EDUTALK CAREER INSTITUTE

DIPLOMA COURSE – MATHS

TEST PAPER - 03

Max Marks: 75

Time: 3 hours

Section 1: Each question carries 1 mark

1. For x, y not equal to zero, the expression $(\frac{2x^2y^{-1}}{5})^2 \; X \; (\frac{5x^{-1}y^3}{4})^3$ simplifies to

a. $5x^4y^7$ b. $(5/16)xy$ c. $(5/16)xy^7$ d. $(5/16)x^4y^7$ e. $(5/4)x^4y^7$

2. Value of $(256)^{0.16} \times (256)^{0.09}$ is

(A) 4 (B) 16 (C) 64 (D) 256.25

3. $\log_a x + 3\log_a y + 2\log_a z$ =

a. $\log_a xyz$ b. $\log_a x^2yz^3$ c. $\log_a xy^3z^2$ 4. $\log_a x^2y^3z^4$

5. The quadratic equation whose roots are -4 and 7 is

a. $x^2 + 3x + 28 = 0$ c. $x^2 + 7x - 14 = 0$

b. $x^2 - 3x - 28 = 0$ d. $x^2 - 4x + 14 = 0$

6. If one zero of the polynomial $4x^2 - (5 - K)x + 9$ is negative of the other, then the value of k is

a. 1 b. -1 c. -5 d. 5

7. Numbers which cannot be written in the form of p/q are called _____ numbers

a. Rational c. Irrational

b. Integer d. Whole

8. If x is a negative number, then which of the following must be TRUE?

a. $X^5 > |X|$ c. $X < \sqrt{-X}$

b. $X > \sqrt{-X}$ d. $X > 1/|X|$

9. A train travelling at a speed of 100 kmph overtakes a motorbike travelling at a speed of 64kmph in 40 seconds. What is the length of the train in meters?

a. 1777m b. 1822m c. 400m d. 1400m

10. The quadratic equation $2x^2 – \sqrt{5}x + 1 = 0$ has

a. Two distinct real roots c. No real roots

b. Two equal real roots d. More than 2 real roots

Section 2: Each question carries 2.5 marks

11. The Rationalizing factor of $\sqrt[3]{5} – 1$ is _____

12. The Rationalizing factor of $1 + \sqrt{2} + \sqrt{3}$ is _____

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13. The sum of the digits of a two-digit number is 9. If 27 is added to it, the digits of the number get reversed. The number is _____
14. If $\log_b \log_a X = 1$ then, X = _____
15. If $\log_{10} 2 = 0.3010$ then $\log_{10} 125 =$ _____
16. If the roots of the equation $x^2 + kx + 16 = 0$ are equal, then the values of k are _____ and _____

Section 3: Each question carries 5 marks

17. Define $\log_a b$. Prove that $\log_a \frac{x}{y} = \log_a x - \log_a y$
18. Show that $\frac{1}{1+\log_x yz} + \frac{1}{1+\log_y zx} + \frac{1}{1+\log_z xy} = 1$
19. On Dividing $x^3 + x^2 + x - 2$ by a polynomial g(x), the quotient and remainder were $x^2 + 2x + 1$ and 2x – 1 respectively. Find g(x)
20. The sides of an equilateral triangle are $2x - 3y + 1$, $x + y - 1$ and $3x - y - 9$. Find its area and perimeter.
21. Two numbers are in the ratio 5 : 6. If 8 is subtracted from each of the numbers, the ratio becomes 4 : 5. Find the numbers
22. If α and β are the roots of the equation $3x^2 + 5x + 2 = 0$, find the value of $\alpha^2 + \beta^2$ and form the equation whose roots are α/β and β/α
23. A train, travelling at a uniform speed for 360 km, would have taken 48 minutes less to travel the same distance if its speed were 5 km/h more. Find the original speed of the train.
24. At present Asha's age (in years) is 2 more than the square of her daughter Nisha's age. When Nisha grows to her mother's present age, Asha's age would be one year less than 10 times the present age of Nisha. Find the present ages of both Asha and Nisha.
25. A person, rowing at the rate of 5 km/h in still water, takes thrice as much time in going 40 km upstream as in going 40 km downstream. Find the speed of the stream.
26. A railway half ticket costs half the full fare, but the reservation charges are the same on a half ticket as on a full ticket. One reserved first class ticket from the station A to B costs Rs 2530. Also, one reserved first class ticket and one reserved first class half ticket from A to B costs Rs 3810. Find the full first class fare from station A to B, and also the reservation charges for a ticket.