Muktangan English School & Jr. College, Pune - 9
Terminal Examination (2024-25)
Standard - IX

Subject - MATHEMATICS (Part I) **Marks - 40**
Date - 24-10-2024 **Time - 8.00 a.m. to 10.00 a.m.**

Q.1 **(A)** **For each question, four alternatives are given. Choose the correct** **(4)**
alternative and write the correct alphabet to indicate the answer.

i) The degree of the polynomial 0 (zero) is ....

(A) 0 (B) 1 (C) undefined (D) Any real number

ii) Which of the following is an irrational number ?

(A) $\sqrt{\dfrac{4}{9}}$ (B) $\sqrt{7}$ (C) $\dfrac{4}{8}$ (D) $\sqrt{225}$

iii) If P = {1, 2, 3, ..., 7}, then what type of Set is set P ?

(A) Null set (B) Infinite set (C) Finite Set (D) Singleton set

iv) I 4-9 I = ...

(A) 5 (B) -5 (C) $\dfrac{1}{5}$ (D) 0

Q.I **(B)** **Attempt the following subquestions.** **(4)**

i) If set A = {2, 3, 5} and set U = {0, 1, 2, 3, 4, 5, 6}, then write A'.

ii) Simplify : $3m^2 \times \dfrac{1}{9m}$

iii) Divide : $\sqrt{98} \div \sqrt{2}$

iv) Write a monomial using variable 'p' having degree 8.

Q.2 **(A)** **Complete any two of the given activities and rewrite it.** **(4)**

i) Compare the pair of given surds $5\sqrt{3}, \ \sqrt{9}$ by completing the activity below.

Solution⟶ $5\sqrt{3}, \ \sqrt{9}$ .... (given)

Squaring each of the given surds.

$\therefore (5\sqrt{3})^2 = 5^2 \times (\sqrt{3})^2$

$= 25 \times \boxed{}$

$= \boxed{}$ .... (1)

$\therefore (\sqrt{9})^2 = 9$ .... (2)

$\therefore \boxed{} > 9$ .... From (1) and (2)

Hence $\boxed{} > \sqrt{9}$

ii) By using remainder theorem divide the polynomial $(x^3 - 2x^2 - 4x - 4)$ by $(x-1)$ and find the remainder by completing the activity given below.

Solution⟶ $p(x) = x^3 - 2x^2 - 4x - 4$ .... (1)

Divisor is $(x-1)$

$\therefore x = \boxed{}$

Substitute $x = 1$ in equation (1)

$\therefore p(\boxed{}) = (1)^3 - 2 \times (1)^2 - 4 \times (1) - 4$ .... (By Remainder theorem)

$\qquad = 1 - 2 \times 1 - 4 - 4$

$\qquad = 1 - 2 - 4 - 4$

$\qquad = \boxed{}$

$\therefore$ Remainder $= \boxed{}$

iii) Complete the table given below :

Rule Method	Roster Method
M = {z / z is a multiple of 5 and is less than 30}	M = {⟦ ⟧}
P = {⟦ ⟧}	P = {-2, -1, 0, 1, 2}

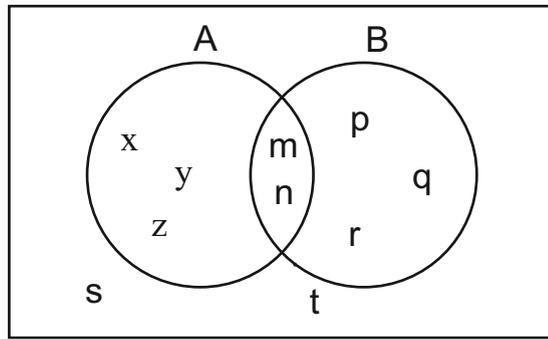**Q.2 (B) Attempt any four of the following subquestions.** **(8)**

i) Solve : $\lvert 16 - (12 + 4) \times 3 \rvert$

ii) If $(x-1)$ is a factor of polynomial $3x^2 + mx$, then find the value of m.

iii) Factorise $(9x^2 - 16)$ stating formula.

iv) Multiply $5\sqrt{3} \times 2\sqrt{18}$ and write the answer in the simplest form.

v) If M is any set, then write M∪φ and M∩φ.

Q.3 (A) Complete any one activity and rewrite it. (3)

i) Observe the given Venn diagram and write the following sets :

Solution→ a) Set A = ◻

b) Set B = ◻

c) $A \cup B$ = ◻

d) U = ◻

e) $(A \cup B)'$ = ◻

f) $(A \cap B)'$ = ◻

$\cup$

A ⃝ B ⃝

x m p

y q

z n

s r

t

ii) Solve : $\left| 5 + \dfrac{x}{4} \right| = 5$, by completing the activity below :

Solution→ $\left| 5 + \dfrac{x}{4} \right| = 5$

∴ $5 + \dfrac{x}{4}$ = ◻

∴ $5 + \dfrac{x}{4}$ = ◻   or $5 + \dfrac{x}{4}$ = ◻

∴ $\dfrac{x}{4}$ = 5-5   or $\dfrac{x}{4}$ = -5-5

∴ $\dfrac{x}{4}$ = 0   or $\dfrac{x}{4}$ = ◻

∴ On Solving

x = ◻   or   x = ◻

Q.3 (B) Attempt any two of the following subquestions. (6)

i) Factorise : $6x^2 - 5x - 6$

ii) Simplify : $4\sqrt{12} - \sqrt{75} - 7\sqrt{48}$

iii) If the polynomial $t^3 - 3t^2 + kt + 50$ is divided by (t-3), the remainder is 62, then find the value of k.

iv) A = {x | x = 2n, n∈N, 0<x ≤10} and B = {y | y is an even number, 1≤y≤10}, then verify whether Set A = Set B stating reason.

Q.4 Attempt any two of the following subquestions. (8)

i) Rationalise the denominator : $\dfrac{\sqrt{3} - \sqrt{7}}{\sqrt{3} + \sqrt{7}}$

ii) Factorise $(x^2 - 2x + 3)(x^2 - 2x + 5) - 35$

iii) Out of 200 persons in a group, 170 persons speak English and 140 persons speak German. Each one out of 200 persons speak atleast one language. Then how many of them speak only English ? and How many of them speak only German ?

Q.5 Attempt any one of the following subquestions. **(3)**

i) Divide the polynomial $(y^3 - 216)$ by $(y - 6)$ using synthetic division method and hence write the quotient and remainder.

ii) Express the recurring decimal 7.529529... in $\dfrac{p}{q}$ form.

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