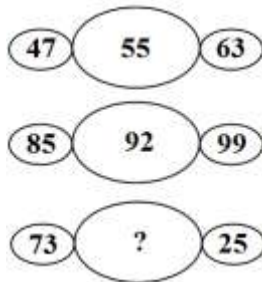


PART – 1 : MAT

SECTION – (I) : (Maximum Marks: 40)

- This section contains **TWENTY** questions.
- Each question has **FOUR** options (a), (b), (c) and (d). **ONLY ONE** of these four options is correct.
- For each question, darken the bubble corresponding to the correct option in the **OMR**.
- For each question, marks will be awarded in one of the following categories:
Full Marks : +2 If only the bubble corresponding to the correct option is darkened.
Zero Marks : 0 In all other cases

1. Find the missing term in the given pattern:



- (a) 45 (b) 49 (c) 47 (d) 46
2. The positions of the first and the sixth digit in the number 5109238674 are interchanged. Similarly, the positions of the second and seventh digit are interchanged and so on. Which of the following will be the third digit from the right end after the rearrangement?
 (a) 9 (b) 0 (c) 6 (d) 3
3. One of the terms in the following sequence is given wrong. Identify the wrong term in the series correcting which the numbers would be arranged in the logical sequence.
 16, 16, 18, 22, 28, 34, 46, 58
 (a) 22 (b) 28 (c) 34 (d) 46
4. In a certain code, 'GRAPES' is written as 'BSHTFQ'. What will be the code of 'BANANA'?
 (a) OCBBOB (b) OBCBOB (c) OBOBCB (d) OCBCBC
5. In a class, boys stand in a single row. One of the boy is nineteenth in order from both the ends. How many boys are there in the row?
 (a) 27 (b) 37 (c) 38 (d) 39
6. Mr. Sharma promised his son that this week starting from Monday to Saturday, they will watch an animated movie every day. Read the clues given below to determine the movies played on each day and answer the following questions.

There is a 1-day gap between the movies Tom and Jerry and Aladdin. The same is true for Kung Fu Panda and Ben 10. Tom and Jerry was watched on Wednesday. Ben 10 was neither the first nor the last movie watched by Mr. Sharma and his son. They

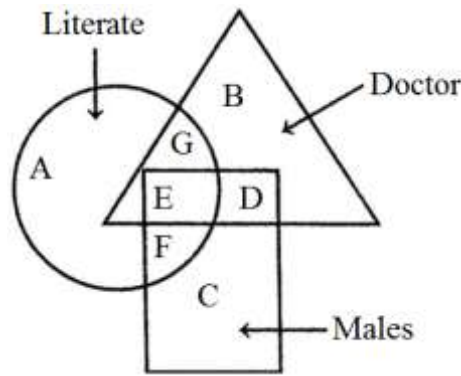
watched Kung Fu Panda on the next day of the Ice Age. Justice League watched after Wednesday.

On which day was Justice League watched?

- (a) Monday (b) Tuesday (c) Friday (d) Saturday

7. Complete the following series by inserting the number in place of '?':
6, 13, 25, ?, 101
(a) 52 (b) 51 (c) 50 (d) 49
8. If STAY = 28, PUT = 21, Find the value of MATCH?
(a) 35 (b) 33 (c) 31 (d) 37
9. P is the mother of K; K is the sister of D; D is J's father. How is P related to J?
(a) Mother (b) Grandmother (c) Aunt (d) Data inadequate
10. If $2 + 3 = 17$; $5 + 4 = 34$; $3 + 6 = 18$; Find the value of $3 + 9 = ?$
(a) 17 (b) 20 (c) 23 (d) 12
11. One of the following numbers shows a property different from the rest. Identify the odd number.
(a) 17 (b) 27 (c) 31 (d) 19
12. After starting from a point, a man walks 4 km towards West, then turning to his right he moves 4 km. After this, he again turns right and moves 4 km. Which choice given below indicates the correct direction in which he is from his starting point?
(a) North (b) East (c) South (d) West
13. If it is possible to make only one meaningful word from the 3rd, the 6th, the 9th and the 10th letters of the word 'PARENTHESIS' using each letter only once, last letter of the word is your answer. If no such word can be formed, your answer is 'X' and if more than one such word can be formed, your answer Y.
(a) R (b) T (c) X (d) Y
14. In the following relation, the first two elements separated by ':' before '::' possess a relationship. The same relationship is possessed by the two elements after '::'. Choose the most appropriate answer in place of '?' to complete the pattern.
 $12 : 29 :: ? : 35$
(a) 15 (b) 16 (c) 20 (d) 19
15. In the following question, a word has been given, followed by four other words, one of which can be formed by using the letters of the given word. Find that word.
DEMOCRACY
(a) SECRECY (b) MICRO (c) MARCY (d) DEMON

16. Study the given Venn diagram and answer the following questions.



Which part shows Literate Males, who are Doctors?

- (a) G (b) E (c) D (d) F
17. Complete the following series by inserting the number in place of '?':
 TQX, URS, WSN, XTI, _____, AYZ
- (a) ZUD (b) YUE (c) ZVE (d) ZUD
18. Identify the figure that gives the completes the pattern.

Question Figure

Answer Figure



(x)



(a)



(b)

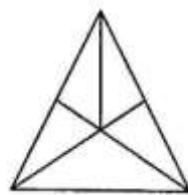


(c)



(d)

19. If Q means 'add to', J means 'multiply by', T means 'subtract from' and K means 'divide by', then $26 \text{ K } 2 \text{ Q } 3 \text{ J } 6 \text{ T } 4 = ?$
- (a) 10 (b) 28 (c) 30 (d) 27
20. How many triangles are there in the given figure?



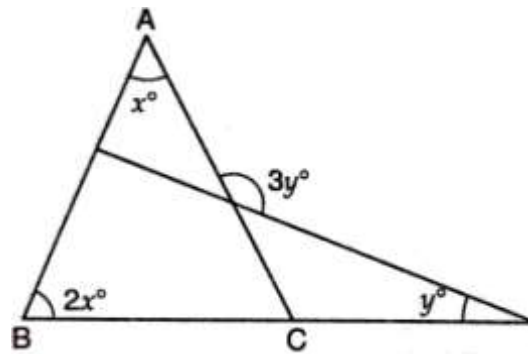
- (a) 11 (b) 16 (c) 14 (d) 12

PART - 2 : MATHS

SECTION - I : (Maximum Marks: 40)

- This section contains **TWENTY** questions.
- Each question has **FOUR** options (a), (b), (c) and (d). **ONLY ONE** of these four options is correct.
- For each question, darken the bubble corresponding to the correct option in the **OMR**.
- For each question, marks will be awarded in one of the following categories:
Full Marks : +2 If only the bubble corresponding to the correct option is darkened.
Zero Marks : 0 In all other cases

21. In the figure what is y in terms of x ?



- (a) $\frac{3}{2}x$ (b) $\frac{4}{3}x$ (c) x (d) $\frac{3}{4}x$

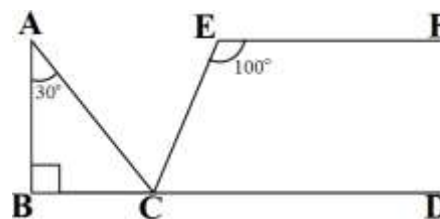
22. Total area of 64 small squares of a chessboard is 400cm^2 . There is 3 cm wide border around the chessboard. What is the length of each side of the chessboard?

- (a) 17 cm (b) 20 cm (c) 23 cm (d) 26 cm

23.
$$\frac{1}{1+x^{(b-a)}+x^{(c-a)}} + \frac{1}{1+x^{(a-b)}+x^{(c-b)}} + \frac{1}{1+x^{(b-c)}+x^{(a-c)}} = ?$$

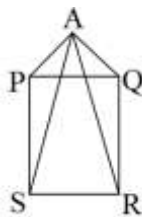
- (a) 0 (b) 1 (c) x^{a-b-c} (d) None of these

24. In the given figure, $EF \parallel BD$. The measure of angle ACE is

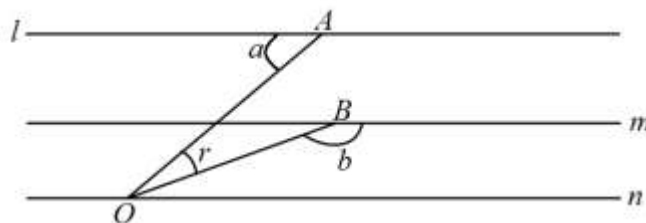


- (a) 60° (b) 40° (c) 70° (d) None of these

25. In the figure, PQRS is a square and APQ is an equilateral triangle.
What is the measure of $\angle ASR$?



- (a) 75° (b) 30° (c) 80° (d) 15°
26. A mixture of 40 litres of milk and water contains 10% water. How much water should be added to this mixture so that the new mixture contains 20% water?
- (a) 4 litres (b) 5 litres (c) 6.5 litres (d) 7.5 litres
27. The difference of two numbers is 1365. On dividing the larger number by the smaller, we get 6 as quotient and 15 as remainder. The smaller number is:
- (a) 240 (b) 270 (c) 295 (d) 360
28. The rational numbers lying between $\frac{1}{4}$ and $\frac{3}{4}$ are:
- (a) $\frac{9}{40}$ and $\frac{31}{41}$ (b) $\frac{13}{50}$ and $\frac{264}{350}$ (c) $\frac{63}{250}$ and $\frac{187}{250}$ (d) $\frac{262}{1000}$ and $\frac{752}{1000}$
29. If the numerator of a fraction is increased by 150% and the denominator of the fraction is increased by 300%, the resultant fraction is $\frac{5}{18}$. What is the original fraction?
- (a) $\frac{4}{9}$ (b) $\frac{4}{5}$ (c) $\frac{8}{9}$ (d) $\frac{8}{11}$
30. A machine was sold at a gain of 10%. Had it been sold at Rs 80 less, the seller would have lost 10%. What is the cost price of the machine?
- (a) Rs. 350 (b) Rs 400 (c) Rs 450 (d) None of these
31. In the given figure, if $l \parallel m \parallel n$, then value of r is



- (a) $a - b$ (b) $a + b + 180^\circ$ (c) $a + b - 180^\circ$ (d) $180^\circ - (a + b)$

32. If $x : y = 3 : 4$, then $(7x + 3y) : (7x - 3y) = ?$
- (a) 4 : 3 (b) 5 : 2 (c) 11 : 3 (d) 37 : 19

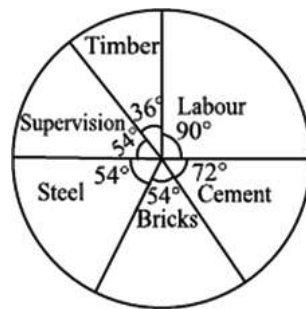
33. $\frac{(5)^{0.25} \times (125)^{0.25}}{(256)^{0.10} \times (256)^{0.15}} = ?$

- (a) $\frac{25}{16}$ (b) $\frac{25}{2}$ (c) $\frac{5}{4}$ (d) $\frac{\sqrt{5}}{2}$

34. $999\frac{1}{7} + 999\frac{2}{7} + 999\frac{3}{7} + 999\frac{4}{7} + 999\frac{5}{7} + 999\frac{6}{7} = ?$

- (a) 2997 (b) 5979 (c) 5997 (d) 5994

35. The Pie-Graph given below shows the break-up of the cost of construction of a house. Assuming that the total cost of construction is Rs 600000, answer the question given below:



The amount spent on cement is:

- (a) Rs 200000 (b) Rs 160000 (c) Rs 120000 (d) Rs 100000

36. The value of $\{(.98)^3 + (.02)^3 + 3 \times .98 \times .02 - 1\}$ is

- (a) 0 (b) 1 (c) 1.09 (d) 1.98

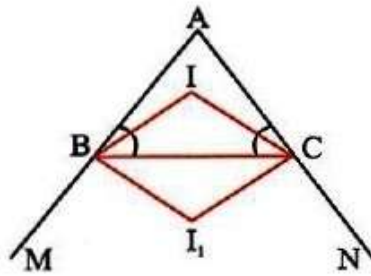
37. If $\frac{3}{5}$ of $\frac{1}{5}$ of a number is 9, then the product of the two digits of the number is

- (a) 35 (b) 55 (c) 60 (d) 75

38. By how much does $\frac{6}{7/8}$ exceed $\frac{6/7}{8}$?

- (a) $6\frac{1}{8}$ (b) $6\frac{3}{4}$ (c) $7\frac{3}{4}$ (d) $7\frac{5}{6}$

39. In the figure, IB and IC are internal angular bisectors while I_1B and I_1C are external angular bisectors. If $\angle BIC + \angle BI_1C = \theta$ then θ is



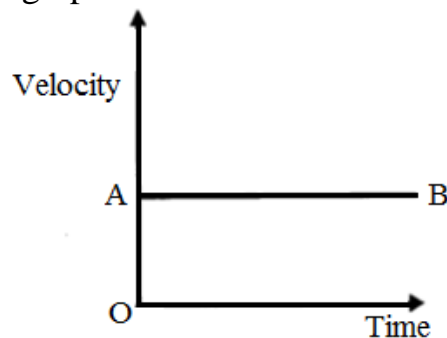
- (a) 120° (b) 360° (c) 180° (d) 90°
40. 18 buckets of water fill a tank when the capacity of each bucket is 9 litres. How many buckets will be needed to fill the same tank, if the capacity of the bucket is 13.5 litres?
- (a) 12 (b) 13.5 (c) 24
- (d) Cannot be determined because the capacity of the tank is not given

PART – 3 : PHYSICS

SECTION – I : (Maximum Marks: 20)

- This section contains **TEN** questions.
- Each question has **FOUR** options (a), (b), (c) and (d). **ONLY ONE** of these four options is correct.
- For each question, darken the bubble corresponding to the correct option in the **OMR**.
- For each question, marks will be awarded in one of the following categories:
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Zero Marks : 0 In all other cases

41. The acceleration of a car that speeds up from 12 meters per second to 30 meters per second in 15 seconds is
- (a) 2.4 m/s^2 (b) 1.2 m/s^2 (c) 2 m/s^2 (d) 5.2 m/s^2
42. A body covers half of its journey with a speed of 60 m/s and the other half with a speed of 40 m/s. Then average speed during whole journey is
- (a) 0 (b) 50 m/s (c) 48 m/s (d) 52 m/s
43. The numerical ratio of displacement to distance for a moving object is
- (a) always less than 1 (b) always equal to 1
(c) always more than 1 (d) equal to or less than 1
44. In the given velocity-time graph AB shows that the body has



- (a) uniform acceleration (b) uniform deceleration
(c) uniform velocity throughout the motion (d) None of these
45. Which of these phenomena is caused due to convection?
- (a) Ventilation (b) Trade winds
(c) Ocean currents (d) All of the above
46. How many parts does a Celsius scale have?
- (a) 100 (b) 273
(c) 180 (d) 50

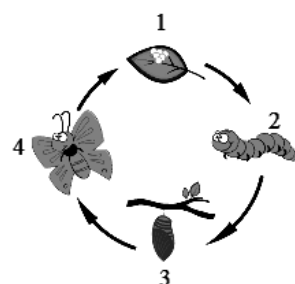
47. A graph is plotted showing the velocity of a car as a function of time. If the graph is a straight line at some angle with x -axis, it means that
- (a) the car started at rest (b) acceleration was constant
(c) acceleration was increasing (d) velocity was constant
48. A train travels 40 km at a uniform speed of 30 km h^{-1} . Its average speed after travelling another 40 km is 45 km h^{-1} for the whole journey. Its speed in the second half of the journey is
- (a) 45 km h^{-1} (b) 90 km h^{-1} (c) 60 km h^{-1} (d) None of these
49. A micro-second is equal to
- (a) $\frac{1}{1000000} \text{ s}$ (b) $\frac{1}{100000} \text{ s}$ (c) $\frac{1}{10000000} \text{ s}$ (d) $\frac{1}{1000} \text{ s}$
50. Express a speed of 360 cm hr^{-1} in kms^{-1} .
- (a) 10^{-6} (b) 10^{-5} (c) 3.6×10^{-6} (d) 360×10^{-5}

PART – 4 : CHEMISTRY

SECTION – I : (Maximum Marks: 20)

- This section contains **TEN** questions.
- Each question has **FOUR** options (a), (b), (c) and (d). **ONLY ONE** of these four options is correct.
- For each question, darken the bubble corresponding to the correct option in the **OMR**.
- For each question, marks will be awarded in one of the following categories:
Full Marks : +2 If only the bubble corresponding to the correct option is darkened.
Zero Marks : 0 In all other cases

51. The two indicators which give red or pink colour on adding a basic solution are:
- A. China rose indicator B. Turmeric indicator
 C. Phenolphthalein indicator D. Blue litmus indicator
- (a) A and B (b) B and C (c) C and D (d) A and D
52. One of the following is not an organic acid. This is :
- (a) acetic acid (b) formic acid (c) citric acid (d) carbonic acid
53. When ice-cream melts:
- A. Heat is lost from the ice-cream B. Heat is gained by the ice-cream
 C. Heat is lost from the surroundings D. Heat is gained by the surroundings
- (a) A and B (b) B and C (c) A and C (d) C and D
54. Identify the different stages of life cycle of silk moth in the given figure and select the correct option.



- | | 1 | 2 | 3 | 4 |
|-----|-------|-------|-------|-------|
| (a) | Egg | Larva | Pupa | Adult |
| (b) | Larva | Egg | Adult | Pupa |
| (c) | Pupa | Larva | Adult | Egg |
| (d) | Egg | Pupa | Larva | Adult |

55. For the formation of a normal salt from one molecule of H_2SO_4 , how many molecules of NaOH are required?
- (a) one (b) two (c) four (d) three
56. The gas we use in the kitchen is called liquefied petroleum gas (LPG). In the cylinder it exists as liquid. When it comes out from the cylinder, it becomes a gas (change – A), then it burns (change – B). The following statements pertain to these changes. Choose the correct one.
- (a) Process A is a chemical change.
(b) Process B is a physical change.
(c) Process A is a physical change but B is a chemical change.
(d) Process A is a chemical change but B is a physical change.
57. Which of the following acids are not present in acid rain?
- (a) Sulphuric acid (b) Nitric acid (c) Carbonic acid (d) Hydrochloric acid
58. When magnesium oxide is dissolved in water the solution formed
- (a) turns red litmus blue (b) turns blue litmus red
(c) gives no colour with phenolphthalein
(d) gives back the magnesium ribbon on standing.
59. A non-metallic element is converted into a compound X after a series of reactions. A little amount of X when tested with blue litmus turns to red. X on complete reaction with another compound Y gave the product which did not respond to litmus test. Identify the correct sequence of the reactions.
- (1) $2\text{SO}_2 + \text{O}_2 \rightarrow 2\text{SO}_3$
(2) $\text{H}_2\text{SO}_4 + 2\text{KOH} \rightarrow \text{K}_2\text{SO}_4 + 2\text{H}_2\text{O}$
(3) $\text{SO}_3 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_4$
(4) $\text{S} + \text{O}_2 \rightarrow \text{SO}_2$
- (a) 1342 (b) 4132 (c) 2314 (d) 4321

60. The salt which will give an acidic solution on dissolving in water is:

(a) sodium sulphate

(b) ammonium sulphate

(c) sodium carbonate

(d) sodium chloride

PART – 5 : BIOLOGY

SECTION – I : (Maximum Marks: 20)

- This section contains **TEN** questions.
- Each question has **FOUR** options (a), (b), (c) and (d). **ONLY ONE** of these four options is correct.
- For each question, darken the bubble corresponding to the correct option in the **OMR**.
- For each question, marks will be awarded in one of the following categories:
Full Marks : +2 If only the bubble corresponding to the correct option is darkened.
Zero Marks : 0 In all other cases

61. Lichens are a symbiotic association of algae and fungi. Which of the following statements is correct in respect of lichens?
- (a) Fungus supplies water and minerals to cells of algae.
(b) Algae supplies food to the fungus.
(c) Fungus supplies water, minerals and food to algae and algae provides shelter to fungus.
(d) Both (a) and (b) are correct.
62. Lenticels are found in
- (a) the root (b) the stem (c) Both stem and root (d) none of these
63. Which of the following briefly describes tropical rainforests?
- (a) Hot and dry (b) Dry and humid (c) Cold and dry (d) Hot and wet
64. Bile juice is secreted by which part of digestive system.
- (a) Small Intestine (b) Liver (c) Pituitary gland (d) Pancreas
65. Which of the following is not an adaptation of polar bear?
- (i) They have large ears.
(ii) They have a very strong sense of smell.
(iii) They are good swimmers.
(iv) Their feet are adapted for grasping the branches of trees firmly.
- (a) (i) and (ii) (b) (ii) and (iii) (c) (i) and (iv) (d) (iii) and (iv)

66. While taking a walk in a park, Muskan observed that an insect sat on a pitcher plant (Nepenthes). Immediately the flower opened up and the insect slid down. To which of the following categories does the pitcher plant belongs?

- (a) Saprophytes (b) Insectivorous
(c) Parasite (d) Symbiotic

67. Choose the correct option w.r.t. the type of respiration

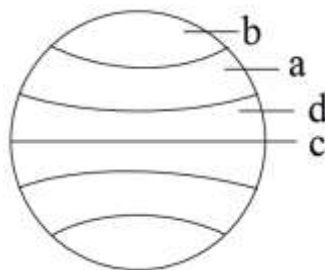
Column-I	Column-II
(a) Earth worm	(i) Pulmonary
(b) Human	(ii) Bronchial
(c) Prawn	(iii) Tracheal
(d) Insects	(iv) cutaneous

- (a) (a) → (i), (B) → (ii), (C) → (iii), (D) → (iv)
(b) (a) → (iv), (B) → (i), (C) → (ii), (D) → (iii)
(c) (a) → (iii), (B) → (ii), (C) → (iv), (D) → (i)
(d) (a) → (iv), (B) → (ii), (C) → (i), (D) → (iii)

68. Which of the following is necessary for photosynthesis?

- (a) Carbondioxide, water and sunlight
(b) Carbondioxide and water only
(c) Carbondioxide, water and chlorophyll
(d) Carbondioxide, water, sunlight and chlorophyll

69. Choose the correct option for the given figure?



- (a) a-temperate zone, b-torrid zone, c-equator, d-frigid zone
(b) a-frigid zone, b-temperate zone, c-equator, d-torrid zone
(c) a-temperate zone, b-equator zone, c-torrid zone, d-frigid zone
(d) a-temperate zone, b-frigid zone, c-equator, d-torrid zone

70. In humans, which of the following structures is analogous to spiracles of cockroach?

- (a) Lungs (b) alveoli
(c) nostrils (d) Bronchioles

PART – 6 : BRAIN TEASERS

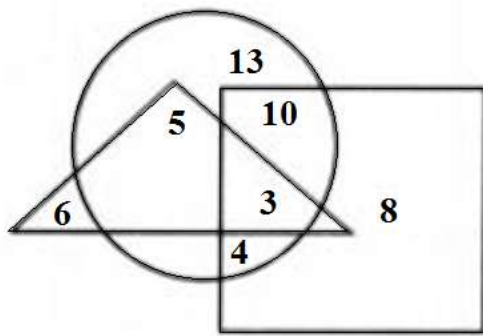
SECTION – I : (Maximum Marks: 20)

- This section contains **TEN** questions.
- Each question has **FOUR** options (a), (b), (c) and (d). **ONLY ONE** of these four options is correct.
- For each question, darken the bubble corresponding to the correct option in the **OMR**.
- For each question, marks will be awarded in one of the following categories:

<i>Full Marks</i>	:	+2	If only the bubble corresponding to the correct option is darkened.
<i>Zero Marks</i>	:	0	In all other cases

71. A man travels 7 kms towards East, then he turns left and travels 8 kms, again he turns left and travels 10 kms. Finally, he turns left and travels 2 kms. In which direction is he from his starting point?
- (a) North-West (b) West (c) East (d) North-East
72. Read the following information carefully and answer the questions given below:
 P is son of U's father's sister. R is son of S, who is the mother of T and paternal grandmother of U. V is the father of W and grandfather of P. T is sister of R.
- How is P related to S?
- (a) Grandfather (b) Grandson (c) Son (d) Uncle
73. If the equation is $10 - 2 + 9 \times 2 \div 4 = 19$. Then which of the following symbols satisfy the equation after replacing '- ' and '÷' with optional symbols given?
- (a) – and ÷ (b) – and + (c) ÷ and + (d) × and ÷
74. Which letter in the word COLLECTION occupies the same position as it does in the English alphabet?
- (a) E (b) O (c) I (d) C
75. In this question, a word has been given, followed by four other words, one of which can be formed by using the letter of the given word. Find that word?
- CIVILIZATION
- (a) civility (b) vacillation (c) action (d) culmination
76. Siva ranks sixteenth from the top and forty ninth from the bottom in a class. How many students are there in the class?
- (a) 60 (b) 64 (c) 66 (d) 69

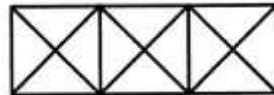
77. Study the given Venn diagram and answer the following questions.



In the following diagram, parallelogram represents women, triangle represents sub-inspectors of police and circle represents graduates. Which numbered area represents women graduate sub-inspectors of police?

- (a) 5 (b) 3 (c) 8 (d) 13

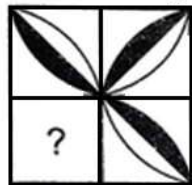
78. How many squares are there in the given figure?



- (a) 5 (b) 6 (c) 4 (d) 3

79. Identify the figure that gives the completes the pattern.

Question Figure



(X)

Answer Figures



- (a) (b) (c) (d)

80. How many pairs of successive numbers have a difference of 3 each? If the series:

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

- (a) 2 (b) 4 (c) 6 (d) 3

Space for Rough Work

Space for Rough Work