1. Every rational number is

(a) a natural number (b) an integer (c) a real number (d) a whole number

2. Between two rational numbers

(a) there is no rational number

(b) there is exactly one rational number

(c) there are infinitely many rational numbers

(d) there are only rational numbers and no irrational numbers.

3. The decimal expansion of the number $\sqrt{2}$ is

(a) a finite decimal (b) 1.41421

(c) non-terminating recurring (d) non-terminating non-recurring

4. A rational number between $\sqrt{2}$ and $\sqrt{3}$ is

(a) $\frac{\sqrt{2+\sqrt{3}}}{2}$ (b) $\frac{\sqrt{2}\cdot\sqrt{3}}{2}$ (c) 1.5 (d) 1.8

5. Which of the following numbers is irrational?

(a) $\sqrt{\frac{4}{9}}$ (b) $\frac{\sqrt{1250}}{\sqrt{8}}$ (c) $\sqrt{8}$ (d) $\frac{\sqrt{24}}{\sqrt{6}}$

6. The value of $0.\overline{23}+0.\overline{22}$ is

(a) $0.\overline{45}$ (b) $0.\overline{43}$ (c) $0.\overline{54}$ (d) 0.45

7. If a, b, c are positive real numbers, then $\sqrt[5]{3125a^{10}b^5c^{10}}$ is equal to

(a) $5a^2bc^2$ (b) $25ab^2c$ (c) $5a^3bc^3$ (d) $125a^2bc^2$

8. If $x=2$ and $y=4$, then $\left(\frac{x}{y}\right)^{x-y}+\left(\frac{y}{x}\right)^{y-x}=$

(a) 4 (b) 8 (c) 12 (d) 2

9. $(256)^{0.16}\times(256)^{0.09}=$

(a) 4 (b) 16 (c) 64 (d) 256.25

10. When simplified $\left(-\frac{1}{27}\right)^{-2/3}$, is

(a) 9 (b) -9 (c) $\frac{1}{9}$ (d) $-\frac{1}{9}$

11. The value of $\frac{\sqrt{32}+\sqrt{48}}{\sqrt{8}+\sqrt{12}}$ is

(a) $\sqrt{2}$ (b) 2 (c) 4 (d) 8

12. If $x=1+\sqrt{7}$, then $-\frac{6}{x}$ is equal to

(a) $1+\sqrt{7}$ (b) $1-\sqrt{7}$ (c) $\sqrt{7}$ (d) $-\frac{6}{\sqrt{7}}$

13. If $x = 2+\sqrt{3}$, then $x+\frac{1}{x}$ is equals

(a) 2 (b) 4 (c) $-2\sqrt{3}$ (d) $4-2\sqrt{3}$

14. If $\sqrt{2}=1.4142$, then $\sqrt{\frac{\sqrt{2}+1}{\sqrt{2}-1}}$ is equal to

(a) 2.4142 (b) 5.8282 (c) 0.4142 (d) 0.1718

15. $\sqrt{10},\sqrt{15}$ is equal to

(a) $5\sqrt{6}$ (b) $6\sqrt{5}$ (c) $\sqrt{30}$ (d) $\sqrt{25}$

16. $\sqrt[3]{6},\frac{7}{2},\frac{15}{}$ equal to

(a) 5.35 (b) $\sqrt[5]{6\times 0}$ (c) $\sqrt[5]{6}$ (d) $\sqrt[5]{12}$

17. If $\frac{3^{5x}\times 81^2\times 6561}{3^{2x}}=3^7$, then the value of x is

(a) 3 (b) -3 (c) $1/3$ (d) $-1/3$

18. $\frac{5^{n+2}-6\times 5^{n+1}}{\sqrt{3}\times 5^n-2\times 5^{n+1}}$ is equal to

(a) $\frac{5}{3}$ (b) $-\frac{5}{3}$ (c) $\frac{3}{5}$ (d) $-\frac{3}{5}$

19. $\sqrt[4]{\sqrt[3]{2^2}}$ equals

(a) 2 (b) 2^{-6} (c) $2^{1/6}$ (d) 2^6

20. Value of $\sqrt[4]{(81)^{-2}}$ is

(a) $\frac{1}{9}$ (b) $\frac{1}{3}$ (c) 9 (d) $\frac{1}{81}$

21. The product $\sqrt[3]{2}\times\sqrt[4]{2}\times\sqrt[12]{32}$ equals

(a) $\sqrt{2}$ (b) 2 (c) $\sqrt[12]{2}$ (d) $\sqrt[12]{32}$

22. Which of the following is equal to x ?

(a) $x^{\frac{12}{7}}-x^{-\frac{5}{7}}$ (b) $\sqrt[12]{\left(x^4\right)^{1/3}}$ (c) $\left(\sqrt{x^3}\right)^{2/3}$ (d) $x^{\frac{12}{7}}\times x^{\frac{7}{12}}$

23. Which of the following is not equal to $\left\{\left(\frac{5}{6}\right)^{1/5}\right\}^{-1/6}$?

(a) $\left(\frac{5}{6}\right)^{\frac{1}{5}-\frac{1}{6}}$ (b) $1\div\left\{\left(\frac{5}{6}\right)^{1/5}\right\}^{1/6}$ (c) $\left(\frac{6}{5}\right)^{\frac{1}{30}}$ (d) $\left(\frac{5}{6}\right)^{-\frac{1}{30}}$

24. If $\sqrt{2^n}=1024$, then $3^{2(n/4-4)}$ is equal to

(a) 3 (b) 9 (c) 27 (d) 81

25. If $10^x=64$, then $10^{\frac{x}{2}+1}$ is equal to

(a) 18 (b) 42 (c) 80 (d) 81

26. If $\frac{\sqrt{3}-1}{\sqrt{3}+1} = a - b\sqrt{3}$, then

(a) $a = 2, b = 1$ (b) $a = 2, b = -1$ (c) $a = -2, b = 1$ (d) $a = b = 1$

27. If $x = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and $y = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, then $x^2 + xy + y^2 =$

(a) 101 (b) 99 (c) 98 (d) 102

28. If $\frac{5-\sqrt{3}}{2+\sqrt{3}} = x + y\sqrt{3}$, then

(a) $x = 13, y = -7$ (b) $x = -13, y = 7$ (c) $x = -13, y = -7$ (d) $x = 13, y = 7$