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SET 1

Healthy Bites is a fast food joint serving three items, burgers, fries and ice cream. It has two employees Anish and Bani who prepare the items ordered by the clients. Preparation time is 10 minutes for a burger and 2 minutes for an order of Ice cream. An employee can prepare only one of these items at a time. The fries are prepared in an automatic fryer which can prepare up to 3 portions of fries at a time, and takes 5 minutes irrespective of the number of portions. The fryer does not need an employee to constantly attend to it, and we can ignore the time taken by an employee to start and stop the fryer; thus, an employee can be engaged in preparing other items while the frying is on. However, fries cannot be prepared in anticipation of future orders.

Healthy Bites wishes to serve the orders as early as possible. The individual items in any order are served as and when ready; however, the order is considered to be completely served only when all the items of that order are served. The table below gives the orders of three clients and the times at which they placed their orders:

Client no.	Time	Order
1	10:00	1 burger, 3 portions of fries, 1 order of ice cream
2	10:05	2 portions of fries. 1 order of ice cream
3	10:07	1 burger. 1 portion of fries

Question 1: Assume that only one client's order can be processed at any given point of time. So, Anish or Bani cannot start preparing a new order while a previous order is being prepared. At what time is the order placed by Client 1 completely served?

A. 10:17
B. 10:10
C. 10:15
D. 10:20

Question 2: Assume that only one client's order can be processed at any given point of time. So, Anish or Bani cannot start preparing a new order while a previous order is being prepared. At what time is the order placed by Client 3 completely served?

A. 10:35
B. 10:22
C. 10:25
D. 10:17

Question 3: Suppose the employees are allowed to process multiple orders at a time, but the preference would be to finish orders of clients who placed their orders earlier. At what time is the order placed by Client 2 completely served?

A. 10:10
B. 10:12
C. 10:15
D. 10:17

Question 4: Suppose the employees are allowed to process multiple orders at a time, but the preference would be to finish orders of clients who placed their orders earlier. Also assume that the fourth client came in only at 10:35. Between 10:00 and 10:30, for how many minutes is exactly one of the employees idle?

A. 7
B. 10
C. 15
D. 23

Video Explanation: https://www.youtube.com/watch?v=Tw7XKJgL_vA

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SET 2

A study to look at the early learning of rural kids was carried out in a number of villages spanning three states, chosen from the North East (NE), the West (W) and the South (S). 50 four-year old kids each were sampled from each of the 150 villages from NE, 250 villages from W and 200 villages from S. It was found that of the 30000 surveyed kids 55% studied in primary schools run by government (G), 37% in private schools (P) while the remaining 8% did not go to school (O).

The kids surveyed were further divided into two groups based on whether their mothers dropped out of school before completing primary education or not. The table below gives the number of kids in different types of schools for mothers who dropped out of school before completing primary education:

	G	P	O	Total
NE	4200	500	300	5000
W	4200	1900	1200	7300
S	5100	300	300	5700
Total	13500	2700	1800	18000

It is also known that:

1. In S, 60% of the surveyed kids were in G. Moreover, in S, all surveyed kids whose mothers had completed primary education were in school.

2. In NE, among the O kids, 50% had mothers who had dropped out before completing primary education.

3. The number of kids in G in NE was the same as the number of kids in G in W.

Question 5: What percentage of kids from S were studying in P?

A. 37%
B. 6%
C. 79%
D. 56%

Question 6: Among the kids in W whose mothers had completed primary education, how many were not in school?

A. 300
B. 1200
C. 1050
D. 1500

Question 7: In a follow up survey of the same kids two years later, it was found that all the kids were now in school. Of the kids who were not in school earlier, in one region, 25% were in G now, whereas the rest were enrolled in P; in the second region, all such kids were in G now; while in the third region, 50% of such kids had now joined G while the rest had joined P. As a result, in all three regions put together, 50% of the kids who were earlier out of school had joined G. It was also seen that no surveyed kid had changed schools.
What number of the surveyed kids now were in G in W?

A. 6000
B. 5250
C. 6750
D. 6300

Question 8: In a follow up survey of the same kids two years later, it was found that all the kids were now in school. Of the kids who were not in school earlier, in one region, 25% were in G now, whereas the rest were enrolled in P; in the second region, all such kids were in G now; while in the third region, 50% of such kids had now joined G while the rest had joined P. As a result, in all three regions put together, 50% of the kids who were earlier out of school had joined G. It was also seen that no surveyed kid had changed schools.
What percentage of the surveyed kids in S, whose mothers had dropped out before completing primary education, were in G now?

A. 94.7%
B. 89.5%
C. 93.4%
D. Cannot be determined from the given information

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SET 3

Applicants for the doctoral programmes of Ambi Institute of Engineering (AIE) and Bambi Institute of Engineering (BIE) have to appear for a Common Entrance Test (CET). The test has three sections: Physics (P), Chemistry (C), and Maths (M). Among those appearing for CET, those at or above the 80th percentile in at least two sections, and at or above the 90th percentile overall, are selected for Advanced Entrance Test (AET) conducted by AIE. AET is used by AIE for final selection.

For the 200 candidates who are at or above the 90th percentile overall based on CET, the following are known about their performance in CET:

1. No one is below the 80th percentile in all 3 sections.

2. 150 are at or above the 80th percentile in exactly two sections.

3. The number of candidates at or above the 80th percentile only in P is the same as the number of candidates at or above the 80th percentile only in C. The same is the number of candidates at or above the 80th percentile only in M.

4. Number of candidates below 80th percentile in P: Number of candidates below 80th percentile in C: Number of candidates below 80th percentile in M = 4:2:1.

BIE uses a different process for selection. If any candidate is appearing in the AET by AIE, BIE considers their AET score for final selection provided the candidate is at or above the 80th percentile in P. Any other candidate at or above the 80th percentile in P in CET, but who is not eligible for the AET, is required to appear in a separate test to be conducted by BIE for being considered for final selection. Altogether, there are 400 candidates this year who are at or above the 80th percentile in P.

Question 9: What best can be concluded about the number of candidates sitting for the separate test for BIE who were at or above the 90th percentile overall in CET?

A. 3 or 10
B. 10
C. 5
D. 7 or 10

Question 10: If the number of candidates who are at or above the 90th percentile overall and also at or above the 80th percentile in all three sections in CET is actually a multiple of 5, what is the number of candidates who are at or above the 90th percentile overall and at or above the 80th percentile in both P and M in CET?

Question 11: If the number of candidates who are at or above the 90th percentile overall and also at or above the 80th percentile in all three sections in CET is actually a multiple of 5, then how many candidates were shortlisted for the AET for AIE?

Question 12: If the number of candidates who are at or above the 90th percentile overall and also are at or above the 80th percentile in P in CET, is more than 100, how many candidates had to sit for the separate test for BIE?

A. 299
B. 310
C. 321
D. 330

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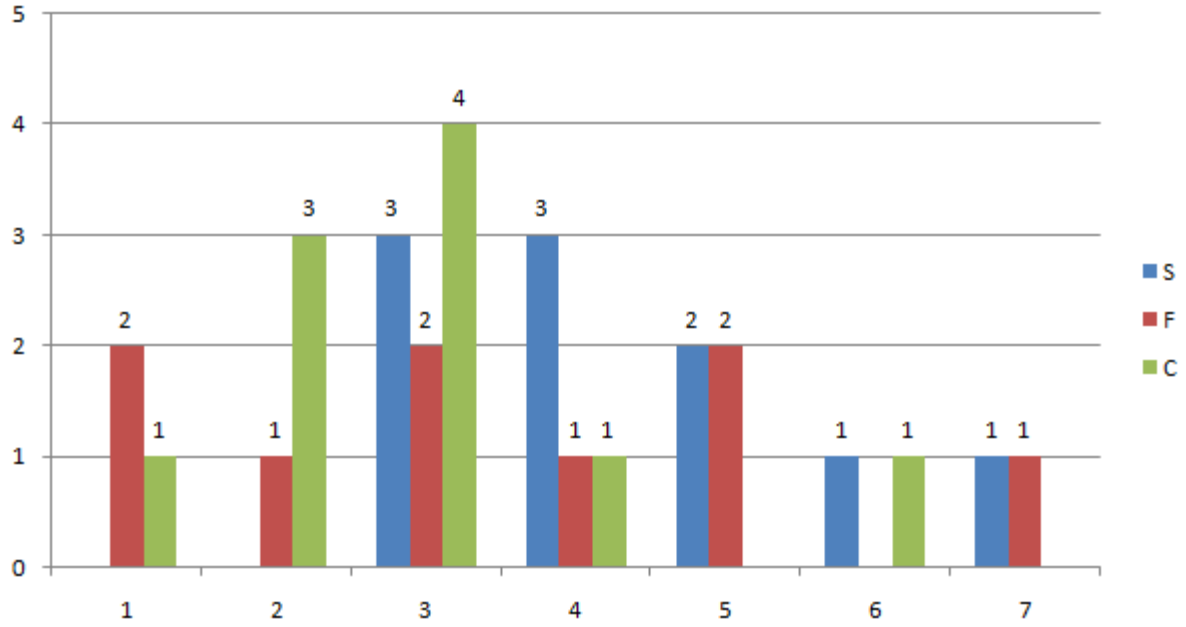
SET 4

Simple Happiness index (SHI) of a country is computed on the basis of three, parameters: social support (S),freedom to life choices (F) and corruption perception (C). Each of these three parameters is measured on a scale of 0 to 8 (integers only). A country is then categorised based on the total score obtained by summing the scores of all the three parameters, as shown in the following table:

Toatal Score	0-4	5-8	9-13	14-19	20-24
Category	Very Unhappy	Unhappy	Neutral	Happy	Very Happy

Following diagram depicts the frequency distribution of the scores in S, F and C of 10 countries - Amda, Benga, Calla, Delma, Eppa, Varsa, Wanna, Xanda,Yanga and Zooma:



Further, the following are known.

1. Amda and Calla jointly have the lowest total score, 7, with identical scores in all the three parameters.

2. Zooma has a total score of 17.

3. All the 3 countries, which are categorised as happy, have the highest score In exactly one parameter.

Question 13: What is Amda's score in F?

Question 14: What is Zooma's score in S?

Question 15: Benga and Delma, two countries categorized as happy, are tied with the same total score. What is the maximum score they can have?

A. 14
B. 15
C. 16
D. 17

Question 16: If Benga scores 16 and Delma scores 15, then what is the maximum number of countries with a score of 13?

A. 0
B. 1
C. 2
D. 3

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SET 5

There are 21 employees working in a division, out of whom 10 are special-skilled employees (SE) and the remaining are regular-skilled employees (RE). During the next five months, the division has to complete five projects every month. Out of the 25 projects, 5 projects are "challenging", while the remaining ones are "standard". Each of the challenging projects has to be completed in different months. Every month, five teams — T1, T2, T3, T4 and T5, work on one project each. T1, T2, T3, T4 and T5 are allotted the challenging project in the first, second, third, fourth and fifth month, respectively. The team assigned the challenging project has one more employee than the rest.

In the first month, T 1 has one more SE than T2, T2 has one more SE than T3, T 3 has one more SE than T4, and T4 has one more SE than T5. Between two successive months, the composition of the teams changes as follows:

a. The team allotted the challenging project, gets two SE from the team which was allotted the challenging project in the previous month. In exchange, one RE is shifted from the former team to the latter team.

b. After the above exchange, if T 1 has any SE and T5 has any RE, then one SE is shifted from T1 to T5, and one RE is shifted from T5 to T1. Also, if T2 has any SE and T4 has any RE, then one SE is shifted from T2 to T4, and one RE is shifted from T 4 to T2.

Each standard project has a total of 100 credit points, while each challenging project has 200 credit points. The credit points are equally shared between the employees included in that team.

Question 17: The number of times in which the composition of team T2 and the number of times in which composition of team T4 remained unchanged in two successive months are:

A. (2,1)
B. (1,0)

C. (0,0)
D. (1,1)

Question 18: The number of SE in T1 and T5 for the projects in the third month are, respectively:

A. (0,2)
B. (0,3)
C. (1,2)
D. (1,3)

Question 19: Which of the following CANNOT be the total credit points earned by any employee from the projects?

A. 140
B. 150
C. 170
D. 200

Question 20: One of the employees named Aneek scored 185 points. Which of the following CANNOT be true?

A. Aneek worked only in teams T1, T2, T3, and T4.
B. Aneek worked only in teams T1, T2, T4, and T5.
C. Aneek worked only in teams T2, T3, T4, and T5.
D. Aneek worked only in teams T1, T3, T4, and T5.

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SET 6

In a square layout of site 5rn X 5m, 25 equal-sized square platforms of different heights are built. The heights (in metre) of individual platforms are as shown 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

Individuals (all of same height) are seated on these platforms. We say an individual A can reach individual B, if all the three following conditions are met;

(i) A and B are in the same row or column

(ii) A is at a lower height than B

(iii) If there is/are any individual(s) between A and B, such Individual(s) must be at a height lower than that of A.

Thus in the table given above, consider the individual seated at height 8 on 3rd row and 2nd column. He ran be reached by four Individuals. He can be reached by the individual on his left at height 7, by the two individuals on his right at heights of 4 and 6 and by the individual above at height 5.

Rows in the layout are numbered from top to bottom and columns are numbered from left to right.

Question 21: How many individuals in this layout can be reached by just one individual?

A. 3
B. 5
C. 7
D. 8

Question 22: Which of the following is true for any individual at a platform of height 1 m in this layout?

A. They can be reached by all the individuals in their own row and column.
B. They can be reached by at least 4 individuals.
C. They can be reached by at least one individual.
D. They cannot be reached by anyone.

Question 23: We can find two individuals who cannot be reached by anyone in

A. the last row.
B. the fourth row.
C. the fourth column.
D. the middle column.

Question 24: Which of the following statements is true about this layout?

A. Each row has an individual who can be reached by 5 or more individuals.
B. Each row has an individual who cannot be reached by anyone.
C. Each row has at least two individuals who can be reached by an equal number of individuals.
D. All individuals at the height of 9 m can be reached by at least 5 individuals.

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SET 7

A new airlines company is planning to start operations in a country. The company has identified ten different cities which they plan to connect through their network to start with. The flight duration between any pair of cities will be less than one hour. To start operations, the company has to decide on a daily schedule.

The underlying principle that they are working on is the following:

Any person staying in any of these 10 cities should be able to make a trip to any other city in the morning and should be able to return by the evening of the same day.

Question 25: If the underlying principle is to be satisfied in such a way that the journey between any two cities can be performed using only direct (non-stop) flights, then the minimum number of direct flights to be scheduled is:

A. 45
B. 90
C. 180
D. 135

Question 26: Suppose three of the ten cities are to be developed as hubs. A hub is a city which is connected with every other city by direct flights each way, both in the morning as well as in the evening. The only direct flights which will be scheduled are originating and/or terminating in one of the hubs. Then the minimum number of direct flights that need to be scheduled so that the underlying principle of the airline to serve all the ten cities is met without visiting more than one hub during one trip is:

A. 54
B. 120
C. 96
D. 60

Question 27: Suppose the 10 cities are divided into 4 distinct groups G1, G2, G3, G4 having 3, 3, 2 and 2 cities respectively and that G1 consists of cities named A, B and C. Further, suppose that direct flights are allowed only between two cities satisfying one of the following:

1. Both cities are in G1
2. Between A and any city in G2
3. Between B and any city in G3
4. Between C and any city in G4

Then the minimum number of direct flights that satisfies the underlying principle of the airline is:

Question 28: Suppose the 10 cities are divided into 4 distinct groups Gl, G2, G3, G4 having 3, 3, 2 and 2 cities respectively and that Gl consists of cities named A, B and C. Further, suppose that direct flights are allowed only between two cities satisfying one of the following:

1. Both cities are in G1
2. Between A and any city in G2
3. Between B and any city in G3
4. Between C and any city in G4

However, due to operational difficulties at A, it was later decided that the only flights that would operate at A would be those to and from B. Cities in G2 would have to be assigned to G3 or to G4.

What would be the maximum reduction in the number of direct flights as compared to the situation before the operational difficulties arose?

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SET 8

Four cars need to travel from Akala (A) to Bakala (B). Two routes are available, one via Mamur (M) and the other via Nanur (N). The roads from A to M, and from N to B, are both short and narrow. In each case, one car takes 6 minutes to cover the distance, and each additional car increases the travel time per car by 3 minutes because of congestion. (For example, if only two cars drive from A to M, each car takes 9 minutes.) On the road from A to N, one car takes 20 minutes, and each additional car increases the travel time per car by 1 minute. On the road from M to B, one car takes 20 minutes, and each additional car increases the travel time per car by 0.9 minute.

The police department orders each car to take a particular route in such a manner that it is not possible for any car to reduce its travel time by not following the order, while the other cars are following the order.

Question 29: How many cars would be asked to take the route A-N-B, that is Akala-Nanur-Bakala route, by the police department?

Question 30: If all the cars follow the police order, what is the difference in travel time (in minutes) between a car which takes the route A-N-B and a car that takes the route A-M-B?

A. 1
B. 0.1
C. 0.2
D. 0.9

Question 31: A new one-way road is built from M to N. Each car now has three possible routes to travel from A to B: A-M-B, A-N-B and A-M-N-B. On the road from M to N, one car takes 7 minutes and each additional car increases the travel time per car by 1 minute. Assume that any car taking the A-M-N-B route travels the A-M portion at the same time as other cars taking the A-M-B route, and the N-B portion at the same time as other cars taking the A-N-B route.

How many cars would the police department order to take the A-M-N-B route so that it is not possible for any car to reduce its travel time by not following the order while the other cars follow the order? (Assume that the police department would never order all the cars to take the same route.)

Question 32: A new one-way road is built from M to N. Each car now has three possible routes to travel from A to B: A-M-B, A-N-B and A-M-N-B. On the road from M to N, one car takes 7 minutes and each additional car increases the travel time per car by j. minute. Assume that any car taking the A-M-N-B route travels the A-M portion at the same time as other cars taking the A-M-B route, and the N-B portion at the same time as other cars taking the A-N-B route.
If all the cars follow the police order, what is the minimum travel time (in minutes) from A to B? (Assume that the police department would never order all the cars to take the same route.)

A. 26
B. 32
C. 29.9
D. 30

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SET 9

Funky Pizzeria was required to supply pizzas to three different parties. The total number of pizzas it had to deliver was 800, 70% of which were to be delivered to Party 3 and the rest equally divided between Party 1 and Party 2.

Pizzas could be of Thin Crust (P) or Deep Dish variety and come in either Normal Cheese (NC) or Extra Cheese (EC) versions. Hence, there are four types of pizzas: T-NC, T-EC, D-NC and D-EC. Partial information about proportions of T and NC pizzas ordered by the three parties is given below:

	Thin crust (T)	Normal cheese (NC)
Party 1	0.6	
Party 2	0.55	0.3
Party 3		0.65
Total	0.375	0.52

Question 33: How many Thin Crust pizzas were to be delivered to Party 3?

A. 398
B. 162
C. 96
D. 364

Question 34: How many Normal Cheese pizzas were required to be delivered to Party 1?

A. 104
B. 84
C. 16
D. 196

Question 35: For Party 2, if 50% of the Normal Cheese pizzas were of Thin Crust variety, what was the difference between the numbers of T-EC and D-EC pizzas to be delivered to Party 2?

A. 18
B. 12
C. 30
D. 24

Question 36: Suppose that a T-NC pizza costs as much as a D-NC pizza, but 3/5th of the price of a D-EC pizza. A D-EC pizza costs Rs. 50 more than a T-EC pizza, and the latter costs Rs. 500. If 25% of the Normal Cheese pizzas delivered to Party 1 were of Deep Dish variety, what was the total bill for Party 1?

A. Rs. 59480
B. Rs. 59840
C. Rs. 42520
D. Rs. 45240

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SET 10

There were seven elective courses — E1 to E7 — running in a specific term in a college. Each of the 300 students enrolled had chosen just one elective from among these seven. However, before the start of the term, E7 was withdrawn as the instructor concerned had left the college. The students who had opted for E7 were allowed to join any of the remaining electives. Also, the students who had chosen other electives were given one chance to change their choice. The table below captures the movement of the students from one elective to another during this process. Movement from one elective to the same elective simply means no movement. Some numbers in the table got accidentally erased; however, it's known that these were either 0 or 1.

		To Elective						
		E1	E2	E3	E4	ES	E6	
From Elective	E1	9	5	10	1	4	2	
	E2		34	8		2	2	
	E3	2	6	25			2	
	E4		3	2	14		4	
	ES		5			30		
	E6		7	3		2	9	
	E7	4	16	30	5	5	41	

Further, the following are known:

1. Before the change process there were 6 more students in E1 than in E4, but after the reshuffle, the number of students in E4 was 3 more than that in E1.

2. The number of students in E2 increased by 30 after the change process.

3. Before the change process, E4 had 2 more students than E6, while E2 had 10 more students than E3

Question 37: How many elective courses among E 1 to E6 had a decrease in their enrolments after the change process?

A. 4
B. 1

C. 2
D. 3

Question 38: After the change process, which of the following is the correct sequence of number of students in the six electives E 1 to E6?

A. 19, 76, 79, 21, 45, 60
B. 19, 76, 78, 22, 45, 60
C. 18, 76, 79, 23, 43, 61
D. 18, 76, 79, 21, 45, 61

Question 39: After the change process, which course among E1 to E6 had the largest change in its enrollment as a percentage of its original enrollment?

A. E1
B. E2
C. E3
D. E6

Question 40: Later, the college imposed a condition that if after the change of electives, the enrolment in any elective (other than E7) dropped to less than 20 students, all the students who had left that course will be required to re- enrol for that elective. Which of the following is a correct sequence of electives in decreasing order of their final enrolments?

A. E2, E3, E6, E5, E1, E4
B. E3, E2, E6, E5, E4, E1
C. E2, E5, E3, E1, E4, E6
D. E2, E3, E5, E6, E1, E3

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SET 11

An old woman had the following assets:

(a) Rs. 70 lakh in bank deposits

(b) 1 house worth Rs. 50 lakh

(c) 3 flats, each worth Rs. 30 lakh

(d) Certain number of gold coins, each worth Rs. 1 lakh

She wanted to distribute her assets among her three children: Neeta, Seeta and Geeta.

The house, any of the flats or any of the coins were not to be split. That is, the house went entirely to one child; a flat went to one child and similarly, a gold coin went to one child.

Question 41: Among the three, Neeta received the least amount in bank deposits, while Geeta received the highest. The value of the assets was distributed equally among the children, as were the gold coins. How much did Seeta receive in bank deposits (in lakhs of rupees)?

A. 30
B. 40
C. 20
D. 10

Question 42: Among the three, Neeta received the least amount in bank deposits, while Geeta received the highest. The value of the assets was distributed equally among the children, as were the gold coins. How many flats did Neeta receive?

Question 43: The value of the assets distributed among Neeta, Seeta and Geeta was in the ratio of 1:2:3, while the gold coins were distributed among them in the ratio of 2:3:4. One child got all three flats and she did not get the house. One child, other than Geeta, got Rs. 30 lakh in bank deposits. How many gold coins did the old woman have?

A. 72
B. 90
C. 180
D. 216

Question 44: The value of the assets distributed among Neeta, Seeta and Geeta was in the ratio of 1:2:3, while the gold coins were distributed among them in the ratio of 2:3:4. One child got all three flats and she did not get the house. One child, other than Geeta, got Rs. 30 lakh in. bank deposits.

How much did Geeta get in bank deposits (in lakhs of rupees)?

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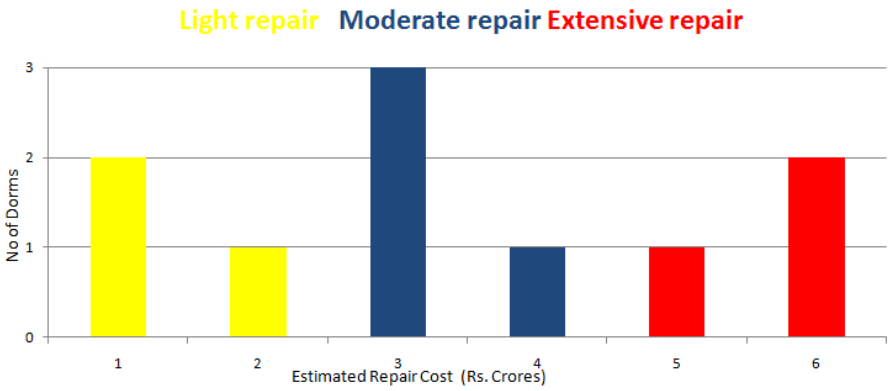
SET 12

At a management school, the oldest 10 dorms, numbered 1 to 10, need to be repaired urgently. The following diagram represents the estimated repair costs (in Rs. Crores) for the 10 dorms. For any dorm, the estimated repair cost (in Rs. Crores) is an integer. Repairs with estimated cost Rs. 1 or 2 Crores are considered light repairs, repairs with estimated cost Rs. 3 or 4 are considered moderate repairs and repairs with estimated cost Rs. 5 or 6 Crores are considered extensive repairs.



Further, the following is known:

1. Odd-numbered dorms do not need light repair; even-numbered dorms do not need moderate repair and dorms, whose numbers are divisible by 3, do not need extensive repair.

2. Dorms 4 to 9 all need different repair costs, with Dorm 7 needing the maximum and Dorm 8 needing the minimum.

Question 45: Which of the following is NOT necessarily true?

A. Dorm 1 needs a moderate repair
B. Dorm 5 repair will cost no more than Rs. 4 Crores
C. Dorm 7 needs an extensive repair
D. Dorm 10 repair will cost no more than Rs. 4 Crores

Question 46: What is the total cost of repairing the odd-numbered dorms (in Rs. Crores)?

Question 47: Suppose further that:

1. 4 of the 10 dorms needing repair are women's dorms and need a total of Rs. 20 Crores for repair.

2. Only one of Dorms 1 to 5 is a women's dorm.

What is the cost for repairing Dorm 9 (in Rs. Crores)?

Question 48: Suppose further that:

1. 4 of the 10 dorms needing repair are women's dorms and need a total of Rs. 20 Crores for repair.

2. Only one of Dorms 1 to 5 is a women's dorm.

Which of the following is a women's dorm?

A. Dorm 2
B. Dorm 5
C. Dorm 8
D. Dorm 10

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SET 13

A tea taster was assigned to rate teas from six different locations — Munnar, Wayanad, Ooty, Darjeeling, Assam and Himachal. These teas were placed in six cups, numbered 1 to 6, not necessarily in the same order. The tea taster was asked to rate these teas on the strength of their flavour on a scale of 1 to 10. He gave a unique integer rating to each tea. Some other information is given below:

1. Cup 6 contained tea from Himachal.

2. Tea from Ooty got the highest rating, but it was not in Cup 3.

3. The rating of tea in Cup 3 was double the rating of the tea in Cup 5.

4. Only two cups got ratings in even numbers.

5. Cup 2 got the minimum rating and this rating was an even number.

6. Tea in Cup 3 got a higher rating than that in Cup 1.

7. The rating of tea from Wayanad was more than the rating of tea from Munnar, but less than that from Assam.

Question 49: What was the second highest rating given?
Question 50: What was the number of the cup that contained tea from Ooty?
Question 51: If the tea from Munnar did not get the minimum rating, what was the rating of the tea from Wayanad?

A. 3
B. 5
C. 1
D. 6

Question 52: If cups containing teas from Wayanad and Ooty had consecutive numbers, which of the following statements may be true?

A. Cup 5 contains tea from Assam
B. Cup 1 contains tea from Darjeeling
C. Tea from Wayanad has got a rating of 6
D. Tea from Darjeeling got the minimum rating\

Video Explanation: https://www.youtube.com/watch?v=gVmvT5uUr_M

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SET 14

In an 8 X 8 chessboard a queen placed anywhere can attack another piece if the piece is present in the same row, or in the same column or in any diagonal position in any possible 4 directions, provided there is no other piece in between in the path from the queen to that piece.

The columns are labelled a to h (left to right) and the rows are numbered 1 to 8 (bottom to top). The position of a piece is given by the combination of column and row labels. For example, position c5 means that the piece is in c th column and 5th row.

Question 53: If the queen is at c5, and the other pieces at positions c2, g1, g3, g5 and a3, how many are under attack by the queen? There are no other pieces on the board.

A. 2
B. 3
C. 4
D. 5

Question 54: If the other pieces are only at positions a1, a3, b4, d7, h7 and h8, then which of the following positions of the queen results in the maximum number of pieces being under attack?

A. f8
B. a7
C. c1
D. d3

Question 55: If the other pieces are only at positions a1, a3, b4, d7, h7 and h8, then from how many positions the queen cannot attack any of the pieces?

A. 0
B. 3
C. 4
D. 6

Question 56: Suppose the queen is the only piece on the board and it is at position d5. In how many positions can another piece be placed on the board such that it is safe from attack from the queen?

A. 32
B. 35
C. 36
D. 37

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SET 15

Eight friends: Ajit, Byomkesh, Gargi, Jayanta, Kikira, Manik, Prodosh and Tapesh are going to Delhi from Kolkata by a flight operated by Cheap Air. In the flight, sitting is arranged in 30 rows, numbered 1 to 30, each consisting of 6 seats, marked by letters A to F from left to right, respectively. Seats A to C are to the left of the aisle (the passage running from the front of the aircraft to the back), and seats D to F are to the right of the aisle. Seats A and F are by the windows and referred to as Window seats, C and D are by the aisle and are referred to as Aisle seats while B and E are referred to as Middle seats. Seats marked by consecutive letters are called consecutive seats (or seats next to each other). A seat number is a combination of the row number, followed by the letter indicating the position in the row; e.g., 1A is the left window seat in the first row, while 12E is the right middle seat in the 12th row.

Cheap Air charges Rs. 1000 extra for any seats in Rows 1, 12 and 13 as those have extra legroom. For Rows 2- 10, it charges Rs. 300 extra for Window seats and Rs. 500 extra for Aisle seats. For Rows 11 and 14 to 20, it charges Rs. 200 extra for Window seats and Rs. 400 extra for Aisle seats. All other seats are available at no extra charge.

The following are known:

1. The eight friends were seated in six different rows.

2. They occupied 3 Window seats, 4 Aisle seats and 1 Middle seat.

3. Seven of them had to pay extra amounts, totalling to Rs. 4600, for their choices of seat. One of them did not pay any additional amount for his/her choice of seat.

4. Jayanta, Ajit and Byomkesh were sitting in seats marked by the same letter, in consecutive rows in increasing order of row numbers; but all of them paid different amounts for their choices of seat. One of these amounts may be zero.

5. Gargi was sitting next to Kikira, and Manik was sitting next to Jayanta.

6. Prodosh and Tapesh were sitting in seats marked by the same letter, in consecutive rows in increasing order of row numbers; but they paid different amounts for their choices of seat. One of these amounts may be zero.

Question 57: In which row was Manik sitting?

A. 10
B. 11

C. 12
D. 13

Question 58: How much extra did Jayanta pay for his choice of seat?

A. Rs 300
B. Rs 400
C. Rs 500
D. Rs. 1000

Question 59: How much extra did Gargi pay for her choice of seat?

A. Rs 0
B. Rs 300
C. Rs 400
D. Rs 1000

Question 60: Who among the following did not pay any extra amount for his jrher choice of seat?

A. Kikira
B. Manik
C. Gargi
D. Tapesh

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SET 16

A high security research lab requires the researchers to set a pass key sequence based on the scan of the five fingers of their left hands. When an employee first joins the lab, her fingers are scanned in an order of her choice, and then when she wants to re-enter the facility, she has to scan the five fingers in the same sequence.

The lab authorities are considering some relaxations of the scan order requirements, since it is observed that some employees often get locked-out because they forget the sequence.

Question 61: The lab has decided to allow a variation in the sequence of scans of the five fingers so that at most two scans (out of five) are out of place. For example, if the original sequence is Thumb (T), index finger (I), middle finger (M), ring finger (R) and little finger (L) then TLMRI is also allowed, but TMRLI is not.
How many different sequences of scans are allowed for any given person's original scan?

Question 62: The lab has decided to allow variations of the original sequence so that input of the scanned sequence of five fingers is allowed to vary from the original sequence by one place for any of the fingers. Thus, for example, if TIMRL is the original sequence, then ITRML is also allowed, but LIMRT is not.
How many different sequences are allowed for any given person's original scan?

A. 7
B. 5
C. 8
D. 13

Question 63: The lab has now decided to require six scans in the pass key sequence, where exactly one finger is scanned twice, and the other fingers are scanned exactly once, which can be done in any order. For example, a possible sequence is TIMTRL.
Suppose the lab allows a variation of the original sequence (of six inputs) where at most two scans (out of six) are out of place, as long as the finger originally scanned twice is scanned twice and other fingers are scanned once.

How many different sequences of scans are allowed for any given person's original scan?

Question 64: The lab has now decided to require six scans in the pass key sequence, where exactly one finger is scanned twice, and the other fingers are scanned exactly once, which can be done in any order. For example, a possible sequence is TIMTRL.
Suppose the lab allows a variation of the original sequence (of six inputs) so that input in the form of scanned sequence of six fingers is allowed to vary from the original sequence by one place for any of the fingers, as long as the finger originally scanned twice is scanned twice and other fingers are scanned once.

How many different sequences of scans are allowed if the original scan sequence is LRLTIM?

A. 8
B. 11
C. 13
D. 14

Answer Key							
Question 1	b	Question 9	a	Question 17	b	Question 25	c
Question 2	c	Question 10	60	Question 18	a	Question 26	c
Question 3	a	Question 11	170	Question 19	b	Question 27	40
Question 4	b	Question 12	a	Question 20	d	Question 28	4
Question 5	a	Question 13	1	Question 21	c	Question 29	2
Question 6	a	Question 14	6	Question 22	d	Question 30	b
Question 7	a	Question 15	b	Question 23	c	Question 31	2
Question 8	a	Question 16	b	Question 24	c	Question 32	b
Answer Key							
Question 33	b	Question 41	c	Question 49	7	Question 57	a
Question 34	c	Question 42	2	Question 50	4	Question 58	c
Question 35	b	Question 43	b	Question 51	b	Question 59	d
Question 36	a	Question 44	20	Question 52	b	Question 60	d
Question 37	c	Question 45	d	Question 53	c	Question 61	11
Question 38	d	Question 46	19	Question 54	4	Question 62	c
Question 39	d	Question 47	3	Question 55	c	Question 63	15

Question 40	a	Question 48	d	Question 56	c	Question 64	c