QB365 Student Learing Managemnet System
Exam Name: Pre Quarterly - Practice
Std: 12th Standard - Business Maths and Statistics
Chapter: Applications of Matrices and Determinants, Integral Calculus – I, Integral Calculus – II, Random Variable and Mathematical Expectation, Differential Equations, Numerical Methods

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Questions:

PART - D

Answer all the questions

1. The marginal cost C′(x) and marginal revenue R′(x) are given by C′(x) = 50 + $\frac{x}{50}$ and R′(x) = 60. The fixed cost is Rs. 200. Determine the maximum profit
2. The probability density function of a random variable X is f(x) = $ke^{-|x|}$, $-\infty < x < \infty$ Find the value of k and also find mean and variance for the random variable.
3. Evaluate the following integrals:
   $\int_0^3 \frac{x dx}{\sqrt{x+1}+\sqrt{5x+1}}$
4. Solve the following:
   $\frac{dy}{dx}$ + ytan x = $\cos^3 x$
5. Using Newton's forward interpolation formula find the cubic polynomial.

x	0	1	2	3
f(x)	1	2	1	10

6. Solve the following equation by using Cramer's rule
   x + 4y + 3z = 2, 2x–6y + 6z = –3, 5x– 2y + 3z = –5

PART - C

Answer the following questions

7. At marina two types of games viz., Horse riding and Quad Bikes riding are available on hourly rent. Keren and Benita spent Rs. 780 and Rs. 560 during the month of May.

Name	Number of hours		Total amount spent (in Rs)
	Horse Riding	Quad Bike Riding	
Keren	3	4	780
Benita	2	3	560

   Find the hourly charges for the two games (rides). (Use determinant method).
8. The marginal cost function MC = 2 + $5e^x$ Find C if C (0)=100
9. A coin is tossed thrice. Let X be the number of observed heads. Find the cumulative distribution function of X.
10. Evaluate the following integrals:
    $\int (x+1)^2 \log x \, dx$
11. Find the missing entry in the following table

x	0	1	2	3	4
y_x	1	3	9	-	81

12. Find the equation of the curve passing through (1, 0) and which has slope $1 + \frac{y}{x}$ at (x,y)

PART- B

Answer the following questions

13. Using Integration, find the area of the region bounded the line 2y + x = 8, the x axis and the lines x = 2, x = 4.
14. Integrate the following with respect to x
    $\frac{6x+7}{\sqrt{3x^2+7x-1}}$
15. Prove that, V(aX) = a^2V(X)
16. Solve 9y″ – 12y′ + 4y = 0
17. Show that the equations x + y + z = 6, x + 2y + 3z = 14 and x + 4y + 7z = 30 are consistent
18. Construct a forward difference table for $y = f(x) = x^2 + 2x + 2$ for $x = 1, 2, 3, 4$

PART - A

Choose the correct answer

19. If $\frac{a_1}{x} + \frac{b_1}{y} = c_1$, $\frac{a_2}{x} + \frac{b_2}{y} = c_2$, $\triangle_1 = \begin{vmatrix} a_1 & b_1 \\ a_2 & b_2 \end{vmatrix}$, $\triangle_2 = \begin{vmatrix} b_1 & c_1 \\ b_2 & c_2 \end{vmatrix}$ $\triangle_3 = \begin{vmatrix} c_1 & a_1 \\ c_2 & a_2 \end{vmatrix}$ then (x, y) is _____.
    (a) $\left(\frac{\triangle_2}{\triangle_1}, \frac{\triangle_3}{\triangle_1}\right)$ (b) $\left(\frac{\triangle_3}{\triangle_1}, \frac{\triangle_2}{\triangle_1}\right)$ (c) $\left(\frac{\triangle_1}{\triangle_2}, \frac{\triangle_1}{\triangle_3}\right)$ (d) $\left(\frac{-\triangle_1}{\triangle_2}, \frac{-\triangle_1}{\triangle_3}\right)$
20. Area bounded by the curve y = e^{-2x} between the limits $0 \le x \le \infty$ is _____.
    (a) 1 sq.units (b) $\frac{1}{2}$ sq.unit (c) 5 sq.units (d) 2 sq.units
21. If c is a constant in a continuous probability distribution, then p(x = c) is always equal to _____.
    (a) zero (b) one (c) negative (d) does not exist
22. A listing of all the outcomes of an experiment and the probability associated with each outcome is called _____.
    (a) probability distribution (b) probability density function (c) attributes (d) distribution function
23. If f (x) is a continuous function and a < c < b, then $\int_a^c f(x)dx + \int_c^b f(x)dx$ is _____.
    (a) $\int_a^b f(x)dx - \int_a^c f(x)dx$ (b) $\int_a^c f(x)dx - \int_a^b f(x)dx$ (c) $\int_a^b f(x)dx$ (d) 0
24. The integrating factor of x $\frac{dy}{dx}$ – y = x^2 is _____.

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

25. For the given data find the value of $\Delta^3 y_0$ is _____.

x	5	6	9	11
y	12	13	15	18

(a) 1 (b) 0 (c) 2 (d) -1

26. The area bounded by the curve $y = e^x$, the X-axis and the lines x = 0 and x = 2 is_____.

(a) e^2-1 (b) e^2+1 (c) e^2 (d) e^2-2

27. $(1 + \Delta)(1 - \nabla)$ is _____

(a) 0 (b) 1 (c) -1 (d) $(1 - \nabla . \Delta)$

28. The value of $\begin{vmatrix} 5^2 & 5^3 & 5^4 \\ 5^3 & 5^4 & 5^5 \\ 5^4 & 5^5 & 5^6 \end{vmatrix}$

(a) 5^2 (b) 0 (c) 5^{13} (d) 5^9

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