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In The Service of Student Community

MM 20

Number System

Time 45 Minutes

Section A 1 Mark Each

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- π is :
(A) A rational number (B) an integer
(C) An irrational number (D) a whole number
- The denominator of a terminating decimal is of the form where m, n are whole numbers
(A) $2^m \cdot 3^n$ (B) $3^m \cdot 5^n$ (C) $2^n \cdot 5^m$ (D) $2^m \cdot 7$
- The product of any two irrational numbers is
(A) Always an irrational number (B) always a irrational number
(C) Always an integer (D) may be rational or irrational
- The value of $\frac{\sqrt{40} + \sqrt{60}}{\sqrt{10} + \sqrt{15}}$ is equal to
(A) $\sqrt{2}$ (B) 2 (C) 4 (D) 8
- $4\sqrt{3}\sqrt{2^2}$ is equals
(A) $2^{-\frac{1}{6}}$ (B) 2^{-6} (C) $2^{\frac{1}{6}}$ (D) 2^6

Section B 2 Marks Each

- Express $0.\overline{528}$ as a vulgar fraction.
- Show sum of two irrational numbers may be rational or irrational.

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Section C 3 Marks Each

8. Rationalise the denominators of the following $\frac{6 - 4\sqrt{3}}{6 + \sqrt{3}}$
9. Find the value of $\frac{3}{(216)^{-\frac{2}{3}}} + \frac{2}{(256)^{-\frac{3}{4}}} + \frac{1}{(243)^{-\frac{1}{5}}}$
10. Find the rational value of 'a' and 'b' for each of the following:
 $\frac{\sqrt{7}-1}{\sqrt{7}+1} - \frac{\sqrt{7}+1}{\sqrt{7}-1} = a + b\sqrt{7}$
11. Simplify $\frac{\sqrt{6}}{\sqrt{2}+\sqrt{3}} + \frac{3\sqrt{2}}{\sqrt{6}+\sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}}$

Section D 4 Marks Each

11. If $x = 3 - 2\sqrt{2}$, find the value of :
- (A) $x + \frac{1}{x}$ (B) $\sqrt{x} + \frac{1}{\sqrt{x}}$ (C) $x^2 + \frac{1}{x^2}$ (C) $x^3 - \frac{1}{x^4}$
12. If $xyz = 1$, then show that
 $(1 + x + y^{-1})^{3-1} + (1 + y + z^{-1})^{-1} + (1 + z + x^{-1})^{-1} = 1$

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