

मंगलाबाई भागवत फाउंडेशन

Time-2 Hrs.

Mathematics Part - I

Marks 40

- Note :-
- i) All questions are compulsory.
 - ii) Use of calculator is not allowed.
 - iii) The numbers to the right of the questions indicate full marks.
 - iv) In case of MCQ's [Q. No. 1(A)] only the first attempt will be evaluated and will be given credit.
 - v) For every MCQ, the correct alternative (A), (B), (C), or (D) with sub question number is to be written as an answer.

Q.1. A) Four alternative answers are given for every sub questions. Choose the correct alternative and write its alphabet with sub question number. (4)

- 1) To solve $x + y = 5$, $3x - 2y = 4 = 0$ by determinant method, Find D.
(A) 5 (B) 1 (C) -5 (D) -1
- 2) If roots of $x^2 + kx + k$ are real and equal what is the value of k ?
(A) 0, (B) 4, (C) 0 or 4 (d) 2
- 3) What is the sum of the first five multiples of 3 ?
a) 45 b) 55 c) 15 d) 75
- 4) A die is rolled. What is the probability that the number appearing on the upper face is less than S ?
a) $\frac{1}{6}$ b) $\frac{1}{3}$ c) $\frac{1}{2}$ d) 0

B) Solve the following sub questions. (4)

- i) Find the value of x , if $4x + 3y = 23$ and $y = 5$
- ii) Write the value of $\alpha + B$ for the quadratic equation $3x^2 - 6x - 5 = 0$
- iii) What is the MV of a share of FV Rs. 50, if it is at a discount of 10% ?
- iv) A die is rolled. Write the probability of the event A getting a number multiple of 2.

Q.2. A) Complete the following activities and rewrite it. (Any two) (4)

- i) Complete the following activity to solve the simultaneous equations.
 $5X + 3y = 9$ 1
 $2X + 3y = 12$ 2
Activity : Adding equations (1) and (2)
 $5X + 3y = 9$ (1)
 $2X - 3y = 12$ (2)

$$\begin{array}{r} \boxed{} \\ \hline \end{array} = 21$$

$\therefore X = \boxed{}$

Substituting the value of x in equation

(1)

$$\boxed{} + 3y = 9$$

$$\therefore 3y = \boxed{}$$

$$\therefore y = -2$$

- ii) Complete the following activity to find which term of the A.P. 2,11,20,29... is 560?

Activity :

Given A.P. 2,11,20,29.....

Here $a = 2$, $d = 11 - 2 = 9$

Let the n th term of this A.P. be 560

$$t_n = \boxed{}$$

$$\therefore 560 = 2 + (n - 1) \times 9 \quad \text{formula substituting the value}$$

$$\therefore 560 = 2 + \boxed{}$$

$$\therefore 9n = \boxed{} \quad \therefore n = \boxed{}$$

- iii) A die is rolled. Complete the following activity to find the probability of getting an odd number on the upper face of the die ?

Activity :

The sample space $S = \boxed{}$

$$\therefore n(s) = 6$$

Event A : to get an odd number on the upper face

$$\therefore A = \{ \}$$

$$\therefore n(A) = 3$$

$$\therefore P(A) = \frac{\boxed{}}{n(s)} \quad \text{(formula)}$$

$$\therefore P(A) = \frac{1}{\boxed{}}$$

Q.2. B) Solve the following sub questions. (Any Four)

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- If $x = 5$ and $y = 3$ is the solution of $3x + ky = 3$ find the value of k .
- Solve the quadratic equation $x^2 + 8x + 15 = 0$ by factorisation method.
- Find the 11th term of the A.P. 12,16,20,24.....
- M/s. Asian Paint sold 2 tins of lustre point each of taxable value Rs. 3000/- find the GST charged at the rate of 28%
- Find the class mark of the class 35-39. What is the next consecutive class ?

Q.3. A) Complete the following activities and rewrite it. (Any one)

(3)

- i) One of the roots of quadratic equation $kx^2 - x - 12 = 0$ is $\frac{3}{2}$ (Complete the following activity to find the value of k .)

Activity:-

Substitute $x = \frac{3}{2}$ in the given quadratic equation.

$$\therefore k \boxed{} - \frac{3}{2} - 12 = 0$$

$$\therefore \boxed{} - \frac{3}{2} - 12 = 0$$

$$\therefore 9k - 6 - \boxed{} = 0 \quad \text{(Multiplying by 4)}$$

$$\therefore 9k = \boxed{}$$

$$\therefore k = \boxed{}$$

$$\therefore k = \boxed{}$$

- ii) The following frequency distribution table gives the ages of 200 patients treated in a hospital in a week. Complete the following activity to find the mode of ages the patients.

Age (Years)	5-10	10-15	15-20	20-25	25-30	30-35
Numbers of Patients	36	30	50	38	24	22

Activity :

Here the modal class is =

Mode = $L + \left[\frac{f_1 - f_0}{2f_1 - f_0 - f_2} \right] \times h$ (Formula)

$$= 15 + \left[\frac{50 - 30}{2 \times 50 - 30 - 38} \right] \times 5 \text{(Substituting the values)}$$

$$= 15 + \left[\frac{20}{22} \right] \times 5$$

$$= 15 + \frac{20}{32} \times 5$$

$$= 15 + \left[\frac{20}{32} \right] \times 5$$

$$= \left[\frac{20}{32} \right] \times 5$$

Q.2. B) Solve the following sub questions. (Any Two) (6)

- i) Two angles are complementary. If the measure of one angle is more by 50° than the other, then find the measure of each angle.
- ii) The sum of a natural number and its reciprocal is $\frac{65}{8}$ find the number.
- iii) The area under crops in a certain village is given below. Draw a pie diagram showing the information.

Crop	Jowar	Wheat	Sugarcane	Vegetable
Area (in he taxes)	40	60	50	30

- iv) Shekhar brought a laptop with 10% discount on the printed price Rs. 50,000. 18% GST was charged on the discounted price. Find the amount of CGST and SGST. What a mount did Shekhar Pay ?

Q.4. Solve the following sub questions. (Any Two) (8)

- i) The following table show the marks of the first term examination of 10th class students. Show the information by a histogram.

Class mark of marls	375	425	475	525	575
Number of students	30	40	45	35	25

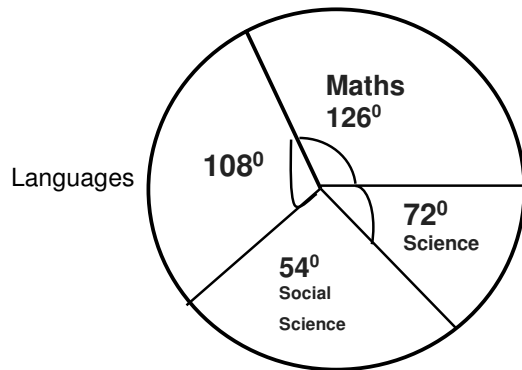
- ii) A two digit number is less than five times the sum of its digits by 8. The number obtained by interchanging the digits is greater by 27 than the original number. Find the original number.

iii) All the face cards of diamond are removed from the pack of 52 playing cards and the remaining cards are reshuffled. A card is drawn at random. Find the probability of getting

- A) A back face card.
- B) A King
- C) A red Card
- D) A black card

Q.5. Solve the following sub questions. (Any One) (3)

i) A survey of 500 students of a school was conducted to know the inclination towards different subject. The data obtained is presented by adjacent pie diagram.



Answer the following question :-

- a) How many students show inclination towards is matches ?
- b) How many students are inclined towards social science ?
- c) How many more students are inclined to wards languages than science ?

ii) Draw the graph as per the given information :-

- a) Draw a line AB which interested the X-axis at (6,0) and the Y-axis at (0,4)
- b) Draw a line CD passing through (5,3) and (-3, -1)
- c) Write the Co-ordinations of the point of intersection of the lines. AB and CD.
