St. Mary's Convent Inter College , Prayagraj

First Terminal Examination 2024

Time: 2½hrs | **Class – 9** | **M.M :80**

Mathematics

Name ..... **Roll No**..... **Date**.....

Section - A [40 Marks]

Attempt all questions from this section.

1- Choose the correct answer to the questions from the given options. **[1x15]**

i) $\sqrt{7} \times \sqrt{6}$ is equal to

a) $3\sqrt{2}$ b) $3\sqrt{7}$

c) $2\sqrt{7}$ d) $\sqrt{42}$

ii) The ~~compound interest~~ Amount on Rs. 100 at 10% per annum compounded annually for 2 years is

a) 121 b) 12

c) 22 d) 90

iii) By using suitable formula find the value of 102^2-98^2.

a) 800 b) 200

c) 1800 d) 400

iv) Determine the irrational number from the following.

a) $\sqrt{36}$ b) $\sqrt{\frac{9}{25}}$

c) $\sqrt{\frac{2}{3}}$ d) $\sqrt{49}$

v) Which one is the common factor of $9a^2b^4+12a^3b^3$

a) $3\ a^3b^3$ b) $3\ ab^3$

c) $3a^2b^3$ d) $3\ a^2b^2$

vi) if $x-\frac{2}{x}=3$ then $x^3-\frac{8}{x^3}$ is equal to

a) 27 b) 36

c) 45 d) 54

vii) if $x = 3$ and $y = k$ is a solution of the equation $3x - 4y + 7 = 0$ then the value of k is

a) 16 b) -16

c) 4 d) -4

viii) The three angles of a triangle are $a + 15°$, $2a - 20°$and $a - 15°$. The angles are

a) 65°, 70° and 45° b) 65°, 80° and 35°

c) 45°, 100°, 35° d) 65°, 60° and 55°

ix) Find the perimeter of a square if its diagonal is $10\sqrt{2}$ cm

a) 10cm b) $40\sqrt{2}$ cm

c) 20cm d) 40cm

x) The value of $(\sin 45° + \cos 45°)$ is

a) $\frac{1}{\sqrt{2}}$ b) $\sqrt{2}$

c) 1 d) $\frac{\sqrt{3}}{2}$

xi) if $\tan A = \frac{3}{4}$, then $\sin A \cos A$ is

a) $\frac{24}{25}$ b) $\frac{12}{25}$

c) $\frac{5}{6}$ d) $\frac{6}{5}$

xii) if $\sin\theta = \frac{a}{b}$, then $\cos\theta$ is equal to

a) $\frac{b}{\sqrt{b^2 - a^2}}$ b) $\frac{b}{a}$

c) $\frac{\sqrt{b^2 - a^2}}{b}$ d) $\frac{a}{\sqrt{b^2 - a^2}}$

xiii) if $\sin x = \frac{1}{2}$ and $\cos y = \frac{1}{2}$ then the value of $x + y$ is

a) 0° b) 30°

c) 60° d) 90°

xiv) Every rational number is

a) a natural number b) an integer

c) a real number d) a whole number

xv) If 5 is a root of $x^2 - kx - 15 = 0$ then the value of k is

a) 3 b) 2

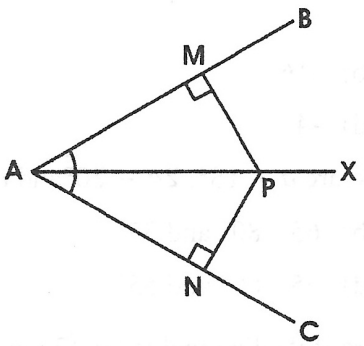
c) 1 d) 0

2- i) Express $0.1\overline{34}$ as a rational number in the simplest form. [4]

ii) Find what sum will amount to Rs. 73810 in two years at 10% per annum compound interest. [4]

iii) Solve $\frac{x+3}{x-1} = \frac{2x+1}{3x-5}$ [4]

3- i) AX is the bisector of∠BAC; P is any point on AX prove that the perpendicular drawn from P to AB and AC are equal. [4]



ii) Prove that the figure formed by joining the mid points of the consecutive sides of quadrilateral is a parallelogram [4]

iii) A ladder 50m long is placed so as to reach a window 48m high and on turning the ladder over to the other side of the street, it reaches a point 14dm high. Find the breadth of the street. [5]

14 m

Section - B [40 Marks]

(Attempt any four question from this section)

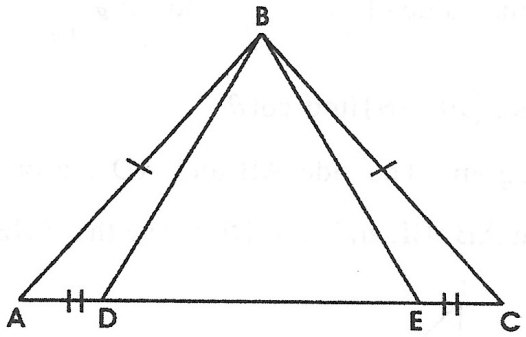
4- i) Give three rational numbers lying between $\frac{1}{3}$ and $\frac{1}{2}$ [3]

ii) Find the amount of Rs. 256 in one year at $12\frac{1}{2}\%$ per annum, when the interest is compounded half yearly. [4]

iii) If $\left(x+\frac{1}{x}\right)^2 = 3$ show that $x^3 + \frac{1}{x^3} = 0$ [3]

5- i) Factorise $4x^3 - 17x^2y - 15xy^2$ [3]

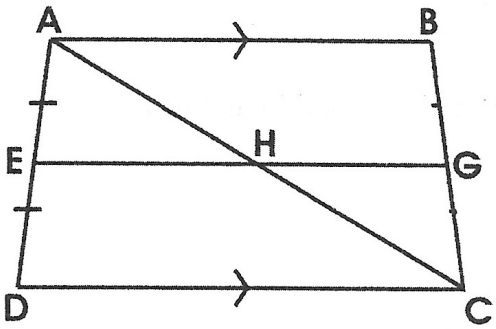
ii) In the given figure AB = BC and AD = EC prove that $\Delta ABE \cong \Delta CBD$. [4]



iii) Evaluate $4\tan^2 45° - 8\cos^2 60° + \sin^2 60° + \cos^2 90°$ [3]

6- i) Solve for x :- $\frac{1}{x+2} + \frac{1}{x} = \frac{3}{4}$ [3]

ii) In the given figure ABCD is a trapezium in which side $AB \parallel DC$ and E is the mid-point of AD, if G is a point on the side BC such that the segment $EG \parallel DC$, show that $EG = \frac{1}{2}(AB + DC)$ [4]



iii) Evaluate $\frac{\sin^2 63° + \sin^2 27°}{\cos^2 17° + \cos^2 73°}$ [3]

7- i) ABC is equilateral triangles of side 2a find each of its attitudes. [4]

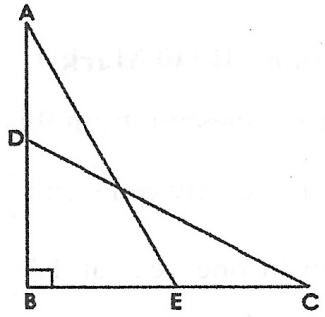
ii) Rationalize the denominator and simplify [3]

$$\frac{3\sqrt{2}}{\sqrt{3}+\sqrt{6}} - \frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}} + \frac{\sqrt{6}}{\sqrt{2}+\sqrt{3}}$$

iii) Factorize $8a^3 - b^3 + 12a^2b - 6ab^2$ [3]

8- i) Share that $7 - 2\sqrt{3}$ is an irrational number. [3]

ii) In the adjoining figure, $AE = DC = 13cm$ $BE = 5cm, \angle ABC = 90°$ and $AD = EC = x$ cm calculate the length of AB and the value of x. [4]



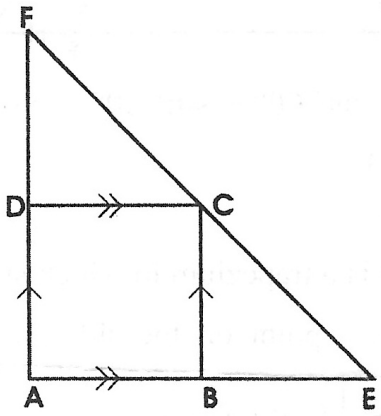
iii) If $\tan\theta = \frac{1}{\sqrt{5}}$, find the value of $\frac{\text{cosec}^2\theta - \sec^2\theta}{\text{cosec}^2\theta + \sec^2\theta}$ [3]

9- i) Find the compound interest on Rs. 80000 for 3 years if the rates for 3 years are 4%, 5% and 10% respectively. [4]

ii) If $a^2 + \frac{1}{a^2} = 7$, find the value of $\left(a + \frac{1}{a}\right)^2$ and $\left(a - \frac{1}{a}\right)^2$ [3]

iii) If $\sin\theta + \cos\theta = \sqrt{2}\sin(90° - \theta)$ find $\cot\theta$ [3]

10- i) ABCD is a parallelogram. The side AB and AD are produced to E and F respectively such that AB=BE and AD=DF prove that $\Delta BEC \cong \Delta DCF$ [4]



ii) Solve $\frac{8}{x+3} - \frac{3}{2-x} = 2$ [3]

iii) If $\frac{3+\sqrt{2}}{3-\sqrt{2}} = a + b\sqrt{2}$ find the value of a and b. [3]

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