

Class No: \_\_\_\_\_

Name : \_\_\_\_\_

FIRST YEAR HIGHER SECONDARY EXAMINATION

MARCH , 2023

Part - III

MATHEMATICS (COMMERCE) Time : 2 Hours

Maximum : 60 Scores Cool-off time : 20minutes

**General Instructions to Candidates :**

- There is a 'Cool off time' of 15 minutes in addition to the writing time.
- Use 'cool off time' to get familiar with questions and to plan your answers.
- Read questions carefully before answering.
- Calculations, figures and graphs should be shown in the answer sheet itself.
- Malayalam version of the questions is also provided.
- Give equations wherever necessary.
- Electronic devices except non programmable calculators are not allowed in the Examination Hall.

വിദ്യാർത്ഥികൾക്കുള്ള പൊതുനിർദ്ദേശങ്ങൾ :

- നിർദ്ദിഷ്ട സമയത്തിന് പുറമെ 15 മിനിട്ട് 'കൂൾ ഓഫ് ടൈം' ഉണ്ടായിരിക്കും.
- 'കൂൾ ഓഫ് ടൈം' ചോദ്യങ്ങൾ പരിചയപ്പെടാനും ഉത്തരങ്ങൾ ആസൂത്രണം ചെയ്യാനും ഉപയോഗിക്കുക.
- ഉത്തരങ്ങൾ എഴുതുന്നതിന് മുമ്പ് ചോദ്യങ്ങൾ ശ്രദ്ധാപൂർവ്വം വായിക്കണം.
- കണക്ക് കൂട്ടലുകൾ, ചിത്രങ്ങൾ, ഗ്രാഫുകൾ, എന്നിവ ഉത്തരപേപ്പറിൽ തന്നെ ഉണ്ടായിരിക്കണം.
- ആവശ്യമുള്ള സ്ഥലത്ത് സമവാക്യങ്ങൾ കൊടുക്കണം.
- ചോദ്യങ്ങൾ മലയാളത്തിലും നൽകിയിട്ടുണ്ട്.
- പ്രോഗ്രാമുകൾ ചെയ്യാനാകാത്ത കാൽക്കുലേറ്ററുകൾ ഒഴികെയുള്ള ഒരു ഇലക്ട്രോണിക് ഉപകരണവും പരിക്ഷാഹാളിൽ ഉപയോഗിക്കുവാൻ പാടില്ല.

Answer any 6 questions from 1 to 8.

Each carries 3 scores.

(6x3 = 18)

1. Let  $U = \{1, 2, 3, 4, 5, 6\}$ .

$A = \{x : x \text{ is a Prime number, } x < 5\}$ ,  $B = \{1, 2, 3, 4\}$

(i) Write A in Roster form.

2/7

(ii) Prove that  $(A \cup B)' = A' \cap B'$ .

(2)

2. (i) If  $(x+1, y-2) = (1, 4)$ , find the values of  $x$  and  $y$ .

(1)

(ii) The Cartesian product  $A \times A$  has 9 elements among which are found  $(-1, 0)$  and  $(0, 1)$ .

Find the set  $A$  and the remaining elements of  $A \times A$ .

(2)

3. Find the multiplicative inverse of  $z = 1 - i\sqrt{3}$ . (3)

4. Solve

$$2(x+3) \leq 3(x+1). \quad (3)$$

5. Find  $n$  if  ${}^{n-1}P_3 : {}^nP_4 = 1:9$  (3)

6. (i) Find the equation of circle with centre  $(2, 2)$  and passing through  $(5, 4)$ . (2)

(ii) Find the length of latus rectum of the parabola  $y^2 = 8x$ . (1)

7. Find  $\lim_{x \rightarrow 0} \frac{\sqrt{x+1} - 1}{x}$  (3)

8. If  $P(A) = 0.3$ ,  $P(B) = 0.5$ , &  $P(A \cap B) = 0.2$

Find (i)  $P(A \cup B)$  (2)

(ii)  $P(A' \cap B')$  (1)

Answer any 6 questions from 9 to 16.

Each carries 4 scores.

9. (i) Let 'R' be a relation defined on the set

$$A = \{1, 2, 3, 4, 5, 6, 7\} \text{ such that } R = \{(x, 2x+1), x \in A\}$$

Find the domain and the range of the relation R.

(ii) Draw the graph of the function  $f(x) = |x| + 1, x \in \mathbb{R}$  (2)

10. (i) If  $\sin x = \frac{-1}{2}$ ,  $x$  lies in the 3<sup>rd</sup> quadrant,

find all other trigonometric functions (2)

(ii) Prove that  $\frac{\sin 5x + \sin 3x}{\cos 5x + \cos 3x} = \tan 4x$  (2)

11. (i) If  ${}^n C_8 = {}^n C_2$ , find the value of  $n$ . (1)

(ii) In how many ways can one select a cricket

team of eleven from 17 players in which only

5 players can bowl if each cricket team of 11

must include exactly 4 bowlers. (3)

12. Find (i)  $(a+b)^4 + (a-b)^4$ . Hence evaluate  $(\sqrt{3}+1)^4 + (\sqrt{3}-1)^4$  (4)
13. Find the vertices, foci, length of latus rectum and eccentricity of the ellipse  $\frac{x^2}{9} + \frac{y^2}{25} = 1$  (4)
14. (i) Name the octant in which the point  $(3, -4, 6)$  lie. (1)
- (ii) Prove that the points  $(2, 3, 4)$ ,  $(-1, 2, -3)$  and  $(-4, 1, -10)$  are collinear. (3)
15. Find the derivative of  $\sin x$  using the first principle (4)
16. Calculate the mean deviation about the Median for the following data: (4)
- |       |   |   |   |    |    |    |    |    |
|-------|---|---|---|----|----|----|----|----|
| $x_i$ | 3 | 6 | 9 | 12 | 13 | 15 | 21 | 22 |
| $f_i$ | 3 | 4 | 5 | 2  | 4  | 5  | 4  | 3  |
- Answer any 3 questions from 17 to 20.  
(Each carries 6 scores.)

17. (i) Consider the sequence  $\sqrt{3}, 3, 3\sqrt{3}, \dots$
- (a) Find the common ratio (1)
- (b) Find the sum of  $n$  terms of this sequence (2)

(ii) Find the sum of the series  $4 + 44 + 444 + \dots$  (3)

18. (i) Find the equation of a line make an angle  $45^\circ$  with  $x$ -axis and passing through  $(4, 3)$  (3)

(ii) Find the equation of a line passing through  $(4, -3)$  and perpendicular to the line  $x - y + 1 = 0$  (3)

19. Consider the following table :

|           |         |       |       |       |       |       |     |
|-----------|---------|-------|-------|-------|-------|-------|-----|
| Class     | : 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 | 90- |
| Frequency | : 3     | 7     | 12    | 15    | 8     | 3     | 2   |

(i) Find the mean

(ii) Find the Variance

(iii) Find the Standard deviation (6)

20. (i) Three coins are tossed once. Find the probability of getting atleast two heads (2)

(ii) If  $E$  and  $F$  are two events such that  $P(E) = \frac{1}{4}$ ,  $P(F) = \frac{1}{2}$  and  $P(E \text{ and } F) = \frac{1}{8}$ , find

(a)  $P(E \text{ or } F)$  (1)

(b)  $P(\text{not } E \text{ and not } F)$  (1)

(iii) Find the probability of getting 3 kings when a hand of 7 cards is drawn from a well shuffled deck of 52 cards (2)

BLUE PRINT

| No | Unit                       | Question pattern |       |                  |       | Total            |       |
|----|----------------------------|------------------|-------|------------------|-------|------------------|-------|
|    |                            | Objective        |       | Descriptive      |       | No. of Questions | Score |
|    |                            | No. of Questions | Score | No. of Questions | Score |                  |       |
| 1  | Sets                       | 1                | 1     | 1                | 2     | 2                | 3     |
| 2  | Relation and Functions     | 1                | 1     | 1+1              | 2+4   | 3                | 7     |
| 3  | Trigonometry.              | -                | -     | 1                | 4     | 1                | 4     |
| 4  | Complex Numbers.           | -                | -     | 1                | 3     | 1                | 3     |
| 5  | Linear inequalities.       | -                | -     | 1                | 3     | 1                | 3     |
| 6  | Permutation & Combination  | 1                | 1     | 2                | 6     | 3                | 7     |
| 7  | Binomial Theorem.          | -                | -     | 1                | 4     | 1                | 4     |
| 8  | Sequence & Series.         | 1                | 1     | 2                | 5     | 3                | 6     |
| 9  | Straight lines.            | -                | -     | 2                | 6     | 2                | 6     |
| 10 | Conics.                    | 1                | 1     | 2                | 6     | 3                | 7     |
| 11 | Three dimensional Geometry | 1                | 1     | 1                | 3     | 2                | 4     |
| 12 | Limits & Derivatives       | -                | -     | 2                | 7     | 2                | 7     |
| 13 | Statistics                 | -                | -     | 2                | 10    | 2                | 10    |
| 14 | Probability                | 0                | 0     | 2                | 9     | 2                | 9     |

Note: Number in the brackets denotes choice

Question prepared by  
Batch III - Mattanur.

1. Sunesh - S - Leader. 9846651150
2. Muhammed Hussain - K.K
3. Abdul Crafoor
4. Sindu Nellikka
5. Sujaya Mallesi
6. Rajasree - C.
7. Sheeba - S.G
8. Rajila - K.L
9. Rosensary Boben
10. Shrutthy - J.