

**Test / Exam Name: Number System**

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| <b>Q1.</b> Express in the form of $\frac{p}{q} : 0.\overline{38} + 1.\overline{27}$ .                                                                                                                                                                                     | <b>3 Marks</b> |
| <b>Q2.</b> Express $0.\overline{6} + 0.\overline{7} + 0.\overline{47}$ in the form $\frac{p}{q}$ , where p and q are integers and $q \neq 0$ .                                                                                                                            | <b>3 Marks</b> |
| <b>Q3.</b> Prove that:<br>$\frac{3^{-3} \times 6^2 \times \sqrt{98}}{5^2 \times \sqrt[3]{\frac{1}{25}} \times (15)^{-\frac{4}{3}} \times 3^{\frac{1}{3}}} = 28\sqrt{2}$                                                                                                   | <b>3 Marks</b> |
| <b>Q4.</b> Simplify:<br>$\frac{4+\sqrt{5}}{4-\sqrt{5}} + \frac{4-\sqrt{5}}{4+\sqrt{5}}$                                                                                                                                                                                   | <b>5 Marks</b> |
| <b>Q5.</b> Express $2.\overline{36} + 0.\overline{23}$ as a fraction in simplest form.                                                                                                                                                                                    | <b>3 Marks</b> |
| <b>Q6.</b> Find the values of a and b if:<br>$\frac{7+3\sqrt{5}}{3+\sqrt{5}} - \frac{7-3\sqrt{5}}{3-\sqrt{5}} = a + b\sqrt{5}$                                                                                                                                            | <b>5 Marks</b> |
| <b>Q7.</b> Represent $\sqrt{9.3}$ on the number line.                                                                                                                                                                                                                     | <b>3 Marks</b> |
| <b>Q8.</b> Simplify $\left[ \left\{ (625)^{\frac{1}{2}} \right\}^{-\frac{1}{4}} \right]^2$                                                                                                                                                                                | <b>2 Marks</b> |
| <b>Q9.</b> Prove that:<br>$\frac{(0.6^0) - (0.1)^{-1}}{\left(\frac{3}{8}\right)^{-1} \left(\frac{3}{2}\right)^3 + \left(\frac{1}{3}\right)^{-1}} = -\frac{3}{2}$                                                                                                          | <b>3 Marks</b> |
| <b>Q10.</b> Prove that:<br>$\frac{(x^{a+b})^2 (x^{b+c})^2 (x^{c+a})^2}{(x^a x^b x^c)} = 1$                                                                                                                                                                                | <b>3 Marks</b> |
| <b>Q11.</b> Prove that:<br>$\left(\frac{64}{125}\right)^{-\frac{2}{3}} + \frac{1}{\left(\frac{256}{625}\right)^{\frac{1}{4}}} + \left(\frac{\sqrt{25}}{\sqrt[3]{64}}\right)^0 = \frac{61}{16}$                                                                            | <b>3 Marks</b> |
| <b>Q12.</b> Evaluate:<br>$\frac{(25)^{\frac{5}{2}} \times (729)^{\frac{1}{3}}}{(125)^{\frac{2}{3}} \times (27)^{\frac{2}{3}} \times 8^{\frac{4}{3}}}$                                                                                                                     | <b>3 Marks</b> |
| <b>Q13.</b> Write the value of $\left\{ 5 \left( 8^{\frac{1}{3}} + 27^{\frac{1}{3}} \right)^3 \right\}^{\frac{1}{4}}$ .                                                                                                                                                   | <b>3 Marks</b> |
| <b>Q14.</b> Simplify the following expressions:<br>1. $(5 + \sqrt{7})(2 + \sqrt{5})$<br>2. $(5 + \sqrt{5})(5 - \sqrt{5})$<br>3. $(\sqrt{3} + \sqrt{7})^2$<br>4. $(\sqrt{11} - \sqrt{7})(\sqrt{11} + \sqrt{7})$                                                            | <b>3 Marks</b> |
| <b>Q15.</b> Prove that:<br>$\frac{1}{1+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}} + \frac{1}{\sqrt{4}+\sqrt{5}}$ $+ \frac{1}{\sqrt{5}+\sqrt{6}} + \frac{1}{\sqrt{6}+\sqrt{7}} + \frac{1}{\sqrt{7}+\sqrt{8}} + \frac{1}{\sqrt{8}+\sqrt{9}} = 2$ | <b>5 Marks</b> |



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