Solutions for CAT 2017 DILR – Morning (Slot-1)

35. As the item which take the maximum time is burger, client 1 will be completely served by 10.00 + 10 minutes = 10.10 Choice (2)

36. The time taken for the different clients are
Client 1 – 10.00 – 10.10 (burger)
Client 2 – 10.10 – 10.15 (fries)
Client 3 – 10.15 – 10.25 (burger) Choice (3)

37. When they are allowed to process multiple orders, the time taken would be
Client 1 – 10.00 – 10.10 (Anish)
Client 2 – 10.05 – 10.10 (Bani)
The second client can be served by 10.10
Choice (1)

38. The time for which exactly one employee would be free would be
10.02 – 10.05 – (Bani) – 3 Minutes.
10.10 – 10.17 (Anish/Bani) – 7 minutes (depending on who prepares the order for client 3.
After 10.17 both of them would be free.
∴ One of them would be free for 3 + 7 = 10 minutes. Choice (2)

Solutions for questions 39 to 42:

With the table given for kids in different schools whose mothers had dropped out of school we will be adding another value for each value already present and the new value will represent the number of kids in different types of schools for kids whose mothers completed primary education.

	C		**P**		**O**		**Total**
	Dropped out	Completed	Dropped out	Completed	Dropped out	Completed	
NE	4200	1050	500	1150	300	300	7500
W	4200	1050	1900	3850	1200	300	12500
S	5100	900	300	3400	300	0	10000
Total	13,500	3000	2700	8400	1800	600	30000

39. 300 + 3400 = 3700 students out of 10,000 from S were studying in P, i.e., 37%
Choice (1)

40. In W, 300 kids whose mothers had completed primary education were not in school.
Choice (1)

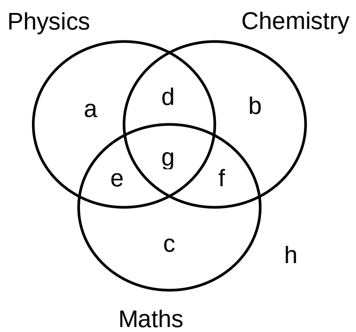
41. As there were initially 2400 students who were not in school and now 1200 of them are in G, with the mentioned percentages the only possibility is 50% of students in W, 25% of students in NE and 100% of students in S who were not going to school shifted to G.
∴ 50% of W = 50% of 1500 = 750
25% of NE = 25% of 600 = 150
100% of S = 100% of 300 = 300
Total 1200

∴ now 4200 + 1050 + 750 = 6000 students were in G is W.
Choice (1)

42. As explained in the previous question, all 300 in S who were not going to school, now shifted to G. Now of the 5700 students whose mothers had dropped out in S regions, 5400 are in G.
The required percentage = $\frac{5400}{5700}\times 100$ = 94.7%
Choice (1)

Solutions for questions 43 to 46:

It is given that 200 candidates scored above 90th percentile overall in CET. Let the following Venn diagram represent the number of persons who scored above 80 percentile in CET in each of the three sections:



From 1, h = 0.
From 2, d + e + f = 150
From 3, a = b = c
Since there are a total of 200 candidates,
3a + g = 200 – 150 = 50

From 4, (2a + d) : (2a + e) : (2a + f) = 4 : 2 : 1
Therefore, 6a + (d + e + f) is divisible by 4 + 2 + 1 = 7.
Since d + e + f = 150, 6a + 150 is divisible by 7, i.e., 6a + 3 is divisible by 7.

Hence, a = 3, 10, 17, . . .

Further, since 3a + g = 50, a must be less than 17. Therefore, only two cases are possible for the value of a, i.e., 3 or 10.
We can calculate the values of the other variables for the two cases.
a = 3 or 10
d = 18 or 10
e = 42 or 40
f = 90 or 100
g = 41 or 20
Among the candidates who are at or above 90^{th} percentile, the candidates who are at or above 80^{th} percentile in at least two sections are selected for AET. Hence, the candidates represented by d, e, f and g are selected for AET.
BIE will consider the candidates who are appearing for AET and are at or above 80^{th} percentile in P. Hence, BIE will consider the candidates represented by d, e and g, which can be 104 or 80.
BIE will conduct a separate test for the other students who are at or above 80^{th} percentile in P. Given that there are a total of 400 candidates at or above 80^{th} percentile in P, and since there are 104 or 80 candidates at or above 80^{th} percentile in P and are at or above 90^{th} percentile overall, there must be 296 or 320 candidates at or above 80^{th} percentile in P who scored less than 90^{th} percentile overall.

43. The number of candidates sitting for separate test for BIE who were at or above 90^{th} percentile in CET (a) is either 3 or 10. Choice (1)

44. From the given condition, g is a multiple of 5. Hence, g = 20.
The number of candidates at or above 90^{th} percentile overall and at or above 80^{th} percentile in both P and M = e + g = 60. Ans: (60)

45. In this case, g = 20.
Number of candidates shortlisted for AET
= d + e + f + g = 10 + 40 + 100 + 20 = 170
Ans: (170)

46. From the given condition, the number of candidates at or above 90^{th} percentile overall and at or above 80^{th} percentile in P in CET = 104.
The number of candidates who have to sit for separate test = 296 + 3 = 299 Choice (1)

Solutions for questions 47 to 50:

The given data can be represented in a table as follows.

Scores	S	F	C
0			
1		2	1
2		1	3
3	3	2	4
4	3	1	1
5	2	3	
6	1		1
7	1	1	
Total	10	10	10

A and C had a total score of 7, with identical scores in all these parameters. So it can only be 1, 2 and 4 or 3, 3 and 1. As Zooma has a score of 17, and all three countries in the happy category had the highest score in exactly one parameter, he can only have a 7 in F, 6 in S and 4 in C as a score of 7 in S and 6 in C would be the scores of the other two countries and he cannot have a 7, 7 and 5 as there is no country which scored a 5 in C.

47. Amda can have a distribution of 3, 3, 1 or 4, 2, 1. In either case the only possible score of F is 1 as no other parameter has a score of 1 for two countries. Ans (1)

48. As explained before Zooma's score in C has to be 6. Ans (6)

49. In the table given, among the highest scores, a score of 7 in F, 6 in S and 4 in S were the score of Zoom. The best possible scores remaining for Benga and Dalma would be

<u>Benga</u>	<u>Dalma</u>
S – 5	S – 7
C – 6	C – 3
F – <u>5</u>	F – <u>5</u>
16	15

As it is given that both had the some total score it can only be 15 for both , i.e. Benga's score in S or F was one less than the maximum possible.
Choice (2)

50. Considering the score of Zoom, Benga and Delma as 17, 16 and 15, we get

	S	F	C	Total
Zoom	6	7	4	17
Benga	5	5	6	16
Delma	7	5	3	15

If Benga score 16 and Dalma score 15 (as illustrated in the previous solution) the maximum possible values remaining are

Score	S	F	C
3	3	2	3
4	3	1	0
5	1	1	0

Now the maximum score of another country can be S – 5, F – 5 and C – 3. Only one country can have a score of 13 as no other country can have a score of 5 in any parameter. Choice (2)

Solutions for questions 51 to 54:

Given that there are 10 SE and 11 RE.
In the first month, since T1 has one more SE than T2, who in turn has one more SE than T3, … till T5, the number of SEs in T1, T2, T3, T4 and T5 must be 4, 3, 2, 1 and 0.

Also, the team that is assigned the challenging project has one more employee than the rest. Hence, the team that is assigned the challenging project will have 5 employees, while the other teams will have 4 employees.

Since T1 is assigned the Challenging project in the first month, T1 will have 5 employees, and the other teams will have 4 employees each.

The following table provides the composition of the teams in the first month:

Team	SE	RE	Total
T1	4	1	5
T2	3	1	4
T3	2	2	4
T4	1	3	4
T5	0	4	4

In the second month, T2 will be allotted the challenging project.
From a, two SEs will be transferred from T1 to T2. One RE is transferred from T2 to T1.
From b, one SE will be transferred from T1 to T5, one RE will be transferred from T5 to T1. Similar transfers will happen between T2 and T4.

The following table provides the number of employees in each team in the second month:

Team	SE	RE	Total
T1	1	3	4
T2	4	1	5
T3	2	2	4
T4	2	2	4
T5	1	3	4

In the third month, T3 will be allotted the challenging project.
From a, two SEs will be transferred from T2 to T3. One RE is transferred from T3 to T2.
From b, one SE will be transferred from T1 to T5, one RE will be transferred from T5 to T1.
Also, one SE will be transferred from T2 to T4 and one RE will be transferred from T4 to T2.
The following table provides the number of employees in each team in the third month:

Team	SE	RE	Total
T1	0	4	4
T2	1	3	4
T3	4	1	5
T4	3	1	4
T5	2	2	4

In the fourth month, T4 will be allotted the challenging project.
From a, two SEs will be transferred from T3 to T4. One RE is transferred from T4 to T3.
From b, one SE must be transferred from T1 to T5. However, since there are no SEs in T1, this will not happen.
Also, one SE must be transferred from T2 to T4 and one RE must be transferred from T4 to T2. However, there are no REs in T4. Hence, this transfer will not happen.
The following table provides the number of employees in each team in the fourth month:

Team	SE	RE	Total
T1	0	4	4
T2	1	3	4
T3	2	2	4
T4	5	0	5
T5	2	2	4

In the fifth month, T5 will be allotted the challenging project.
From a, two SEs will be transferred from T4 to T5. One RE is transferred from T5 to T4.
From b, one SE must be transferred from T1 to T5. However, since there are no SEs in T1, this will not happen.
Also, one SE will be transferred from T2 to T4 and one RE will be transferred from T4 to T2.
The following table provides the number of employees in each team in the fifth month:

Team	SE	RE	Total
T1	0	4	4
T2	0	4	4
T3	2	2	4
T4	4	0	4
T5	4	1	5

51. The composition of T2 did not change once between the third and the fourth months.
The composition of T4 changed between any two successive months.
Hence, the answer is (1, 0). Choice (2)

52. Number of SE in T1 in third month = 0
Number of SE in T5 in third month = 2.
Hence, the answer is (0, 2) Choice (1)

53. Given that challenging projects has 200 credits and standard projects have 100 credits.
In each type of project, the credits are equally shared by the employees in the team.

Hence, for a challenging project an employee earns 200/5 = 40 credits

For a standard project, an employee earns 100/4 = 25 credits.

For the five months, an employee can work in five challenging projects OR four challenging projects and one standard project OR three challenging projects and two standard projects OR two challenging projects and three challenging projects OR one challenging project and four standard projects OR five standard projects.

In each case, an employee will earn 200 or 185 or 170 or 155 or 140 or 125 credits.

Hence, it is not possible for an employee to earn 150 credits. Choice (2)

54. Since Aneek secured 185 credits, he worked in four challenging projects and one standard project.
Option A: Aneek could have worked in T1 in first month (in challenging project), T2 in second month (in challenging project), T3 in third month (in challenging project), T4 in fourth month (in challenging project) and fifth month (in standard project). Hence, this is possible.

Option B: Aneek could have worked in T1 in first month (in challenging project), T2 in second month (in challenging project), T4 in third month (in standard project), T4 in fourth month (in challenging project) and T5 in fifth month (in challenging project). Hence, this is possible.

Option C: Aneek could have worked in T2 in first month (in standard project), T2 in second month (in challenging project), T3 in third month (in challenging project), T4 in fourth month (in challenging project) and T5 in fifth month (in challenging project). Hence, this is possible.

Option D: Aneek could have worked in T1 in first month (in challenging project). He can work in T1 or T5 in the second month. In either case, he cannot work in T3 without working in T2 first. If we assume, he worked in T3 in the first month, he could not have worked in four teams in the five months. Similarly, we can rule out the other possibilities for this option. Hence, this is the answer. Choice (4)

Solutions for questions 55 to 58:

The heights of the platforms given is as below

6	1	2	4	3
9	5	3	2	8
7	8	4	6	5
3	9	5	1	2
1	7	6	3	9

55. The number of persons who can be reached by just one individual is circled

6	1	(2)	4	3
9	5	3	2	8
(7)	8	(4)	6	(5)
(3)	9	5	1	(2)
1	7	6	(3)	9

A total of 7 persons can be reached by just one individual. Choice (3)

56. For individual at a platform of height 1, they cannot be reached by anyone as condition (II) will be violated. Choice (4)

57. Only in the fourth column can we find two individuals who cannot be reached by anyone. In the fourth column the individual at height 2 and the individual at height 1 cannot be reached by anyone. Choice (3)

58. Statement 1 is wrong as no individual in row 1 can be reached by 5 or more individuals. Statement 2 is wrong as row 3 has no individual who cannot be reached by anyone.
Statement 4 is wrong as the individual at height 9 in column 1 can be reached by only 4 individuals.
∴ Only statement 3 is correct. Choice (3)

59. For any pair of cities, say A and B, to satisfy the underlying principle, there must be a morning flight from A to B, an evening flight from B to A and a morning flight from B to A and an evening flight from A to B. Only then can a person from A or B travel to B or A and return the same day.
Hence, there must be four flights between any pair of cities.
Number of ways of selecting two cities from ten cities = $\frac{10 \times 9}{2}$ = 45.
Hence, the minimum number of flights that must be scheduled = 45 ×4 = 180. Choice (3)

60. Let the ten cities be represented by A through J. Among these ten cities, consider A, B and C to be hubs and the other seven cities to be non-hub cities.
It is given that any direct flight should originate and/or terminate at a hub.
Consider city D, which not a hub. D should be connected to each of A, B and C. Between D and each of A, B and C, there must be four flights (from the above solution). Hence, from D, there must be 4 × 3 = 12 flights to the three hubs, A, B and C.
Similarly, for each of the other six non-hub cities, there must be 12 flights connecting each non-hub city with the three hubs.
Hence, a total of 12 ×7 = 84 flights will connect a non-hub city with a hub.
In addition to this, the three hubs must be connected amongst themselves. Since there must be four flights between any pair of cities, there must be a total of 4 × 3 = 12 flights connecting any pair of hubs.
Hence, the total minimum number of flights that should be scheduled = 84 + 12 = 96.
Choice (3)

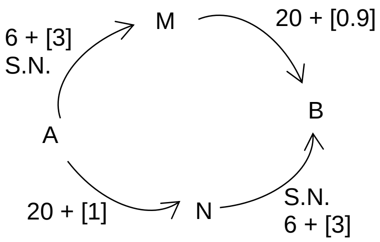
61. Given that G1 has the cities A, B and C.
G2, G3 and G4 have 3, 2 and 2 cities respectively. From the given conditions, we can see that a city in G2 cannot be connected by a direct flight to a city in G3 or G4. Hence, for a person to travel from a city in G2 to a city in G3 or G4, all the cities in G2 must be connected to A and from A, he can travel to B or C to travel to a city G3 or G4 respectively.
Hence, the 3 cities in G2 must be connected to A. Between each pair of cities there must be four flights. Hence, there must be 4 × 3 = 12 flights between cities in G2 and A.

Since there are 2 cities in G3, there must be 2 × 4 = 8 flights between cities in G3 and B.
Since there are 2 cities in G4, there must be 2 × 4 = 8 flights between cities in G4 and C.
Also, the cities in G1, i.e., A, B and C must be connected to each other. Hence, there must be an additional 4 × 3 = 12 flights between these three cities.
Therefore, the total minimum number of direct flights that must be scheduled = 12 + 8 + 8 + 12 = 40 Ans: (40)

62. It is given that the cities in G2 will be assigned to G3 or G4. However, this, by itself, will not result in any reduction in the number of flights because the cities in G2 will still have to be connected to either B or C.
However, it is also given that there are now no flights between A and C. Hence, the 4 flights that would have been scheduled in the previous case, will now not be scheduled.
Hence, the reduction in the number of flights can be a maximum of 4. Ans: (4)

63. As there are four cars and as the time through each route is nearly the same, two cars should go through A-M-B and the other two through A-N-B. In case three cars are directed to go through any of the routes, one of the three cars can break the police order and reduce its travel time.
Ans: (2)

64.



According to the police order 2 cars each would pass through A – M – B and A – N – B.
Then time taken through A – M – B = 29.9
and time taken through A – N – B = 30.0
∴ Difference = 0.1 Choice (2)

65. No car should be able to reduce its travel time by not following the order and all the cars cannot take the same route. So either two or three cars should go through A-M. If two cars go through M-B, one car can break the police order and go through M-N and reach B in 9 + 7 + 12 = 28 minutes as compared to 29.9 minutes had both gone through A-M-B. If two cars go through A-M and one is directed to go through M-N, one of the cars which was directed to go through A-N can break the police order and go through A-M-B and save time as follows:
Original time (A-N-B) = 21 + 12 = (three cars) = 33
New time = 12 (3 cars) + 20 .9 = 32.9
The police department cannot direct both cars to go through M-N as in that case all four cars would go through N-B
In case three cars are directed to go through A-M, either one car can be directed through M-N or two cars can be directed through M-N.
If one car is directed through M-N, one of the two cars directed through M-B, can break the police order and go through M-N, and save time as shown.
Original time (A-M-B) = 12 (3 cars) + 20.9 = 32.9
New time (A-M-N-B) = 12 + 8 + 12 = 32 minutes.
∴ two cars must be directed through M-N such that any car breaking the police order cannot reduce the travel time. Ans: (2)

66. When all cars follow the police order the time taken would be
A-M-B (1 car) = 12 + 20 = 32 minutes.
A-M-N-B (2cars) = 12 + 8 + 12 = 32 minutes.
A-N-B (1 car) = 20 + 12 =32 minutes.
Ans: (32)