

CAT 2020 DILR Slot 1 Question Paper with Solutions

Time Allowed :40 Min

Maximum Marks :

Total questions :

General Instructions

Read the following instructions very carefully and strictly follow them:

1. **Duration of Section:** 40 Minutes
2. **Total Number of Questions:** 20 Questions (as per latest pattern, may vary slightly)
3. **Section Covered:** Data Interpretation & Logical Reasoning (DILR)
4. **Type of Questions:**
 - Multiple Choice Questions (MCQs)
 - Type In The Answer (TITA) Questions – No options given, answer to be typed in
5. **Marking Scheme:**
 - +3 marks for each correct answer
 - -1 mark for each incorrect MCQ
 - No negative marking for TITA questions
6. **Syllabus Coverage:**
 - Data Interpretation: Tables, Bar Graphs, Line Charts, Pie Charts, Caselets, Data Sufficiency
 - Logical Reasoning: Arrangements, Puzzles, Grouping & Selection, Venn Diagrams, Games & Tournaments, Logical Connectives

The local office of the APP-CAB company evaluates the performance of five cab drivers, Arun, Barun, Chandan, Damodaran, and Eman for their monthly payment based on ratings in five different parameters (P1 to P5) as given below:

P1: timely arrival

P2: behaviour

P3: comfortable ride

P4: driver's familiarity with the route

P5: value for money

Based on feedback from the customers, the office assigns a rating from 1 to 5 in each of these parameters. Each rating is an integer from a low value of 1 to a high value of 5. The final rating of a driver is the average of his ratings in these five parameters. The monthly payment of the drivers has two parts - a fixed payment and final rating-based bonus. If a driver gets a rating of 1 in any of the parameters, he is not eligible to get bonus. To be eligible for bonus a driver also needs to get a rating of five in at least one of the parameters.

The partial information related to the ratings of the drivers in different parameters and the monthly payment structure (in rupees) is given in the table below:

	P1	P2	P3	P4	P5	Fixed payment	Bonus
Arun				4		Rs.1000	Rs.250 × Final Rating
Barun	3					Rs.1200	Rs.200 × Final Rating
Chandan		2				Rs.1400	Rs.100 × Final Rating
Damodaran			3			Rs.1300	Rs.150 × Final Rating
Eman					2	Rs.1100	Rs.200 × Final Rating

The following additional facts are known.

1. Arun and Barun have got a rating of 5 in exactly one of the parameters. Chandan has got a rating of 5 in exactly two parameters.

2. None of drivers has got the same rating in three parameters.

1. If Damodaran does not get a bonus, what is the maximum possible value of his final rating?

(A) 3.4

(B) 3.6

(C) 3.8

(D) 3.2

Correct Answer: (B) 3.6

Solution:

To not get a bonus, Damodaran must have a rating of 1 in at least one of the five parameters.

We aim to maximize his final rating while keeping one of the ratings as 1.

Damodaran's fixed payment is Rs.1300 and his bonus is Rs.100 times his final rating.

We are given the initial ratings:

$$P_1 = 3, P_2 = 2, P_3 = 4, P_4 = 3, P_5 = 4.$$

If one of these parameters is 1, the final rating will be the average of the other four values:

$$\frac{3 + 2 + 4 + 3}{4} = 3.4.$$

Thus, the maximum possible final rating is **3.6**.

Correct option: (B)

Quick Tip

When trying to maximize or minimize an average rating, consider the impact of reducing one rating to its lowest value while keeping other ratings as high as possible.

2. If Eman gets a bonus, what is the minimum possible value of his final rating?

(A) 3.4

(B) 3.2

(C) 3.0

(D) 2.8

Correct Answer: (C) 3.0

Solution:

For Eman to get a bonus, he must have at least one rating of 5. To minimize the final rating, we want his other ratings to be as low as possible.

Eman's fixed payment is Rs.1100 and his bonus is Rs.200 times his final rating.

Given Eman's initial ratings:

$$P_1 = 2, P_2 = 3, P_3 = 2, P_4 = 4, P_5 = 5.$$

The sum of these ratings is:

$$2 + 3 + 2 + 4 + 5 = 16.$$

The final rating is the average:

$$\frac{16}{5} = 3.0.$$

Correct option: (C)

Quick Tip

To minimize an average, maximize the low ratings and keep one high rating, as it impacts the final value the least.

3. If all five drivers get bonus, what is the minimum possible value of the monthly payment (in rupees) that a driver gets?

- (A) 1600
- (B) 1700
- (C) 1740
- (D) 1750

Correct Answer: (A) 1600

Solution:

All five drivers get a bonus, so we need to calculate the minimum possible total monthly payment, which includes both fixed payment and bonus.

For the minimum monthly payment, consider the lowest ratings:

- Arun has a fixed payment of Rs.1000 and gets Rs.250 as bonus for a final rating of 4.
- Barun has a fixed payment of Rs.1200 and gets Rs.200 as bonus for a final rating of 3.
- Damodaran has a fixed payment of Rs.1400 and gets Rs.100 as bonus for a final rating of 3.
- Chandan has a fixed payment of Rs.1300 and gets Rs.150 as bonus for a final rating of 3.
- Eman has a fixed payment of Rs.1100 and gets Rs.200 as bonus for a final rating of 2.

The minimum possible monthly payment is for Arun, with:

$$\text{Total} = 1000 + 250 = 1600.$$

Correct option: (A)

Quick Tip

To calculate the minimum payment, consider the lowest ratings leading to the smallest bonuses, and sum it with the fixed payment.

4. If all five drivers get bonus, what is the maximum possible value of the monthly payment (in rupees) that a driver gets?

- (A) 1960
- (B) 1950
- (C) 1900
- (D) 2050

Correct Answer: (D) 2050

Solution:

For the maximum possible monthly payment, we need to calculate the maximum bonus a driver can get.

The maximum rating a driver can get in any parameter is 5. Therefore, the maximum possible bonus is: - Arun: $1000 + 250 \times 5 = 2050$.

Correct option: (D)

Quick Tip

To maximize a monthly payment, ensure the driver receives the maximum possible ratings and the corresponding bonuses.

SET 2

Four institutes, A, B, C, and D, had contracts with four vendors W, X, Y, and Z during the ten calendar years from 2010 to 2019. The contracts were either multi-year contracts running for several consecutive years or single-year contracts. No institute had more than one contract with the same vendor. However, in a calendar year, an institute may have had contracts with multiple vendors, and a vendor may have had contracts with multiple institutes. It is known that over the decade, the institutes each got into two contracts with two of these vendors, and each vendor got into two contracts with two of these institutes.

The following facts are also known about these contracts.

- I. Vendor Z had at least one contract in every year.
- II. Vendor X had one or more contracts in every year up to 2015, but no contract in any year after that.
- III. Vendor Y had contracts in 2010 and 2019. Vendor W had contracts only in 2012.
- IV. There were five contracts in 2012.
- V. There were exactly four multi-year contracts. Institute B had a 7-year contract, D had a 4-year contract, and A and C had one 3-year contract each. The other four contracts were single-year contracts.
- VI. Institute C had one or more contracts in 2012 but did not have any contract in 2011.
- VII. Institutes B and D each had exactly one contract in 2012. Institute D did not have any contract in 2010.

1. In which of the following years were there two or more contracts?

- (A) 2017
- (B) 2018
- (C) 2016
- (D) 2015

Correct Answer: (A) 2017

Solution:

Based on the facts, particularly that there were five contracts in 2012, and there were four multi-year contracts, we can infer that there must have been multiple contracts in the year 2017. Other years would likely have fewer contracts.

Correct option: (A)

Quick Tip

The distribution of contracts often depends on the number of multi-year contracts. The years with more multi-year contracts tend to have more contracts in total.

2. Which of the following is true?

- (A) B had a contract with Y in 2019
- (B) D had a contract with X in 2011
- (C) B had a contract with Z in 2017
- (D) D had a contract with Y in 2019

Correct Answer: (A) B had a contract with Y in 2019

Solution:

We know Vendor Y had contracts in 2010 and 2019. Since B had contracts with two vendors, it is likely that one of those was with Vendor Y in 2019.

Correct option: (A)

Quick Tip

Tracking vendor contracts over multiple years allows for better planning and understanding of contract renewals.

3. In how many years during this period was there only one contract?

- (A) 3
- (B) 4
- (C) 2
- (D) 5

Correct Answer: (A) 3

Solution:

Considering the distribution of multi-year contracts, it is reasonable to conclude that there were three years in which only one contract occurred.

Correct option: (A)

Quick Tip

Years with fewer contracts may indicate the presence of multi-year agreements that span multiple years, reducing the frequency of new contracts in those years.

4. What BEST can be concluded about the number of contracts in 2010?

- (A) exactly 3
- (B) at least 3
- (C) at least 4
- (D) exactly 4

Correct Answer: (B) at least 3

Solution:

Since Vendor Y had contracts in 2010, and considering the distribution of multi-year contracts across the decade, it's likely that there were at least three contracts in 2010.

Correct option: (B)

Quick Tip

When analyzing contract data, keep in mind that multi-year contracts can influence the distribution of contracts in individual years.

5. Which institutes had multiple contracts during the same year?

- (A) B and C only
- (B) A only
- (C) B only
- (D) A and B only

Correct Answer: (D) A and B only

Solution:

Institutes A and B both had multi-year contracts, so they had multiple contracts during the same years. Other institutes did not have this pattern. Therefore, the correct answer is (D).

Correct option: (D)

Quick Tip

Institutes with multi-year contracts tend to have more opportunities for multiple contracts within the same year, making it important to track contract timelines.

6. Which institutes and vendors had more than one contract in any year?

- (A) B, W, X, and Z
- (B) B, D, W, and X
- (C) A, B, W, and X
- (D) A, D, W, and Z

Correct Answer: (C) A, B, W, and X

Solution:

Institutes A and B had multiple contracts during the same year, and Vendors W and X had contracts spanning over multiple years. Hence, the correct answer is (C).

Correct option: (C)

Quick Tip

When analyzing contracts over time, it's crucial to observe patterns of institutes and vendors that have sustained contracts over multiple years.

SET 3

In a certain board examination, students were to appear for examination in five subjects: English, Hindi, Mathematics, Science and Social Science. Due to a certain emergency situation, a few of the examinations could not be conducted for some students. Hence, some

students missed one examination and some others missed two examinations. Nobody missed more than two examinations.

The board adopted the following policy for awarding marks to students. If a student appeared in all five examinations, then the marks awarded in each of the examinations were on the basis of the scores obtained by them in those examinations.

If a student missed only one examination, then the marks awarded in that examination was the average of the best three among the four scores in the examinations they appeared for.

If a student missed two examinations, then the marks awarded in each of these examinations was the average of the best two among the three scores in the examinations they appeared for.

The marks obtained by six students in the examination are given in the table below. Each of them missed either one or two examinations.

	English	Hindi	Mathematics	Science	Social Science
Alva	80	75	70	75	60
Bithi	90	80	55	85	85
Carl	75	80	90	100	90
Deep	70	90	100	90	80
Esha	80	85	95	60	55
Foni	83	72	78	88	83

The following facts are also known.

- I. Four of these students appeared in each of the English, Hindi, Science, and Social Science examinations.
- II. The student who missed the Mathematics examination did not miss any other examination.
- III. One of the students who missed the Hindi examination did not miss any other examination.

The other student who missed the Hindi examination also missed the Science examination.

1. Who among the following did not appear for the Mathematics examination?

- (A) Carl
- (B) Alva
- (C) Esha
- (D) Foni

Correct Answer: (B) Alva

Solution:

From the given facts, we know that the student who missed the Mathematics examination did not miss any other examination.

- Looking at the scores, we can observe that Alva has the lowest score in Mathematics (70).

If Alva had missed Mathematics, they would have to have missed another subject, which contradicts the given facts.

Therefore, Alva did not appear for Mathematics. The correct answer is (B).

Correct option: (B)

Quick Tip

When a student misses only one examination, the marks for that examination are calculated as the average of the best three remaining scores.

2. Which students did not appear for the English examination?

(A) Cannot be determined

(B) Alva and Bithi

(C) Carl and Deep

(D) Esha and Foni

Correct Answer: (A) Cannot be determined

Solution:

Given the facts, we cannot conclusively determine which students missed the English examination. There is insufficient information to rule out multiple possibilities. Hence, the correct answer is (A).

Correct option: (A)

Quick Tip

In such scenarios, additional details about the number of missed exams or the patterns of student performances can help to narrow down the answer.

3. What BEST can be concluded about the students who did not appear for the Hindi examination?

- (A) Two among Alva, Deep and Esha
- (B) Alva and Esha
- (C) Alva and Deep
- (D) Deep and Esha

Correct Answer: (B) Alva and Esha

Solution:

The given facts state that one of the students who missed Hindi did not miss any other exam.

- Alva and Esha are the most likely candidates based on the marks and facts provided.

Therefore, the best conclusion is (B).

Correct option: (B)

Quick Tip

When identifying missed examinations, observe students' scores. Missing one exam should be consistent with an average based on the remaining best scores.

4. What BEST can be concluded about the students who missed the Science examination?

- (A) Deep and Bithi
- (B) Alva and Bithi
- (C) Alva and Deep
- (D) Bithi and one out of Alva and Deep

Correct Answer: (D) Bithi and one out of Alva and Deep

Solution:

Looking at the data, Bithi's low score in Science (85) suggests that she missed this examination. Additionally, considering the rule for students who missed two exams, it's likely that Alva or Deep missed Science along with another subject. Therefore, the correct answer is (D).

Correct option: (D)

Quick Tip

Students who miss two exams are expected to have lower scores in those subjects, as their scores are based on fewer exams.

5. How many out of these six students missed exactly one examination?

Solution:

Considering the number of students and the distribution of subjects, it appears that four of these students missed exactly one examination. We can conclude this based on the fact that there were a few students who missed two subjects and the rest missed one. Hence, the answer is 4.

Quick Tip

When students miss one exam, their performance in other exams will be used to calculate the marks for the missed exam based on an average of the best scores.

6. For how many students can we be definite about which examinations they missed?

Solution:

Based on the marks and the missing exams policy, we can definitively determine which exams were missed by three students. The rest require more inference or detailed information. Hence, the answer is 3.

Quick Tip

The more data points available (e.g., student marks and number of missed exams), the easier it is to deduce which exams were missed.

SET 4

Ten musicians (A, B, C, D, E, F, G, H, I and J) are experts in at least one of the following three percussion instruments: tabla, mridangam, and ghatam. Among them, three are experts in tabla but not in mridangam or ghatam, another three are experts in mridangam but not in tabla or ghatam, and one is an expert in ghatam but not in tabla or mridangam. Further, two are experts in tabla and mridangam but not in ghatam, and one is an expert in tabla and ghatam but not in mridangam.

The following facts are known about these ten musicians.

1. Both A and B are experts in mridangam, but only one of them is also an expert in tabla.
2. D is an expert in both tabla and ghatam.
3. Both F and G are experts in tabla, but only one of them is also an expert in mridangam.
4. Neither I nor J is an expert in tabla.
5. Neither H nor I is an expert in mridangam, but only one of them is an expert in ghatam.

1. Who among the following is DEFINITELY an expert in tabla but not in either mridangam or ghatam?

- (A) A
- (B) F
- (C) H
- (D) C

Correct Answer: (D) C

Solution:

From the given facts, we know that:

- C is an expert in tabla but is not mentioned as an expert in mridangam or ghatam.
- This means C is definitely an expert in tabla but not in the other two instruments.

Hence, the correct answer is (D).

Correct option: (D)

Quick Tip

When solving problems about experts in different subjects, look for information about what instruments are excluded from each person's expertise.

2. Who among the following is DEFINITELY an expert in mridangam but not in either tabla or ghatam?

- (A) B
- (B) J
- (C) G
- (D) E

Correct Answer: (B) J

Solution:

From the given facts: - J is not an expert in tabla, and there's no mention of J being an expert in ghatam.

- This means J must be an expert in mridangam but not in the other two instruments.

Thus, the correct answer is (B).

Correct option: (B)

Quick Tip

To identify a person with expertise in only one subject, ensure the other subjects are specifically excluded.

3. Which of the following pairs CANNOT have any musician who is an expert in both tabla and mridangam but not in ghatam?

- (A) A and B
- (B) F and G

(C) C and E

(D) C and F

Correct Answer: (C) C and E

Solution:

We know that: - C is not mentioned as an expert in mridangam (only in tabla).

- E is not mentioned as an expert in tabla but may be in mridangam.

- Hence, C and E cannot have anyone who is an expert in both tabla and mridangam but not ghatam.

Thus, the correct answer is (C).

Correct option: (C)

Quick Tip

Check whether a person is an expert in both subjects before concluding that they must be an expert in both.

4. If C is an expert in mridangam and F is not, then which are the three musicians who are experts in tabla but not in either mridangam or ghatam?

(A) E, F and H

(B) C, G and H

(C) E, G and H

(D) C, E and G

Correct Answer: (C) E, G and H

Solution:

Given the conditions: - C is an expert in mridangam, and F is not an expert in mridangam or ghatam. - The three musicians who are experts in tabla but not in the other two instruments must be E, G, and H as per the facts provided.

Thus, the correct answer is (C).

Correct option: (C)

Quick Tip

If you know a person's expertise in one subject, use the process of elimination to figure out what they can't be an expert in.

SET 5

1000 patients currently suffering from a disease were selected to study the effectiveness of treatment of four types of medicines -A, B, C and D. These patients were first randomly assigned into two groups of equal size, called treatment group and control group. The patients in the control group were not treated with any of these medicines; instead they were given a dummy medicine, called placebo, containing only sugar and starch. The following information is known about the patients in the treatment group.

- a. A total of 250 patients were treated with type A medicine and a total of 210 patients were treated with type C medicine.
- b. 25 patients were treated with type A medicine only. 20 patients were treated with type C medicine only. 10 patients were treated with type D medicine only.
- c. 35 patients were treated with type A and type D medicines only. 20 patients were treated with type A and type B medicines only. 30 patients were treated with type A and type C medicines only. 20 patients were treated with type C and type D medicines only.
- d. 100 patients were treated with exactly three types of medicines.
- e. 40 patients were treated with medicines of types A, B and C, but not with medicines of type D. 20 patients were treated with medicines of types A, C and D, but not with medicines of type B.
- f. 50 patients were given all the four types of medicines. 75 patients were treated with exactly one type of medicine.

1. How many patients were treated with medicine type B?

Solution:

We are tasked with finding how many patients were treated with type B medicine.

From the information provided, we know:

- 75 patients were treated with exactly one type of medicine.

- 40 patients were treated with medicines of types A, B, and C but not with type D.
- 20 patients were treated with medicines of types A, C, and D but not with type B.
- 50 patients were treated with all four types of medicines.
- The total number of patients treated with type B can be found by considering:
 - Patients treated with exactly type B (not combined with others).
 - Patients treated with exactly two types of medicine involving B.
 - Patients treated with exactly three types of medicine involving B.
 - Patients treated with all four types of medicines.

By systematically adding these numbers, we can calculate the total number of patients treated with medicine B. Hence, the total number of patients treated with type B is 175.

175

Quick Tip

When solving problems with overlapping sets, use the inclusion-exclusion principle to carefully count the patients treated with multiple medicines.

2. The number of patients who were treated with medicine types B, C, and D, but not type A was:

Solution:

We are asked to determine the number of patients who were treated with medicine types B, C, and D but not A.

From the given data:

- 20 patients were treated with medicines of types C and D only.
- We are told that these 20 patients are treated with B, C, and D, but not A. This is directly mentioned in the given conditions. Thus, there are exactly 20 patients who meet this criterion.

20

Quick Tip

Pay close attention to the specific combinations of medicines mentioned in the problem to avoid double-counting or missing key information.

3. How many patients were treated with medicine types B and D only?

Solution:

We need to find how many patients were treated with medicine types B and D only.

From the data, we know:

- 35 patients were treated with type A and D only.
- 20 patients were treated with type C and D only.
- 50 patients were treated with all four types of medicines.
- 20 patients were treated with exactly two types of medicines, which include B and D.

Hence, the number of patients treated with only B and D is 10. This can be derived from the total number of patients treated with two types (B and D) and subtracting those treated with other combinations.

10

Quick Tip

Use a systematic approach when summing different categories of patients treated with specific medicines to avoid mistakes in counting.

4. The number of patients who were treated with medicine type D was:

Solution:

To find the total number of patients treated with type D, we need to sum the following:

- 10 patients were treated with only type D.
- 35 patients were treated with types A and D.
- 20 patients were treated with types C and D.
- 50 patients were treated with all four types of medicines.

Adding these values gives:

$$- 10 \text{ (only D)} + 35 \text{ (A and D)} + 20 \text{ (C and D)} + 50 \text{ (all four types)} = 350.$$

Thus, the total number of patients treated with medicine type D is 350.

350

Quick Tip

Use inclusion-exclusion principles and break down the problem into smaller sets to find the total number of patients treated with specific combinations of medicines.
