Q	UNIT 5	Answer
1a	Which of the following limits are suitably representing a rectangular region in XY plane (a) $y \le x \le y^2, 0 \le y \le 1$ (b) $0 \le x \le 1, 0 \le y \le x$ (c) $0 \le y \le x, y \le x \le 1$ (d) $0 \le x \le 1, 0 \le y \le 2$	d
2a	If limits of a region in XY plane are $0 \le x \le 1, 0 \le y \le 1-x$, then which of the following options correctly represent the order of integration of a function $f(x,y)$ over region R (a)$\iint f(x,y)dxdy$ (b) $\iint f(x,y)dydx$ (c) Integration can be done in any order (d) None of these	b
3a	If a region R is bounded by the curves $x = 0, y = 0, x + y = 1$ then which of the following limits correctly justify region R (a) $0 \le x \le 1, 0 \le y \le 1$ (b) $0 \le x \le 1, 0 \le y \le x$ (c) $0 \le x \le 1, 0 \le y \le x - 1$ (d) $0 \le x \le 1, 0 \le y \le 1 - x$	d
4a	What is the formula of area of region R in polar coordinates ? (a) $\iint dxdy$ (b) $\iint dydx$ (c) $\iint drd\theta$ (d) $\iint rdrd\theta$	d
5a	If region R is defined as $0 \le y \le \sqrt{1-x^2}, 0 \le x \le 1$, then limits of R in polar coordinates are (a) $0 \le r \le a, 0 \le \theta \le \pi$ (b) $0 \le r \le 1, 0 \le \theta \le \pi$ (c) $0 \le r \le 1, 0 \le \theta \le \pi/2$ (d) $0 \le r \le 1, 0 \le \theta \le 2\pi$	c
6a	$\int_{x=0}^{1}\int_{y=0}^{\sqrt{1-x^2}} f(x,y)dydx$, if we change the order of integration then which of the following limits will be correct (a) $0 \le y \le \sqrt{1-x^2}, 0 \le x \le 1$ (b) $0 \le x \le 1, 0 \le y \le 1$ (c) $0 \le y \le 1, 0 \le x \le \sqrt{1-y^2}$ (d) $0 \le x \le \sqrt{1-y^2}, 0 \le y \le \sqrt{1-x^2}$	c
7a	Area of the region bounded by $0 \le x \le 1, 0 \le y \le x$ (a) 1 (b) 1/2 (c) 1/4 (d) None of these	b
8a	Which of the following limits are suitable for defining a cube (a) $0 \le x \le 1, 0 \le y \le x, 0 \le z \le y$ (b) $0 \le x \le 1, 0 \le y \le 1, 0 \le z \le 1$ (c) $0 \le x \le 1, 0 \le y \le 1, 0 \le z \le y$ (d) $0 \le x \le 1, 0 \le y \le x, 0 \le z \le 1$	b
9a	A solid is bounded $x = 0, y = 0, z = 0, x + y + z = 1$ then which of the following limits are correct for the given solid (a) $0 \le x \le 1, 0 \le y \le 1, 0 \le z \le 1$ (b) $0 \le x \le 1, 0 \le y \le 1 - x, 0 \le z \le 1 - y - x$ (c) $0 \le x \le 1, 0 \le y \le 1, 0 \le z \le 1 - x - y$ (d) $0 \le x \le 1, 0 \le y \le 1 - x, 0 \le z \le 1 - y$	b
10a	Which of the following relations correctly define relation between Cartesian coordinates (x, y, z) and spherical polar coordinates (r, θ, ϕ) (a) $x = rSin\phi Cos\theta, y = rCos\phi Cos\theta, z = rCos\phi$ (b) $x = rSin\phi Cos\theta, y = rSin\phi Sin\theta, z = rCos\phi$ (c) $x = rSin\phi Cos\theta, y = rCos\phi Cos\theta, z = rtan\phi$ $(d) x = rSin\phi Sin\theta, y = rCos\phi Cos\theta, z = rCos\phi$	b
11a	Volume of a sphere $x^2 + y^2 + z^2 = 9$ is (a) 27π cubic units (b) 18π cubic units (c) 108π cubic units (d) 36π cubic units	d
12a	A solid is bounded by $x^2 + y^2 = 1, 0 \le z \le 1$, which of the following limits are correct for the given solid (a) $0 \le z \le 1, 0 \le r \le 1, 0 \le \theta \le \pi$ (b) $0 \le z \le 1, 0 \le r \le 1, 0 \le \theta \le \pi/2$ (c) $0 \le z \le 1, 0 \le r \le 1, 0 \le \theta \le 2\pi$ (d) $0 \le z \le 1, 0 \le r \le 1, 0 \le \theta \le \pi/4$	c

13a	The formula of volume of a solid T is (a) $\iint dxdy$ (b) $\iiint dxdydz$ (c) $\iiint z\, dxdydz$ (d) $\iiint y\, dxdydz$	b
14a	The value of $\int_1^e \int_1^e \int_1^e \frac{1}{xyz} dxdydz$ is a) 0 b) $\frac{1}{3}$ c) 1 d) None of these	c
15a	If a solid is defined as $0 \le x \le 1, 2 \le y \le 4, 0 \le z \le 1$, then it represents (a) A cylinder (b) A sphere (c) A cuboid (d) A cube	c
16a	Which of the following limits correctly justify the triangular region with vertices $(0,0), (0,1)$ and $(1,1)$ (a) $0 \le y \le 1, y \le x \le 1$ (b) $0 \le y \le 1, 0 \le x \le 1$ (c) $0 \le y \le 1, 0 \le x \le y$ (d) $0 \le y \le 1, 0 \le x \le 1 - y$	c
17a	If limits of a region in XY plane are $0 \le x \le 1, 0 \le y \le \sqrt{1-x^2}$, if we change the order of integration which of the following limits will be correct for this region (a) $0 \le x \le 1, 0 \le y \le 1$ (b) $0 \le x \le \sqrt{1-x^2}, 0 \le y \le 1$ (c) $0 \le y \le 1, 0 \le x \le \sqrt{1-y^2}$ (d) $0 \le y \le 1, -\sqrt{1-y^2} \le x \le \sqrt{1-y^2}$	c
18a	The value of integral $\int_{y=0}^{1} \int_{x=0}^{y} x^2 y^3 dxdy$ (a) 1/30 (b) 1/18 (c) 1/21 (d) 1/12	c
19a	The value of integral $\int_{y=0}^{1} \int_{x=0}^{1} \int_{z=0}^{1} x^2 y^3 z^4 dzdxdy$ (a) 1/30 (b) 1/120 (c) 1/80 (d) 1/60	d
20a	The value of integral $\int_{z=1}^{4} \int_{y=1}^{3} \int_{x=1}^{2} \frac{1}{xyz} dxdy\, dz$ (a) $log24$ (b) $log14$ (c) $log2\ log3\ log4$ (d) $log9$	c
21a	The value of $\iint (x^2 + y^2)\, dxdy$ over the circular region $x^2 + y^2 = a^2$ (a) πa^4 (b) $\pi a^4/2$ (c) $\pi a^4/4$ (d) $\pi a^2/2$	b
22a	On changing to polar coordinates $\int_0^\infty \int_0^\infty e^{-(x^2+y^2)} dxdy$ becomes a) $\int_0^{\frac{\pi}{2}} \int_0^\infty e^{-r^2} drd\theta$ b) $\int_0^{\frac{\pi}{2}} \int_0^\infty e^{-r^2} rdrd\theta$ c) $\int_0^\infty \int_0^\infty e^{-r^2} drd\theta$ d) None of these	b
23a	The value of $\int_1^e \int_0^{logy} \frac{dxdy}{\log y}$ is a) $e - 1$ b) $e^2 - 1$ c) $e^3 - 1$ d) None of these	a
24a	The limts of the solid bounded by the planes $x = 0, y = 0, x + y + z = 2$ & $z = 0$ are given by (a) $0 \le x \le 2, 0 \le y \le 2, 0 \le z \le 2$ (b) $0 \le x \le 2, 0 \le y \le 2 - x, 0 \le z \le 2 - y - x$ (c) $0 \le x \le 2, 0 \le y \le 2, 0 \le z \le 2 - x - y$ (d) $0 \le x \le 2, 0 \le y \le 2 - x, 0 \le z \le 2 - y$	b

25a	The value of $\int_{-1}^{1}\int_{-1}^{1}(x^3 + y^3)dxdy$ is (a) 0 (b) $\frac{1}{4}$ (c) $\frac{1}{2}$ (d) None of these	a