Higher Mathematics Model Test

Time: 25 minutes **Marks: 25**

Multiple Choice Questions

Answer all questions. Each question carries 1 mark.

1. What is the slope of the line $x = 3y + 5$?

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

2. What is the y-intercept of the line $x = 3y + 5$?

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

3. $P(x, y, z) = x^2y + y^2z + z^2x$

   (i) has a degree of 2.
   (ii) is a symmetric expression.
   (iii) is a cyclic expression.

   Which of the following is true?

   (a) (iii)
   (b) (i), (iii)
   (c) (ii), (iii)
   (d) (i), (ii), (iii)

4. $\sin\theta = \frac{\sqrt{3}}{2}$, then what is the value of θ, where $\pi \leq \theta \leq \frac{3\pi}{2}$?

   (a) $\frac{\pi}{6}$
   (b) $\frac{\pi}{3}$
   (c) $\frac{4\pi}{3}$
   (d) None of these

5. How many terms are there in the expansion of $(x^2 - 6x + 9)^2$?

(a) 3

(b) 4

(c) 5

(d) 6

6. What is the probability of the number being a prime if we choose a random number between 20 and 30?

   (a) $\frac{1}{11}$

   (b) $\frac{2}{11}$

   (c) $\frac{3}{11}$

   (d) $\frac{4}{11}$

7. What angle the line $\sqrt{3}x + y + 11 = 0$ produces with the positive direction of the y-axis?

   (a) 45°

   (b) 60°

   (c) 120°

   (d) 150°

8. $P(x) = x^3 - x^2 - 10x - 8$, which of the following is a factor of $P(x)$?

   (a) $x - 1$

   (b) $x + 4$

   (c) $x + 2$

   (d) All of these

9. Angle between the hour and minute hands of a clock at 12:30 AM is:

   (a) 180°

   (b) 165°

   (c) 150°

   (d) 155°

10. If the coefficient of x^3 is 60 in the expansion of $(2x - \frac{x}{6})^5$, then what is the value of k?

    (a) ± 3

    (b) $\pm 2\sqrt{2}$

    (c) $\pm 3\sqrt{2}$

    (d) $\pm 3\sqrt{3}$

11. If P(A) is the probability of event A, then which of the following is true?

    (a) $0 < P(A) < 1$

    (b) $0 \leq P(A) < 1$

(c) $0 < P(A) \leq 1$

(d) $0 \leq P(A) \leq 1$

12. Distance of the x-axis from the point $(-3, -4)$ is:

(a) 3 unit

(b) -3 unit

(c) 4 unit

(d) -4 unit

13. Which of the following is not a polynoimal?

(a) $x + 5$

(b) $\frac{3}{x} + 5$

(c) 0

(d) (b) and (c) both.

14. If $\tan 20x = \cot 10x$, what is the value of x?

(a) 2°

(b) 3°

(c) 6°

(d) 45°

15. In the expansion of $(2x + \frac{1}{x})^6$:

i there are 7 terms.

ii 4th terms is a constant.

iii value of the constant term is 160.

Which of the following is true?

(a) (i), (ii)

(b) (i), (iii)

(c) (ii), (iii)

(d) (i), (ii), (iii)

16. There are 8 black, 16 red and 32 white balls in a box. If a ball is chosen an random, what is the probability that it is **not** blue?

(a) $\frac{3}{7}$

(b) $\frac{4}{7}$

(c) $\frac{4}{3}$

(d) $\frac{3}{4}$

17. What is the area of the triangle formed by the points $(1, 1)$, $(1, 4)$ and $(5, 1)$?

    (a) 6 sq unit
    (b) 12 sq unit
    (c) 24 sq unit
    (d) 18 sq unit

18. If $(x + 3)$ is a factor of $2x^4 + px^2 - 3x - 9$, what is the value of p?

    (a) -4
    (b) 4
    (c) -6
    (d) 6

19. The angle -1665° lies in which quadrant?

    (a) First
    (b) Second
    (c) Third
    (d) Fourth

20. How many terms are there in the expansion of $(1 + 3x + 3x^2 + x^3)^7$?

    (a) 7
    (b) 8
    (c) 21
    (d) 22

21. At which point the line 3x + 4y - 12 = 0 intersects the x-axis?

    (a) (3, 0)
    (b) (0, 3)
    (c) (4, 0)
    (d) (0, 4)

22. $P(x, y) = 2x^4y + 3x^3y^3 + 5$. What is the leading coefficient of the polynoimal?

    (a) 2
    (b) 3
    (c) $2y$
    (d) 5

23. $2^\circ 56' 9.47''$ is equal to:

    (a) 2.936^c
    (b) 168.218°
    (c) 0.051°
    (d) 168.218^c

24. Distance between the points $(-3, -4)$ and $(4, -3)$ is:

(a) $5\sqrt{2}$ unit

(b) $7\sqrt{2}$ unit

(c) 50 unit

(d) 98 unit

25. $\dfrac{3}{(x-2)(x-3)}$ is equal to:

(a) $\dfrac{3}{x-2} + \dfrac{3}{x-3}$

(b) $\dfrac{3}{x-2} - \dfrac{3}{x-3}$

(c) $\dfrac{3}{x-3} - \dfrac{3}{x-2}$

(d) $-\dfrac{3}{x-2} - \dfrac{3}{x-3}$