# Number Systems  Question Answers Test-1

**Subjective Test**

**Question 1** (1.0 marks)

State whether the following statements are true or false.

(a) The sum of a rational number and an irrational number is a rational number. ($\frac{1}{2}$ mark)

(b) The product of a rational number and an irrational number is an irrational number. (1 mark)

**Question 2** (2.0 marks)

Without actual division, state whether each of the following fractions is a terminating decimal or not. Give reasons to justify your answer.

(a) $\dfrac{3}{40}$ (1 mark)

(b) $\dfrac{13}{42}$ (1 mark)

**Question 3** (2.0 marks)

Express $0.43\overline{7}$ as a fraction in the simplest form.

**Question 4** (2.0 marks)

Find eight rational numbers between 7 and 8.

**Question 5** (3.0 marks)

Represent $\sqrt{6.5}$ on the number line.

**Question 6** (3.0 marks)

If $x = \sqrt{3} - 1$, then find the value of $\left\{ x + \dfrac{1}{x} \right\}^2$.

**Question 7** (6.0 marks)

Simplify the following expressions.

(a) $\dfrac{(25)^{\frac{1}{2}} \times (32)^{\frac{2}{5}}}{(27)^{\frac{2}{3}} \times (16)^{\frac{1}{4}}}$ (2 marks)

(b) $\left( \dfrac{27}{8} \right)^{-\frac{1}{3}} \times \left[ \left( \dfrac{125}{27} \right)^{-\frac{4}{3}} \div \left( \dfrac{2}{5} \right)^4 \right]$ (2 marks)

(c) $\dfrac{(81)^{-\frac{7}{4}} - (81)^{-\frac{3}{4}}}{(81)^{\frac{5}{4}}}$ (2 marks)

**Question 8** (6.0 marks)

Simplify the following expressions.

(a) $\left(\dfrac{x^r}{x^p}\right)^q \left(\dfrac{x^q}{x^r}\right)^p \left(\dfrac{x^p}{x^q}\right)^r$  (2 marks)

(b) $\left(\dfrac{16}{9}\right)^{-\frac{1}{2}} \div \left[\left(\dfrac{256}{81}\right)^{-\frac{1}{4}} + \dfrac{\sqrt{3}}{\sqrt{27}}\right]$  (2 marks)

(c) $\left(\sqrt[3]{3}\right)^{-\frac{3}{2}} \times \sqrt[4]{b^4} \div \sqrt{a^2 b}$  (2 marks)

**Question 9** (6.0 marks)

Represent both $\sqrt{2}$ and $\sqrt{7}$ on the number line.

**Question 10** (6.0 marks)

Rationalize the denominators of the following expressions.

(a) $\dfrac{1}{\sqrt{5}+\sqrt{13}}$  (2 marks)

(b) $\dfrac{3-\sqrt{2}}{\sqrt{7}}$  (2 marks)

(c) $\dfrac{3\sqrt{6}-2\sqrt{5}}{3\sqrt{5}-6\sqrt{3}}$  (2 marks)