate the percentage of passengers handled at Heathrow Airport.
Now total number of passengers in the 5 busiest airport is approximately
(77 + 72 + 63 + 62 + 60) million
= 334 million
At Heathrow it is 62 million.
The approximate percentage is

$\frac{60}{300} \times 100 \simeq 20\%$

108. All the international airports handle more than 30 million passengers. Among these only 6 airports are not located in USA. Hence, (b) is the answer.

109. Man-hours spent in coding is 420 + 100 = 520.
Now going by options, we see (a) is the only option.

110. Total work is approximately
(100 + 80) + (420 + 100) + (280 + 140) = 1120
On-site work = 80 + 100 + 140 = 320
Percentage of total work carried out on-site is

$\frac{320}{1120} \times 100 =$ 30% approxmately.

111. From figure the total effort in man-hours spent on-site is 320.
It is nearest to actual man-hours of offshore testing which is 280 (approximately.)

112. Total man-hours = (100 + 80) + (420 + 100) + (280 + 140) = 1120.
Total working hours = 100

Total man working = $\frac{1120}{100} = 11.2$ or 11.

For 50 hr the total man-hours is 50 × 11 = 550 which is near to coding (420 + 100)
Hence, (a) is the answer

113. Total offshore work = 100 + 420 + 280
= 800 man-hours.
50% of offshore work are carried out on-site.
Distribution of effort are in ratio 180 : 520 : 420
9 : 26 : 21
Effort distributed to testing will be

$\frac{21}{56} \times 400 = 147$ man-hours.

Offshore testing work is $\frac{280}{2} = 140$

∴ Proportion of testing carried out offshore is

$\frac{140}{(140 + 140 + 147)} \times 100 = 30\%$

114.

	Design	Coding	Testing
Initially	80	100	140
Finally	$80 + \frac{100}{2} = 130$	$100 + \frac{420}{2} = 310$	$140 + \frac{294}{2} = 287$

115. We see flow from Vaishali to Jyotishmati is 300 where as demand is 400 so the deficient 100 would be met by flow from Vidisha. Again the demand of 700 in Panchal is again to be met by flow from Jyotishmati which can get it from Vidisha.
Thus, the quantity moved from Avanti to Vidisha is 200 + 100 + 700 = 1000

116. Free capacity at Avanti-Vaishali pipeline is 300, since capacity of each pipeline is 1000 and demand at Vidisha is 400 and 300 flows to Jyotishmati.
Thus, free capacity = {1000 – (400 + 300)} = 300

117. Free capactiy in Avanti-Vidisha is zero. Explanation is similar as in previous answer.

118. On interchanging the effort allocation between operations B and C, then C and D, and then D and E we find that B takes the E's position.
Looking at the effort in B and then ranking in ascending order we find that the company 3 ranks third.

119. Total effort for operation B through F is 81.5%.
Even distribution will give effort allocation in each operation = $\frac{81.5}{5} = 16.3\%$

$\therefore$ Change in E = 28.6 – 16.3 = 12.3%

120. Since we are given about company 1, 4, 5 in options so we will look for changes in these companies only.

Allocation of effort in B, C, D in companies 1 = 43.1

Remaining operations gets $\frac{43.1}{3} = 14.4\%$ each.

Allocation of effort in B, C, D operations of company 4 = 29.7
Remaining operation is allocated extra

$\frac{29.7}{3} = 9.9\%$ each.

Allocation of effort in B, C, D operation of company 5 = 36.8

Remaining operation is allocated $\frac{36.8}{3} = 12.3\%$ each.

We see that operation E in company 5 will then show the maximum.

121. From II, m, n could be (2, 15) (5, 6), (3, 10) and (1, 30) but from I, we get m, n as (2, 15).

122. From I nothing can be said since exact figures are not given.
From II since X > Y (from B) we do not know how much X is greater than Y, because if it is slightly greater than it will be less than Y after 5 years whereas if the difference is very high, then X will be greater than Y even after 5 years.

123. From I, unequal even integers less than 10 are 2, 4, 6, 8.

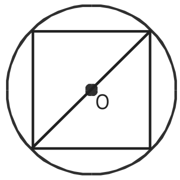
$\frac{X}{Y}$ is an odd integer is possible only if x = 6, y = 2

From II, even integers less than 10 are 2, 4, 6, 8.
XY = 12 $\Rightarrow$ X = 6, Y = 2 or X = 2, Y = 6
Hence, question can be answered using either statement alone but not from statement B.

124. I gives the capacity of boat and is of no help in finding out the number of round trips.
From II round trips can be calculated since we know the total time taken is 12 hr.

125. I gives the rate and II gives the size. It is like I gives the speed and II the distance and we are to find out time. So both statements are needed.

126.



We know that the diameter of circle will be the diagonal of the square.
Thus, from any of the two statements, we can find out the areas of the circle and square.
Hence, (b) is the answer.

127. I gives a general figure of Ram and Gopal.
II does not give any idea of how much apples Ram and Gopal purchased.
Both statements together also cannot give any result.

128. Cost in rupees of oil moved by rail and road is 18% of 30 million = 5.4 million.
Volume of oil transported by rail and road
= 31% of 12 million tonnes = 3.72 million tonnes.

Cost in rupees per tonnes = $\frac{5.4}{3.72}$ = 1.5 approximately.

129. From the chart, we can make out the least among road, rail, pipeline, ship by looking at the ratio of cost to volume.

Road = $\frac{6}{22}$

Rail = $\frac{12}{9}$

Pipeline = $\frac{65}{49}$

Ship = $\frac{10}{9}$

Obviously road is the lowest and hence the cheapest.

130. Ship, air and road.
Like the previous answer again look at ratio of

$\frac{10}{9}, \frac{7}{11}, \frac{6}{22}$

So $\frac{10}{9} > \frac{7}{11} > \frac{6}{22}$

Hence, P > Q > R

131. Sati-Savitri starts at the earliest.
So we view it first.
(1) *Sati-Savitri* — 9.00 a.m. to 10.00 a.m.
(2) *Veer Abhimanu* — 10.00 a.m. to 11.00 a.m.
(3) *Jhansi Ki Rani*/*Sundar Kand* — 11.00 a.m. to 11.30 a.m.
(4) *Joru Ka Ghulam* — 11.30 a.m. to 12.30 p.m.
Now lunch break from 12.30 p.m. to 1.30 p.m.
At 1.30 p.m. he can takes the show of only *Jhansi Ki Rani* so it cannot be viewed at 3rd.

(5) *Jhansi Ki Rani* — 1.30 p.m. to 2.30 p.m.
(6) *Reshma aur Shera* 2.00 p.m. to 3.00 p.m.
Hence, option (c) is best.

132. Three children Vaibhav, Suprita and Anshuman.
Vaibhav > Suprita
↓
(Born in April)

One of children is born in September, but it is not Vaibhav, so it has to be Anshuman.
So Vaibhav is born in June and is 7-year-old. Vaibhav is 7-year-old and Anshuman is not 4-year-old.
So Suprita is 4-year-old.
Youngest child is 2-year-old and it has to be Anshuman.
Vaibhav > Suprita > Anshuman
(June, 7 years) (April, 4 years) (Sept., 2-year-old)
Hence, (c) is the answer.

133. We can find out the time for lunch of respective families from the table below:

Family/Time	12:00	1:00	2:00
Sharma	✓		
Banerjee			✓
Pattabhiraman	✓		

Fried brinjal → Chinaware
Sambar → White Chinaware
Makkai-ki-roti → Red Chinaware
The family that eats at 1 o'clock serves fried brinjal, hence Pattabhiraman serves fried brinjal.
The family that eats last like makkai-ki-roti so Banaerjees like makkai-ki-roti. Sharmas are left with sambar.
Sharma - 12:00 - Sambar - White
Pattabhiraman - 1:00 - Fried brinjal - Blue
Bannerjees - 2:00 - Makkai-ki-roti - Red
Hence, (c) is the best option.

134. We start making one true and other false.
Case I

	T	F
Shopkeeper 1:	Black hair	Long tail
Shopkeeper 2:	Short tail	Wore a collar
Shopkeeper 3:	White hair	No collar

Case II

	T	F
Shop keeper 1:	Black hair	Long tail
Shop keeper 2:	Short tail	Wore a collar
Shop keeper 3:	White hair	No collar

Both the cases are correct, and hence we see only option (b) is correct.

135. Elle is 3 times older than Yogesh and Zaheer is half the age of Wahida.
If Wahida is 2x-year-old, then Zaheer is x.
Now Yogesh > Zaheer
$\Rightarrow$ Yogesh > x
Elle is 3 times older than Yogesh.
Which means Elle is older than Wahida as 3x > 2x.

Alternative method:
$E = 3y$ ...(i)

$z = \frac{w}{2}$, or $2z = w$ ...(ii)

$y > z$, implies $2y > 2z$ implies $2y > w$ from (ii)
Now, if $2y > w$
$3y > w$, i.e. $E > w$ from (i)
Hence, Elle is older than Wahida.

136. From (a) Zaheer is 10-year-old means Wahida is 20-year-old. From (b) Yogesh and Wahida are older than Zaheer by same number of years.
This means Yogesh is 20-year-old. Now Elle is 3 times older than Yogesh.
Elle is 20 × 3 = 60-year-old.
Hence, we see that both (a) and (b) statements are needed so the answer is (c).

137. Find out from the options.
(a) David, Rama and Rahim
Ram would like to be in the group only if Peter is there, so it is not feasible.
(b) Peter, Shyam and Rahim
Shyam and Rahim want to be selected together and none of them have problem or any conditions, hence feasible.
(c) Since Shyam is there, Rahim has to be but he is not also Fiza is not there which David insists so not feasible.
(d) Since Peter is not there and so Ram would not prefer that group, hence not feasible.

138. Looking at options, we see (c) is best as Shyam and Rahim is selected and Fiza is there when David is selected.
In (a) we see Shyam is not there with Rahim.
In (b) Fiza is not there with David.
In (d) Peter and David cannot go together as David would not like Peter in the group.

139. In Ist option — Kavita is in the group means David is there and David would not like Peter in the group, whereas Ram would like to be in the group if Peter is there so the statement cannot be true.
2nd option — If David is there, then only the group will have both women Kavita and Fiza, but in that case we see none of the rest could be the fourth person as Shyam and Rahim has to be together and Ram would be if Peter is there and David would not like Peter in the group, hence statement is false.
3rd option — It is not possible as Ram cannot go with Shyam and David with Peter.
So none of the above statements are true.

140. Let S = spotted, NS = Non-spotted

Oak				Maple			
Red		Non-red		Red		Non-red	
S	NS	S	NS	S	NS	S	NS
2n	x	10n	0	6	x	0	22

There are 50 coloured leaves and is given as red and non-red.
We make the following table. Let 2n be number of red oak leaves where n is any natural number.

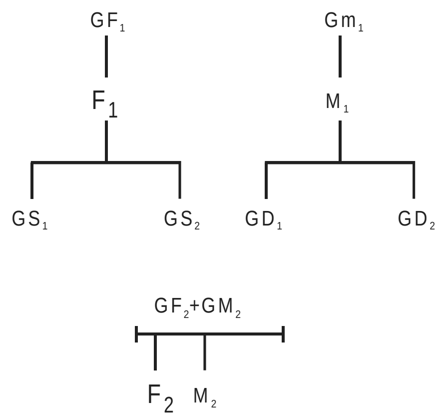
Now we have 2n + x + 10n + 6 + x + 22 = 50
$\Rightarrow$ 12n + 2x = 22
It is possible for only n = 1, x = 5
We cannot take n > 1
Hence, number of oak leaves are
2 × 1 + 5 + 10 × 1 = 17

141. O, P, Q and R carried on motorcycles M_1, M_2, M_3 and M_4 respectively. So

OP	Q	R	
M_1	M_2	M_3	M_4
F E	A + G	C	
B D		H	

Since B cannot be with R so it will go with O that is only left.
Hence, C and H will go together in M_4 with R.

142.



Thus, we have 2 grandfathers GF_1, GF_2
4 fathers GF_1, GF_2, F_1 and F_2
2 grandmothers GM_1, GM_2
4 mothers GM_1, GM_2, M_1 and M_2
Thus, minimum number will be 12.

143. We have packages as follows:
3 item (D + 2B) = Rs. 40 + Rs.180 = Rs. 220 ... (i)
2 item (A + C) = Rs.180 ... (ii)
4 item (E + 2D + B) = 45 + 50 + 90 = 215 ... (iii)
The combinations of purchase possible are

Case 1: Rs. 220 × 4 = Rs. 880
Points: 12 × 1000 – 120 × 1500 = – 1,68,000

Case 2: Rs. 180 × 5 = Rs. 900
Points: 10 × 1000 – 100 × 1500 = – 1,40,000

Case 3: Rs. 215 × 4 = Rs. 860
Points:16 × 1000 – 140 × 1500 = – 1,94,000

Case 4: 2(220 + 180) + 180 = Rs. 980
Points: 12 × 1000 – 20 × 1500 = – 18,000

Case 5: 2(220 + 215) = Rs. 890
Points : 14 × 1000 – 110 × 1500 = – 1,51,000

Case 6: 2(215 + 180) + 180 = Rs. 970
Points :14 × 1000 – 30 × 1500 = – 31,000
By seeing the above figure, we see that we maximize the point in last case when purchase is 14 item for Rs. 970.

144. Bashir < Chirag.
Now Chirag borrows Rs. 300 and Bashir Rs. 100 from Ashok. Ashok buys 3 shirt so he must have at least Rs. 1,000.
Bashir is left with no money after buying a sweater and he had to borrow Rs.100 from Ashok means he had Rs. 500 with him.
Ashok must have less than Rs. 1,500.
Ashok has three times the money with Deepak.
So Deepak cannot have Rs. 300 because Ashok must have Rs.1,000, again Deepak cannot have Rs. 500 because Ashok should have less than Rs.1,500.
So Deepak has Rs. 400 for which he can purchase the shawl which is costliest.

145.

W1			W4	
Rupa	Radha	Renuka	Ruchika	Ritu
Sonali	↓	Rupali	Somya	Tara
Shalini		Komal	Sweta	↓
Shubhra		↓	Jyotika	Deepika
Shahira			↓	
Amita	Elina	Chandrika	Babita	

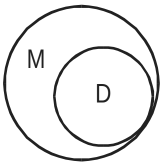
Hence, Elina is instructor of Radha.

146.

	Fishing	Smoking	Drinking	Gam-bling	Mount-aineer-ing
Likes	M_1 M_6	M_1 M_2 M_8	M_2 M_5	M_3 M_7 M_8	M_4 M_7
Dislikes	M_2 M_7	M_3 M_5 M_6	M_4	M_1	M_5 M_6 M_8

Now go by options.
(a) M does not hate at least one of the liking of any of the other 3 persons selected.
(b) None of person shares the liking of at least one of the other selected.
(c) None of the person shares a liking with at least one of the other three selected.
(d) M_1 shares liking with M_2 and vice versa.
M_4 shares liking with M_7 and vice versa.
M_1, M_2 dislikes M_7 liking.
M_4, M_7 dislikes M_2 liking.
Hence the answer is (d).

147. $X = M.D = M \cap D$
$X = D$
$M \cap D = D$
$\Rightarrow D \subset M$
Thus all dogs are mammals.



148. $Y = F \cap (D \cap V)$ is not a null set means some F's are D's and sum D's are V's .
That means some fish are dogs.

149. $Z = (P.D) \cup M$
$Z = (P \cap D) \cup M$
$P \cap D$ means pluto the dog.
$P \cap D \cup M$ means pluto the dog or any other mammal.

150. $P.A = \phi \quad P \cup A = D$
$P \cap A = \phi$ means no alsations are pluto or pluto is not an alsation where dogs are composed of alsation or pluto or both.