Session: 2023-24   **Semester: I**   **Section: All**

Course Code: BAS-103   **Course Name: Engineering Mathematics-I**

Assignment 4

Date of Assignment: **Date of submission:**

S.No.	KL	CO	PI	Question	Marks
1	K3	CO3	1.2.1, 1.3.1, 2.1.3, 2.4.1, 2.4.2, 5.1.1, 3.3.2	Evaluate $\iint_D x^2 dxdy$, where D be the region in the first quadrant bounded by the curves $xy = 16$, $x = y$, $y = 0$ *and* $x = 8$.	5
2	K3	CO3	1.2.1, 1.3.1, 2.1.3, 2.4.1, 2.4.2	Evaluate $\iint r^3\, dr d\theta$ over the area included between the circles $r = 2sin\theta$ *and* $r = 4sin\theta$.	5
3	K3	CO3	1.3.1, 2.2.3, 2.4.2	Evaluate the following integral by changing the order of integration: $\int_0^2 \int_{x^2}^{3-x} xy\, dy\, dx$	5
4	K3	CO3	2.2.4, 2.2.5, 2.3.2, 2.4.1, 2.4.2, 2.4.3	Evaluate $\iiint_R (x + y + z)dxdydz$, where R is the region determined by $0 \le x \le 1, 0 \le y \le x^2, 0 \le z \le x + y$.	5
5	K3	CO3	2.2.5, 2.3.2, 2.4.2, 2.4.3, 3.3.2,	Compute $\iiint_V x^2 dxdydz$ over volume of tetrahedron bounded by $x = 0, y = 0, z = 0$ *and* $x/a + y/b + z/c=1$	5
6.	K3	CO3	5.1.1, 10.1.2,10.3.1	Evaluate the following integral by changing the order of integration: $\int_0^3 \int_0^{6/x} x^2\, dy\, dx.$.	5
7.	K3	CO3	12.1.1, 12.1.2, 12.2.2	Evaluate $\int_0^\infty \int_0^\infty e^{-(x^2+y^2)}\, dydx$ by changing to polar coordinates.	5

8.	K3	CO3	1.3.1, 2.2.3, 2.4.1	Prove the relation between Beta and gamma function.	5
9.	K3	CO3	5.1.1, 10.1.2, 10.3.1, 2.4.1, 1.2.1	Find the volume of solid bounded by the coordinate planes and the surface $\sqrt{\frac{x}{a}} + \sqrt{\frac{y}{b}} + \sqrt{\frac{z}{c}} = 1$	5
10.	K3	CO3	1.2.1, 1.3.1, 2.1.3, 2.4.1, 2.4.2	Evaluate by changing the variables $\iint_R (x + y)^2 \, dxdy$ where R is the region bounded by the parallelogram $x + y = 0, x + y = 2, 3x - 2y = 0 \text{ and } 3x - 2y = 3$	5

Answers:

1. **448**   2. $\frac{45\pi}{2}$

3. **8/3**

4. **9/2**

5. $a^3bc/60$

6. 27   7. $\pi/4$

9. $\frac{abc}{90}$

10.8/5