FMS 2010 - SERIES 20 - Solution Key

SECTION - 1 (Reading Comprehension)

1. Options 1 and 3 are incorrect as they have been explicitly stated in the passage.
   Option 1 is mentioned in the last few lines of the passage where the author states that his analyst died and then he was not tested by anyone else.
   Option 3 is incorrect because the author states that he finds Mayo's comparison of Freud and Janet to be useful.
   Option 2 is incorrect as it cannot be stated with a degree of certainty whether or not the author compared Mayo and Freud.
   Option 4 is incorrect because the author did not 'constantly' compare Janet and Freud rather he used **Mayo's comparison of them**.
   Hence, the correct answer is option 4.

2. Paragraph 1 clearly states that epistemology is what makes knowledge knowledge.
   Ontology is that branch of metaphysics that studies the nature of existence or being as such.
   Aesthetics is what makes the beautiful beautiful.
   This eliminates options 1, 2 and 4.
   Hence, the correct answer is option 3.

3. Throughout the latter part of the passage, Mayo has drawn on inputs from both- he was influenced by Janet and Freud.
   Hence, the correct answer is option 3.

4. Options 1, 2 and 3 are true statements as stated in paragraph 2 of the passage.
   Option 4 is not a true statement as "Synthetic propositions" constitute 'a posterior knowledge'.
   Hence, the correct answer is option 4.

5. The author states that he was a bit of a logician, a bit of a positivist and a bit of a pragmatist. This eliminates options 2.
   Options 3 and 4 are eliminated as the author does not state them in the passage.
   Hence, the correct answer is option 1.

6. Paragraph 3 states, 'I felt it important to maintain this distinction without having to accept wholly either Hume's or Kant's epistemological conclusions'.
   This eliminates options 1, 2 and 3.
   Hence the correct answer is option 4.

7. Option 1 is incorrect. The passage states that a positive effect of FDI on Lithuanian local suppliers working through backward links was found. From this, we cannot make a conclusion that local

suppliers promote multinationals.
Option 3 is an incorrect statement. The passage has nothing to say with regard to backward links and increased competition.
Option 4 is partially correct. The passage states that "because a multinational has more incentives to promote local suppliers, backward links *may* be more widely observed…"
The following extract, "… backward links may be more widely observed than horizontal links, which inherently are associated with increased competition" determines option 2 to be the correct statement. Hence option 2 scores over option 4.
Hence, the correct answer is option 2.

8. The following extract, "The evidence from Russia indicates that FDI inflows are lagging behind those of some BRICs comparators…" determines option 3 to be the correct answer option.
Hence, the correct answer is option 3.

9. The following extract, "At the same time, the large increases in FDI observed since 2002 suggest a growing balance within manufacturing and between the manufacturing and service sectors…" points to option 2 as being the correct answer option.
Option 1 can also be eliminated since it pertains to FDI made prior to 2002.
Hence, the correct answer is option 2.

10. The following extract, "Russian multinationals continue to dominate the **outward FDI of** the South-Eastern Europe and CIS region for FDI in joint ventures and mergers, accounting for 87 percent of the total in 2005" point to option 1 as being the correct answer option.
Hence, the correct answer is option 1.

11. The following extract, "Investment includes large deals to acquire and create joint ventures with enterprises…" establishes the fact that Russian MNCs have created large partnerships. The passage goes on to give two examples of such large partnerships. This establishes option 1 to be the correct answer option.
In light of the above explanation, we can eliminate option 2.
Option 3 has not been explicitly mentioned nor can it be implied from the passage.
Hence, the correct answer is option 1.

12. Option 1 can be eliminated since the passage mentions Russian MNCs only in one paragraph.
Option 2 can be eliminated as multinational investments in are a part, but not the essence of the passage.
It is a close choice between options 3 and 4.
The first and the last paragraphs are entirely about diffusion of international technology and the paragraphs in-between move on to FDI and how FDI inflow is necessary. The idea of FDI inflow emanates from the need to promote diffusion of international technology. Infact the last paragraph is entirely about how FDI inflows are not a sufficient factor for diffusion of technology. Thus the entire passage makes a case for a builds up factors that would help the diffusion of international technology.
Hence, the correct answer is option 4.

13. The following extract, "… the amount of ICT investment in Russia, as a percent of GDP, is substantially lower than that in Central and Eastern Europe (CEE) countries" establishes option 3 to be the correct answer option.
    In light of the above extract, option 2 can be eliminated.
    The following extract, "… is the amount of FDI in communications, which in Russia remains extremely low (0.4 percent of total annual FDI in 2004-05)" establishes option 1 to be incorrect.
    Option 4 is incorrect since the passage implies that since Russian plants were more vertically integrated than Western ones, absorption of technology was slow.
    Hence, the correct answer is option 3.

14. The following extract, "In the 'soft systems' approach… towards organizational actor's understandings and formulations of problem situations" determines option 3 to be the correct answer option.
    Hence, the correct answer is option 3.

15. The following extract, "Many natural systems, including ecologies and the weather, are non-linear. They are characterized by complex multiple patterns of interaction…" determines option 2 to be the correct answer option.
    Hence, the correct answer is option 2.

16. The following extract, "Change is thus externalized beyond the system boundary" determines option 1 to be true.
    The following extract, "… which serve to maintain or increase order in the system" determines option 2 to be true.
    The following extract, "… but still, change is seen as a way of preserving or improving order in the system, **rather than** as a fundamental feature of the system itself" determines option 3 to be our correct answer option.
    Option 4 can be implied to be untrue indirectly based on data in option 2. But it loses out to option 3 as option 3 is directly contradicted in the passage.
    Hence, the correct answer is option 3.

17. The following extract, "However, some of the legacy of the earlier systems views persists in the soft systems approach and methodology, and serves to prevent fuller appreciation of the nature of change in organizational life" determines option 1 to be the correct answer option.
    Hence, the correct answer is option 1.

18. The following extract, "The second stage, equilibrium-based change, is essentially the systems perspective…" determines option 2 to be the correct answer option.
    Hence, the correct answer is option 2.

19. The following extract, "Change is thus externalized beyond the system boundary" determines option 4 to be the correct answer option.
    The following extract, "…change is seen primarily as an adaptive response by the system… with a shifting environment" determine options 1, 2 and 3 to be true.
    Hence, the correct answer is option 4.

20. The following extract, “Change now becomes something… and which involves negotiation by competing parties” determines option 4 to be the correct answer option.
In light of the above extract, options 1,2 and 3 can be eliminated.
Hence, the correct answer is option 4.

21. The following extract, “The model assumes that the organism is so constituted as to be able to detect significant disparities and to be able to adjust its behavior in response to them” determines option 3 to be the correct answer option.
In light of the above extract, options 1,2 and 4 can be eliminated.
Hence, the correct answer is option 3.

22. The following extract, “The human role in defining (and subsequently carrying out) changes is thus recognized” with reference to the ‘soft systems’ approach determines option 3 to be the correct answer option.
In light of the above explanation, options 1,2 and 4 can be eliminated.
Hence, the correct answer is option 3.

23. The following extract, “… the model attributes too central a role to management…” determines option 1 to be true.
The following extract, “When the organic model is generalized… the emphasis on boundary, environment, feedback and adaptive response are carried over” determines option 2 to be true.
The following extract, “However, organizations do not possess the same unity or consistency of form as organisms” determines option 4 to be true.
Option 3 is not true as per the passage.
Hence, the correct answer is option 3.

24. Option 2 is true as the passage does not link the organic model with the human role in any way.
The following extract, “it culminates in a debate… ‘systemically desirable and culturally feasible‘.
The human role in defining (and subsequently carrying out) changes is thus recognized” determines options 3 and 4 to be true.
Option 1 is incorrect. The soft systems approach recognizes the human role- not the cybernetic model.
Hence, the correct answer is option 1.

25. Options 3 and 4 essentially communicate the same idea and thus can be eliminated.
Between options 1 and 2, we choose option 1 since the passage mentions, “The cybernetic model provides a more elaborate account of control and communication mechanisms…”In this case, the cybernetic model is being compared to the organic model.
Hence, the correct answer is option 1.

26. The following extract, “It also includes an environmental scanning function…” with regard to the cybernetic model determines option 1 to be the correct answer option.
In light of the above extract, option 2 can be eliminated.
Options 3 and 4 contradict the passage.
Hence, the correct answer is option 1.

27. The passage states that 'just because an idea was useful in one company at one moment in time, does not mean it will always work'.
This eliminates options 1, 3 and 4.
Hence, the correct answer is option 2.

28. The first paragraph states that 'gradually ideas and models emerged that provided the necessary structure to the chaos of anecdotal memories'. This eliminates options 2, 3 and 4.
Hence, the correct answer is option 1.

29. The first paragraph states, 'early books on business strategy aimed to structure and codify the many documentary histories and memoires of business leaders'.
This eliminates options 1, 2 and 4.
Hence, the correct answer is option 3.

30. Options 1 and 2 are incorrect as they directly contradict what has been mentioned in the passage.
Paragraph 1 states, 'at a corporate level businesses look at which business they should be in while at a business level, a business asks itself as to how to compete'.
This eliminates option 3.
Hence, the correct answer is option 4.

31. Paragraph 1 states that early books contained precious little theory or models drawn from economics or other social sciences but they did contain many good ideas.
This eliminates options 1, 3 and 4 which are true.
Hence, the correct answer is option 2.

32. Paragraph 1 states, 'how we think about business strategy has evolved and changed as new and better ideas have become more widely known and accepted'.
This eliminates option 1, 2 and 3.
Hence, the correct answer is option 4.

33. Paragraph 1 states, 'business strategy has many definitions'.
This eliminates options 1, 2 and 4.
Hence, the correct answer is option 3.

34. Paragraph 2 states, 'the changing environment of a business can be understood by assessing the main factors that create change in a marketplace: political, economic, social and technological'.
This eliminates option 1, 2 and 4.
Hence, the correct answer is option 3.

35. Swot analysis is the process by which a company assesses its ability to cope with the environment and is also a means of self-appraisal.
This eliminates option 1, 2 and 4.
Hence, the correct answer is option 3.

36. Paragraph 2 states 'it is time to identify better ways in which any organization can identify how to match itself to the changing needs and views of the most important part of its environment, its customers '.
This eliminates option 2, 3 and 4.
Hence, the correct answer is option 1.

37. Paragraph 2 states that the third definition of strategy explains why commercial organizations should invest time and money in creating a strategy'.
This eliminates option 1, 3 and 4.
Hence, the correct answer is option 2.

38. The passage states that companies still use SWOT analysis.
This eliminates option 1, 2 and 4.
Hence, the correct answer is option 3.

39. The passage states, 'a century ago the multinational was the exception on the corporate landscape'.
This eliminates option 1, 2 and 4.
Hence, the correct answer is option 3.

40. Gap analysis shows 'how to bridge the gap between existing financial performances and where the business would progress in the future'. It means that Gap analysis merely informs and does not actually bridge the gap as mentioned in option 2.
Hence, the correct answer is option 3.

41. The passage states that the value of gap lies in its simplicity. The passage has mentioned one key weakness and followed it up with one more shortcoming in Gap analysis. This cannot be equated with 'many' weaknesses as mentioned in option 3.
This eliminates option 1, 2 and 3.
Hence, the correct answer is option 4.

42. The passage states that specific strategies tend to emerge rather than be created.
This eliminates option 1, 3 and 4.
Hence, the correct answer is option 2.

43. Paragraph 6 explicitly states that the businesses must formalise their strategies by a combination of direction and evolution.
This eliminates option 1, 3 and 4.
Hence, the correct answer is option 2.

44. Options 1, 2 and 3 can be derived from paragraph 6 which states "..strategy is about having a clear understanding of how the organization is planning to meet its objectives…the value of allowing radical ideas to emerge from the customer interface…"
Hence, the correct answer is option 4.

45. Paragraph 6 explicitly mentions "our focus is on market strategy, what organizations should.."
This eliminates option 1, 3 and 4.
Hence, the correct answer is option 2.

46. Paragraph 7 states "There will be two distinct flows in any business, the financial planning flow and the strategic planning flow. They interact and often conflict."
This eliminates option 1, 2 and 3.
Hence, the correct answer is option 4.

47. The passage states in paragraph 9 "Even among some apparently better performing organizations, employee turnover can be an issue."
This eliminates option 1, 3 and 4.
Hence, the correct answer is option 2.

48. Paragraph 7 states "If the organization is in a stable environment, then a simple extrapolation from last year is adequate. In such a case, the financial flow will dominate management thinking."
This eliminates option 1, 2 and 4.
Hence, the correct answer is option 3.

49. Paragraph 7 states "Senior management's role is to set targets."
This eliminates option 1, 3 and 4.
Hence, the correct answer is option 2.

50. The passage states in paragraph 6 that 'tactics are short term, day-to-day matters that will be of relevance to many employees, for example a sales target of four customer calls a day, a production plan for 50 tonnes of product'.
This encompasses both, options 1 and 2.
Hence, the correct answer is option 3.

SECTION - 2 (Data Interpretation and Logical Reasoning)

51. The letters of the English alphabet are numbered such that 26 stands for A, 25 stands for B and so on.
Thus, the number assigned to each letter can be as shown below:

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

The numbers assigned to the five vowels are A ≡ 26, E ≡ 22, I ≡ 18, O ≡ 12 and U ≡ 6.
Hence, the required sum is 26 + 22 + 18 + 12 + 6 = 84.
Hence, option 2.

52. Consider option 1:
6 – 12 – 17 – 23 implies U-O-J-D i.e. UOJD. This is not a valid word.

Consider option 2:
5 – 11 – 18 – 22 implies V-P-I-E i.e. VPIE. This is not a valid word.

Consider option 3:
5 – 12 – 18 – 23 implies V-O-I-D i.e. VOID which is a valid word.

Consider option 4:
5 – 12 – 17 – 23 implies V-O-J-D i.e. VOJD. This is not a valid word.
Thus, only the combination in option 3 denotes a valid word.
Hence, option 3.

53. The alphabets stand for the number that denotes them.
Hence, the given sequence Z, W, R, K is equivalent to 1, 4, 9, 16.
This is a series of squares of consecutive natural numbers.

Thus, the next term in the sequence should be $5^2 = 25$.

25 denotes the letter B.
Hence, option 2.

54. Six students are sitting in a row in an examination hall.
B is sitting on the extreme left; M is sitting next to B and V is sitting next to M.
Thus, the arrangement can be as shown below:
B M V _ _ _
K is sitting between V and R, while Q is next to R. Thus, Q has to be to the immediate right of R.
Thus, the final arrangement is as shown below.
B M V K R Q
Thus, M and K are sitting adjacent to V.
Hence, option 2.

55. The letters 'Q B Z H X H Q D U M B' are placed in the order opposite to the order in which they would be normally placed.
Thus, they are placed in the reverse alphabetical order.
Thus, their order is 'Z X U Q Q M H H D B B'.
As per this order, the fifth letter from right to left is H.
Hence, option 1.

56. Arun's back was positioned towards the sun.
Thus, depending on the time of the day, Arun could have been walking towards the West (morning) or towards the East (evening).
Case I : Arun was walking towards the West.
Step 1: He turned left. Thus, he now faces South.
Step 2: Then turned right. Thus, he now faces West again.
Step 3: Then turned towards the left again. Thus, he finally faces the **South**.

Case II : Arun was walking towards the east.
Step 1: He turned left. Thus, he now faces North.
Step 2: Then turned right. Thus, he now faces East again.
Step 3: Then turned towards the left again. Thus, he finally faces the **North**.
Thus, Arun could have been going either towards the **South** or towards the **North**.
Hence, option 2.

57. Consider option 1: P, R, V, S, U
We know that if song P is to be played on a day, song V cannot be played.
∴ This cannot be the combination of songs to be played on the first day.
Consider option 2: Q, S, R, V, U

If song Q is to be played on a day, T must be one of the songs to be played after Q.
∴ This combination is not correct.
Consider option 4: U, Q, S, T, W
The last song to be played on any day must be either S or U.
∴ This combination is also not correct.
Option 3 satisfies all the given conditions and hence can be a combination of songs to be played on the first day of the month.
Hence, option 3.

58. It is given that R and W are the songs to be played on the first day.
Now,
Consider option 1: P, T, U
∵ R is to be played, V has to be one of the songs to be played.
∴ This combination is not correct.
Consider option 2: Q, S, V
If Q is one of the songs to be played, T must be one of the songs to be played after Q.
∴ This combination is also not correct.
Consider option 4: Q, T, V
The last song to be played on any day must be either S or U.
∴ Q, T, V cannot be the other songs to be played with R and W.
Option 3 satisfies all the conditions and hence can be the combination of remaining songs to be played.
Hence, option 3.

59. If any one of the four given statements is true, that particular arrangement has to be invalid either for that day or for the subsequent day. Therefore, If the statement yields a valid combination for two consecutive days, the given statement becomes false.
Consider option 1: P cannot be played at third place.
If song P is played at the third place,
Q, T, P, W, U can be one of the combination of songs played.
Then on the next day R, V, Q, T, U can be the combination of songs played.
∴ Song P can be played at the third place.
∴ The statement in option 1 is false.
Consider option 2: Q cannot be played at third place.
If song Q is played at the third place,
S, W, Q, T, U can be one of the combination of songs played.
Then on the next day R, V, S, W, U can be the combination of songs played.
∴ Song Q can be played at the third place.
∴ The statement in option 2 is false.
Consider option 3: T cannot be played at third place.

If song T is played at the third place,
P, Q, T, U, S can be one of the combination of songs played.
On the next day R, V, Q, T, S can be the combination of songs played.
∴ Song T can be played at the third place.
∴ The statement in option 3 is false.

Consider option 4: U cannot be played at fourth place.
If song U is played at the fourth place,
W, Q, T, U, S can be one of the combination of songs played.
On the next day, R, V, W, U, S can be the combination of songs played.
∴ Song U can be played at fourth place.
∴ The statement in option 4 is false.
∴ All the statements are false.

60. If song R is to be played third in the sequence then V must be the song to be played fourth and one of S or U must be the songs played fifth.
We know that If Q is one of the songs to be played then T must be one of the songs to be played after Q.
∴ Q cannot be the second song to be played in that sequence.
Hence, option 1.

61. Based on the information given in the question, we can draw the following table:

STUDENT	SUBJECT	HOBBY 1/GAME 1	HOBBY 2/GAME 2
Dinakaran	Psychology	Billiards	Chess
Sumit	Psychology	Weight Training	Chess
Tarun	Physics	Badminton	Chess
Amul	Commerce	Golf	Lawn Tennis

From the table, we can conclude that Amul does not play Chess.
Hence, option 4.

62. From the table, we can conclude that Dinakaran studies Psychology and plays Billiards.
Hence, option 1.

63. From the table, we can conclude that 6 games are played and 3 subjects are studied by all the four students.
Hence, option 3.

64. **Assumption**: "At least three windows away" has been read as "at least three windows between … and …".
Here, alphabets A, V, R, N, G and P represent six products - Ariel, Vivel, Rin, Nirma, Gillette Gel and Pepsodent respectively.
Given conditions can be summarised pictorially as below:

- A R or R A
- A … … … N or A … … … … N or N … … … A or N … … … … A
- G … P … R or R … P … G
- P … … V or P … … … V or P … … … V or V … … P or V … … … P or V … … … … P
- R V or V R
- V … … … … …

Now, since V cannot be displayed in window 1, let's consider the case to display V in window 2:
If V is in window 2, P has to be in window 5 or 6 (at least 2 windows away). But since, P has to be between G and R, it cannot be in window 6. So, consider P in window 5 as given below:
… V … … P …
Now, pair of A and R can be there in windows 3 and 4 only, as given below:
… V A R P … or … V R A P …
The second case given above is not possible, because V cannot be with R.
Also, in first case, we cannot display A and N at least 3 windows away.
Therefore, this case is not possible.
Similarly, we can discard the cases for V to be in windows 3, 4 or 5.
Therefore, V can be displayed in window 6 only.
The final 2 possible combinations (considering all the conditions) are as given below:
A R P G N V or N G P R A V
But based on the question, which asked for "product left to A", we can only take the second case as true, i.e.
N G P R A V
Therefore, the product displayed left to Ariel is Rin. (To get a unique answer, we are taking the immediate left to Ariel).
Hence, option 3.

65. If we interchange the position of Rin and Ariel, the item displayed in window 5 will be Rin.
Hence, option 3.

66. Except Rin, the product displayed left of Ariel but right of Gillette Gel is Pepsodent.
Hence, option 3.

67. The letters from A to M have a negative numeric value from −13 to −1 while the letters from N to Z have a positive numeric value from 1 to 13.
The value corresponding to each letter is shown in the table below.

Letter	Number	Letter	Number
A	−13	N	1
B	−12	O	2
C	−11	P	3
D	−10	Q	4

E	−9	R	5
F	−8	S	6
G	−7	T	7
H	−6	U	8
I	−5	V	9
J	−4	W	10
K	−3	X	11
L	−2	Y	12
M	−1	Z	13

Consider the given words.
HIS ≡ (−6) × (−5) × 6 = 180
HELL ≡ (−6) × (−9) × (−2) × (−2) = 216
ROD ≡ 5 × 2 × (−10) = −100
Thus, the product of the numeric codes is negative only for the word ROD.
Hence, option 3.

68. One of the given words should have an absolute numeric value equal to that for BELL when the product of the numeric codes is taken.
Since the absolute numeric value is to be computed, the signs are irrelevant.
Note that two words in the options (YELL and HELL) have 3 letters common with BELL.
Thus, these 3 letters (E × E × L) will yield the same product for all 3 words.
The word that will give the same product as BELL will have a letter that has the number assigned to it as B.
B is assigned −12. However, only the absolute value is required.
Thus, B ≡ 12.
Also, Y ≡ 12.
Thus, YELL will give the same product of numeric codes as BELL.
Hence, option 1.

69. Salaries and perks are coded using the code given above. Note that the question does not mention the operation to be performed to calculate the salary. Hence, technically, it is not possible to calculate it. However, none of the answer options is "Cannot be determined" or "Data Insufficient". Hence, the salary has to be calculated using some mathematical operation. Since the only operation mentioned in all the questions of this set is "product of the numeric codes", it may be used for calculations.
PEON ≡ 3 × (−9) × 2 × 1 = −54
CLERK ≡ (−11) × (−2) × (−9) ×5 × (−3) = 2970
HEAD ≡ (−6) × (−9) × (−13) × (−10) = 7020
Thus, the highest salary is for the designation HEAD.
Hence, option 3.

70. Consider DSFU.
If the position of each letter in the alphabet is considered, then
D + 2 = F and S + 2 = U
Similarly, for PGRI, P + 2 = R and G + 2 = I
Thus, the pattern is 1st letter + 2 = 3rd letter and 2nd letter +2 = 4th letter.
Thus, B + 2 = D and U + 2 = W
This pattern is not followed in INKR because N + 2 = P and not R.
Thus, INKR is the odd group.
Hence, option 3.

71. Sanjay says "I have as many sisters as brothers."
Thus, if there are b brothers and s sisters in all, then $b - 1 = s$
Similarly, Sarita says "Each of us sisters has only half as many sisters as brothers."
Thus, this can be expressed as $b = 2(s - 1)$
The only combination that satisfies both the equations is $b = 4$ and $s = 3$.
Thus, there are 4 brothers and 3 sisters.
Hence, option 4.

72. In a row, if a person's position from the left and right is known, then the total number of people in the row can be calculated as
No. of people in the row = Position of person from left + Position of person from right – 1
A is 9th from the right. Also, there are 20 people in the row.
∴ 20 = Position of A from the left + 9 – 1
∴ Position of A from the left = 12
Thus, A is originally 12th from left.
When, A and B interchange positions, A's old position becomes B's new position.
Thus, B is now 12th from left.
Hence, option 2.

73. Percentage Revenue growth is as follows:

$$2005 = \frac{(11799 - 10156)}{10156} \times 100 = 16.178\%$$

$$2006 = \frac{(14380 - 11799)}{11799} \times 100 = 21.875\%$$

$$2007 = \frac{(17996 - 14380)}{14380} \times 100 = 25.146\%$$

$$2008 = \frac{(22430 - 17996)}{17996} \times 100 = 24.639\%$$

Percentage Revenue growth over the previous year has been the highest in the year 2007.
Hence, Statement I is correct.

Percentage Revenue growth over the previous year has been the lowest in the year 2005.
Hence, Statement II is incorrect.
Hence, option 1.

74. Total Assets growth rate is as follows:

$$2005 = \frac{(20687 - 12763)}{12763} \times 100 = 62.086\%$$
$$2006 = \frac{(29029 - 20687)}{20687} \times 100 = 40.325\%$$
$$2007 = \frac{(34572 - 29029)}{29029} \times 100 = 19.095\%$$
$$2008 = \frac{(47268 - 34572)}{34572} \times 100 = 36.723\%$$

Lowest growth rate over the previous year in Total Assets was recorded in the year 2007.
Hence, Statement I is incorrect.
Total Equity growth rate is as follows:

$$2005 = \frac{(10837 - 7995)}{7995} \times 100 = 35.547\%$$
$$2006 = \frac{(15012 - 10837)}{10837} \times 100 = 38.525\%$$
$$2007 = \frac{(16919 - 15012)}{15012} \times 100 = 12.703\%$$
$$2008 = \frac{(23025 - 16919)}{16919} \times 100 = 36.089\%$$

Highest growth rate over the previous year in Total Equity was recorded in the year 2006.
Hence, Statement II is incorrect.
Hence, option 4.

75. Gross Profit growth rate is as follows:

$$2005 = \frac{(9766 - 8386)}{8386} \times 100 = 16.456\%$$
$$2006 = \frac{(11864 - 9766)}{9766} \times 100 = 21.483\%$$
$$2007 = \frac{(14647 - 11864)}{11864} \times 100 = 23.458\%$$
$$2008 = \frac{(18446 - 14647)}{14647} \times 100 = 25.937\%$$

Gross Profit every year has recorded higher growth rate as compared to the previous year for the period under review.
Hence, Statement I is correct.
From the solution to the previous question, we can conclude that:

Total Assets every year has not recorded higher growth rate as compared to the previous year for the period under review.
Hence, Statement II is correct.
Hence, option 3.

76. COGS to Revenue ratio is as follows:

$$2004 = \frac{1770}{10156} = 0.1743$$
$$2005 = \frac{2033}{11799} = 0.1723$$
$$2006 = \frac{2516}{14380} = 0.1750$$
$$2007 = \frac{3349}{17996} = 0.1861$$
$$2008 = \frac{3984}{22430} = 0.1776$$

The COGS to Revenue ratio is the lowest in the year 2005.
Hence, Statement I is incorrect.
The COGS to Revenue ratio is the highest in the year 2007.
Hence, Statement II is correct.
Hence, option 2.

77. The Gross Profit to Revenue ratio is as follows:

$$2004 = \frac{8386}{10156} = 0.8257$$
$$2005 = \frac{9766}{11799} = 0.8277$$
$$2006 = \frac{11864}{14380} = 0.8250$$
$$2007 = \frac{14647}{17996} = 0.8139$$
$$2008 = \frac{18446}{22430} = 0.8224$$

The Gross Profit to Revenue ratio is the lowest in the year 2007.
Hence, Statement I is correct.
The Gross Profit to Revenue ratio is the highest in the year 2005.
Hence, Statement II is correct.
Hence, option 3.

78. Total Assets to Total Liabilities Ratio is as follows:

$$2004 = \frac{12763}{4768} = 2.677$$

$2005 = \frac{20687}{9850} = 2.100$

$2006 = \frac{29029}{14017} = 2.071$

$2007 = \frac{34572}{17653} = 1.958$

$2008 = \frac{47268}{24243} = 1.950$

Total Assets to Total Liabilities Ratio is the lowest in the year 2008.

Hence, Statement I is incorrect.

Total Assets to Total Liabilities Ratio is the highest in the year 2004.

Hence, Statement II is incorrect.

Hence, option 4.

79. Shikhar, Dolly, Snehal, Akash, Swarn and Amar were playing the game.
It is given that Dolly, Shikar's mother got more points than Shikhar's father.
Shikhar's father got more points than Amar.
Akash got more points than Swarn and less than Amar.
Swarn's niece got the lowest points.
∴ The arrangement in the descending order of points will be:
1) Dolly
2) Shikhar's father
3) Amar
4) Akash
5) Swarn
6) Swarn's niece

∴ Shikhar has to be Swarn's niece and Snehal has to be Shikhar's father.
∴ The arrangement will be:
1) Dolly
2) Snehal
3) Amar
4) Akash
5) Swarn
6) Shikhar
∴ Shikhar is the lady in the group besides Dolly.
Hence, option 4.

80. From the arrangement given in the solution to the first question of the set we get that, Snehal stood second in the game.
Hence, option 3.

81. From the arrangement given in the solution to the first question of the set, we get that Dolly won the game.
Hence, option 2.

82. Based on the information given in the question, we can draw the following table:

	Corporate Planning	Information Technology	Finance	HR/Personnel	Exports	Qualification
Aditya	✓				✓	MIB/MBA
Aryan		✓		✓		MCA/PMIR
Harish	✓				✓	MIB/MBA
Puru		✓	✓	✓	✓	MIB/MCA/MFC/ PMIR
Sheetal						

From the table, we can conclude that both Aditya and Harish are MBA.
Hence, option 3.

83. We cannot answer this question directly from the table.
Now, every department recommended at least two recruits from this group.
However, Finance recommended only one recruit.
So, the other recruit has to be Sheetal.
∴The final table is as follows:

	Corporate Planning	Information Technology	Finance	HR/Personnel	Exports	Qualification
Aditya	✓				✓	MIB/MBA
Aryan		✓		✓		MCA/PMIR
Harish	✓				✓	MIB/MBA
Puru		✓	✓	✓	✓	MIB/MCA/MFC /PMIR
Sheetal			✓			MFC

Hence, option 2.

84. From the table, we can conclude that the qualification which is most common among the new recruits is MIB.
Hence, option 1.

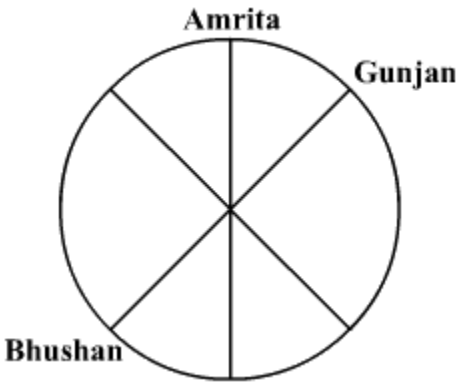
85. From the table, we can conclude that the recruit who is an MCA as well as MFC is Puru.
Hence, option 4.

86. P * Q + R means:
P is the sister-in-law of Q and Q is the mother-in-law of R.
∴ P is not the mother-in-law of Q and R.

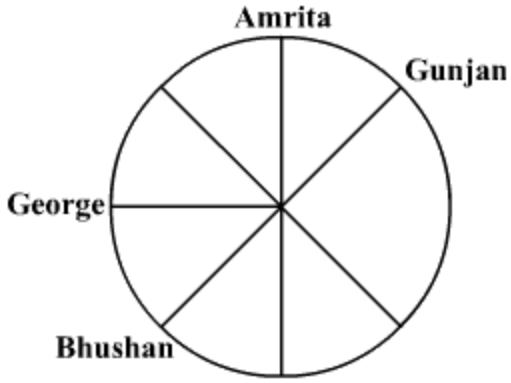
∴ Option 1 and 2 are incorrect.
Q is the mother-in-law of R, but we don't know whether R is the daughter-in-law or son-in-law of Q.
∴ Option 3 is not definitely true.
Hence, option 4.

87. X – Y + Z means:
Y is the mother-in-law of Z and X is the daughter-in-law of Y.
∴ Y is definitely the mother-in-law.
Hence, option 1.

88. Seven workmen are sitting in a circle.
Six out of them i.e. Amrita, Bhushan, Ronnie, Deepak, Prem and Gunjan are sitting at equal distances from each other.
∴ These six are sitting at 60° from each other.
And George must be sitting between them.
Now, Amrita is sitting at an angle of 120° from Bhushan.
∴ Two cases are possible:
Case 1:



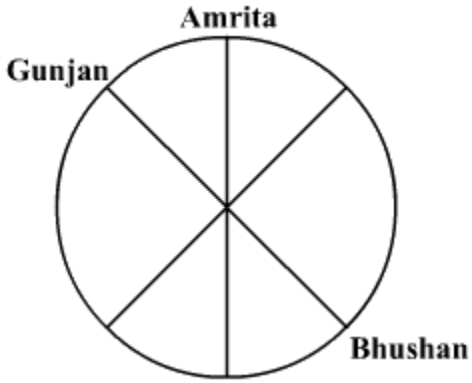
We know that Gunjan is sitting opposite Bhushan and also to the left of George. And Amrita forms an angle of 90° with George.



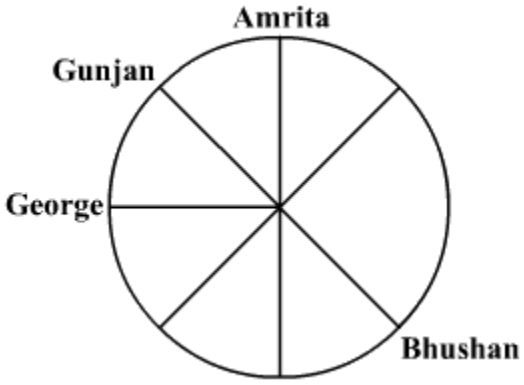
Now in this case we cannot place Ronnie two places to the left of Prem and Prem one place to the right of Deepak.

∴ This case is not valid.

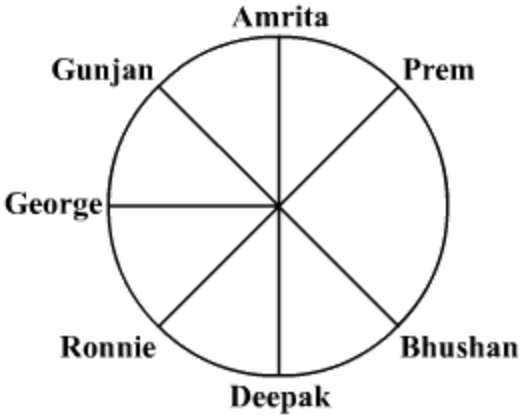
Case 2:



Gunjan is sitting opposite Bhushan and to the left of George. Also Amrita forms an angle of 90° with George.



Ronnie is sitting two places to the left of Prem, who is sitting one place to the right of Deepak. This arrangement can be done as follows:



∴ Deepak is the only person sitting between Ronnie and Deepak.
Hence, option 2.

89. From the arrangement given in the solution of the first question of the set, we get that George is not sitting at equal distance from Ronnie and Prem.
Hence, option 2.

90. From the arrangement given in the solution of the first question of the set, we get that, George is not sitting opposite Prem.
Hence, option 3.

91. On rearranging the given alphabets, the word formed is 'ABHORRENCE'.
The word opposite in meaning to this word is 'liking'.
Hence, option 4.

92. On rearranging the given alphabets, the word formed is 'CONGRUITY'.
'Consistency' and 'agreement' are both valid synonyms of 'CONGRUITY'.
Hence, both 'inconsistency' and 'disagreement' are both valid antonyms of the given word.
Hence, this question is ambiguous.

93. From the given information, Devika's grandson is the man's son's grandson. Thus, Devika's husband is the man's son.
Hence, option 1.

94. The outer ring contains sectors marked clockwise starting from A while the inner ring has sectors marked anticlockwise starting from A.
The sectors on the outer and inner circles match perfectly.
Rather than visualizing the two circles, it is easy to think of these sectors written in a linear manner as shown in the table below.

Outer Circle	Inner Circle

A	A
B	Z
C	Y
D	X
E	W
F	V
G	U
H	T
I	S
J	R
K	Q
L	P
M	O
N	N
O	M
P	L
Q	K
R	J
S	I
T	H
U	G
V	F
W	E
X	D
Y	C
Z	B

Apart from A, the only alphabet that currently coincides is N.
Hence, option 1.

95. The only instance where a vowel on the outer circle faces a vowel on the inner circle is for A (A faces A on both the circles.)
Hence, option 1.

96. The inner circle is rotated anti-clockwise by one sector from the original position.
Hence, the new arrangement is as shown below.

Outer Circle	Inner Circle
A	Z
B	Y
C	X
D	W
E	V

F	U
G	T
H	S
I	R
J	Q
K	P
L	O
M	N
N	M
O	L
P	K
Q	J
R	I
S	H
T	G
U	F
V	E
W	D
X	C
Y	B
Z	A

As can be seen, no element coincides.

Hence, option 4.

97. The outer circle is rotated clockwise by two sectors from the original position.
Hence, the new arrangement is as shown below.

Outer Circle	Inner Circle
Y	A
Z	**Z**
A	Y
B	X
C	W
D	V
E	U
F	T
G	S
H	R
I	Q
J	P
K	O
L	N
M	**M**

N	L
O	K
P	J
Q	I
R	H
S	G
T	F
U	E
V	D
W	C
X	B

Thus, it can be seen that Z and M coincide on both the circles.
Hence, option 2.

98. Six directors A, B, C, D, E and F are playing Golf.
It is given that A and E are brothers and F is their sister.
It is also given that C is the only son of A's uncle.
∴ C can be their maternal or paternal cousin.
B and D are daughters of the brother of C's father.
∴ B and D can be the sisters of A, E and F, but this cannot be definitely said as we don't know the number of brother's of C's father.
C is F's cousin.
Hence, option 1.

99. There are 3 male executives in the group, A, E and C.
Hence, option 2.

100. From the explanation given in the first question of the set we get that,
A and E are real brothers.
Hence, option 1.

SECTION - 3 (Verbal Ability)

101. Option 1 requires a subject such as 'they'. We do not know who is doing the spending in Netherlands.
In option 2, comparison is drawn between two dissimilar entities- a group with a country. 'they spend a large percentage' is compared to 'United states spending ' .
Option 3 convolutes the meaning. It suggests that Netherlands spends more on defending its coast from rising seas and not on defending its coast from United States military expense. The error in comparison is rectified in option 4 with the introduction of 'does.'
Hence, the correct answer is option 4.

102. 'others by suggesting' is incorrect usage. Eliminate options 1 and 3.
Option 2 has a parallelism error- 'suggest', 'are calling'. This error is corrected in option 4.
Hence, the correct answer is option 4.

103. The sentence suggests computers will do all the things that a human can do. Hence, computers will start acting 'like' a human- 'Like' is more appropriate than 'as' used in option 1.
Option 4 has an erroneous sentence structure which, changes the intended meaning. '..like an expert, to be used to diagnose..' indicates that the expert is going to be used.
Option 3 is unnecessarily wordy with '..the use of which would be for purposes like…' instead of '..to be used to' and 'whether or not' where only 'whether ' would suffice. Option 2 removes such wordiness.
Hence, the correct answer is option 2.

104. The sentence has been picked up from the book "The Argumentative Indian" by Amartya Sen.
India can be an immensely 'diverse' and not 'divergent' or 'distinct' country. Eliminate options 2 and 3.
'customs' fits better with 'divergent' and 'pursuits' with 'distinct'.
Hence, the correct answer is option 1.

105. The sentence has been picked up from the book "The Argumentative Indian" by Amartya Sen.
"..a great many ____ between defenders…" The blank cannot take 'skepticism' as it would be grammatically incorrect. Eliminate options 2, 3 and 4.
All the words in option 1 fit in the context.
Hence, the correct answer is option 1.

106. The meanings of the words are as follows:
Stygian: dark or gloomy; infernal; hellish
Abysmal: of or like an abyss; immeasurably deep or great
Fortuitous: happening or produced by chance; accidental
Cogent: to the point; relevant; pertinent
Contentious: tending to argument or strife; quarrelsome
Cataclysmic: of, pertaining to, or resulting from a cataclysm (any violent upheaval, especially one of a social or political nature)
Doomed: condemned to ruination or death

'Stygian' means 'dark'; therefore their relationship is synonymous.
'Abysmal' means 'immeasurably deep', which is different from 'low'.
The only other synonymous pair is 'fortuitous' and 'accidental'.
Hence, the correct answer is option 3.

107. 'Contiguous' means 'in contact or in close proximity without actually touching'.
'Abut' means 'adjacent; touch or join at the edge or border'. Thus the words are synonymous.
'Possible' means 'that may or can be' and 'occur' means 'to take place or to happen'.
'Synthetic' means 'produced by a synthetic or chemical process, especially not of natural origin' and 'create' means 'to cause to come into being'.
'Simultaneous' means 'existing or occurring at the same time' and 'coincide' means 'to happen at the same time or during the same period'. Therefore these words are synonyms.
'Constant' means 'not changing; uniform' and 'stabilise' means 'to make or hold stable, firm, or steadfast'.
Hence, the correct answer is option 3.

108. "Men's interest" mentioned in options 1 and 4 render them incorrect. Whenever the general interest of humankind is stated, the correct usage is '**Man's** interest'
Option 2, "That men are interested…have promoted (should be has promoted)".
Option 3 does not have any such errors.
Hence, the correct answer is option 3.

109. The absence of the contrasting conjunction, "but" renders options 1,2 and 3 incorrect. Secondly, options 1 and 2 change the tense unnecessarily with 'will'.
By elimination, option 4, although with a slightly awkward 'in addition', is the best and grammatically compact answer.
Hence, the correct answer is option 4.

110. Option 2 has a tense error.
The word "shall" renders option 3 incorrect.
Option 4 has the error of repeating 'would have'.
Option 1 uses the right tense in both the parts of the sentence.
Hence, the correct answer is option 1.

111. "In that" in option 2 renders the option incorrect.
"Rarely hunting" in option 3 renders the option incorrect.
Option 4 changes the meaning of the sentence. "Hunts were rare" twists the meaning from the main statement which states that the leader of the Neanderthal tribe rarely hunted.
Hence, the correct answer is option 1.

112. "These kind of mistakes" is incorrect grammatical usage. The correct usage is either '**this kind of**' or 'these **kinds** of'
Hence, the correct answer is option 4.

113. "More preferable" in part 2 is incorrect usage. The word "more" is redundant due to the word "preferable" in the part.
Hence, the correct answer is option 2.

114. The word "that" in part 3 is a redundancy error as the same word is used in part 1.
The comma at the end of part 1 is unnecessary and can be ignored.
Hence, the correct answer is option 3.

115. 'Acquiescence' means 'passive assent or agreement without objection'. This is closest in meaning to "quiet submission", which means 'giving in without a fight'.
Hence, the correct answer is option 1.

116. 'Wheedle' means 'to try to influence (a person) by smooth, flattering, or beguiling words or acts'.
'Flattery' is closest in meaning to 'wheedle'.
Emaciated: made or became extremely thin, especially as a result of starvation.
Purge: to rid of whatever is impure or undesirable; cleanse; purify
Scant: limited; meagre
Thus options 1, 3 and 4 are eliminated.
Hence, the correct answer is option 2.

117. 'Immiseration' means 'misery or impoverished'.
Immigration: settling in a country or region to which one is not native
Immersion: placing under water or other liquid
Impoverishment: poverty
Discrimination: partiality; discernment
Therefore, the word closest in meaning to immiseration is impoverishment.
Hence, the correct answer is option 3.

118. 'Beatitude' means 'supreme blessedness; exalted happiness'.
Accursed: under a curse; doomed; ill-fated
Cleansed: made clean
Retreated: withdrew, as into safety or privacy; retirement; refuge; seclusion
Blessed: sacred; holy
Therefore, the word closest in meaning to 'beatitude' is 'blessed'.
Hence, the correct answer is option 4.

119. 'Bedizen' means 'to dress or adorn in a showy, gaudy, or tasteless manner'.
Therefore, 'gaudily dressed' is the closest in meaning.
Hence, the correct answer is option 2.

120. 'Cachinnate' means 'to laugh loudly or immoderately'.
Therefore, laugh aloud is the closest in meaning.

Hence, the correct answer is option 3.

121. 'Canoodle' means 'caress, fondle, or pet amorously'.
Cuddle: to hold close in an affectionate manner; hug tenderly
Canonise: to consider or treat as sacrosanct or holy; to glorify
Brazen: shameless or impudent
Articulate: uttered clearly in distinct syllables
Therefore, the word closest in meaning to canoodle is cuddle.
Hence, the correct answer is option 1.

122. 'Tumescent' means 'becoming swollen; swelling; slightly tumid'.
Shrink: to contract or lessen in size
Annoy: to bother (a person) in a way that displeases, troubles, or slightly irritates; to harass
Engorge: to swallow greedily; glut or gorge
Enlighten: to instruct; impart knowledge to
Therefore, the word closest in meaning to 'tumescent' is 'engorge'.
Hence, the correct answer is option 3.

123. 'Twaddle' means 'trivial, feeble, silly, or tedious talk or writing'.
The words smart, indecisive and obscene are not related to twaddle.
'Waffle' means 'to talk foolishly or without purpose; idle away time talking'.
Hence, the correct answer is option 4.

124. 'Ennui' is a noun meaning 'a feeling of utter weariness and discontent resulting from satiety or lack of interest; boredom; listlessness'.
Lassitude: weariness of body or mind from strain, oppressive climate, etc.; lack of energy; listlessness.
The words 'confront', 'enthuse' and 'entrap' are verbs and are not related to the noun 'ennui'.
Therefore, the word closest in meaning to 'ennui' is 'lassitude'.
Hence, the correct answer is option 1.

125. 'Cantankerous' means 'disagreeable to deal with; contentious; peevish; cranky'.
Irascible: easily angered; irritable; grouchy
Co-operative: working or acting together willingly for a common purpose or benefit
Adamant: utterly unyielding in attitude or opinion; inflexible; uncompromising
Captivate: to attract and hold the attention or interest of; fascinate
Therefore, the word that is most opposite in meaning to 'cantankerous' is 'co-operative'.
Hence, the correct answer is option 2.

126. 'Emblazon' means 'to decorate with brilliant colours; to proclaim'.
Extol: to praise highly

Cinder: a partially or mostly burned piece of coal, wood, etc
Embalm: to treat (a dead body) so as to preserve it, as with chemicals, drugs, or balsams
Subtle: faint, tenuous, or rarefied, as a fluid or an odour; fine or delicate in meaning or intent; difficult to perceive or understand
Therefore, the word that is most opposite in meaning to 'emblazon' is 'subtle'.
Hence, the correct answer is option 4.

127. 'Inveigh' means 'to protest strongly or attack vehemently with words'.
Harangue: a scolding or a long or intense verbal attack; rant
Celebrate: to observe (a day) or commemorate (an event) with ceremonies or festivities
Endorse: to approve, support, or sustain
Neglect: to pay no attention or too little attention to
Therefore, the word that is most opposite in meaning to 'inveigh' is 'endorse'.
Hence, the correct answer is option 3.

128. 'Leaven' refers to 'a substance, as yeast or baking powder, that causes fermentation and expansion of dough or batter or an element that produces an altering or transforming influence.'
Static: showing little or no change
Transform: to change
Coherent: logically connected; consistent
Diffuse: to pour out and spread, as a fluid
Therefore, the word that is most opposite in meaning to 'leaven' is 'static'.
Hence, the correct answer is option 1.

129. 'Opprobrium' means 'disgrace arising from exceedingly shameful conduct; ignominy'.
Ignominy: disgrace; dishonour
Opportunity: a situation or condition favourable for attainment of a goal
Obituary: a notice of the death of a person
Honour: high public esteem; fame; glory
Therefore, the word that is most opposite in meaning to 'opprobrium' is 'honour'.
Hence, the correct answer is option 4.

130. 'Parsimonious' means 'frugal or stingy; miserly'.
Extravagant: spending much more than is necessary or wise; wasteful
Penurious: extremely stingy
Partial: being a part; biased or prejudiced
Passionate: having intense emotion or strong feeling
Therefore, the word that is most opposite in meaning to 'parsimonious' is 'extravagant'.
Hence, the correct answer is option 1.

131. 'Insidious' means 'intended to entrap or beguile; stealthily treacherous or deceitful'.

Deceitful: misleading
Apparent: readily seen; obvious
Insincere: not sincere; not honest in the expression of actual feeling
Tepid: moderately warm; characterized by a lack of force or enthusiasm
Therefore, the word that is most opposite in meaning to 'insidious' is 'apparent'.
Hence, the correct answer is option 2.

132. 'Rapacious' means 'given to seizing for plunder or the satisfaction of greed'.
Avaricious: greedy
Satiated: satisfied, as one's appetite or desire, to the point of boredom
Decorated: furnished or adorned with something ornamental
Subconscious: the part of the mind below the level of conscious perception
Therefore, the word that is most opposite in meaning to 'rapacious' is 'satiated'.
Hence, the correct answer is option 2.

133. 'Soporific' means 'causing sleep; sleepiness; drowsiness'.
Somnolent: tending to cause sleep
Unromantic: pragmatic; matter-of-fact
Alert: fully aware and attentive
Slumber: to sleep, especially lightly; doze; drowse
Therefore, the word that is most opposite in meaning to 'soporific' is 'alert'.
Hence, the correct answer is option 3.

134. 'Ubiquitous' means 'existing or being everywhere, esp. at the same time; omnipresent'.
Universal: pertaining to, or characteristic of all or the whole; applicable everywhere or in all cases; general
Rare: coming or occurring far apart in time; unusual; uncommon; exceptional
Ensnare: to capture in, or involve as in, a snare; entrap
Conscientious: scrupulous; upright
Therefore, the word that is most opposite in meaning to 'ubiquitous' is 'rare'.
Hence, the correct answer is option 2.

135. Ab initio (Latin): from the beginning
Ante mortem (Latin): before death
Avant garde (French): unorthodox or daring; radical; of or pertaining to the experimental treatment of artistic, musical, or literary material
Biennial (Latin): happening every two years
Only the term 'Avant garde' has a French origin.
Hence, the correct answer is option 3.

136. Abhorrence (from Latin *abhorrere*): a feeling of extreme repugnance or aversion
Acoustical (from Greek *akoustikós*): pertaining to the sense or organs of hearing, to sound, or to the science of sound
Addicted (from Latin addictus): physiologically or psychologically dependent on an addictive substance
Amenable (from Middle French *amener*): open to influence
Therefore, 'acoustical' is the only word having a Greek origin.
Hence, the correct answer is option 2.

137. 'Asinine' means 'foolish; of or like an ass or donkey'. Similarly, 'vulpine' means 'of or resembling a fox'. 'Avian' means 'of or pertaining to birds' in general, and not specifically doves.
Hence, the correct answer is option 1.

138. A 'stallion' is 'a male horse' while a 'mare' is 'a female horse'. Therefore, the relationship is Male: Female.
In options 1, 3 and 4 this relationship has been inverted.
In option 2, ram, a male sheep, precedes ewe, a female sheep. Thus, the Male: Female relationship is analogous to the given words.
Hence, the correct answer is option 2.

139. An eponym is a word based on a person's name.
The term boycott is based on Charles C. Boycott, an English estate manager in Ireland, against whom nonviolent coercive tactics were used in 1880.
The cardigan is named after J. T. Brudnell, 7th Earl of Cardigan.
The sandwich is named after the fourth Earl of Sandwich.
The word fresco is derived from the Italian word *fresco*.
Hence, the correct answer is option 4.

140. The January to December calendar now in use represents the Gregorian form of calendar. It was introduced by Pope Gregory XIII, in 1582.
Hence, the correct answer is option 3.

141. Kyogen: a brief Japanese play performed between *No* plays to provide comic relief.
Kabuki: a popular type of Japanese drama, performed by men only, with elaborate costumes, stylized movements, dances, and songs.
Duologue: a dramatic performance in the form of a dialogue limited to two speakers only
Masque: A dramatic entertainment, usually performed by masked players
Pantomime: a play in which the performers express themselves mutely by gestures, often to the accompaniment of music
Therefore, all of the above are types of Play/Drama.
Hence, the correct answer is option 2.

142. Chanson: a song with French lyrics
Clerihew: a humorous verse form, usually consisting of two couplets, with lines of uneven length and irregular meter, the first line usually containing the name of a well-known person
Dirge: a funeral song or tune, or one expressing mourning
Haiku: a major form of Japanese verse, written in 17 syllables divided into 3 lines of 5, 7, and 5 syllables, and employing highly evocative allusions and comparisons, often on the subject of nature or one of the seasons
Tanka: a Japanese poem consisting of 31 syllables in 5 lines, with 5 syllables in the first and third lines and 7 in the others
Therefore, all of the above are types of Poems/Songs.
Hence, the correct answer is option 1.

143. The words Blackboard, Blackmail and Blacksmith are single words. Only Black box is written as two separate words.
Hence, the correct answer is option 2.

144. The question stem asks for words which are nouns only, i.e. they cannot be used as nouns as well as verbs or adjectives or any other parts of speech.
In option 1, both 'blame' and 'billow' are nouns as well as verbs.
In option 2, 'blemish' is a noun and a verb; 'assert', 'abut' and 'chasten' are only verbs.
In option 4, 'flagrant' and 'farcical' are adjectives only.
The words 'acolyte', 'foible', 'bigotry' and 'denizen' in option 3 are nouns only.
Hence, the correct answer is option 3.

145. The question stem asks for words which are adjectives only, i.e. they cannot be used as adjectives as well as verbs or nouns or any other parts of speech.
In option 2, 'acquaint' is a verb only, and 'ghastly' is an adjective as well as an adverb.
In option 3, 'oblique' is a noun, adjective, adverb and verb; 'observant' is an adjective and a noun; 'panorama' is a noun only.
In option 4, 'acknowledge' is a verb only; 'potent' is a noun and an adjective; 'posterity' is a noun only.
The words 'abstruse', 'flagrant', 'grandiose' and 'obdurate' in option 1 are adjectives only.
Hence, the correct answer is option 1.

146. According to the question stem, each word in the option should be a noun, verb and adjective.
In option 1, 'object' is not an adjective; 'servile' is an adjective only.
In option 2, 'assert' is a verb only.
In option 3, 'billow' is not an adjective; 'elixir' is a noun only.
'Bluff', 'desert', 'lead' and 'counter' are all nouns, verbs and adjectives.
Hence, the correct answer is option 4.

147. Thriftiness refers to economical management of money and other resources.
Options 2 and 3 are too general and can be eliminated.
Option 4, "a stitch in time saves nine", refers to nipping a problem in the bud and not allowing it to escalate.
Option 1, "feast today, famine tomorrow", cautions us against overindulging and using too many resources or using up all our resources today, and being left with nothing (famine) tomorrow.
Hence, the correct answer is option 1.

148. 'Dog-whistle politics' is 'a coded, concealed or unstated idea, usually divisive or politically dangerous'. We can eliminate this option as this does not convey the same meaning as the main statement.
'Fifth Columnist' is 'a group of people who act traitorously and subversively out of a secret sympathy with an enemy of their country'. We can eliminate this option as well.
'Pork barrel' means 'government funding of something that benefits a particular district, whose legislator thereby wins favour with local voters'. This option can be eliminated.
A 'Carpet Bagger' is 'any opportunistic or exploitative outsider'. This idiom conveys the same meaning as the main statement. ('Carpet Bagger' has been incorrectly spelt in the question paper as 'Carpet Beggar').
Hence, the correct answer is option 2.

149. "You can't tell a book by its cover" refers to the fact that the outward appearance or cover of a book is not indicative of the quality of the contents inside. It also implies that one cannot judge a person by outward appearances or looks.
Hence, the correct answer is option 4.

150. The proverb "You can take the boy out of the country but you can't take the country out of the boy" means that even if a person leaves his/her home country, its social and cultural values remain deeply ingrained. Thus, a person can leave the geographical boundaries of his nation, but he cannot leave behind his cultural roots.
Hence, the correct answer is option 2.

SECTION - 4 (Quantitative Ability)

151. In the first 50 balls, 49 are red. If $8x$ balls are counted after the first 50 balls, then $7x$ out of them are red.

$\therefore$ So the proportion of red balls is $\frac{7x + 49}{8x + 50}$

Here $n = 8x + 50$

$\frac{7x + 49}{8x + 50} \geq \frac{90}{100}$

$\therefore 700x + 4900 \geq 720x + 4500$

$\therefore 20x \leq 400$

$\therefore x \leq 20$

$\therefore n \leq 8x + 50$

$\therefore n \leq 210$

Hence, option 2.

152.

The two men meet when the sum of the distances covered by them is 76.

No. of Hours	Distance Covered by		Sum of distances covered by the men
	Man at R	Man at S	
1	4.5	3.25	< 76
2	4.5 + 4.5 = 9	3.25 + 3.75 = 7	< 76
3	9 + 4.5 = 13.5	7 + 4.25 = 11.25	< 76
4	13.5 + 4.5 = 18	11.25 + 4.75 = 16	< 76
5	18 + 4.5 = 22.5	16 + 5.25 = 21.25	< 76
6	22.5 + 4.5 = 27	21.25 + 5.75 = 27	< 76
7	27 + 4.5 = 31.5	27 + 6.25 = 33.25	< 76
8	31.5 + 4.5 = 36	33.25 + 6.75 = 40	76

$\therefore$ The men meet 36 km from R and 40 km from S.

$\therefore$ They meet 4 km nearer to R than S.

Hence, option 4.

153. Finally all of A, B, C have rupees 16.

So, C gave B and A Rs. 8 each.

So C had 16 + 8 + 8 = 32 rupees just after B gave money to A and C.

As, B doubled the money A and C had, B gave A Rs. 4 and C Rs. 16.

Hence, B had 8 + 4 + 16 = 28 just after A gave money to B and C.

Similarly, A doubled the money B and C had, hence A gave B Rs. 14 and C Rs. 8.

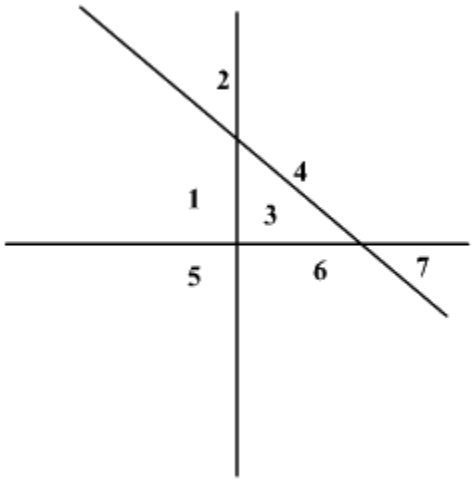
Hence, A had 4 + 4 + 8 = Rs. 26

	A	B	C
Final	16	16	16
After B gave	8	8	32
After A gave	4	28	16
Initially	26	14	8

Hence, option 1.

154.

When 1 line is drawn, the plane is divided into 2 parts.
When 2 lines are drawn, the plane can be divided into 4 parts at the most.
When 3 lines are drawn, the plane can be divided into 7 parts at the most as shown below.



So, if we define a function $f(x)$ such that it represents maximum number of regions in which x lines divides a plane, than we have

$f(1) = 2$
$f(2) = 4$
$f(3) = 7$

So, we can see that
$f(2) = f(1) + 2$
$f(3) = f(2) + 3$ ...

So, $f(x) = f(x - 1) + x$
Thus, $f(4) = f(3) + 4$

$= 7 + 4 = 11$

$f(5) = f(4) + 5 = 11 + 5 = 16$

$f(6) = f(5) + 6 = 16 + 6 = 22$

Hence, option 3.

155. $s = 160t - 16t^2$

$\therefore \frac{ds}{dt} = 160 - 32t$

If $\frac{ds}{dt} = 0$ then $t = 5$

$\frac{d^2s}{dt^2} = -632$

$\therefore \left.\frac{d^2s}{dt^2}\right|_{t=5} = -32 < 0$

$\therefore$ By the second derivative test, s is maximum at $t = 5$

$\therefore s_{max} = (160 \times 5) - (16 \times 5^2)$

$= 400$

Hence, option 3.

156.

$(0, 6)$ is a point on the line $y = \frac{3}{4}x + 6$

The distance between (0, 6) and L should be 4 units.

Distance of a line $Ax + By + C = 0$ from a point (x_1, y_1)

$d = \left|\frac{Ax_1 + By_1 + C}{\sqrt{a^2 + b^2}}\right|$

Consider option 1.

Distance of the given line from the point (0, 6)

$= d = \frac{\left|y_1 - \frac{3}{4}x_1 - 1\right|}{\sqrt{1^2 + \left(\frac{3}{4}\right)^2}}$

$d = \left|\frac{6 - 1}{5/4}\right|$

$\therefore d = 5 \times \frac{4}{5} = 4$

$\therefore$ Option 1 is correct.

Hence, option 1.

157. After every win, the amount becomes 1.5 times what it was and after every loss the amount becomes 0.5 times what it was.

As the initial amount was 64, irrespective of the order in which the wins and losses occur, the final amount will be $64 \times (1.5)^3 \times (0.5)^3 = 27$
$\therefore$ There is a loss of Rs. 37

Alternatively,
We can do this question by trial and error method also.
Let L denote a loss and W denote a win.
If the order of wins and losses is LLWLWW,
Then, we can see that the money left with him after 6 bets is Rs. 27
If the order of wins and losses is LLLWWW, even then the money left with him after 6 bets is Rs. 27.
$\therefore$ Continuing like this after trying a few more combinations we get that the person will incur a loss of Rs. 37 whatever be the arrangement of losses and wins.
Hence, option 2.

158. Let $a = x + 9$ and $b = x - 9$
$\therefore$ The given equation is,
$a^{\frac{1}{3}} - b^{\frac{1}{3}} = 3$
Cubing both the sides we get,
$a - b - 9a^{\frac{1}{3}}b^{\frac{1}{3}} = 27$
$\therefore x + 9 - x + 9 - 9(x+9)^{\frac{1}{3}}(x-9)^{\frac{1}{3}} = 27$
$\therefore 18 - 9(x+9)^{\frac{1}{3}}(x-9)^{\frac{1}{3}} = 27$
$\therefore -9(x+9)^{\frac{1}{3}}(x-9)^{\frac{1}{3}} = 9$
$\therefore (x+9)^{\frac{1}{3}}(x-9)^{\frac{1}{3}} = -1$
$\therefore (x+9)(x-9) = -1$
$\therefore x^2 - 81 = -1$
$\therefore x^2 = 81 - 1$
$\therefore x^2 = 80$
$\therefore x^2 = 80$
Hence, option 3.

159. $[\log_{10}(5 \log_{10} 100)]^2$
$= [\log_{10}(5 \times 2)]^2$ ... ($\because \log_{10} 100 = 2$)
$= [\log_{10} 10]^2$
$= 1^2$
$= 1$
Hence, option 4.

160. $x^2 - 4y^2 = 0$

$\therefore (x + 2y)(x - 2y) = 0$

$\therefore x = \pm 2y$

Thus, the given equation is the equation of a pair of straight lines.

Hence, option 3.

161.

The jobber buys an article at Rs. 24 less $12\frac{1}{2}\%$

i.e. at 87.5% of 24

$= \frac{7}{8} \times 24 = \text{Rs. } 21$

He wishes to sell the article at $33\frac{1}{3}\%$ gain

So, the selling price of the article must be $\frac{4}{3} \times 21 = \text{Rs. } 28$

But, he wants to give a discount of 20% on his marked price.

If the marked price is x,

$0.8x = 28$

$\therefore x = \frac{28}{0.8} = \frac{28}{4} \times 5$

= Rs. 35

Hence, option 4.

162.

$2^x = 8^{y+1}$

$\therefore 2^x = (2^3)^{y+1}$

$\therefore 2^x = 2^{3(y+1)}$

$\therefore x = 3y + 3$ ...(i)

Consider,

$9^y = 3^{x-9}$

$\therefore (3^2)^y = 3^{x-9}$

$\therefore 3^{2y} = 3^{x-9}$

$\therefore 2y = x - 9$ ...(ii)

Solving (i) and (ii) simultaneously, we get,

$x = 21$ and $y = 6$

$\therefore x + y = 21 + 6 = 27$

Hence, option 4.

163. Let the farmer buy each sheep for Rs. 1.

∴ Cost price of the farmer for 749 sheep = Rs. 749

∴ SP of 700 sheep = Rs. 749

As the remaining 49 sheep are sold at the same price as the other 700, the profit percentage will be the same as that when 700 sheep are sold.

∴ Profit percent of the farmer $= \frac{749 - 700}{700} \times 100$

= 7%

Hence, option 3.

164. Let the numbers be a and b

∴ $a - b = x$ ...(i)

∴ $a + b = 7x$ ...(ii)

$ab = 24x$ ... (iii)

Solving (i) and (ii) simultaneously, we get

$a = 4x$ and $b = 3x$

Substituting the values of a and b in (iii) we get, $x = 2$

∴ $ab = 24 \times 2$

$= 48$

Hence, option 4.

165. By the conditions given in the question we have that, if the first runs 10 km then the second runs 8 km and the third runs 6 km.

∴ When the second runs 8 km the third runs 6 km.

∴ When the second runs 10 km then the third runs $\frac{6 \times 10}{8} = 7.5$ km

∴ The second beats the third by 2.5 km in a 10 km race.

Hence, option 2.

166.

$\frac{a+b}{b+c} = \frac{c+d}{a+d}$

∴ $a^2 + ad + ab + bd = bc + bd + c^2 + cd$

∴$a^2 + ad + ab = c^2 + bc + cd$

∴ $ad + ab - bc - cd = c^2 - a^2$

∴ $a(b + d) - c(b + d) = (c - a)(a + c)$

∴ $(a - c)(b + d) = -(a - c)(a + c)$

∴ $(a - c)(b + d) + (a - c)(a + c) = 0$

∴ $(b + d + a + c)(a - c) = 0$

∴ $a + b + c + d = 0$ or $a = c$ or both.

Hence, option 3.

167. When the actual time elapsed is 24 hours = 24 × 60 = 1440 minutes,
the time elapsed on the faulty watch = 1437.5 minutes.
From 1 pm on March 15 to 9 am on March 21, the time elapsed on the faulty watch = 140 hours = 140 × 60 = 8400 minutes

$\therefore$ The actual time elapsed $= \dfrac{8400 \times 1440}{1437.5}$

$$= \frac{84 \times 144 \times 10000}{14375}$$
$$= \frac{84 \times 144 \times 16}{23}$$
$$= 8414\ \frac{14}{23}$$

$\therefore$ The correction $n = 8414\ \dfrac{14}{23} - 8400$

$$= 14\frac{14}{23} \text{ minutes}$$

Hence, option 1.

168.
$2^{2x^2-7x+5} = 1$
$\therefore 2^{2x^2-7x+5} = 2^0$
$\therefore 2x^2 - 7x + 5 = 0$
$\therefore 2x^2 - 5x - 2x + 5 = 0$
$\therefore x(2x - 5) - 1(2x - 5) = 0$
$\therefore (2x - 5)(x - 1) = 0$
$\therefore x = 1$ or $5/2$
So, there are two real values of x which satisfy the equation.
Hence, option 2.

169.
I. $\left(\sqrt{-4}\right)\left(\sqrt{-16}\right) = \left(2\sqrt{-1}\right)\left(4\sqrt{-1}\right)$
$= 2i \times 4i \ \ (\because \sqrt{-1} = i)$
$= 8i^2$
$= -8$
II. $\sqrt{(-4)(-16)} = \sqrt{64} = 8$
III. $\sqrt{64} = 8$

So II and III are correct.
I is incorrect.
Hence, option 2.

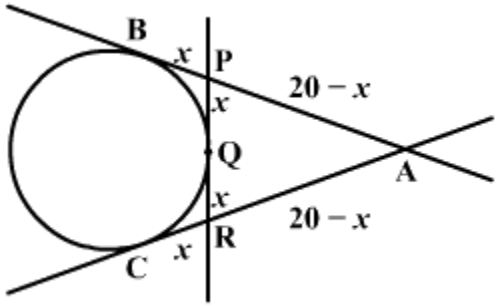
170. $(25)_b$ in decimal system can be represented as $5 + 2b$.
Similarly $(52)_b$ is represented as $2 + 5b$
$\therefore 2 + 5b = 2(5 + 2b)$
$\therefore 2 + 5b = 10 + 4b$
$\therefore b = 8$
Hence, option 2.

171. Let x and y be any two elements of set u.
$\because$ Every element of set u is a perfect square,
$x = a^2$ and $y = b^2$ for some positive integers a and b
$\therefore xy = a^2b^2$
$\therefore xy$ is also a perfect square.
$\therefore xy$ is also an element of u.
$\therefore$ Set u is closed with respect to multiplication.
Hence, option 2.

172.
$S = (x - 1)^4 + 4(x - 1)^3 + 6(x - 1)^2 + 4(x - 1) + 1$
$(a + b)^4 = {}^4C_0\, a^4 + {}^4C_1\, a^3b + {}^4C_2\, a^2b^2 + {}^4C_3\, ab^3 + {}^4C_4\, b^4$
$= a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$
$\therefore$ We can see that
$S = [(x - 1) + 1]^4$
$= x^4$
Hence, option 3.

173. By the condition given in the question,
$r = (2a)^{2b}$
$= 2^{2b} \times a^{2b}$
$= (2^2)^b \times (a^b)^2$
$= (4)^b \times (a^b)^2$
Also, $r = a^b \times x^b$
$\therefore a^b \times x^b = 4^b \times (a^b)^2$
$\therefore x^b = 4^b \times a^b$
$\therefore x^b = (4a)^b$
$\therefore x = 4a$
Hence, option 2.

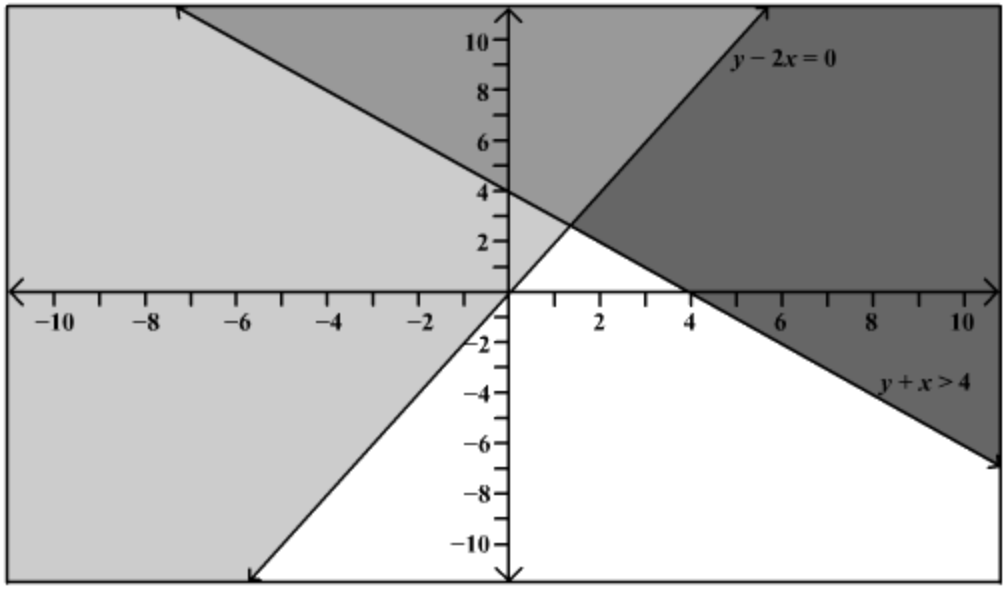
174.



Two tangents drawn from a point to a circle are congruent.
∴ AB =AC, PB = PQ and QR = RC
Also, by symmetry of the figure,
PQ = QR
Let PB = PQ = QR = CR = x
As AB = 20, AP = AB – BP = 20 – x
∴ AR = 20 – x
∴ Perimeter of ΔAPR = AP + PR + AR
= 20 – x + 2x + 20 – x
= 40 units
Hence, option 3.

175. At the point/s where the lines y = 2log x and y = log 2x intersect, we get
2log$x$ = log2x
∴ log x^2 = log 2x
∴ x^2 = 2x
∴ x(x – 2) = 0
x = 0 or 2
But log 0 does not exist. So, there is only 1 point where the graphs intersect.
Hence, option 1.

176. We plot the two inequalities y > 2x and y> 4 – x and find the region common to both.



∴ We can see that the common region is in quadrants I and II.
Hence option 1.

177. $3x^3 - 9x^2 + kx - 12$ is divisible by $x - 3$
∴ $f(3) = 0$
∴ $3 \times 3^3 - 9 \times 3^2 + 3k - 12 = 0$
∴ $81 - 81 + 3k - 12 = 0$
∴ $3k = 12$
∴ $k = 4$
So, the equation will be
$3x^3 - 9x^2 + 4x - 12 = 0$
∴ $(x - 3)(3x^2 + 4) = 0$
Thus $3x^2 + 4$ is a factor of the given equation.
Hence, option 2.

178. P divides AB in the ratios 2 : 3, AP : PB = $2x : 3x$

Q divides AB in the ratio 3 : 4
∴ AQ : QB = $3y : 4y$

Now, AB = AP + PB = AQ + QB
∴ $2x + 3x = 3y + 4y$

$\therefore 5x = 7y$ ... (i)

Also given that PQ = 2

$\text{PQ} = \text{AQ} - \text{AP} \quad \left(\because \frac{3\text{AB}}{7} > \frac{2\text{AB}}{5}\right)$

$\therefore 2 = 3y - 2x$ ... (ii)

From (i) and (ii),

$\therefore 3y - 2\left(\frac{7}{5}y\right) = 2$

$\therefore 3y - \frac{14}{5}y = 2$

$\therefore 15y - 14y = 10$

$\therefore y = 10$

So length of AB = $7y = 70$

Hence, option 1.

179. Let the price of the cheapest magazine i.e. the one at the extreme left be x.

Difference, between the prices of two adjacent magazines is Rs. 2

$\therefore$ Price of extreme right or the costliest magazine will be $x + 30 \times 2$

$= x + 60$

Now, the price of the magazine in middle (the 16th position) = $x + 15 \times 2 = x + 30$

The price of the magazines, adjacent to the one in the middle is $x + 28$ or $x + 32$ depending on whether it is on the left or right of the middle magazine respectively.

Suppose, $x + 60 = x + 28 + x + 30$

$\therefore x + 60 = 2x + 58$

$\therefore x = 2$

And if $x + 60 = x + 30 + x + 32$

$\therefore 60 = x + 62$

$\therefore x = -2$ (which is not possible)

So the adjacent magazine is the one whose price is $x + 28$ i.e. one to the left of the middle magazine.

Hence, option 1.

180. $\log_5 12 = \log_3(3 \times 4)$

$= \log_5 3 + \log_5 4$

$= \log_5 3 + 2\log_5 2$

$= \frac{\log_{10} 3}{\log_{10} 5} + \frac{2\log_{10} 2}{\log_{10} 5}$

$$= \frac{\log_{10} 3}{\log_{10} 10 - \log_{10} 2} + \frac{2\log_{10} 2}{\log_5 10 - \log_{10} 2}$$

$$= \frac{b}{1-a} + \frac{2a}{1-a}$$

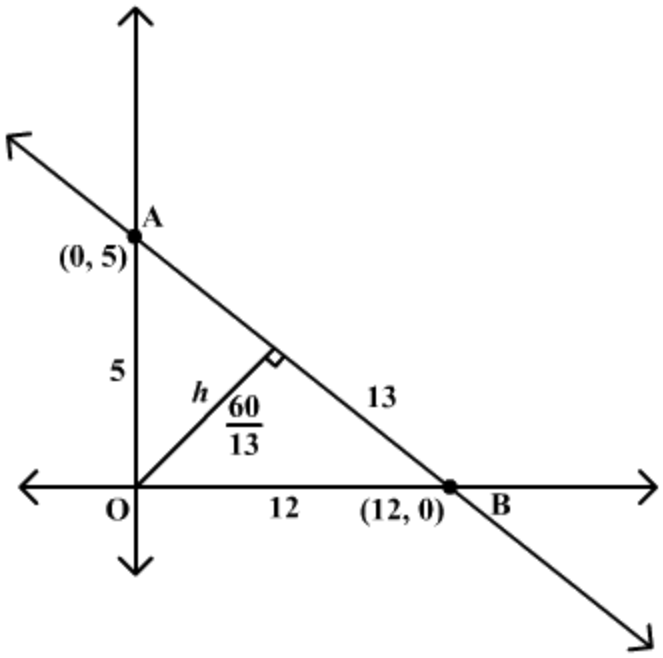
$$= \frac{2a+b}{1-a}$$

Hence, option 4.

181. When A runs d metres, B runs $(d - 20)$ metres.
When B runs d metres, C runs $(d - 10)$ metres.
When A runs d metres, C runs $(d - 28)$ metres.
$\therefore \frac{d-20}{d-28} = \frac{d}{d-10}$
$\therefore (d - 20)(d - 10) = d(d - 28)$
$\therefore d^2 - 30d + 200 = d^2 - 28d$
$\therefore 200 = 2d$
$\therefore d = 100$ m
Hence, option 2.

182. Two points on or inside the square will be at the maximum distance when they are on two opposite vertices. Let us select 4 points on the vertices of the square. Then, the distance between any two of them is 1 or $\sqrt{2}$.
Now we select the fifth point such that it is at the maximum possible distance from each of the other four points. Such a point lies on the point of intersection of the diagonals and its distance from each of the other four points is $\sqrt{2}/2$
Any other point on or inside the square will be at a distance less than $\sqrt{2}/2$ from at least one of the other four points.
Hence, option 2.

183.
$\sqrt{x^2 + y^2}$ is the radius of a circle with x and y
such that $5x + 12y = 60$
The line $5x + 12y = 60$ is plotted as follows:



All the points on the line AB satisfy $5x + 12y = 60$

$\sqrt{x^2 + y^2}$ will be minimum when the distance between O and line AB is minimum.

$\text{A}(\Delta\ \text{ABC}) = \frac{1}{2} \times \text{OB} \times \text{AO} = \frac{1}{2} \times \text{AB} \times h$

$\therefore \frac{1}{2} \times 12 \times 5 = \frac{1}{2} \times 13 \times h$

$\therefore h = \frac{60}{13}$

Hence, option 1.

184.

$$\sqrt{\frac{4}{3}} - \sqrt{\frac{3}{4}}$$

$$= \frac{\sqrt{4} \times \sqrt{4} - \sqrt{3} \times \sqrt{3}}{\sqrt{3} \times \sqrt{4}}$$

$= \frac{4-3}{\sqrt{12}}$

$= \frac{1}{\sqrt{12}}$

$= \frac{\sqrt{12}}{12}$

$= \frac{2\sqrt{3}}{12}$

$= \frac{\sqrt{3}}{6}$

Hence, option 1.

185.

Sum of numbers $= \left(1 - \frac{1}{n}\right) + 1 + 1 + 1 \ldots (n-1)$times

$= 1 - \frac{1}{n} + (n-1)$

$\therefore$ Arithmetic mean of numbers

$= \frac{1 - \frac{1}{n} + n - 1}{n}$

$= \frac{n - 1 + n^2 - n}{n^2}$

$= \frac{n^2 - 1}{n^2}$

$= 1 - \frac{1}{n^2}$

Hence, option 4.

186.

Speed while going $= \frac{150}{3 + \frac{20}{60}} = 45$ km/hr

Average speed $= \frac{\text{Total distance}}{\text{Total time}}$

$r = \frac{300}{7.5}$

r = 40 km/hr
∴ Average rate for the trip going exceeds r by 45 – 40 = 5 km/hr
Hence, option 1.

187.

The last three coefficients in the expansion of $\left(1-\frac{1}{a}\right)^6$ are
${}^6C_4$, $-{}^6C_5$ and ${}^6C_6$
${}^6C_4 = 15$
$-{}^6C_5 = -6$
${}^6C_6 = 1$
∴ The sum of coefficients = 15 – 6 + 1 = 10
Hence, option 3.

188.
$a = \log_8 225, b = \log_2 15$
$\therefore a = \log_{2^3} 15^2$
$= \frac{2}{3}\log_2 15$
$= \frac{2}{3} \times b$
Hence, option 2.

189. The sum of interior angles of a pentagon = 540°
Let the angles of the pentagon be $a - 2d, a - d, a, a + d, a + 2d$
∴ $a - 2d + a - d + a + a + d + a + 2d = 540$
∴ $5a = 540$
∴ $a = 108°$
∴ One of the angles must be 108°.
Hence, option 1.

190. P takes $(x + 6)$ hours to do the job alone.
Q takes $(x + 1)$ hours to do the job alone.
R takes $(2x)$ hours to do the job alone.
The three take x hours to do the job, when working together.
$\therefore \frac{1}{x+6} + \frac{1}{x+1} + \frac{1}{2x} = \frac{1}{x}$
$\therefore \frac{2x+7}{x^2+7x+6} = \frac{1}{2x}$
∴ $4x^2 + 14x = x^2 + 7x + 6$
∴ $3x^2 + 7x - 6 = 0$

$\therefore x = \frac{2}{3}$ or $x = -3$

As x cannot be negative, $x = \frac{2}{3}$

Hence, option 1.

191. $f(x) = 8x - 3x^2$

$\therefore f'(x) = 8 - 6x$

If $f'(x) = 0, x = \frac{4}{3}$

$f''(x) = -6$

$\therefore f''\left(\frac{4}{3}\right) = -6$

$\therefore$ The function has a maximum at $x = \frac{4}{3}$

$\therefore$ The maximum value of the function $= 8 \times \frac{4}{3} - 3 \times \frac{4}{3} \times \frac{4}{3}$

$= \frac{32}{3} - \frac{16}{3}$

$= \frac{16}{3}$

Hence, option 4.

192. $2x^2 + x < 6$

$\therefore 2x^2 + x - 6 < 0$

$\therefore 2x^2 + 4x - 3x - 6 < 0$

$\therefore 2x(x + 2) - 3(x + 2) < 0$

$\therefore (2x - 3)(x + 2) < 0$

$\therefore -2 < x < 3/2$

Hence, option 1.

193.

$x_{k+1} = x_k + \frac{1}{2}$

$\therefore x_1, x_2, x_3 \ldots\ldots, x_n$ form an arithmetic progression with common difference $d = 1/2$

$\because x_1 = 1$, first term $= a = 1$

Sum of n terms of an arithmetic progression

$= \frac{n}{2}[2a + (n-1)d]$

$= \frac{n}{2}\left[2(1) + (n-1)\frac{1}{2}\right]$

$= \frac{n}{2}\left[2 + \frac{n}{2} - \frac{1}{2}\right]$

$= \frac{n}{2}\left[\frac{n+3}{2}\right]$

$= \frac{n^2 + 3n}{4}$

Hence, option 4.

194. When the hour hand and minute hand form an angle of 110°, x minutes after 6:00 pm, we have two possibilities

1. The minute hand is behind the hour hand.
   The speed of the minute hand is 6° per minute and the speed of the hour hand is 0.5° per minute.
   Initial distance between the hour and the minute hands at 6:00 pm is 180°
   $\therefore (180 + 0.5x) - (6x) = 110°$
   $\therefore 180 - 5.5x = 110°$
   $\therefore x \approx 12.72$ minutes $\approx$ 12 minutes 43 seconds.

2. The minute hand is ahead of the hour hand.
   $\therefore 6x - 180 - 0.5x = 110°$
   $\therefore 5.5x - 180 = 110°$
   $\therefore x \approx 52.72$ minutes $\approx$ 52 minutes 43 seconds

   $\therefore$ The man leaves at 06:12:43 pm and returns at 06:52:43 pm
   $\therefore$ He is away for 40 minutes.

Hence option 2.

195. $(x - 8)(x - 10) = 2^y$
$\therefore$ Both $(x - 8)$ and $(x - 10)$ are powers of 2.
The only two powers of 2 that differ by 2 are 2 and 4.

Case(i) : $(x - 8) = 4$ and $(x - 10) = 2$
$\therefore x = 12$

Case(ii) : $x - 8 = -2$ and $x - 10 = -4$
$\therefore x = 6$

$\therefore$ There are two solutions of the given equation viz (12, 3) and (6, 3).

Hence, option 2.

196.

$y = \frac{x}{x+1}$

Substituting options, we find that (−1, 1) gives us 0 in the denominator.

$\therefore (-1, 1)$ cannot lie on the graph of $y = \frac{x}{x+1}$

Hence, option 4.

197.

$y = x^2$ and $y = 3x + k$

$\therefore x^2 = 3x + k$

$\therefore x^2 - 3x - k = 0$

This has two identical solutions when the discriminant of the equation is 0.

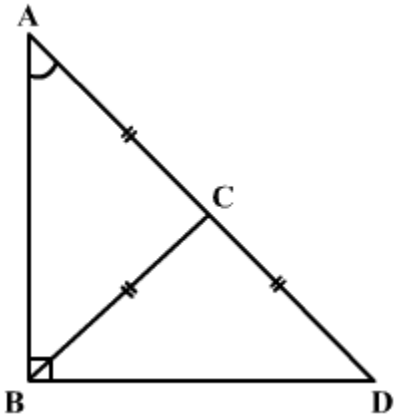
$\therefore (-3)^2 - 4(-k) = 0$

$\therefore 9 + 4k = 0$

$\therefore k = -9/4$

Hence, option 3.

198.



As C is the midpoint of the hypotenuse AD, it is the circumcentre.

$\therefore$ AC = CD = BC

But AB = BC

$\therefore$ In Δ BAC, AB = AC = BC

$\therefore$ Δ BAC is an equilateral triangle.

$\angle DAB = \angle BAC = 60°$

Hence, option 2.

199. Slope of the line $ax + by + c = 0$ is $-a/b$

(a) $3y - 2x = 12$

$\therefore$ slope $= 2/3$

(b) $-2x - 3y = 10$

$\therefore$ slope $= -2/3$

(c) $3y + 2x = 12$

$\therefore$ slope $= -2/3$

(d) $2y + 3x = 10$

$\therefore$ slope $= -3/2$

For two lines to be perpendicular, product of their slopes is -1.

$\therefore$ (a) and (d) represent perpendicular lines.

Hence, option 1.

200. a, b, c form an AP.

$\therefore 2b = a + c$

Increasing a by 1 or c by 2 results in a GP

$\therefore b^2 = (a + 1)c$ ...(i)

and $b^2 = a(c + 2)$ ...(ii)

$\therefore (a + 1)c = a(c + 2)$

$\therefore ac + c = ac + 2a$

$\therefore c = 2a$

Now, $2b = a + c$

$\therefore 2b = a + 2a$

$\therefore b = \frac{3a}{2}$

Putting this in (i), we get

$\frac{9a^2}{4} = (a + 1)2a$

$\therefore \frac{9a}{4} = 2a + 2$

$\therefore 9a = 8a + 8$

$\therefore a = 8$

$\therefore b = \frac{3a}{2} = \frac{3 \times 8}{2} = 12$

Hence, option 3.