# Section – I

Direction for Questions 1 to 4: Read the information given below and answer the questions that follow.
The Venn diagram shown below represents the past-time habits of people of age 10 years and above in five different categories - smoking, drinking, playing golf, playing cards and chewing tobacco. The numbers given in each region represent the number of people in that category. For example, 28 represents the number of people who have the following past-time habits - drinking and playing cards.
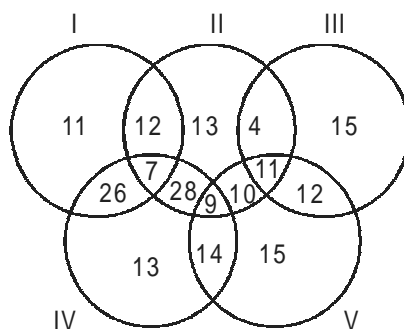
Category I   → People who smoke
Category II   → People who drink
Category III   → People who play golf
Category IV   → People who play cards
Category V   → People who chew tobacco

The graph below provides additional information on further age group distribution for only category IV, which hold true for all the included regions individual as well (that is, common regions out of which at least one category is IV)
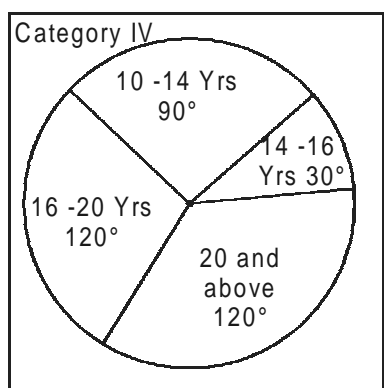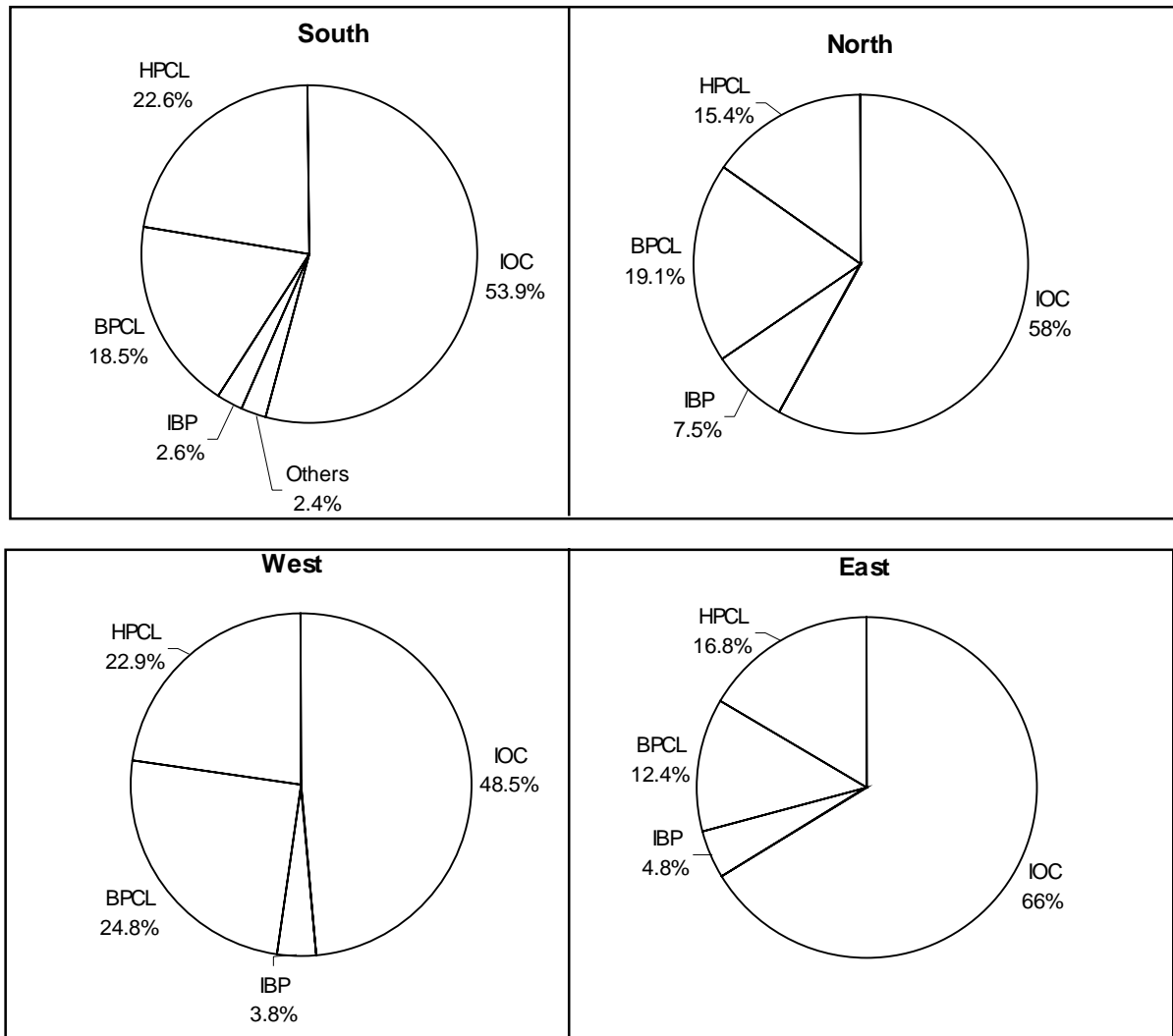

All fractions can be rounded off to the nearest natural number.

1.   How many people who play cards only or play golf only, belong to the age group 16-20 years ?
       a. 28   b.30   c.19   d. Data Insufficient

2.   How many people who smoke and play cards, belong to the age group 14-16 years ?
       a. 3   b. 33   c. 2   d. Data Insufficient

3.   How many people who play cards and chew tobacco, belong to the age group 10-14 years ?
       a. 4   b. 6   c. 23   d. Data Insufficient

4.   If the age distribution of Category IV applies to all the five categories, then the total number of people (having these five past-time habits), who belong to the age group 20 and above, is
     a. 54   b. 32   c. 67   d. 49

Direction for Questions 5 to 9 : Refer to the graphs given below and answer the questions that follow. The following pie-charts show the market share break-up (by sales value) of the major oil producing companies in India across the four regions of the country in 1995. Except for the south region, all regions have only 4 oil producing companies - IOC, BPCL, HPCL and IBP. Among the regions, south accounts for 23% of the total sales, north accounts for 28% of the total sales, west accounts for 33% of the total sales and east accounts for 16% of the total sales. The total oil sales in India by all companies in 1995 was $600 billion (where, $1 billion = Rs. 3300 crores).

South
HPCL 22.6%
IOC 53.9%
BPCL 18.5%
IBP 2.6%
Others 2.4%

North
HPCL 15.4%
BPCL 19.1%
IOC 58%
IBP 7.5%

West
HPCL 22.9%
IOC 48.5%
BPCL 24.8%
IBP 3.8%

East
HPCL 16.8%
BPCL 12.4%
IBP 4.8%
IOC 66%

The following chart shows the sectorwise demand (by weight, kgs) for oil in 1995. The total demand for oil in 1995 was 100,000 crore kgs for the entire country.

Sectorwise Demand

- Others 2%
- Industry 25%
- Transport 50%
- Agriculture 9%
- Household 14%
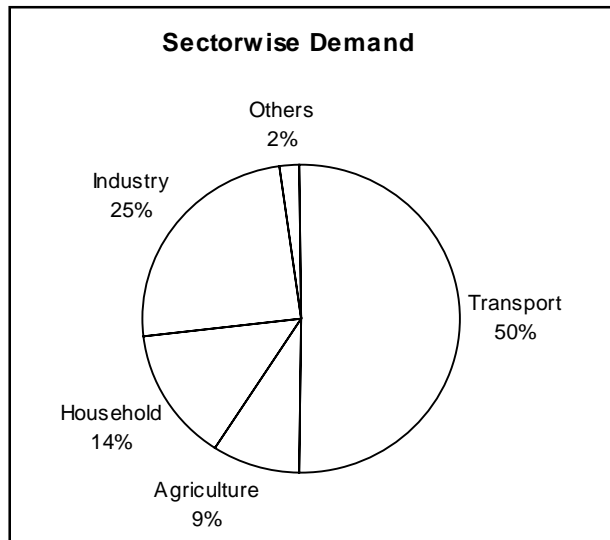
5. If total sales (in kg), all over India, by the given oil companies in 1995 is 80 % of the total demand that year, the price of oil (on an average) in 1995 must have been
   a. Rs. 18.20/kg   b. Rs. 13.60/ kg   c. Rs. 15.84/ kg   d. None of these

6. It can be inferred from the graph that :
   a. IOC is the largest oil company in India .
   b. IBP is the smallest oil company in India.
   c. The greatest consumption of oil is by the 'transport' sector.
   d. None of the above

7. In 1995, the sales of HPCL in West region exceeded the sales of BPCL in North region by
   a. Rs. 3,397 crores   b. Rs. 43,725 crores   c. Rs. 5,479 crores   d. $ 4.3 billion

8. The 'agriculture' sector demand in 1995 exceeded twenty times the market share of others (in Kg, taking the same percentage numbers as given for sales in the pie-charts) in South region by (Note: data from the previous questions may be used)
   a. 168 crore kgs   b. 120 lakh kgs   c. 120 million kgs   d. 8,558 crore kgs

9. The total all-India sales of IOC in 1995 was approximately :
   a. $ 300 billion   b. $ 310 billion   c. $ 331.2 billion   d. $ 340.1 billion

Direction for Questions 10 to 14 : Read the data given below and answer the questions that follow.
A market survey was conducted to ascertain brand switching parameters among toothpaste users. The initial and the current usage of the 4 brands of toothpaste - Close Up, Cibaca, Pepsodent and Colgate were checked out and presented as follows :

|	Current	Initial
Close up	80	74
Cibaca	26	30
Pepsodent	72	10
Colgate	49	60
No toothpaste	25	16
Total	252	190

The people surveyed were known to use only one brand of toothpaste per person.

10. In the sample surveyed, what is the increase in the number of people using the brand Close Up as percentage of the total current sample population?
   a. 6%   b. 2.38%   c. –4.5%   d. –7%

11. If the total number of people using any of these 4 brands of toothpaste is defined as the size of the toothpaste market, what has been the increase in the size of the toothpaste market, based on the data obtained in the survey?
   a. 30.45 %   b. 15.55 %   c. 20.6 %   d. 33.33 %

Additional directions for Questions 12 to 14 : Read the following information and answer the questions that follow.

The diagram given below represents the brand switching pattern from one brand to another for the sample surveyed. For example, people have switched from Colgate to Cibaca only and also those users of Cibaca who have switched brands have switched only to Close Up.This diagram does not include the additional 62 people included in the sample survey and represent only for initial 190 people.
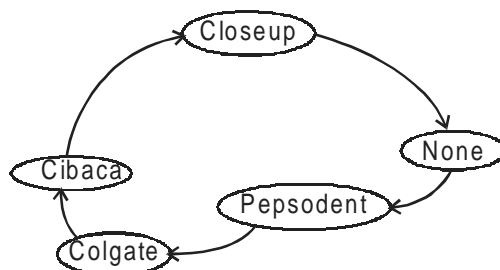
12. Which toothpaste brand was most likely chosen by the new people included in the current sample survey?
   a. Colgate   b. Cibaca   c. Pepsodent   d. Close Up

13. If, in the sample surveyed, 10 people switched from Pepsodent to Colgate, how many people switched from Cibaca to Close Up?
   a. 21   b. 25   c. 19   d.Data insufficient

14. Using the data from question 13, what is the ratio of the number of people who switched from Pepsodent to Colgate and those who switched from None to Pepsodent?
   a. 0.5   b. 2.1   c. 0.4   d. 1.0

Direction for Questions 15 to 18 : Read the passages given below and answer the questions that follow.

Five Universities Ambrosia, Euphoria, Inferia, Ostentia and Utopia select candidates for their M B A programmes on basis J A T (Joint Admission Test) conducted by an educational consultancy service. Selection to the interview prior to admission into any of the Universities is done on the basis of:
   (a) Academic aggregate marks of the candidate.
   (b) Performance in J A T
   (c) Performance in a common group discussion conducted by the consultancy service.
The J A T has a total of 200 marks. G D performance is rated in a scale of 80 points.The selection standards exercised by five Universities are given in Table – 1. The result of J A T in a particular batch of candidates are given in Table – 2.

University	Cut off marks in		
	Academics (1000)	JAT (200)	GD (80)
Ambrosia	500	125	40
Euphoria	550	150	60
Inferia	400	75	30
Ostentia	600	125	60
Utopia	800	180	80

In written Test (JAT)	In GD					
	Below 20	20–29	30–39	40–59	60 and above	Total
Below 50	122	200	254	280	236	1092
50–74	138	264	348	389	281	1420
75–79	202	259	426	486	461	1934
100–124	92	210	110	180	108	700
125–149	92	198	100	160	104	654
150 and above	163	247	298	258	109	1075
Total	809	1478	1536	1753	1299	6875

15. At least what percentage of those scoring 75% or above in the J A T will fail to make it to the interview in Ostentia University ?
a. 90%   b. 87%   c. 85%   d. Cannot be determined

16. 70 % of those who clear the JAT in the highest marks category (150 and above) in second table, have over 80 % marks in their academic grades and are also in the highest marks category for GD. What percentage of such students will qualify for the interview at Utopia ?
a. 14%   b. 10%   c. Not less than 10%   d. Cannot be determined

17. If 20 % of those in the highest marks category for GD obtain 100 % marks in GD and 10 % of those who are in the highest marks category for the JAT, score 180 and above in JAT, how many will be eligible for the interview in the Utopia University?
a. 260   b. 107   c. 367   d.Cannot be determined

18. The Ostentia University wanted to admit 30 candidates without altering its requirement standards. All candidates who qualified the JAT and GD cut-off requirements for this University, met the required academic cut-off of that University, out of which 90 % secured and accepted admission into Universities another than Ostentia. What percentage of seats went vacant in Ostentia ?
a. 5 to 10   b.20 to 25   c. 26 to 30   d. 10 to 12

Direction for the Questions 19 to 22: Read the following information and answer the questions that follow.
Five of the integers from 1 to 16 have been placed in the various squares of a 4 × 4 grid as shown.

		3	
14			
	6		12
			7

The remaining integers from 1 to 16 are to be placed in the remaining squares of the grid, subject to the following conditions:
1. No even number into placed in the first or fourth row.
2. No multiple of 5 is to be placed in the first and fourth column.
3. The sum of the integers in one of the diagonals is 18.
4. No square or cube of an integer is to be placed in third column.
5. The sum of the integers in the column which contains 10, should not be less than sum of integers in the column containing 1.
6. No more than one square of an integer is to be placed in any diagonal.
7. The sum of the integers in the first row is equal to 30.
Based on the above information, answer the questions below by identifying the integers to be placed in each row, where the numbers in the options indicate their position in the row from left to right (excluding the integers already shown in the grid)

19.   The integers which are to be placed in the remaining squares of the first row are
        a. 5, 9, 13   b. 1, 15, 11   c. 11, 15, 9   d. 5, 13, 1

20.   The integers which are to be placed in the remaining squares of the second row are
        a. 2, 4, 10,   b. 2, 8, 10   c. 4, 10, 16   d. 8, 10, 16

21.   The integers which are to be placed in the remaining squares of the third row are
        a. 2, 8   b.4, 2   c. 2, 16   d. 4, 10

22.   The integers which are to be placed in the remaining squares of the fourth row are
        a. 15, 11, 1   b. 1, 9, 13   c. 9, 5, 13   d. 5, 13, 11

Direction for Questions 23 to 27: On 1st August, 2004, a survey was conducted in a restaurant regarding flow of customer, type of customer, collection of money at the counter. The results are compiled in the table below.

Time of the day	No. of single customers	No. of customers in group	Average bill amount for a customer or a group of customer (Rs.)		No. of bills per time interval
			When single	When in group	
8 am – 10 am	210	80	6	5.2	230
10 am –12 noon	120	50	4.8	4.3	130
12 noon – 2 pm	50	28	4	4	57
2 pm - 4pm	60	30	4.2	3.9	70
4 pm – 6 pm	180	100	5.8	5.5	200
6 pm – 8 pm	130	72	6.1	6	154

Only one bill is issued per single customer or per customer group. Group here means more than one customer at one time. This represents a typical day's scenario and all working days of the month will show the same data on each day.

23.   What is the total number of groups of customers between 8 am and 12 noon in one day?
        a. 30   b. 25   c. 20   d. 28

24. The average number of customers in a group is
    a. 2   b. 5   c. 4   d. 6

25. The average bill amount spend by customer in a group is approximately _____ times that spent by a customer when single ?
    a. 0.9   b. 0.5   c. 1.2   d. 0.7

26. During which 2-hour interval during the day is the collection amount maximum ?
    a. 8 am – 10 am   b. 4 pm – 6 pm   c. 2 pm – 4 pm   d. 6 pm – 8 pm

27. If restaurant makes a profit of 5 % on the selling price of each item and is open 25 days in the month of August, what is the approximate profit amount in August?
    a. Rs. 5000   b. Rs. 8000   c. Rs. 6000   d. Rs. 7500

Directions for questions 28 to 37: Each question consists of a question and two statements, I and II. Choose
    a. if one of the two statements (I or II) alone is sufficient to answer the question, but cannot be answered by using the other statement alone.
    b. if each statement alone is sufficient to answer the question asked.
    c. if I and II together are sufficient to answer the question but neither statement alone is sufficient.
    d. if even I and II together are not sufficient to answer the question.

28. In the following figure, the vertices of the parallelogram ABCD lie on the circumference of a circle. What is the ratio of length of AC to length of AE, if the radius of the circle is 1 cm?
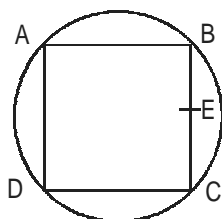
    I. Quadrilateral ABCD is a rhombus.
    II. The ratio of length of BE to the length of AB is 1 : 2.

29. $y = ax^2 + bx + c$. If a graph of y is plotted with the values of x on the X axis and the value of y on the Y axis, at how many points does the graph cut the X-axis?
    I. The point (4, -5) lies on the graph.

    II. $\dfrac{a}{b^2 + c^2} > 0$, where $b^2 + c^2$ is not equal to zero.

30. What is the numerical value of $\dfrac{a - 2c}{b - 2d}$?
    I. $a = 2 \times c$
    II. $\dfrac{a}{c} = \dfrac{b}{d} = \dfrac{1}{2}$

31. Amol goes to his office from home usually at a speed of s and reaches office on time. What is the value of s in kmph?

I. If Amol leaves his home at same time as usual but goes to his office at a speed of $\frac{3}{4}s$, he reaches his office 4 minutes late.

II. If Amol leaves his home at same time as usual but goes to his office at a speed of $\frac{4}{3}s$, he reaches his office 3 minutes early.

32. A game is played between two intelligent students, A and B. The student who starts has to pick out one folded chit out of eight chits each with one number between 1 to 8 (both inclusive) and then the other student can speak out any number by adding any natural number 1 to 8 to the number picked last. The students continue speaking out numbers in this manner by adding 1 to 8 to the number last spoken. The student who speaks 100 first wins the game. Who wins the game?
   I. A starts the game and picks chit with number 1.
   II. B speaks second and speaks 10.

33. Books numbered 1, 2, 3 and 4 are placed in racks 1, 2, 3 and 4 not in that order such that there is one book in each rack, and every even numbered book is in an odd numbered rack. What is the exact way in which books are placed?
   I. Rack numbered 3 has book 2.
   II. Rack numbered 2 has book 3.

34. How much cardboard will it take to make an open cubical box with no top?
   I. The area of the bottom of the box is 4 square feet.
   II. The volume of the box is 8 cubic feet.

35. If '∗' represents one of the operation '+' addition, '–' subtraction and '×' multiplication, is

   $a^3 * (b^3 - c^3) = (a^3 * b^3) - c^3$ for all positive integers a, b and c?

   I. $a^2 * b^2 = -(b^2 * a^2)$

   II. $a * b = b * a$

36. If x + y + z > 0, is z > 1 ?
   I. z > x + y + 1
   II. x + y + 1 < 0

37. Is X greater than 2? (You may assume Y is not equal to zero).

   I. $\left(\frac{X}{Y}\right)$ is greater than 2.

   II. $\left(\frac{1}{Y}\right)$ is less than 1.

Direction for questions 38 to 41: Read the information given below and answer the questions that follow.

CIA always sends messages in a coded format. The code is based on the relative positioning of English alphabets. Position of A is taken by another letter which is a few places away from A and the position of B will be taken by a letter which is exactly the same number of places away from B as the letter replacing A was from A and so on. Of course, the code is case sensitive. Even the solution key to break the codes in order to decipher the messages is in the form of paragraph and the solution key is hidden somewhere in the paragraph. On 22nd of December, 2020 CIA released a solution key in form of paragraph which was "The places by which the alphabets have moved can be found by reading the following equalities (original word = coded word):
BOIXNG = SONATH, BOCCER = SOFFERS, TOPPED = KOSSTE, INDIAN = DHGLNO
In the above equalities only one letter in the left-hand side (LHS) and the corresponding letter in the right-hand side (RHS) gives the relative positioning of letters in the solution key. For the correct solution key, it will satisfy all four equalities".

38.   The world 'Water' in CIA coded form will be written as
       a. xhufs   b. Vzsdq   c. vzsdq   d. Xbufs

39.   The word 'EnCYcloPaeDia' will be coded by CIA as
       a. FoDZdmPQBfEjb   b. FoDZdmPQBfEjb   c. FoDZdmpQbfEjb   d. FoDZdmpQbFEjb

40.   The word 'chintu' after coding becomes a word whose letters are juggled and various words are formed. Which among the following CANNOT be one of the words?
       a. dijouv   b. douijv   c. oiurdj   d. uoivdj

41.   A coded word 'DIBNJZB' was received from CIA. What would be the decoded word?
       a. EJCOKAC   b. CHAMIYA   c. BGZLHXZ   d. None of these

Direction for questions 42 to 45: Read the information given below and answer the questions that follow.
Sunil Chandra runs a bakery manufacturing bread pastries, biscutes, dinner rolls and buns. He has devised a method wherein he makes a mixture of water, flour and sugar which he called 'supermix'. By varying the proportion of ingredients in it, he can generate various products. Everyday he needs 30 m^3 of supermix to manufacture bread, 28 m^3 to make biscuits, 51 m^3 for pastries, 72 m^3 for dinner rolls and 38 m^3 for buns. Supermix for bread has 1 part sugar, 4 parts water and 5 parts flour by volume. Similarly the supermix for biscuits is 4 parts sugar, 5 parts water and 5 parts flour. The pastry supermix is 6 parts flour, 7 parts sugar and 4 parts water. Dinner rolls have sugar, water and flour mixed in proportion 7 : 7 : 10 and the buns have these in the proportion 1 : 8 : 10. He uses only two kinds of flour for his manufacturing purposes — Captain cook and Trupti. 40% of the flour used in the bread is Captain Cook, 55% flour in the biscuits is Trupti, 45% flour in the pastries is Captain cook, the dinner rolls use 75% Captain cook flour and the buns are made completely out of Trupti flour.

42.   What is the total daily consumption of Captain cook flour?
       a. 51.9 m^3 b. 41.1 m^3 c. 93 m^3 d. None of these

43.   What percentage of total supermix for the day is used for pastries?
       a. 23%   b. 33%   c. 43%   d. 53%

44.   The ratio of volume of Captain cook flour to that of Trupti flour consumed daily is:
       a. 0.60   b. 0.70   c. 0.80   d. 0.90

45. On the basis of customer survey, Chandra decides to increase the sugar content in the pastries by 100% and reduce the flour content by two thirds and water content by 3/4. What will now be the total volume of the daily consumption of sugar and flour respectively in m^3?
a. 76 and 81   b. 81 and 76   c. 93 and 93   d. 110 and 62

46. In the given figure, an electric circuit is fitted with 4 switches, S_1, S_2, S_3 and S_4. A current flows in a circuit only when all the switches on any path are in 'ON' position. When will the current flow in the given circuit?
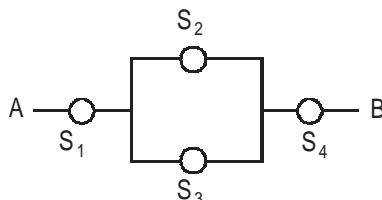
(A switch can be in either of the two positions – ON or OFF)

Condition 1: When S_1 is ON and S_2 is ON. Other switches are OFF.
Condition 2: When both S_1 and S_4 are ON. Other switches are OFF.
Condition 3: When S_3 and S_4 are ON. Other switches are off.
Condition 4: There will be no current flow in the given circuit.
a. Condition 1   b. Condition 2   c. Condition 3   d. Condition 4

Direction for questions 47 to 50: Read the passage given below and answer the questions that follow:
There were 6 gentlemen who were out at Megacity Shopping Mall Each one of them bought one item only. The 6 gentlemen are – Mr. Gupta, Mr. Pandey, Mr. Sharma, Mr. Chowbey, Mr. Haathi, Mr. Handa. The items bought (not necessarily in the order) were – Dress, Sweater, Dresser, Telephone, Tires, Bicycle. The original prices of these items (not necessarily in the order) was – Rs. 200, Rs. 1500, Rs. 300, Rs. 2000, Rs. 900 and Rs. 1200 and the prices paid (after various discounts) were – Rs. 800, Rs. 600, Rs. 1200, Rs. 1000, Rs. 75, Rs. 50. The following information is available to us:
    1. Mr. Gupta found a clothing item.
    2. The bicycle was bought at 50% off the buyer name starts with H.
    3. Mr. Chowbey bought the item priced at Rs. 1500 for 4/5 ths of the amount.
    4. The tires set was sold for Rs. 100 less than the asking price.
    5. The item that was sold for Rs. 50 was an article of clothing.
    6. Mr. Pandey spent Rs. 400 less than Mr. Chowbey.
    7. Mr. Haathi paid for the dress with a Rs. 100 note (value equal to 50% the original price) and received Rs. 25 in change.
    8. Mr. Gupta spent less for the item, than Mr. Sharma, who spent less than Mr. Pandey.
    9. The item originally priced the highest did not sell for the highest price. Nor did the lowest priced item sell for the lowest amount.
   10. The paid price for telephone was more than the dresser.

47. Who bought the dresser?
a. Mr. Gupta   b. Mr. Pandey   c. Mr. Sharma   d. Mr. Handa

48. Who paid the highest price?
    a. Mr. Sharma   b. Mr. Handa   c. Mr. Haathi   d. Mr. Chowbey

49. What did Mr. Handa buy?
    a. The dresser   b. The sweater   c. The tires   d. The bicycle

50. What was the percentage discount on the highest original price item?
    a. 70%   b. 50%   c. 25%   d. 75%