**1.2 SEQUENCING AND ORDERING**

**Introduction to the Topic**

The questions of this topic are based on ranking or putting in an order some people or other items like lectures, buildings, matches etc. The information given in these questions talks about the ranks of different persons or items with relation to each other and a candidate has to use this information to form a correct logical sequence or order and then answer the questions based on them.

**Relevance in CAT**

These questions have commonly featured in the previous CAT examinations. The difficulty level of such questions have been easy to moderate and hence can be used to increase the score.

**What is ordering or sequencing**

In these questions we may sometimes not be working with the actual values of items but will be working with their comparative values or comparative information. The attributes on basis of which this ordering or sequencing is generally asked in examination are: age, height, weight, complexion, marks and size etc.

Let us see some commonly used statements and their meanings.

|  |  |
| --- | --- |
| **Some common Logical Conditions** | |
| **Statement** | **Meaning** |
| A is taller than B | A > B or B < A, in terms of height |
| A is older than B and B is older than C | A > B > C or C < B < A in terms of age |
| A has score more marks than B but less marks than C. | C > A > B or B < A < C in terms of marks.  We can also deduce that C > B or B < C. |
| A has more money than B but is not less than C. | A > B is fixed. While A is more than C but we do not know the relation between B and C, so we get the following sequences:  A > C > B or A > B > C or A > B = C |
| A is taller than B and C is shorter than D. | A > B and D > C, in terms of height.  We do not know their relationship according to height with one another so there can be many possibilities like: A > B > D > C, A > D > C > B and many more. We will require some more information to further relate them. |

**Example 1:** While on going to the tour of Australia, K.L. Rahul took 8 bats with him for the 4 test matches to be played. EW1, EW2, EW3, EW4 and EW5 are five bats made of English Willow while AW1, AW2 and AW3 are three bats made of Australian Willow.

I. EW1 is the heaviest among the English Willows and AW3

is the lightest among the Australian Willows.

II. EW3 costs more than EW4 and AW2 but is cheaper as compared to EW2.

III. EW1 is not the costliest English Willow.

IV. EW5 is costlier than EW4 and there is no other English or Australian bat whose cost lies between these 2 bats.

V. EW5 is heavier than 3 of the English Willows and all the Australian Willows.

VI. AW2 costs more than AW3 but cheaper than AW1, which is heavier than AW2.

a. Which of the English Willows cannot be exactly in between when they are arranged according to their cost?

b. If AW1 costs more than EW 5 then how many English Willows will cost less than AW1?

c. If EW2 and EW3 are heavier than EW4 then which English willow is the lightest in weight?

**Solutions:**

From the given information we see that there are 2 attributes viz. Weight and Cost on basis of which the bats have been classified.

On basis of the information given we get the following points regarding the bats:

|  |  |  |  |
| --- | --- | --- | --- |
| **Weight of Bats** | | **Cost of Bats** | |
| ● | EW1 – heaviest among English willows. | ● | EW3 is costlier than EW4 and AW2. |
| ● | EW5 – 2nd heaviest English Willow (As it is heavier than 3 English Willows) | ● | EW2 is costlier than EW3. |
| ● | AW 3 – Lightest Australian Willow | ● | EW1 is not the costliest English Willow. |
| ● | AW1 is heavier than AW 2 | ● | EW5 is costlier than EW4 with no other willow in between. |
|  | | ● | AW2 is costlier AW3. |
|  | | ● | AW1 is costlier than AW2. |

Using the above information we get the following deductions:

**English Willows**

In descending order of weights: EW1 EW5 \_\_\_ \_\_\_ \_\_\_

In descending order of cost: EW2 \_\_\_ EW3 \_\_\_ EW5 EW4 \_\_\_ (One of the blanks will contains EW1)

**Australian Willows**

In descending order of weights: AW1 AW2 AW3

In descending order of Cost: AW1 AW2 AW3

a. If we see the arrangement of the cost of English Willows, then EW2 and EW4 can never be at a place which is exactly middle of the arrangement.

b. If the cost of AW1 is more than EW5, we cannot find a unique answer to this as there can by any number of bats which can cost less than AW1.

c. We have: EW1 EW5 \_\_\_ \_\_\_ \_\_\_, if we plug in the

additional information we will get the following arrangement:

EW1 EW5 EW2/EW3 EW2/EW3 EW4.

Hence, EW4 is the lightest bats.

**Example 2:** A, B, C, D, E, F and G are brothers. Two brothers had an argument and A said to B “You are as old as C was when I was twice as old as D, and will be as old as E was when he was as old as C is now”. B said to A “You may be older than F but G is as old as I was when you were as old as G is, and D will be as old as F was when F will be as old as G is” **[CAT 1994]**

I. Who is the eldest brother?

II. Who is the youngest brother?

III. Which two are probably twins?

IV. Which of the following is false?

a. G has 4 elder brothers.

b. A is older than G but younger than E.

c. B has three elder brothers.

d. There can be a pair of twins among the brothers.

**Solution:**

The first step in this example will be to understand the relative ages of the brothers and find a sequence or order of them according to their ages. Using the two statements given in the questions we can get following results:

● B is now as old as C was in the past, hence B < C.

● Also sometime in the past A was twice as old as D, so A > D.

● C will be as old as E in future, hence C < E.

● A > F

● A was as old as G in the past, hence A > G.

● D will be as old as F in future, hence F > D.

● F will be as old as G now in future, hence G > F.

● G was as old as B, when A was as old as G, hence A = B.

Combining all the results, we get:

**E > C > B = A > G > F > D**

(Note by A = B, it is meant that they may be of similar age group, not necessarily the same age).

a. Based on the final sequence of the brother according to their ages we get E as the eldest brother.

b. We can clearly see that D will be youngest brother.

c. As A and B can have same ages, then they may be twins.

d. G as 4 elder brother viz. A, B, C and E, so this statement is true. A is older than G and has to be younger to E, hence this statement is also true. Also, A and B can be twins hence this statement is also true. B has only 2 elder brother’s viz. C and E, hence this statement is false.

**Practice Exercise – Easy**

1. Jayanthi received 5 presents on her 18th birthday. The presents were given to her by her Mother, Father, Brother, Grandfather and Grandmother. The number of presents which were costlier than the present of her grandfather is same as the number of presents cheaper than her grandmothers present. The present given by her dad is the costliest and the present given by her mother is not the cheapest. Whose present was the cheapest of all?

a. Grandfather b. Mother

c. Grandmother d. Brother

2. Three new luxury cars have been launched in India recently viz. Audi A9, BMW 8 and Mercedes B. Auto Car magazine conducted a trial run on all the 3 cars and published their rankings according to power and speed. No car got same rank in both power and speed. Mercedes B is faster than BMW 8 but less powerful than Audi A9, who is not the most powerful car. Which car is the most powerful car of the three?

a. Audi A9 b. BMW 8

c. Mercedes B d. Cannot be determined

3. Five metro lines viz. Harbor, Western, Eastern, Central and Southern have different number of passengers travelling through them daily. Western has more passengers travelling through it as compared to the Harbor and Eastern lines. Central line doesn’t have as many passengers travelling through it as compared to Southern but has more passengers travelling through it as compared to the Harbor line, which doesn’t have the lowest load of commuters. Which line has the lowest number of passengers travelling through it?

a. Harbor b. Western c. Eastern d. Central

4. In the finals of 100 meters race at the London Olympics Bolt, Powell, Green and Gay were the only runners. All the races ran the race with different speeds. Powell was faster than Green. Gay finished the race ahead of Bolt and Powell finished the race after Bolt. Who came at the last position in the race considering all of them finished the race?

a. Bolt b. Green c. Gay d. Powell

**Directions (Q. Nos. 5 – 9):** *Answer the questions on basis of the information given.*

Rahul Dravid went to the tour of New Zealand with 5 of his favorite bats. Each bat has a different label on it viz. MRF, Britannia, TVS, Ceat and Wills. All the bats were of different weights as well. While placing his kit into the weighing machine at the airport, Rahul gave following information to the airlines:

I. The weight of Britannia bat is half of the weight of the MRF bat.

II. The ratio of weights of Britannia and TVS bats is 4.5.

III. Ceat bats weight is double that of TVS.

IV. Wills weights double that of Ceat.

5. Which of the following bat is the lightest in weight?

a. MRF b. Britannia

c. TVS d. Ceat

6. Which bat is lighter as compared to Wills bats?

a. MRF, Britannia b. TVS, Ceat

c. MRF, TVS d. Ceat, Britannia

7. Will bat is lighter than which of the following bats?

a. Ceat, Britannia b. MRF, Wills

c. Ceat, MRF d. MRF, Britannia

8. Which of the following bat weighs the most?

a. MRF b. Britannia

c. TVS d. Ceat

9. Which of the following represents the descending order of weights of the articles?

a. MRF, Britannia, Wills, Ceat, TVS

b. Britannia, Ceat, Wills, MRF, TVS

c. MRF, Britannia, TVS, Ceat, Wills

d. TVS, Ceat, Wills, Britannia, MRF

**Directions (Q. Nos. 10 – 14):** *Answer the questions on basis of the information given.*

Six buildings WTC, Petronas, CT101, Khalifa, Al Burj and Wall are standing on a road next to each other in decreasing order of the number of floor they have with each building having different number of floors.

I. WTC has more floors as compared to the Petronas and CT101.

II. The number of towers having more floors than Khalifa is equal to the number of towers having fewer floors than WTC.

III. Petronas has more floors as compared to Khalifa but not as many floors as there are in Al Burj.

IV. CT101 neither has the most nor the least number of floors among the buildings.

V. Wall has less number of floors as compared to atleast 2 of the buildings.

VI. Al Burj and WTC are not standing next to each other.

10. Which building has the most number of floors?

a. WTC b. Petronas

c. CT101 d. Al Burj

11. Which building is placed between WTC and Al Burj?

a. Petronas b. CT101

c. Khalifa d. Cannot be determined

12. Which building is the shortest building?

a. Petronas b. CT101 c. Al Burj d. Khalifa

13. How many buildings have fewer floors as compared to CT 101?

a. 1 b. 2 c. 3 d. 4

14. How many buildings have more floors as compared to the Petronas?

a. 1 b. 2

c. 3 d. Cannot be determined

**Directions (Q. Nos. 15 – 17):** *Answer the questions on basis of the information given.*

AAT, KLP, CIP, BLP, NP and IND are six political parties contesting the elections in the city. They want to organize a road show in the city. According to the Municipal Committee of the city the road shows can be planned in the next week from Sunday to Saturday as it will have necessary manpower to manage the shows.

I. Any party can organize a road show only on 1 day of the week.

II. AAT doesn’t want its show on Thursday as they have already planned TV show on that day.

III. The road show of CIP should be organized on the immediate next day of the road show of IND.

IV. The road shows of BLP and NP should have a gap of 2 days between them as there is a possibility of riots between the supporters of the two parties.

V. BLP’s road show should be organized just before the day on which there is no road show.

VI. Friday cannot be the day when there is no road show.

VII. KLP the ruling party has decided to host the road show on Tuesday as it’s the auspicious day for them and their road show should not be succeeded by the road show of BLP.

15. Which day is it when there will be no road show in the city?

a. Monday b. Tuesday

c. Sunday d. Cannot be determined

16. IND’s road show will be on which day?

a. Thursday b. Friday

c. Saturday d. Sunday

17. Which of the following information is not required in finding the complete sequence of the road shows?

a. II

b. III

c. Both II and III are not required

d. All are required

**Directions (Q. Nos. 18 – 20):** *Answer the questions on basis of the information given.*

The Home Ministry of India has decided to present cultural programs from different states of India to the US President who will be in the country from 22nd to 28th of January. The 6 chosen states to present their cultural programs are Assam, Punjab, Maharashtra, Bihar, West Bengal and Andhra Pradesh. Each day there can be only 1 program which can be presented in front of the US President due to his busy schedule.

I. The cultural program of Bihar should be presented on the next day of the cultural program of West Bengal.

II. Maharashtra’s cultural program shall be presented on 24th and Andhra Pradesh’s presentation cannot be presented on the next day of it.

III. The cultural program of Punjab will be presented before West Bengal and there has to be a gap of 2 days between programs of Assam and Andhra Pradesh.

IV. The cultural program of the Andhra Pradesh is to be organized on the next day of the day when there is no cultural program scheduled and 27th cannot be the day on which no program is scheduled.

18. Which states will present their cultural programs on 22nd and 28th of January?

a. Maharashtra and Bihar

b. Andhra Pradesh and Maharashtra

c. Andhra Pradesh and Punjab

d. None of these

19. Assam will present its cultural program on:

a. 23rd January b. 24th January

c. 26th January d. None of these

20. Which of the following information is not required for the above lecture arrangements?

a. I b. II

c. III d. All are required

**Practice Exercise – Medium**

1. Among four friends, Senthil is twice the age of Karthik. Gopi is one and a halftime younger than Karthik. Bala is six years elder to Karthik, but six year younger to Senthil. Who is the eldest?

a. Senthil b. Karthik c. Bala d. Gopi

2. Megha, Priya, Suman, Kamla and Rani are five girls competing in a race. Suman and Megha have at least two girls ahead of each of them. Rani and Megha do not have more than one girl behind each of them. Who arrives atthe finishing line after two girls as well as before two other girls, if no two girls finish the race at the same time?

a. Priya b. Kamla

c. Suman d. Cannot be determined

**Directions (Q. Nos. 3 – 5):** *Answer the questions on basis of the information given.*

Karan, Nitin, Leenesh, Vicky and Akshat are 5 friends who have appeared for the supplementary examinations in Digital Circuits and Electronic Devices, there 4th semester engineering subjects. When the results were declared it was learnt that all 5 have secured the top 5 positions in both the subjects (not necessarily in any order).None of them got the same rank in any subject neither their individual ranks were same in the 2 subjects.

I. Nitin’s rank in Digital Circuit is the same as that of Vicky’s

rank in Electronic Devices.

II. Leenesh got a better rank than atmost one person in both subjects respectively.

III. Akshat got the least rank in Digital Circuits.

IV. Vicky got second rank in Digital Circuits and Nitin got third rank in Electronic Devices.

V. In Electronic Devices Karan’s rank is better than Akshat’s

rank.

3. What is the rank of Vicky in Electronic Devices?

a. 1 b. 2 c. 3 d. 4

4. What is the rank of Leenesh in Digital Circuits?

a. 1 b. 2 c. 3 d. 4

5. The rank of Karan in Digital Circuits is the same as the rank of which person in Electronic Devices?

a. Nitin b. Leenesh c. Vicky d. Akshat

**Directions (Q. Nos. 6 – 7):** *Answer the questions on basis of the information given.*

Sehwag, Yuvraj, Saruyu, Reddy and Bundella are the top 5 batsmen on basis of the runs scored in the current season of Ranji Trophy, not necessarily in the same order. Each of these batsmen has got a different average. The person with the highest average has scored the 4th highest number of runs while Bundella is 2nd on the list according to the runs scored. Reddy is 3rd on the run scoring list and has average more than at least 2 persons. The batsman having the least average is also the highest runs scorer and he is not Saruyu. Yuvraj’s average is better than only person and Reddy has a better average as compared to Bundella.

6. Which batsman is 2nd from the bottom in terms of runs scored?

a. Sehwag b. Saruyu c. Yuvraj d. Reddy

7. How many batsmen have average more than Sehwag?

a. One b. Two c. Three d. Four

**Directions (Q. Nos. 8 – 12):** *Answer the questions on basis of the information given.*

4 friends Kumar, Ratan, Sanju and Rajan appeared for the Indian Military Academy test. All the four friends achieved top 4 positions in all the four events. They underwent Physical, Psychometric, Endurance and Personality tests. No friend had a same position in any of the 2 tests.

I. The friend who topped the Physical was 4th in the Personality test.

II. One of the friends finished 2nd, 3rd and 1st in Psychometric,

Endurance and Personality tests respectively.

III. Ratan finished 2nd in Physical and Sanju is not the 4th ranker in Psychometric.

IV. Kumar’s rank in Psychometric and Personality tests are less than Ratan.

8. Who got the 4th rank in Psychometric test?

a. Kumar b. Ratan c. Sanju d. Rajan

9. Who topped the Endurance test?

a. Kumar b. Ratan c. Sanju d. Rajan

10. Who finished 3rd in the Personality test?

a. Kumar b. Ratan c. Sanju d. Rajan

11. Who finished runner up in Psychometric test?

a. Kumar b. Ratan c. Sanju d. Rajan

12. Who finished 2nd in Personality test?

a. Kumar b. Ratan c. Sanju d. Rajan

**Directions (Q. Nos. 13 – 17):** *Answer the questions on basis of the information given.*

4 friends Lalit, Sachin, Sunil and Vishal recorded their heights and weights. No 2 friends have either the same weight or height.

I. Height of Lalit is more than the height of Sachin and his weight is less than that of Sunil.

II. Sunil’s height and weight are more than that of Vishal.

III. Sachin has got the 3rd highest height and his weight is less that of Vishal.

IV. Weight of Sachin is less than that of Lalit.

13. Who is the tallest among the 4 friends?

a. Lalit b. Sachin

c. Sunil d. Either (a) or (c)

14. Who is the second in terms of weight?

a. Lalit b. Sachin

c. Sunil d. Cannot be determined.

15. Which friend has got the least height?

a. Lalit b. Sachin c. Vishal d. Sunil

16. How many friends have weight more than that of Sachin?

a. 1 b. 2

c. 3 d. Either (a) or (b)

17. If no friend has the same ranking in weight and height, then who has the 2nd highest weight?

a. Lalit b. Sachin

c. Vishal d. Cannot be determined

**Directions (Q. Nos. 18 – 22):** *Answer the questions on basis of the information given.*

5 tennis stars Nadal, Federer, Murray, Djokovic and Nalbandian played in the World Tennis Series and played a series of matches. Winner of a particular match is awarded 2 points and the looser 0 points, while no match is drawn. At the end of the tournament players are ranked according to the total points. Either Nadal is the last and Nalbandian is the 1st or Nadal is 1st and Nalbandian is the last. Federer has more points than Murray.

18. Which of the following cannot be true?

a. Murray finishes second

b. Djokovic finishes second

c. Murray finishes ahead of Djokovic

d. Djokovic finishes ahead of Federer

19. If Federer finishes third, then which of the following must

be true?

a. Nalbandian finishes first.

b. Murray finishes ahead of Djokovic.

c. Djokovic finishes ahead of Murray.

d. Djokovic finishes behind Federer.

20. If Nadal finishes first, then in how many different orders of ranking are possible?

a. 1 b. 2 c. 3 d. 4

21. Which of the following additional conditions make it certain that Djokovic finishes second?

a. Murray has more points than Federer

b. Federer more points than Djokovic

c. Djokovic has more points that Federer

d. Federer has fewer points as compared to Nalbandian.

22. If there is exactly one person between Nadal and Fedrer, then which of the following must be true?

a. Nadal finishes first

b. Nalbandian finishes first

c. Djokovic finishes third

d. Murray finished fourth

**Directions (Q. Nos. 23 – 25):** *Answer the questions on basis of the information given.*

I. There is a group of 5 girls.

II. Kamini is second in height but younger than Rupa.

III. Pooja is taller than Monika but younger in age.

IV. Rupa and Monika are of the same age but Rupa is tallest among all the girls.

V. Neelam is taller than Pooja and elder to Rupa.

23. If they are arranged in the ascending order of height, then who will be in the third position?

a. Monika b. Rupa

c. Monika or Rupa d. None of these

24. If they are arranged in the descending order of their ages, then who will be in the 3rd position?

a. Monika b. Kamini

c. Monika or Rupa d. Cannot be determined

25. To answer the question “who is the youngest person in the group”, which of the given statements is superfluous?

a. (I) b. (V)

c. (II) d. Either (I) or (IV)

**Practice Exercise – Difficult**

**Directions (Q. Nos. 1 – 2):** *Answer the questions based on the following information.*

Elle is three times older than Yogesh. Zaheer is half the age of Wahida. Yogesh is older than Zaheer. **[CAT 2001]**

1. Which of the following can be inferred?

a. Yogesh is older than Wahida

b. Elle is older than Wahida

c. Elle may be younger than Wahida

d. None of these

2. Which of the following information will be sufficient to estimate Elle’s age?

a. Zaheer is 10-year-old

b. Both Yogesh and Wahida are older than Zaheer by the same number of years

c. Both (a) and (b)

d. None of these

**Directions (Q. Nos. 3 – 5):** *Answer the questions based on the following information.*

A, B, C and D are to be seated in a row. But C and D cannot be together. Also B cannot be at the third place.

3. Which of the following must be false?

a. A is at the first place

b. A is at the second place

c. A is at the third place

d. A is at the fourth place

4. If A is not at the third place, then which of the following options does C have?

a. The first place only

b. The third place only

c. The first and third place only

d. Any of the places

5. If A and B are together, then which of the following must be necessarily true?

a. C is not at the first place

b. A is at the third place

c. D is at the first place

d. C is at the first place

**Directions (Q. Nos. 6 – 8):** *Answer the questions based on the following information.*

Six rabbits R1, R2, R3, R4, R5 and R6 are checked by a vet. He recorded some points regarding their length and weight. R1 is longer than R2 but lighter than R6. R3 is smaller than R4 but heavier than R1. R2 is longer than R5 but heavier than R6. R6 is longer than R1 and heavier than R3. R5 is longer as well as lighter than R3. R4 is smaller as well as lighter than R5.

6. Who is lightest among all?

a. R1 b. R4

c. R5 d. Cannot be determined

7. When arranged is ascending order of length and descending

order of weight, there is a rabbit which has the same rank in either attributes. Who may be that rabbit?

a. R1 b. R5 c. R4 d. R3

8. If ranks are given from 1 to 6, after arranging these people in descending order of weight and length and then the corresponding ranks are added, who has the highest total?

a. R5 b. R3 c. R4 d. R2

**Directions (Q. Nos. 9 – 11):** *Answer the questions based on the following information.*

A showroom has 5 types of trousers viz. T1, T2, T3, T4 and T5 all having different lengths and waist sizes.

I. Either T1 or T2 are the longest trousers.

II. T5 is longer than only T3 and T4.

III. T5 has more waist size than T3 and T4 and all 3 occupy consecutive places.

IV. The trouser with the largest waist is also the 3rd longest whereas the 2nd longest trouser has the least waist size.

V. Only one trouser has waist size less than that of T2.

VI. T3 has more waist than T4 but is shorter in length as compared to it.

9. Which trouser has the least waist size?

a. T1 b. T2 c. T3 d. T4

10. Which trousers have more length and more waist size than T4?

a. T1 and T5 b. Only T5

c. Only T5 and T2 d. Only T3

11. How many trousers have more waist than T1?

a. 1 b. 2 c. 3 d. 4

**Directions (Q. Nos. 12 – 14):** *Answer the questions based on the following information.*

Vikas, Sanjeev, Karan, Rahul and Hitesh are 5 contestants taking part in a TV reality show. They are tested on 2 different parameters viz. Cooking and Singing. It is known that Sanjeev is better cook than Vikas but is a poor singer as compared to him. Karan is the best cook among all the contestants and is the worst singer as well. Hitesh is a better cook as well as a better singer as compared to Rahul. Hitesh is a better cook than Vikas but Vikas is a better cook than Rahul. Hitesh is better singer than Sanjeev who is a better singer than Rahul.

12. Who is the worst cook?

a. Sanjeev b. Hitesh c. Vikas d. Rahul

13. Who is the second best singer?

a. Vikas b. Hitesh

c. Sanjeev d. Cannot be determined

14. If no person get the same rank in the two attributes, then who are the 3rd best cook and 3rd best singer respectively?

a. Hitesh, Rahul b. Rahul, Vikas

c. Sanjeev, Hitesh d. Hitesh, Sanjeev