Group – II $S_{2(UAD12B10, DTPH12B12)}$ **All**

B.Tech 2nd Semester Mid-Term Examination 2021

Subject Name: Engineering Mathematics – II

Subject Code: UAD12B10, DTPH12B12

Full Marks: 20 **Answer Script To Be Submitted Through Email: nita.ma.btech.j1@gmail.com** **Time: 1 Hour**

Symbols Used Here Have Their Usual Meanings

Choose the correct option from the following: **[10 × 2 = 20 Marks]**

1. If $B\ (n, 2)\ = \frac{1}{6}$ and n is a positive integer, then the value of n is

a) 3 b) -2

c) 2 d) -3

2. If A is the region bounded by the parabolas $y^2 = 4x,\ x^2 = 4y$ then $\iint_A y\ dx\ dy$ is equal to

a) $\frac{48}{5}$ b) $\frac{36}{5}$

c) $\frac{32}{5}$ d) None of these

3. The value of $\int_0^\infty \int_x^\infty \frac{e^{-y}}{y}\ dx\ dy$ changing the order of integration is

a) 0 b) $\frac{3}{4}$

c) 1 d) None of these

4. The value of the integral $\iint r^3 dr d\theta$ over the area included between the circles $r = 2sin\theta$ and $r = 4sin\theta$,is

a) $\frac{28}{9}\pi$ b) $\frac{45}{2}\pi$

c) $\frac{22}{7}\pi$ d) π

5. The definite integral $\int_a^b f(x)dx$ is said to be improper integral of 2nd kind if

a) [a,b] is of finite length but f(x) has one or more points of infinite discontinuity b) The interval of integration [a,b] is unbounded or f(x) is not bounded on [a,b]

c) [a,b] is of finite length and f(x) is bounded in the interval [a,b] d) None of these

6. The value of k for which the system of equations $x + ky + 3z = 0, 4x + 3y + kz = 0, 2x + y + 2z = 0$ is consistent is/are

a) $0, \frac{9}{2}$ b) $0, \frac{7}{2}$

c) $0, -\frac{9}{2}$ d) None of these

7. Let $A = \begin{pmatrix} 1 & 2 & 3 \\ 1 & 0 & 1 \\ 3 & -1 & 5 \end{pmatrix}, B = \begin{pmatrix} 1 & 0 & 1 \\ 1 & 1 & 2 \\ 0 & -1 & 3 \end{pmatrix}$ and rank of A is 3. Then rank of AB is

a) 0 b) 1

c) 2 d) 3

8. The value of $X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$, when $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 1 \\ 3 & 1 & 2 \end{bmatrix} X = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$ is

a) $X = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ b) $X = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$

c) $X = \begin{bmatrix} 1 \\ 0 \\ -1 \end{bmatrix}$ d) $X = \begin{bmatrix} 2 \\ -1 \\ 1 \end{bmatrix}$

9. For which of the following value of x, the rank of the matrix $\begin{bmatrix} 2 & 1 & 4 \\ 1 & x & 2 \\ 4 & 0 & x+2 \end{bmatrix}$ will be 2?

a) $x = 6$ b) $x \neq 6$

c) $x = 2$ d) None of these

10. The system of equations $2x + 3y + 5z = 9, 7x + 3y - 2z = 8, 2x + 3y + \lambda z = \mu$ has infinite number of solution for

a) $\lambda = 9$ b) $\lambda = 5, \mu = 9$

c) $\lambda = 5, \mu = any\ value$ d) None of these

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