

Number of Questions : 30

Directions for questions 1 to 3: Answer the questions on the basis of the information given below.

An aeroplane has 5 intermediate stops on its route. The aeroplane starts from stop 1 and then stops at stop 2, stop 3, stop 4, stop 5, stop 6 and stop 7 (in that order). Stop 1 and stop 7 are called terminal stops. In its return journey, the aeroplane starts from stop 7 and returns to stop 1, stopping at all the above intermediate stops in the reverse order. The stops are at seven airports: Khujuraho, Barangal, Sindh, Kangi, Manthoo, Khurshi and Thansu, not necessarily in that order.

Some additional information is also available:

- I. The aeroplane stops at exactly two stops between Manthoo and Sindh.
 - II. Immediately before Barangal, the aeroplane stops at Khurshi.
 - III. The airport at Kangi is not one of the terminal stops.
1. In case stop 4 is at Khujuraho, which among the following must be true?
 - (1) Either Khurshi or Barangal is one of the terminal stops.
 - (2) Kangi must be the stop 3.
 - (3) Manthoo must be one of the terminal stops.
 - (4) Both (1) and (3)
 2. If Thansu is stop 2, which among the following cannot be the Khurshi airport?
 - (1) Stop 5
 - (2) Stop 3
 - (3) Stop 4
 - (4) Stop 3 and Stop 4

3. After leaving the terminal stop during the return journey, the third place where the aeroplane stopped is the Kangi airport. How many possible positions (out of the seven stops) can Thansu airport occupy in the return journey?
 - (1) 3
 - (2) 4
 - (3) 5
 - (4) 6

Directions for questions 4 to 7: Answer the questions on the basis of the information given below.

Each of the 10 persons namely A, Q, R, Z, M, N, P, B, K and L are wearing a shirt. The colour of each shirt is one out of blue, green and red. There are ten chairs placed in a row. The chairs are consecutively numbered 1, 2, 3, 4...9 and 10 from left to right in that order. These ten persons have to sit on the chairs such that there is only one person in each chair. The number of persons wearing a green and a blue shirt is 2 and 3 respectively.

Additional Information:

1. No two persons wearing blue shirts sit on consecutively numbered chairs.
2. Among the persons wearing red shirts, exactly three persons always is sitting together while the remaining two never.
3. A person wearing a blue shirt and a person wearing a green shirt never is sitting on consecutively numbered chairs.
4. A person wearing a green shirt cannot sit on chairs numbered 2 or 9.
5. Persons wearing red shirt are not sitting at extreme end.

The following table provides information about the six different seating arrangements namely I, II, III, IV, V and VI of the ten persons done by Mr. Crazy. He observed that out of all the seating arrangements done by him, there is one arrangement that is not consistent with the information stated under "Additional Information".

		Chair Number									
Arrangements		1	2	3	4	5	6	7	8	9	10
	I	B	P	Q	K	L	R	A	Z	M	N
	II	A	P	L	K	Z	M	Q	B	R	N
	III	N	Q	Z	M	K	L	P	B	R	A
	IV	N	M	B	Q	R	P	L	K	Z	A
	V	B	Z	Q	R	L	K	M	A	P	N
	VI	A	R	M	Z	K	L	P	N	Q	B

4. Which of the arrangements done by Mr. Crazy is not consistent with the information stated under "Additional Information"?
 (1) I (2) VI
 (3) III (4) V
5. Which of the following persons is wearing a blue shirt?
 (1) R (2) K
 (3) L (4) N
6. Which of the following persons is wearing a green shirt?
 (1) K (2) A
 (3) R (4) P
7. Which of the following is not a permissible group of four persons such that the number of persons wearing a red, a green and a blue shirt is 2, 1 and 1 respectively?
 (1) A, P, L and R (2) N, Q, K and Z
 (3) K, A, N and Z (4) B, L, M and Q

Directions for questions 8 to 12: Answer the questions on the basis of the information given below:

Alord received a large order for stitching school uniforms from Mayflower School and Little Flower School. He has two cutters who will cut the fabric, five tailors who will do the stitching, and two assistants to stitch the buttons and button holes.

Each of these 9 persons work for 10 hrs in a day. Each of the Mayflower uniform requires 20 min for cutting the fabric, 1 hr for stitching, and 15 min for stitching buttons and button holes, whereas the Little Flower uniform requires 30 min, 1 hr, and 30 min respectively for these activities.

Following steps are followed, to complete the work:
 Step I: Cutter will cut fabric.
 Step II: Tailor will do the stitching.
 Step III: Assistant will stitch the buttons and button holes.

8. What is the maximum number of Little Flower uniforms that Alord can make in a day?
9. What is the maximum number of Mayflower uniforms that Alord can make in a day?
10. On a particular day, Alord decided to make 20 Little Flower uniforms. How many Mayflower uniforms can be made on that day?
11. If Alord decides to make 30 Little Flower uniforms only and no other uniform on a particular day, how many total man-hours will remain unutilised?
 (Man-hours for a task = number of men who can do the task × number of hours for task)
12. What is the maximum total number of uniforms Alord can complete in a day if he has to deliver at least 15 uniforms to both the schools everyday?

Directions for questions 13 to 15: Answer the questions on the basis of the information given below.

Six friends namely Brijesh, Vijay, Shishir, Ujjawal, Jeetu and Narayan planned to watch the 3rd ODI of the on-going cricket match series between India Vs Pakistan in Kanpur. They decided to board from New Delhi to Kanpur on a certain day. Each of the friend board a different train on the same day between 7:45 pm to 11:30 pm. The trains were namely Shramshakti Express, Licchavi Express, Mahabodhi Express, Shivganga Express, Purushottam Express and Gorakhdham Express. The timings for the departure

of the trains were 8:00 pm, 9:40 pm, 8:30 pm, 10:20 pm, 11:15pm and 9:10 pm (not necessarily in the same order). Further, it is given that:

- (i) Shishir and Vijay departed at an interval of 30 minutes. Ujjawal and Jeetu departed at an interval of 40 minutes.
- (ii) Brijesh departed from Purushottam Express and the one who departed at last did not board by Licchavi.
- (iii) Gorakhdham and Shramshakti departed at an interval of 30 minutes
- (iv) Jeetu and Shishir departed from Shivganga and Shramshakti respectively.
- (v) Ujjawal departed immediately after Brijesh who departed at 9:10 pm.

13. Among all the given trains, "Licchavi Express" departed at
 (1) 9:40 pm (2) 9:10 pm
 (3) 10:20 pm (4) 11:15 pm

14. Who was the last friend to depart?
 (1) Vijay (2) Ujjawal
 (3) Narayan (4) Shishir

15. Which was the last train, out of the given six, to depart from 'New Delhi' to 'Kanpur' ?
 (1) Purushottam Express
 (2) Mahabodi Express
 (3) Shivganga Express
 (4) Gorakhdham Express

Directions for question 16 to 19: Answer the questions on the basis of the information given below.

There are 8 friends – J, K, L, M, N, O, P and Q – who are sitting in a circle. It is also known that:

- i. Q is sitting to the immediate right of N.
- ii. O is sitting opposite to K, who has 2 people sitting between J and himself.
- iii. L is sitting opposite N and second to the left of O.
- iv. O and M are neighbours.

16. Who is sitting to the immediate right of K?
 (1) Q (2) P
 (3) L (4) J

17. Who is sitting opposite to Q?
 (1) P (2) J
 (3) M (4) J or M

18. Who is sitting 2 seats to the left of L?
 (1) K (2) O
 (3) M (4) Q

19. If J switches his place with the person opposite him, then who of the following cannot be neighbour of J?
 (1) Q (2) P
 (3) O (4) All of these

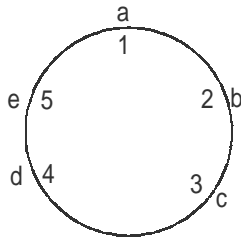
Directions for questions 20 to 23: Answer the questions on the basis of the information given below.

A circular field, with inner radius of 10 meters and outer radius of 20 meters, was divided into five successive stages for ploughing. The ploughing of each stages was handed over to a different farmer.

- 1. Farmers are referred to by following symbols: F1, F2, F3, F4, F5.
 - 2. The points between different stages of project are referred to by the following symbols: P1, P2, P3, P4, P5, not necessarily in the order.
 - 3. Farmer F5 was given the work of ploughing stage starting at point P4.
 - 4. The stage from point P5 to point P3 was not the first stage.
 - 5. Farmer F4 was given the work of the fourth stage.
 - 6. Stage 3 finished at point P1, and the work of which was not given to farmer F1.
 - 7. Farmer F3 was given work of stage ending at point P5. **[XAT-2009]**
20. For which farmer was P2 a finishing point?
 (1) F1 (2) F2
 (3) F3 (4) F5

21. Which were the starting and finish points of stage 2?
 (1) P2 and P5 (2) P5 and P3
 (3) P3 and P1 (4) P5 and P4
22. Which was the starting point for Farmer F3?
 (1) P2 (2) P3
 (3) P4 (4) P1
23. Which was the finish point for farmer F2?
 (1) P1 (2) P2
 (3) P3 (4) P4

Directions for questions 24 to 27: Answer the questions on the basis of the information given below.



A process consists of interchanging the letters at the position given within brackets, for example, (1, 2) means that letters in positions 1 and 2 are interchanged. The whole process may be an interchange of one or more pairs of letters.

24. If a process is a combination of (1, 2), (2, 3), (5, 4) and (4, 3) in succession, how many minimum number of such processes in succession need to occur so that all the letters come back to their original positions?
 (1) 1 (2) 2
 (3) 3 (4) 5
25. If a process is a combination of (1, 2), (2, 3), (5, 4) and (4, 3) in succession, how many letters out of the 5 would be at their original position when the process is executed 101 times successively?
 (1) 0 (2) 2
 (3) 3 (4) 4

26. If a process is a combination of (1, 2); (2, 4); (5, 4) in succession, which letter will be at the position 1 when the process is executed 100 times successively?
 (1) a (2) e
 (3) d (4) c
27. If a process is a combination of (1, 2); (2, 3); (3, 4); (4, 2); (4, 1); (3, 1); (3, 2); (2, 4) and (1, 4) in succession, the intermediate processes are redundant except the exchange of letters at the positions
 (1) (1, 2) (2) (2, 3)
 (3) (1, 4) (4) (1, 3)

Directions for questions 28 to 30: Answer the questions on the basis of the information given below.

Divide a circle into eight equal parts and number them in clockwise order from 1 to 8. Assume that you are at 1 with a score 1. You can move only in one of the three directions - one slot clockwise, one slot anticlockwise, or diagonally across. If you move a step clockwise, you add the number of the slot you move to your current score for a new score. If you move a step anticlockwise, you add the number in that slot but subtract 2 from the total to get a new score. If you move diagonally across, you add that number but subtract 3 from the total to get a new score.

28. Your maximum score after the third move can be
 (1) 12 (2) 16
 (3) 20 (4) 13
29. Assuming a clockwise move as the first move, then the score you can not get the first three moves is
 (1) 7 (2) 10
 (3) 13 (4) 9
30. If you make three moves, you can get a score of
 (1) 8 (2) 9
 (3) 10 (4) Any of the above

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LRDI - 05

Answers and Explanations

CEX-D-0277/18

1	1	2	4	3	2	4	1	5	4	6	1	7	3	8	3	9	1	10	1
11	2	12	4	13	1	14	3	15	2	16	2	17	4	18	1	19	4	20	4
21	2	22	1	23	1	24	4	25	1	26	1	27	4	28	3	29	1	30	4

1. 1 We know that Manthoo and Sindh are separated by two positions, Khurshi and Barangal are always together and Kangi is neither stop 1 nor stop 7. If Khujuraho is stop 4, then there are four possibilities for order of the stops in which Khurshi and Barangal can interchange their positions.

Case I: Two possibilities when Manthoo and Sindh are in 3rd and 6th OR 6th and 3rd positions.

Stop Number	1	2	3	4	5	6	7
Airports	Khurshi	Barangal	Manthoo	Khujuraho	Kangi	Sindh	Thansu
Airports	Khurshi	Barangal	Sindh	Khujuraho	Kangi	Manthoo	Thansu

Case II: Two possibilities when Manthoo and Sindh are in 2nd and 5th OR 5th and 2nd positions.

Stop Number	1	2	3	4	5	6	7
Airports	Thansu	Manthoo	Kangi	Khujuraho	Sindh	Khurshi	Barangal
Airports	Thansu	Sindh	Kangi	Khujuraho	Manthoo	Khurshi	Barangal

In all of these four possibilities, either Khurshi or Barangal is one of the terminal stops. So, statement (1) must be true. In each of these cases (I and II) Khurshi and Barangal can interchange their places as we do not know whether Khurshi is immediately before Barangal in its onward journey or return journey.

2. 4 Here Thansu is stop 2. If Khurshi is stop 3, Barangal will be stop 4 and it would be impossible to accommodate other stops as per given conditions.
Hence Khurshi can't be stop 3.
If Khurshi is stop 4, then Barangal is either stop 3 or stop 5.
(a) When Barangal is stop 3.
It would again be impossible to accommodate Manthoo and Sindh.
(b) When Barangal is stop 5.
In this case Manthoo and Sindh will be occupying stop 3 and stop 6 (not necessarily in the order). This condition is not possible.
Khurshi can be stop 5. In this case Barangal will be stop 6 and there would not be any problem in accommodating

3. 2 The stops order for different cases are listed below:

Stop Number	1	2	3	4	5	6	7
Case I	Khurshi	Barangal	Manthoo	Kangi	Thansu	Sindh	Khujuraho
Case II	Khurshi	Barangal	Manthoo	Kangi	Khujuraho	Sindh	Thansu
Case III	Khujuraho	Manthoo	Thansu	Kangi	Sindh	Khurshi	Barangal
Case IV	Thansu	Manthoo	Khujuraho	Kangi	Sindh	Khurshi	Barangal

Among the possibilities, there are four possible positions of stops of Thansu.

(The position of Khurshi and Barangal can be interchanged and the same is true for Manthoo and Sindh)

For questions 4 to 7:

Let the people who wear a blue, red and green shirt be denoted by b, r and g respectively.

Restrictions on the seating arrangement:

- Two b's must not be together.
- Three r's must be together.
- A 'b' and a 'g' must not be together.
- A 'g' cannot sit on chair numbered 2 or 9.

Case I:

A person wearing a green shirt is sitting on chair numbered 1. It is only possible if another person wearing a green shirt sits on chair numbered 2, but this violates restriction number 4. Hence, this is also not possible.

Case II:

A person wearing a blue shirt sits on chair numbered 1. The six seating arrangements that are possible are as follows.

	1	2	3	4	5	6	7	8	9	10
Case 1	b	r	b	r	g	g	r	r	r	b
Case 2	b	r	r	r	b	r	g	g	r	b
Case 3	b	r	g	g	r	r	r	b	r	b
Case 4	b	r	r	r	g	g	r	b	r	b
Case 5	b	r	g	g	r	b	r	r	r	b
Case 6	b	r	b	r	r	r	g	g	r	b

Now, we see that the cases 4, 5 and 6 are just obtained by reversing the cases 1, 2 and 3 respectively.

It can be concluded that in any possible seating arrangement, the chairs numbered 1 and 10 are always occupied by people wearing blue shirts. It is given that the number of people wearing a blue shirt is 3. Looking at the table given in the question, we observe that in each of the six arrangements two out of the three different people i.e. A, B and N always sit on chairs numbered 1 and 10.

Hence it can be concluded that the people who wear a blue shirt are A, B and N.

From the given table the person wearing a blue shirt can never sit on chairs numbered 2, 4, 7 and 9.

So, (in arrangement I), A, B and N sitting on chairs numbered 1, 7 and 10 is inconsistent.

Also, the people wearing red shirts sit on chairs numbered 2 and 9 and in all the possible arrangements five different people namely P, Q, M, Z and R are sitting on chairs numbered either 2 or 9.

Therefore, P, Q, M, Z and R are wearing red shirts and K and L are wearing green shirts.

- I arrangement is not consistent.
- A, B and N are wearing blue shirts. Hence, N is the answer.
- K and L are wearing green shirts. Hence, K is the answer.
- Option (1): A (Blue), P (Red), R (Red) and L (Green): Permissible

Option (2): N (Blue), Q (Red), K (Green) and Z (Red): Permissible

Option (3): K (Green), A (Blue), N (Blue) and Z (Red): Not Permissible

Option (4): B (Blue), L (Green), M (Red) and Q (Red): Permissible.

- Number of –
cutters: 2; tailors: 5; assistants: 2
Number of hours of work for each: 10
Number of man-hours available in a day:
Cutters: $2 \times 10 = 20$
Tailors: $5 \times 10 = 50$
Assistants: $2 \times 10 = 20$
When all ten hours are devoted to Little Flower School Uniform (for maximum number) –
Number of uniforms which can be cut by 2 cutters in

$$\text{a day} = 20 \div \frac{1}{2} = 40 \text{ (@ 1 per 30 min)}$$

Number of uniforms which can be stitched by 5 tailors in a day = $50 \div 1 = 50$ (@ 1 per hr)

Number of uniforms for which buttons and button holes can be stitched by 2 assistants

$$= 20 \div \frac{1}{2} = 40 \text{ (@ 1 per 30 min)}$$

From the data it is clear that the maximum number of Little Flower uniforms that can be made in a day = 40.

- Number of –
cutters: 2; tailors: 5; assistants: 2
Number of hours of work for each: 10
Number of man-hours available in a day:
Cutters: $2 \times 10 = 20$
Tailors: $5 \times 10 = 50$
Assistants: $2 \times 10 = 20$
When all ten hours are devoted to Mayflower School Uniform (for maximum number) –
Number of uniforms which can be cut by 2 cutters in

$$\text{a day} = 20 \div \frac{1}{3} = 60 \text{ (@ 1 per 20 min)}$$

Number of uniforms which can be stitched by 5 tailors in a day = $50 \div 1 = 50$ (@ 1 per hr)

Number of uniforms for which buttons and button holes can be stitched by 2 assistants

$$= 20 \div \frac{1}{4} = 80 \text{ (@ 1 per 15 min)}$$

From the data it is clear that the maximum number of Mayflower uniforms that can be made in a day = 50.

- For completing 20 Little Flower uniforms man-hours required of each category of employee:
cutters 10, tailors 20, assistants: 10
Man-hours available after completing 20 Little Flower uniforms:
cutters 10, tailors 30, assistants 10
Number of Mayflower uniforms that can be handled

within the man-hours available after completing 20 Little Flower uniforms:

$$\text{Cutter: } 10 \div \frac{1}{3} = 30, \text{ Tailor: } 30 \div 1 = 30,$$

$$\text{Assistant: } 10 \div \frac{1}{4} = 40$$

From above it is obvious that 30 Mayflower uniforms can be completed.

11. 2 Man-hours required to complete 30 Little Flower uniforms:

$$\text{Cutters: } 30 \times \frac{1}{2} = 15$$

$$\text{Tailors: } 30 \times 1 = 30$$

$$\text{Assistants: } 30 \times \frac{1}{2} = 15$$

Man-hours that will be idle:

$$\text{Cutters: } 20 - 15 = 5$$

$$\text{Tailors: } 50 - 30 = 20$$

$$\text{Assistants: } 20 - 15 = 5$$

$$\text{Total} = 30.$$

12. 4 Obviously Little Flower School Uniforms take more time to complete. To finish 15 Little Flower uniforms, following are Man-hours required by each category of the employees:

Cutters – 7.5, Tailors – 15, Assistants – 7.5.

Man-hours available after completing 15 Little Flower uniforms:

Cutters – 12.5, Tailors – 35, Assistants – 12.5.

Number of Mayflower Uniforms that can be made within the man-hours available after completing 15 Little Flower uniforms:

$$\text{Cutter} - 12.5 \div \frac{1}{3} = 37.5, \text{ Tailor} - 35 \div 1,$$

$$\text{Assistant} - 12.5 \div \frac{1}{4} = 50.$$

Obviously only 35 Mayflower uniforms can be made. So total number of uniforms in this case, which can be completed is (15 + 35) = 50.

It can be seen that maximum total number of uniforms that can be completed is 50 only. It can be achieved if the numbers of Little Flower uniforms are from 0 to 20. If Little Flower uniforms are more than 20, then total number of uniforms will be reduced.

For questions 13 to 15:

The information is tabulated below:

Timing	Friend	Train
8:00 pm	Shishir/Vijay	Shram shakti/Gorakhdham
8:30 pm	Vijay/Shishir	Gorakhdham/Shramshakti
9:10 pm	Brijesh	Purushottam
9:40 pm	Ujjaw al	Licchavi
10:20 pm	Jeetu	Shivganga
11:15 pm	Narayan	Mahabodhi

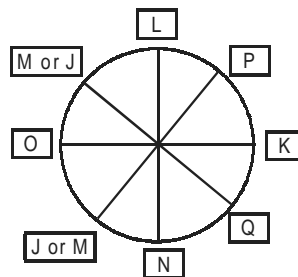
13. 1 Licchavi departs at 9 : 40 pm.

14. 3 Narayan departs at last.

15. 2 Mahabodhi was the last train.

For questions 16 to 19:

From the statements given in the question the arrangement will be



16. 2 P is sitting to the immediate right of K.

17. 4 Either J or M is sitting opposite to Q.

18. 1 K is sitting 2 seats to the left of L.

19. 4 All of these cannot be neighbour of J because J's neighbour can only be L, K or N.

For questions 20 to 23:

Stage 3 finished at point P1 and the work in the stage 4 was done by F4.

It is given that one of the stages starts with P5 and ends with P3, and that stage cannot be the stage 1 (Condition 4), stage 3 (Condition 6), stage4 (Condition 6 and 5) or stage 5 (Condition 4 and 3).

Hence, stage 2 starts and ends with point P5 and P3 respectively.

Therefore, F3 ploughed in stage 1 (Condition 7).

So stage 5 will start and end with P4 and P2 respectively (Condition 3)

So the work of stage 2 and stage 3 was done by F1 and F2 respectively (Condition 6).

Based on the inferences, the following table can be formed:

Stage	Starting point	End point	Farmer
1	P2	P5	F3
2	P5	P3	F1
3	P3	P1	F2
4	P1	P4	F4
5	P4	P2	F5

20. 4 P2 was finishing point for F5.

21. 2 P5 and P3 were the starting and finish points of stage 2.

22. 1 P2 was the starting point for Farmer F3

23. 1 P1 was the finish point for farmer F2.

24. 4 The positions of a, b, c, d and e after the combination of the four steps in the process are

$$\begin{array}{cccc} & b & & b & & b & & b \\ e & a & \rightarrow & e & c & \rightarrow & d & c & \rightarrow & d & c \\ d & c & & d & a & & e & a & & a & e \end{array}$$

If the process repeats then by observation the last set of letters should be

$$\begin{array}{cc} c & \\ a & e \\ b & d \end{array} \quad (\text{after 2 processes in succession})$$

$$\begin{array}{cc} e & \\ b & d \\ c & a \end{array} \quad (\text{after 3 processes in succession})$$

$$\begin{array}{cc} d & \\ c & a \\ e & b \end{array} \quad (\text{after 4 processes in succession})$$

$$\begin{array}{cc} a & \\ e & b \\ d & c \end{array} \quad (\text{after 5 processes in succession})$$

So, a minimum of 5 such processes in succession need to occur so that all the letters come back to their original positions.

25. 1 Using data from solution of previous question, a minimum of 5 such processes in succession need to occur so that all the letters come back to their original positions.

This cycle will be repeated 20 times. Therefore at the end of 100th process all the letters come back to their original positions. After the 101st process the position of letters should be the same as the positions after 1 process. I.e

$$\begin{array}{cc} b & \\ d & c \\ a & e \end{array}$$

Number of letters out of the 5 which would be at their original position when the process is executed 101 times successively is zero.

26. 1 The positions of a, b, c, d and e after the combination of the first three steps are:

$$\begin{array}{cccc} & b & & b & & b \\ e & a & \rightarrow & e & d & \rightarrow & a & d \\ d & c & & a & c & & e & c \end{array}$$

We can observe that if we repeat the process 4 times, all the letters come back to their original positions.

This cycle will be repeated 25 times. Therefore at the end of 100th process 'a' will be at the position 1.

27. 4 After every sub process, the configuration will be as follows:

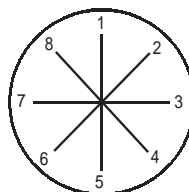
$$\begin{array}{cccc} & b & & b & & b \\ e & a & \rightarrow & e & c & \rightarrow & e & c & \rightarrow \\ d & c & & d & a & & a & d \end{array}$$

$$\begin{array}{cccc} & b & & c & & d \\ e & a & \rightarrow & e & a & \rightarrow & e & a & \rightarrow \\ c & d & & b & d & & b & c \end{array}$$

$$\begin{array}{cccc} & d & & d & & c \\ e & c & \rightarrow & e & b & \text{ and } & e & b \\ b & a & & c & a & & d & a \end{array}$$

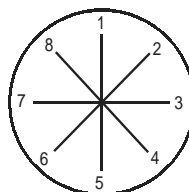
Therefore, the whole process is equivalent to the interchange of letters at first and third positions.

28. 3



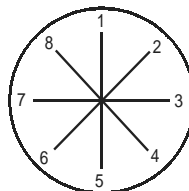
Maximum score will be along anticlockwise direction.
 $1 + 8 - 2 = 7$ after first move,
 $7 + 7 - 2 = 12$ after second move.
 Score of second move in anticlockwise direction = 12.
 In third move we'll go clockwise to get score = $12 + 8 = 20$.

29. 1



10 can be scored by moving clockwise for all three moves. 13 can be scored by moving clockwise (score 3), diagonally (score 6) and clockwise (score 13). 9 can be scored by moving clockwise (score 3), diagonally (score 6) and anticlockwise (score 9). 8 can be scored by taking two successive anticlockwise turns just after one initial clockwise movement. Only 7 cannot be scored.

30. 4



Diagonal = D, Anticlockwise = A and Clockwise = C
 $CDA \Rightarrow 9$
 $DCD \Rightarrow 8$
 $CCC \Rightarrow 10$
 Thus any of the three scores can be obtained.