**UNIT III - MATHEMATICAL AND ARITHMATIC PROBLEM SOLVING**

**LOGARITHM**

1. log2 64

a. 6 b. 8 c. 16 d. 32

2. 

a) 7 b) -3 c) –4 d) 9

3. 49log74  
  
a. 7 b. 14 c. 16 d. 18

4. 

a. 0 b. 1 c. 2 d. abc

5. Simplify: log43 × log24364

a. 3/5 b. 2/5 c. 3/4 d. 1/3

6. The value of 25 log5 6 is

A. 5 B. 36 C. 25 D. 6

7. If log9 x + log 3 x = 9, then the value of x is

A. 27 B. 81 C. 243 D. 729

8. (log5 5)(log4 9)(log3 2) is equal to

A. 2 B. 5 C. 1 D. 3

9. log 360 is equal to

A. 3log 2 + 2log 3 B. 3log 2 - 2log 3 + log5 C. 3log 2 + 2log 3 + log5 D. 2log 2 + 3log 3

10. If log10 2 = 0.3010, the value of log10 80 is

A. 1.9030 B. 1.6020 C. 9.9030 D. 3.6020

**PROBABILITY**

31. A box contains 20 electric bulbs, out of which 4 are defective. Two bulbs are chosen at random from this box. The probability that at least one of these is defective is

(a) 7/19 (b) 32/95 (c) 3/95 (d) 7/95

32. A speaks truth in 75% of cases and B in 80% of cases. In what percentage of cases are they likely to contradict each other, narrating the same incident

(a) 25% (b) 50% (c) 35% (d) 45%

33. Tickets numbered 1 to 20 are mixed up and then a ticket is drawn at random. What is the probability that the ticket drawn has a number which is a multiple of 3 or 5?

(a) 6/20 (b) 9/20 (c) 10/20 (d) None of these

34. A box contains 5 green, 4 yellow and 3 white balls. Three balls are drawn at random. What is the probability that they are not of same color?

(a) 3/44 (b) 3/55 (c) 52/55 (d) 41/44

35. The odds in favour of standing first of three students Amit, Vikas and Vivek appearing at an examination are 1:2, 2:5 and 1:7 respectively. What is the probability that either of them will stand first (assume that a tie for the first place is not possible)?

(a) 168/178 (b) 122/168 (c) 5/168 (d) 125/168

36. A box contains 6 red balls, 7 green balls and 5 blue balls. Each ball is of a different size. The probability that the red ball selected is the smallest red ball is

(a) 1/18 (b) 1/3 (c) 1/6 (d) 2/3

37. A five-digit number is formed by using digits 1, 2, 3, 4 and 5 without repetition. What is the probability that the number is divisible by 3?

(a) 1/4 (b) 1/3 (c) 1/2 (d) 1

38. Three dice are thrown simultaneously. Find the probability that all of them show the same number.

(a) 1/216 (b) 1/36 (c) 4/216 (d) 3/216

39. If four coins are tossed at random, what is the chance that these will turn up head and tail alternately but not necessarily head in the first toss?

(a) 1/8 (b) 1/4 (c) 7/8 (d) 3/8

40. What is the probability that there are 52 Thursdays in a normal year?

(a) 0 (b) 1/2 (c) 1/7 (d) 1

**PERMUTATIONS AND COMBINATIONS**

41. In how many different ways can the letters of the word 'LEADING' be arranged in such a way that the vowels always come together?

(a) 650 (b) 700 (c) 760 (d) 720

42. A college has 10 basketball players. A 5-member team and a captain will be selected out of these 10 players. How many different selections can be made?

(a) 1040 (b) 1400 (c) 1260 (d) 1160

43. In how many different ways can the letters of the word 'DETAIL' be arranged in such a way that the vowels occupy only the odd positions?

(a) 25 (b) 49 (c) 36 (d) 64

44. When four fair dice are rolled simultaneously, in how many outcomes will at least one of the dice show 3?

(a) 620 (b) 625 (c) 567 (d) 671

45. In how many ways can the letters of the word EDUCATION be rearranged so that the relative position of the vowels and consonants remain the same as in the word EDUCATION?

(a) 4! × 4! (b) 5! × 5! (c) 4! × 5! (d) 3! × 4!

46. How many ways can a child climb 8 steps in such a way he/she either climbs 1 or 2 steps at a time?

(a) 31 (b) 32 (c) 33 (d) 34

47. In how many ways digits be arranged for 8-digit phone number where the first three numbers are 1, 3 and 5 and the repetition of number is not allowed?

(a) 18002 (b) 2520 (c) 15120 (d) 13550

48. How many can you arrange 6 boys B1, B2, B3, B4, B5 and B6 around a circular table in such a way that B1 and B2 are always together?

(a) 120 (b) 24 (c) 48 (d) 96

49.Derek must choose a four-digit PIN number. Each digit can be chosen from 0 to 9. How many different possible PIN numbers can Derek choose?

(a) 5040 (b) 9000 (c) 10000 (d) 6561

50. A coach invited 9 players of the team on dinner. All 10 persons seated in a circular table. In how many ways team can seat, if caption and vice-captain seat either side of coach.

(a) 80640 (b) 5040 (c) 10080 (d) 40320

**UNIT- IV LOGICAL REASONING - COGNITIVE THINKING**

**ARRANGEMENTS**

**Direction for Q1 to Q5**

Read the given information carefully and answer the questions that follow.

Eleven friends M, N, O, P, Q, R, S, T, U, V and W are sitting in the first row of the stadium watching a cricket match.

T is to the immediate left of P and third to the right of U.

V is the immediate neighbour of M and N and third to the left of S.

M is the second to the right of Q, who is at one of the ends.

R is sitting next to the right of P and P is second to the right of O.

1. Who is sitting in the center of the row?

a. N b. O c. S d. U

2. Which of the following people are sitting to the right of S?

a. OTPQ b. OTPR c. UNVM d. UOTPR

3. Which of the following statements is true with respect to the above arrangement?

a. Three persons sitting between P and S b. W is between M and V.

c. N is sitting between V and U d. S and O are neighbors sitting to the immediate right of T

4. Who are the immediate neighbors of T?

a. O, P b. O, R c. N, U d. V, U

5. If Q and P, O and N, M and T, and W and R interchange their positions then which of the following pairs of friends is sitting at the ends?

a. P and Q b. Q and R c. P and W d. W and R

**Direction for Q6 to Q10**

Read the following information given below and answer the questions that follow.

P, Q, R, S, T, U and V are seven friends and are sitting in a circle facing the center of the circle.

V is second to the left of S and is the neighbor of T and U.

S is not a neighbor of R or T.

P is neighbor of Q and R.

6. Which of the following is correct?

1. Q is between P and S. 2. S is between U and P.

3. T is to the immediate right of V. 4. U is to the immediate left of V.

7. Which of the following has the pair with the second person sitting to the immediate right of the first person?

a. QU b. VU c. TR d. PT

8. Which of the following will be S’s position after T and S interchange their places?

a. Neighbor of V and R b. To the immediate left of R

c. To the immediate right of U d. Neighbor of R and P

9. What is the position of R?

a. Second to the left of Q b. Third to the right of U

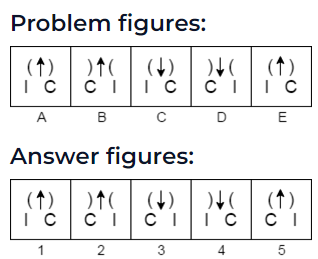
c. To the immediate left of P d. None of these

10 Which of the following has the second person sitting between the first and third persons?

a. SPQ b. VRT c. QRP d. VUS

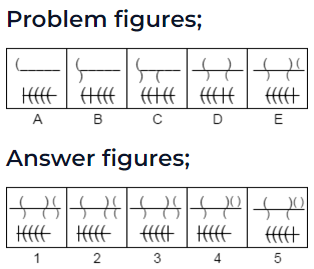
**VISUAL REASONING**

11. Observe the problem figures given and select one option from the answer figures which will continue the same pattern followed in the problem figures.

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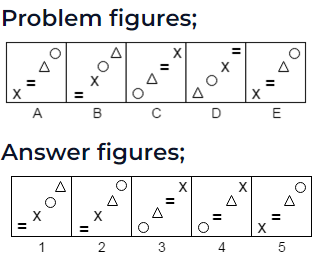
a) 5 b) 4 c) 3 d) 2

12.



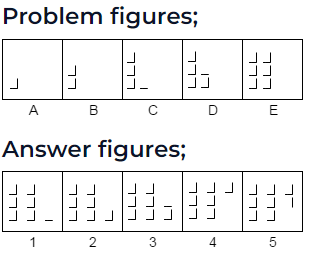
a) 2 b) 1 c) 3 d) 5

13.



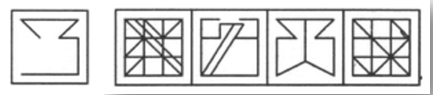
a) 1 b) 3 c) 5 d) 4

14.



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

15. In the below question one main figure is embedded in any of the four option figures. Find the option which contains main figure.



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

**DATA INTERPRETATION**

Directions (Q16 – Q20): Study the information given below and answer the following questions:

Mr X has built a mansion with 10 rooms. He was confused about the colours he should use while painting each room. He had the following choice of colours: blue, hazy grey, jumping yellow, teal, violet latte, Terry Cherry and happy pink. It was also known that he could paint more than 1 room with a single colour. Finally, he set up an algorithm to decide the colours that he would be using.

If he painted any room teal, then he did not paint any other room happy pink.

If he painted any room blue, then he did not paint any other room jumping yellow.

If he painted any room blue, then he painted at least one room happy pink.

If he painted any room jumping yellow, then he painted at least one room violet latte.

If he painted any room violet latte, then he painted at least one room happy pink.

If he painted any room happy pink, then he painted at least rooms happy pink.

16. Which one of the following could be a complete list of the number of rooms and colours that Mr X used to paint some of the rooms of his house?

a) one blue, one Terry cherry, one violet latte, two happy pink

b) one blue, one teal, one Terry cherry, three happy pink

c) two blue, one teal, three Terry Cherry

d) one jacket, one Terry cherry, two violet latte and one happy pink

17. If Mr. X did not paint any room happy pink, what was the maximum number of the different types of colours that he could paint ?

a) two b) three c) four d) five

18. Which one of the following statements must be false?

a) Mr. X painted exactly four rooms with colours, one of which was a hat.

b) Mr. X painted exactly three rooms with colours, one of which was a happy pink.

c) Mr. X painted exactly four rooms with colours, one of which was a blue.

d) None of these

19. If Mr. X painted as many different types of colours as possible, then it must be true that he did not paint one of the following types of colours.

a) blue b) hazy grey c) teal d) jumping yellow

20. If Mr. X painted at least one room, find out which one of the following are the minimum and the maximum numbers of the types of colours that he could paint ?

a) 1, 4 b) 1, 5 c) 1, 6 d) 2, 5

**UNIT V LOGICAL REASONING - CRITICAL THINKING**

**LOGICAL SEQUENCE**

Arrange the words given below in a meaningful sequence.

1. Key 2. Door 3. Lock 4. Room 5. Switch on

a) 5, 1, 2, 4, 3 b) 4, 2, 1, 5, 3 c) 1, 3, 2, 4, 5 d) 1, 2, 3, 5, 4

2. Arrange the words given below in a meaningful sequence.

1. Word 2. Paragraph 3. Sentence 4. Letters 5. Phrase

a) 4, 1, 5, 2, 3 b) 4, 1, 3, 5, 2 c) 4, 2, 5, 1, 3 d) 4, 1, 5, 3, 2

3.Arrange the words given below in a meaningful sequence.

1. Police 2. Punishment 3. Crime 4. Judge 5. Judgement

a) 3, 1, 2, 4, 5 b) 1, 2, 4, 3, 5 c) 5, 4, 3, 2, 1 d) 3, 1, 4, 5, 2

4.Arrange the words given below in a meaningful sequence.

1. Family 2. Community 3. Member 4. Locality 5. Country

a) 3, 1, 2, 4, 5 b) 3, 1, 2, 5, 4 c) 3, 1, 4, 2, 5 d) 3, 1, 4, 5, 2

5.Arrange the words given below in a meaningful sequence.

1. Poverty 2. Population 3. Death 4. Unemployment 5. Disease

a) 2, 3, 4, 5, 1 b) 3, 4, 2, 5, 1 c) 2, 4, 1, 5, 3 d) 1, 2, 3, 4, 5

**INFERRED MEANING**

6. Should there be a law to punish parents who get their minor children married?

Arguments:

I. Yes, a minor girl is physiologically not prepared to conceive a baby.

II. No, this has been a custom prevailing since many centuries.

A. if only argument I is strong. B. if only argument II is strong.

C. if either I or II is strong. D. if neither I nor II is strong.

E. If both I and II are strong

7. Should the institute conduct classes in remote villages?

Arguments:

I. Yes, this will help those students who belong to villages and cannot visit urban ares for studies.

II. No, this is not an economically viable proposal, as the number of students who attend such classes cannot contribute to break-even.

A. if only argument I is strong. B. if only argument II is strong.

C. if either I or II is strong. D. if neither I nor II is strong.

E. If both I and II are strong

8. Are there any good politicians left in this world?

Arguments:

I. Yes, so many poor people are sustaining themselves and improving economically.

II. No, there is nothing in this world which is completely good or completely bad.

A. if only argument I is strong. B. if only argument II is strong.

C. if either I or II is strong. D. if neither I nor II is strong.

E. if both I and II are strong.

9. Are these sanctuaries, which are meant to protect the endangered animals, necessary?

Arguments:

I. Yes, these are necessary as it is our responsibility to conserve environment and to provide posterity with a better world to live in.

II. No, these are a huge burden on our receding economy.

A. if only argument I is strong. B. if only argument II is strong.

C. if either I or II is strong. D. if neither I nor II is strong.

E. if both I and II are strong.

10. Should the teachers be stopped from beating the students?

Arguments:

I. Yes, child psychologies say that beating hinders the learning process in a child.

II. No, spare the cane and spoil the child.

A. if only argument I is strong. B. if only argument II is strong.

C. if either I or II is strong. D. if neither I nor II is strong.

E. if both I and II are strong.

**AGREE DISAGREE PSYCHOMETRIC**

**11. Statements**: In a one day cricket match, the total runs made by a team were 200. Out of these 160 runs were made by spinners.

**Conclusions**:

I) 80% of the team consists of spinners.

II) The opening batsmen were spinners.

a) Only conclusion I follows b) Only conclusion II follows

c) Either I or II follows d) Neither I nor II follows

e) Both I and II follow

12. **Statements**: The old order changed yielding place to new.

**Conclusions**:

I) Change is the law of nature.

II) Discard old ideas because they are old.

a) Only conclusion I follows b) Only conclusion II follows

c) Either I or II follows d) Neither I nor II follows

e) Both I and II follow

13**. Statements**: Government has spoiled many top ranking financial institutions by appointing bureaucrats as Directors of these institutions.

**Conclusions:**

I) Government should appoint Directors of the financial institutes taking into consideration the expertise of the person in the area of finance.

II) The Director of the financial institute should have expertise commensurate with the financial work carried out by the institute.

a) Only conclusion I follows b) Only conclusion II follows

c) Either I or II follows d) Neither I nor II follows

e) Both I and II follow

14.**Statements**: Population increase coupled with depleting resources is going to be the scenario of many developing countries in days to come.

**Conclusions**:

I) The population of developing countries will not continue to increase in future.

II) It will be very difficult for the governments of developing countries to provide its people decent quality of life.

a) Only conclusion I follows b) Only conclusion II follows

c) Either I or II follows d) Neither I nor II follows

e) Both I and II follow

15.**Statements:** Prime age school-going children in urban India have now become avid as well as more regular viewers of television, even in households without a TV. As a result there has been an alarming decline in the extent of readership of newspapers.

**Conclusions:**

I) Method of increasing the readership of newspapers should be devised.

II) A team of experts should be sent to other countries to study the impact of TV. on the readership of newspapers.

a) Only conclusion I follows b) Only conclusion II follows

c) Either I or II follows d) Neither I nor II follows

e) Both I and II follow

**CUBES AND CUBOIDS**

The following questions are based on the information given below:

A cuboid shaped wooden block has 6 cm length, 4 cm breadth and 1 cm height.

Two faces measuring 4 cm x 1 cm are coloured in black.

Two faces measuring 6 cm x 1 cm are coloured in red.

Two faces measuring 6 cm x 4 cm are coloured in green.

The block is divided into 6 equal cubes of side 1 cm (from 6 cm side), 4 equal cubes of side 1 cm(from 4 cm side).

16. How many cubes having red, green and black colours on at least one side of the cube will be formed ?

a) 16 b) 12 c) 10 d) 4

17. How many small cubes will be formed ?

a) 6 b) 12 c) 16 d) 24

18. How many cubes will have 4 coloured sides and two non-coloured sides ?

a) 8 b) 4 c) 16 d) 10

19. How many cubes will have green colour on two sides and rest of the four sides having no colour ?

a) 12 b) 10 c) 8 d) 4

20. How many cubes will remain if the cubes having black and green coloured are removed ?

a) 4 b) 8 c) 12 d) 16