6

CHAPTER

Miscellaneous Questions

MISCELLANEOUS QUESTIONS

1990

1. There were x pigeons and y mynahs in a cage. One fine morning p of them escaped to freedom. If the bird keeper, knowing only that p = 7, was able to figure out without looking into the cage that at least one pigeon had escaped, then which of the following does not represent a possible (x,y) pair?

(a) (10,8)

(b) (7,2)

(c) (25,6)

(d) (12,4)

2. Mr.X enters a positive integer Y in an electronic calculator and then goes on pressing the square – root key repeatedly. Then

(a) The display does not stabilize

(b) The display becomes closer to 0

(c) The display becomes closer to 1

(d) May not be true and the answer depends on the choice of Y

3. Consider the following steps :

1. Put x = 1, y = 2
2. Replace x by xy
3. Replace y by y +1
4. If y = 5 then go to step 6 otherwise go to step 5.
5. Go to step 2
6. Stop

Then the final value of x equals

(a) 1 (b) 24

(c) 120 (d) 720

Direction for Question 4: The question is followed by two statements. As the answer, MARK,

(a) if the question can be answered with the help of statement I alone,

(b) if the question can be answered with the help of statement II alone,

(c) if both, statement I and statement II are needed to answer the question, and

(d) if the statement cannot be answered even with the help of both the statements.

4. The unit price of product P1 is non-increasing and that of product P2 is decreasing. Which product will be costlier 5 years hence?

I. Current unit price of P1 is twice that of P2.

II. 5 years ago, unit price of P2 was twice that of P1.

5. 116 people participated in a singles tennis tournament of knock out format. The players are paired up in the first round, the winners of the first round are paired up in second round, and so on till the final is played between two players. If after any round, there is odd number of players, one player is given a bye, i.e. he skips that round and plays the next round with the winners. Find the total number of matches played in the tournament.

(a) 115 (b) 53

(c) 232 (d) 116

Directions for Questions 6 to 9: The pages of a book are numbered 0, 1, 2 … upto M, M>0. There are four categories of instructions that direct a person in positioning the book at a page. The instruction types and their meanings are :

1. OPEN : Position the book at page No. 1
2. CLOSE : Position the book at page No. 0
3. FORWARD, n :From the current page move forward by n pages; if, in this process, page number M is reached, stop at M.
4. BACKWARD, n : From the current page, move backward by n pages; if in this process, page number 0 is reached, stop at page number 0.

In each of the following questions, you will find a sequence of instructions formed from the above categories. In each case, let n_1 be the page number before the instructions are executed and n_2 be the page number at which the book is positioned after the instructions are executed.

6. FORWARD, 25 ; BACKWARD, 10.

Which of the following statements is true about above set of instructions?

(a) $n_1 = n_2$ if M = 10 and $n_1 = 0$

(b) M = 20 provided $n_1 > 0$

(c) $n_1 > 30$ provided M = 900

(d) $n_1 = 37$ provided M = 25

7. BACKWARD, 5; FORWARD, 5.

Which of the following statements is true about the above set of instructions?

(a) $n_1 = n_2$ provided $n_1 \geq 5$

(b) $n_1 = n_2$ provided $n_1 > 0$

(c) $n_2 = 5$ provided $M > 0$

(d) $n_1 > n_2$ provided $M > 0$

8. FORWARD, 10; FORWARD, 10.

Which of the following statements about the above instructions is true?

(a) $n_2 - n_1 = 20$ only if $n_1 = 0$

(b) $n_2 - n_1 = 20$ if $M > 20$ and $n_1 = 1$

(c) $n_2 - n_1 = 10$ if $M = 21$ and $n_1 = 0$

(d) $n_2 > n_1$ if $M > 0$

9. FORWARD, 5; BACKWARD, 4.

Which of the following statements about the above instructions is true?

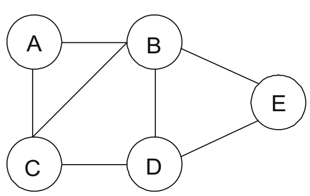
(a) $n_2 = n_1 + 4$ Provided $1 < n_1 < 7$

(b) $n_2 = n_1$ provided $M < 6$

(c) $n_2 = n_1+1$ provided $M - n_1 > 5$

(d) $n_2 - n_1 < 0$ provided $M > 0$

Directions for Questions 10 and 11: There are 5 cities, A, B, C, D and E connected by 7 roads as shown in the figure below:



Design a route such that you start from any city of your choice and walk on each of the 7 roads once and only once, not necessarily returning to the city from which you started.

10. For a route that satisfies the above restrictions, which of the following statements is true?

(a) There is no route that satisfies the above restriction.

(b) A route can either start at C or end at C, but not both.

(c) D can be only an intermediate city in the route.

(d) The route has to necessarily end at E.

11. How many different starting cities are possible such that the above restriction is satisfied?

(a) One (b) Zero

(c) Three (d) Two

Directions for Questions 12 and 13: Answer the questions on the basis of the information given below.

In a game played by two people there were initially N match sticks kept on the table. A move in the game consists of a player removing either one or two matchsticks from the table. The one who takes the last matchstick loses. Players make moves alternately. The player who will make the first move is A. The other player is B.

12. The smallest value of N (greater than 5) that ensures a win for B is

(a) 7 (b) 6

(c) 10 (d) 8

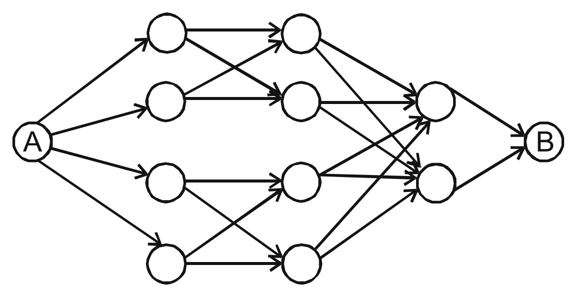
13. The largest value of N (less than 50) that ensures a win for B is

(a). 46 (b) 47

(c) 48 (d) 49

1991

14. What is the total number of ways to reach A to B in the network given?



(a) 12 (b) 16

(c) 20 (d) 22

15. A calculator has two memory buttons, A and B. Value 1 is initially stored in both memory locations. The following sequence of steps is carried out five times:

add 1 to B

multiply A to B

store the result in A

What is the value stored in memory location A after this procedure?

(a) 120 (b) 450

(c) 720 (d) 250

16. In a six-node network, two nodes are connected to all the other nodes. Of the remaining four, each is connected to four nodes. What is the total number of links in the network?

(a) 13 (b) 15

(c) 7 (d) 26

1993

17. An intelligence agency decides on a code of 2 digits selected from 0, 1, 2, …. , 9. But the slip on which the code is hand–written allows confusion between top and bottom, because these are indistinguishable. Thus, for example, the code 91 could be confused with 16. How many codes are there such that there is no possibility of any confusion?

(a) 25
(b) 75
(c) 80
(d) None of these

18. 139 persons have signed up for an elimination tournament. All players are to be paired up for the first round, but because 139 is an odd number one player gets a bye, which promotes him to the second round, without actually playing in the first round. The pairing continues on the next round, with a bye to any player left over. If the schedule is planned so that a minimum number of matches is required to determine the champion, the number of matches which must be played is

(a) 136 (b) 137
(c) 138 (d) 139

19. There are ten 50 paise coins placed on a table. Six of these show tails, four show heads. A coin is chosen at random and flipped over (not tossed). This operation is performed seven times. One of the coins is then covered. Of the remaining nine coins, five show tails and four show heads. The covered coin shows

(a) a head
(b) a tail
(c) more likely a head
(d) more likely a tail

Directions for Questions 20 to 23: Use the following information:

Swetha, Swarna, Sneha and Soumya are four sisters who have an agreement that they share all snacks equally among themselves. One day, uncle Prem gave a box of cookies to Swetha. Since the other sisters were not around, Swetha divided the cookies into four parts, ate her share and put the rest into the box. As she was closing the box, Swarna came in, She took all the cookies from the box and divided them into four equal parts. Swetha and Swarna ate one part each and put the rest into the box. Just then Sneha walked in. She took all the cookies from the box, divided them into four equal parts. The three of them ate their respective shares and put the rest into the box. Later, when Soumya came, she divided all the cookies into four equal parts and all the four sisters ate their respective shares. In total, Soumya ate 3 cookies.

20. How many cookies, in total, did Sneha eat?

(a) 30 (b) 12
(c) 15 (d) 6

21. How many cookies did uncle Prem give to Swetha?

(a) 128 (b) 156
(c) 256 (d) 192

22. How many cookies, in total, did Swetha eat?

(a) 32 (b) 142
(c) 72 (d) 71

23. How many cookies, in total, did Swarna eat?

(a) 9 (b) 30
(c) 39 (d) 78

Directions for Questions 24 to 26 : The following functions have been defined for three numbers A, B and C:

@ (A, B) = average of A and B

*(A, B) = product of A and B

/(A, B) = A divided by B

Answer these questions with the above data.

24. If A = 2 and B = 4, the value of @(/(*(A, B), B), A) would be

(a) 2 (b) 4
(c) 6 (d) 16

25. The sum of A and B is given by

(a) *(@(A, B), 2)
(b) /(@(A, B), 2)
(c) @(*(A, B), 2)
(d) @(/(A, B), 2)

26. The sum of A, B, and C is given by

(a) *(@(*(@(B, A), 2), C), 3)
(b) /(@(*(@(B, A), 3), C), 2)
(c) /(*(@(*(B, A), 2), C), 3)
(d) None of these

1996

27. A cube of side 12 cm is painted red on all the faces and then cut into smaller cubes, each of side 3 cm. What is the total number of smaller cubes having none of their faces painted?

(a) 16 (b) 8
(c) 12 (d) 24

1998

Direction for Question 28: The question is followed by two statements, I and II. Answer the questions based on the statements and mark the answer as

(a) if the question can be answered with the help of any one statement alone but not by the other statement.

(b) if the question can be answered with the help of either of the statements taken individually.

(c) if the question can be answered with the help of both statements together.

(d) if the question cannot be answered even with the help of both statements together.

28. Find $2 \otimes 3$, where $2 \otimes 3$ need not be equal to $3 \otimes 2$.

I. $1 \otimes 2 = 3$

II. $a \otimes b = \frac{(a+b)}{a}$, where a and b are positive.

2001

29. If 09/12/2001(DD/MM/YYYY) happens to be Sunday, then 09/12/1971 would have been a

(a) Wednesday (b) Tuesday

(c) Saturday (d) Thursday

2002

30. The owner of a local jewellery store hired three watchmen to guard his diamonds, but a thief still got in and stole some diamonds. On the way out, the thief met each watchman, one at a time. To each he gave $\frac{1}{2}$ of the diamonds he had then, and 2 more besides. He escaped with one diamond. How many did he steal originally?

(a) 40 (b) 36

(c) 25 (d) None of these

Directions for Questions 31 and 32: Answer the questions based on the following information.

A boy is asked to put one mango in a basket when ordered '1', one orange when ordered '2', one apple when ordered '3', and is asked to take out from the basket one mango and an orange when ordered '4'. A sequence of orders is given as:

1 2 3 3 2 1 4 2 3 1 4 2 2 3 3 1 4 1 1 3 2 3 4

31. How many total oranges were in the basket at the end of the above sequence?

(a) 1 (b) 4

(c) 3 (d) 2

32. How many total fruits will be in the basket at the end of the above order sequence?

(a) 9 (b) 8

(c) 11 (d) 10

2003(R)

33. Using only 2, 5, 10, 25, and 50 paisa coins, what will be the minimum number of coins required to pay exactly 78 paise, 69 paise and Rs. 1.01 to three different persons?

(a) 19 (b) 20

(c) 17 (d) 18

2003(L)

34. Twenty-seven persons attend a party. Which one of the following statements can never be true?

(a) There is a person in the party who is acquainted with all the twenty-six others.

(b) Each person in the party has a different number of acquaintances.

(c) There is a person in the party who has an odd number of acquaintances.

(d) In the party, there is no set of three mutual acquaintances.

35. In a certain examination paper, there are n questions. For j = 1,2 …n, there are 2^{n-j} students who answered j or more questions wrongly. If the total number of wrong answers is 4095, then the value of n is

(a) 12 (b) 11

(c) 10 (d) 9

2004

Direction for Question 36: The question is followed by two statements, A and B. Answer the question using the following instructions.

Choose (a) if the question can be answered by using one of the statements alone but not by using the other statement alone.

Choose (b) if the question can be answered by using either of the statements alone.

Choose (c) if the question can be answered by using both statements together but not by either statement alone.

Choose (d) if the question cannot be answered on the basis of the two statements.

36. Tarak is standing 2 steps to the left of a red mark and 3 steps to the right of a blue mark. He tosses a coin. If it comes up heads, he moves one step to the right; otherwise he moves one step to the left. He keeps doing this until he reaches one of the two marks, and then he stops. At which mark does he stop?

A. He stops after 21 coin tosses.

B. He obtains three more tails than heads.

2008

Directions for Questions 37 and 38: The question is followed by two statements, A and B. Answer the question using the following instructions.

Mark (a) if Q can be answered from A alone but not from B alone.

Mark (b) if Q can be answered from B alone but not from A alone.

Mark (c) if Q can be answered from A alone as well as from B alone.

Mark (d) if Q can be answered from A and B together but not from any of them alone.

Mark (e) if Q cannot be answered even from A and B together.

In a single elimination tournament, any player is eliminated with a single loss. The tournament is played in multiple rounds subject to the following rules :

(a) If the number of players, say n, in any round is even, then the players are grouped into n/2 pairs. The players in each pair play a match against each other and the winner moves on to the next round.

(b) If the number of players, say n, in any round is odd, then one of them is given a bye, that is he automatically moves on to the next round. The remaining (n–1)players are grouped into (n–1)/2 pairs. The players in each pair play a match against each other and the winner moves on to the next round. No player gets more than one bye in the entire tournament.

Thus, if n is even, then n/2 players move on to the next round while if n is odd, then (n+1)/2 players move on to the next round. The process is continued till the final round, which obviously is played between two players. The winner in the final round is the champion of the tournament.

37. What is the number of Matches played by the champion?

A. The entry list for the tournament consists of 83 players.

B. The champion received one bye.

38. If the number of players, say n, in the first round was between 65 and 128, then what is the exact value of n?

A. Exactly one player received a bye in the entire tournament.

B. One player received a bye while moving on to the fourth round from the third round.

2016

39. A leap year X has exactly the same calendar as another leap year Y. What can be the absolute difference between the values of X and Y?

(a) 12 (b) 28

(c) 40 (d) All of these

ANSWERS

1. (a)	**2.** (c)	**3.** (b)	**4.** (d)	**5.** (a)	**6.** (a)	**7.** (a)	**8.** (b)	**9.** (c)	**10.** (b)
11. (d)	**12.** (a)	**13.** (d)	**14.** (b)	**15.** (c)	**16.** (a)	**17.** (c)	**18.** (c)	**19.** (a)	**20.** (c)
21. (a)	**22.** (d)	**23.** (c)	**24.** (a)	**25.** (a)	**26.** (a)	**27.** (b)	**28.** (a)	**29.** (d)	**30.** (b)
31. (d)	**32.** (c)	**33.** (a)	**34.** (b)	**35.** (a)	**36.** (b)	**37.** (d)	**38.** (d)	**39.** (d)	

EXPLANATIONS

1. a For the bird keeper to figure out that at least 1 pigeon had escaped, the number of mynahs has to be less than 7. In other words, $y < 7$. Hence, the pair (10,8)is not a valid one.

2. c Repeated square root of positive integer y

$$= \left(\left(\left(y^{\frac{1}{2}}\right)^{\frac{1}{2}}\right)^{\frac{1}{2}}\right)^{\cdot^{\cdot^{\infty}}} = (y)^{\frac{1}{2^{\infty}}} = y^0 = 1.$$

3. b The successive values of x and y are as follows:

Cycle	X	Y	XY	Y+1
1	1	2	2	3
2	2	3	6	4
3	6	4	24	5
4	24	5		

4. d Although using both the statements we can find out by how much has the price of P1 and P2 changed over the 5 years, we cannot answer the question that is being asked as it is no where mentioned that the rate of change is uniform.

5. a There are 116 players in all. If we have to choose 1 winner, there have to be 115 losers in all. And since 1 match gives 1 loser, there has to be 115 matches to be played in all in the tournament.

6. a FORWARD 25, BACKWARD 10 would effectively mean FORWARD 15 i.e. n_2-n_1 = 15, (if $M - n_1 > 25$) and $n_2 = M - 10$ (if $M - n_1 < 25$).

The only option satisfies is option (a).

So if M = 10 and n_1 = 0., then $M - n_1 < 25$ and so $n_2 = 10 - 10 = 0$. Hence, $n_1 = n_2$.

7. a BACKWARD, 5; FORWARD, 5 would effectively mean $n_1 = n_2$ (in case $n_1 \geq 5$) or $n_2 = 5$ (in case $n_1 < 5$). The only option that satisfies this is (a).

8. b FORWARD, 10 ; FORWARD, 10 would effectively mean FORWARD 20 i.e. n_2-n_1 = 20, (if $M - n_1 \geq 20$).or $n_2 = M$ (if $M - n_1 < 20$).

The option that satisfies this condition is (b), as if M>20 and n_1=1, then $M - n_1 > 20$, and hence n_2-n_1 = 20.

9. c FORWARD, 5; BACKWARD, 4, would effectively mean FORWARD 1 i.e. n_2-n_1 = 1 (if $M - n_1 \geq 5$) or $n_2 = M - 4$ (if $M - n_1 < 5$).

The option that satisfies this condition is (c).

10. b Option (a)cannot be true as there are many routes that satisfy the given condition. Option (c) is also not true as we can have a route starting from D (eg. DEBDCBAC). The route need not necessarily end at E, which is apparent from the given example.

Hence, the correct option is (b).

11. d City A is connected by 2 roads, B by 4 roads, C by 3 roads, D by 3 roads and E by 2 roads. For a city to be starting city for such a route, it has to be connected by odd number of roads. Hence, the required answer is 2 i.e. C and D are the stating cities.

For questions 12 and 13: Students please note that the best way to answer this question is by finding generally what would ensure a win for B. If B has to win, A has to pickup the last matchstick. This can be forced upon A if there are 2 or 3 matchsticks left on the table when it is B's turn. As then, B could pick-up 1 or 2 matchsticks and force upon A to pick-up the last one. For this to happen there should always be odd number of matchsticks initially. Eg. If there are 7 match sticks initially any of the following combinations will leave either 2 or 3 matchsticks on the table when it is B's turn.

A	B	B	A			
1	2	3	4	5	6	7

A	B	B	A	A		
1	2	3	4	5	6	7

A	A	B	A			
1	2	3	4	5	6	7

A	A	B	A	A		
1	2	3	4	5	6	7

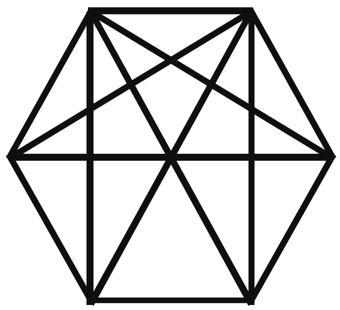
Hence, the smallest value of N (greater than 5) to ensure a win for B is 7. Also the largest value of N (less than 50)to ensure a win for B is 49.

14. b Total number of ways to reach A to B = 4 × 2 × 2 × 1 = 16.

15. c

	A	B	Step I	Step II	Step III	Step III
			(B + 1)	(A x B)	A	B
Beginning	1	1				
1st Time	1	1	B =2	(1 × 2) = 2	2	2
2nd Time	2	2	B = 3	(2 × 3) = 6	6	3
3rd Time	6	3	B = 4	(6 × 4) = 24	24	4
4th Time	24	4	B = 5	(24 × 5) = 120	120	5
5th Time	120	5	B = 6	(120 × 6) = 720	**720**	6

16. a We find that the total number of links in the network is 13. (Note : In the diagram given below, the top two nodes are connected to all the other nodes, while the remaining four are connected to only four other nodes).



17. c Total number of two-digit codes that can be formed is 10 × 10 = 100

Out of them 0,1,6,8,9 can create confusion.

Using these five digits, total number of two-digit numbers that can be made is 5 × 5 = 25.

But out of these 25 numbers, 00, 11, 88, 69 and 96 will not make any confusion.

Hence, the required answer is 100 – 25 + 5 = 80.

18. c This can be logically done in the following manner. There are 139 players in all. We want to determine 1 champion among them. So all except the Champion should lose. A player can lose only once and since any match produces only one loser, to produce 138 losers, there should be 138 matches that should be played.

19. a The initial reading for 10 coins is : 6 Tails and 4 Heads

After repeating the process of flipping one coin at random for 7 times, the final reading for 9 coins is: 5 Tails and 4 Heads.

Therefore, possible final reading for 10 coins is:

6 Tails and 4 Heads or 5 Tails and 5 Heads.

If the final reading is 6T and 4H, it is same as the initial one. However, this is not possible as the process of flipping a coin has taken place an odd number of times, so there has to be atleast one change in the final reading.

Therefore, the final reading is 5T and 5H.

So the covered coin will certainly be a Head.

For questions 20 to 23: Since Soumya was the last one to eat the cookies and she ate 3 cookies, the total number of cookies left when she entered the room = (3 × 4) = 12. This should be Soumya's share that was left in the box uneaten. Hence, just before Soumya entered, Swetha, Sneha and Swarna would have eaten their share of 12 cookies each. Total number of cookies left when Sneha entered = (12 × 4) = 48. This in turn should have been the combined share of Sneha and Soumya (24 × 2) that was left in the box uneaten. So just before Sneha entered, Swetha and Swarna should have eaten 24 cookies each. In other, words number of cookies left, just before Swarna entered = (24 × 4) = 96. Now this should have been the combined share of Swarna, Sneha and Soumya (3 × 32) that was kept in the box by Swetha . So just before Swarna entered, Swetha must have eaten her share of 32 cookies. Hence, total number of cookies given by Prem uncle = (32 × 4) = 128.

The situation is also shown in the following table:-

		Number of cookies eaten					
		Swetha	**Swarna**	**Sneha**	**Soumya**	**Not Eaten**	**Total**
Girl entered	**Soumya**	3	3	3	3	-	12
	Sneha	12	12	12	-	12	48
	Swarna	24	24	-	-	(24×2) = 48	96
	Swetha	32	-	-	-	(32×3) = 96	128
	Total	71	39	15	3	-	-

20. c Sneha ate 15 cookies, in total.

21. a Prem uncle gave 128 cookies to Swetha.

22. d Swetha ate 71 cookies, in total.

23. c Swarna ate 39 cookies, in total.

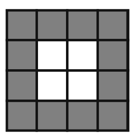
24. a @(/(*(2, 4), 4), 2)= @(/(8, 4), 2) = @(2, 2)   2.

25. a A + B = 2((A + B)/2)= 2(@(A, B)) = *(@(A, B), 2).

26. a Sum of A, B, C =[A + B + C] = 3{[2((A + B)/2) + C] / 3} =*(@(*(@(B, A), 2), C), 3).

(**HINT :** Students please note that for Q87 and Q88, if it doesn't strike you to simplify in this manner, the best way is to simplify the answer choices and work backwards.)

27. b Since each side of the smaller cube is 3 cm, it can be figured out that each face of the original cube is divided into 4 parts, or in other words, the original cube is divided into 64 smaller cubes. For a smaller cube to have none of its sides painted, it should not be a part of the face of the original cube (i.e. none of its faces should be exposed). We can find at the centre of the original cube there are (2 × 2 × 2)= 8 such cubes.



Hint: Students please note that the answer can only be a cube of some integer. The only cube among the answer choices is $(2)^3 = 8$.

28. a It is clear that statement II alone is enough to answer the question. This statement gives the value of the function $a \otimes b$, so we can find the value of $2 \otimes 3$.

So $2 \otimes 3 = \frac{(2+3)}{2} = 2.5$

29. d 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

30. b Since thief escaped with 1 diamond,

Before 3rd watchman he had (1 + 2) × 2 = 6 diamonds.

Before 2nd watchman he had (6 + 2) × 2 = 16 diamonds.

Before 1st watchman he had (16 + 2) × 2 = 36 diamonds.

31. d Number of oranges at the end of the sequence = Number of (2s)– Number of (4s) = 6 – 4 = 2

32. c Number of (1s + 2s + 3s)– 2(Number of 4s) = 19 – 8 = 11

33. a Let's make the given sum by using minimum number of coins as

Value of coin	No. of coins	No. of coins	No. of coins	Total no. of coins
50	1	1	1	3
25	—	—	1	1
10	1	2	2	5
5	1	—	—	1
2	2	4	3	9
Total amount	69	78	101	19

34. b Since there are 27 people, each person can have 0 upto 26 acquaintances.

If a person has zero acquaintances, then the maximum number of acquaintances any of the other persons can have is 25.

Similarly, if a person has one acquaintance, then the maximum number of acquaintances any of the other persons can have is 26.

Therefore, the number of acquaintances can be any number from 0 to 25 or from 1 to 26. This rules out options (a) and (c).

The congregation consists of 27 people whereas the number of acquaintances any person can have is 26 (either 0 to 25 or 1 to 26). This implies that there is one person who share the same number of acquaintances as atleast one of the other persons. This contradicts option (b).

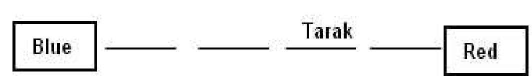
Hence, (b)is the desired option.

Note: If we consider the situation other wise, to satisfy condition 2, the first person must have 26 acquaintances, the second 25, third 24 and so on. If we continue, the last one should have 0 acquaintance, which is not possible.

35. a Let us say there are only 3 questions. Then, there are $2^{3-1} = 4$ students who have done 1 or more questions wrongly, $2^{3-2} = 2$ students who have done 2 or more questions wrongly and $2^{3-3} = 1$ student who must have done all 3 wrongly. Thus, total number of wrong answers = 4 + 2 + 1 = 7 $= 2^3 - 1 = 2^n - 1$.

In our question, the total number of wrong answers $= 4095 = 2^{12} - 1$. Thus n = 12.

36. b



Statement A: To reach the Red mark, Tarak needs to take even number of steps and to reach the Blue mark, he needs to take odd number of steps. Given that the number of steps taken by him is 21. Therefore, Tarak stops at the Blue mark.

Hence, statement A alone is sufficient.

Statement B: If the number of tails is 3 more than the heads, then the effective movement will be 3 steps to the left, i.e. Tarak will reach Blue mark.

Hence, statement B alone is sufficient.

37. d **Statement A:** If the number of players at the entry level is 83, we can get the following table.

Round	Number of players	Pair of players	Byes	Number of matches
1	83	41	1	41
2	41 + 1 = 42	21	0	21
3	21	10	1	10
4	10 + 1 = 11	5	1	5
5	5 + 1 = 6	3	0	3
6	3	1	1	1
7	1 + 1 = 2	1	0	1

Since we do not know the number of byes given to the champion, we cannot ascertain the number of matches played by him.

Hence, statement A alone is not sufficient.

Statement B: The champion received one bye, but no information is given regarding the number of entrants in the tournament.

Hence, statement B alone is not sufficient.

Combining statements A and B: We get that the total number of matches played by the champion = 7 - 1 = 6

Hence, statements A and B both are required to answer.

38. d **Using statement A:**

When n = 127, exactly one bye is given in round 1.

When = 96, exactly one bye is given in round 6.

As no unique value of n can be determined, hence, statement A alone is not sufficient.

Using statement B:

As we do not know exactly how many bye 5 are given in total, we cannot determine the value of n, uniquely.

Combining statement A and B:

There is a unique value of n = 124, for which exactly 1 bye is given from the third round to the fourth round.

39. d The calendars of two leap years with a gap of 28 years will be the same. E.g. the calendars of 1908 and 1936 are exactly the same.

The calendars of two leap years with a gap of 12 years will be the same if a century year, which is not a leap year, falls between the two years. E.g. since 1900 falls between 1896 and 1908, the calendars of 1896 and 1908 are exactly the same.

Also, we can see that the calendars of 1896 and 1936 (a gap of 40 (12 + 28) years) are exactly the same.