

QB365 Question Bank Software Study Materials

Applications of Integration 50 Important 1Marks Questions With Answers (Book Back and Creative)

12th Standard

Maths

Total Marks : 50

50 x 1 = 50

- 1) The value of $\int_{-4}^4 \left[\tan^{-1} \left(\frac{x^2}{x^4+1} \right) + \tan^{-1} \left(\frac{x^4+1}{x^2} \right) \right] dx$ is
 (a) π (b) 2π (c) 3π **(d) 4π**
- 2) The value of $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \left(\frac{2x^7-3x^5+7x^3-x+1}{\cos^2 x} \right) dx$ is
 (a) 4 (b) 3 **(c) 2** (d) 0
- 3) If $f(x) = \int_0^x t \cos t dt$, then $\frac{df}{dx} =$
 (a) $\cos x - x \sin x$ (b) $\sin x + x \cos x$ **(c) $x \cos x$** (d) $x \sin x$
- 4) The area between $y^2 = 4x$ and its latus rectum is
 (a) $\frac{2}{3}$ (b) $\frac{4}{3}$ **(c) $\frac{8}{3}$** (d) $\frac{5}{3}$
- 5) The value of $\int_0^1 x(1-x)^{99} dx$ is
 (a) $\frac{1}{11000}$ **(b) $\frac{1}{10100}$** (c) $\frac{1}{10010}$ (d) $\frac{1}{10001}$
- 6) The value of $\int_0^\pi \frac{dx}{1+5^{\cos x}}$ is
(a) $\frac{\pi}{2}$ (b) π (c) $\frac{3\pi}{2}$ (d) 2π
- 7) If $\frac{\Gamma(n+2)}{\Gamma(n)} = 90$ then n is
 (a) 10 (b) 5 (c) 8 **(d) 9**
- 8) The value of $\int_0^{\frac{\pi}{6}} \cos^3 3x dx$ is
 (a) $\frac{2}{3}$ **(b) $\frac{2}{9}$** (c) $\frac{1}{9}$ (d) $\frac{1}{3}$
- 9) The value of $\int_0^\pi \sin^4 x dx$ is
 (a) $\frac{3\pi}{10}$ **(b) $\frac{3\pi}{8}$** (c) $\frac{3\pi}{4}$ (d) $\frac{3\pi}{2}$
- 10) The value of $\int_0^\infty e^{-3x} x^2 dx$ is
 (a) $\frac{7}{27}$ (b) $\frac{5}{27}$ (c) $\frac{4}{27}$ **(d) $\frac{2}{27}$**
- 11) If $\int_0^a \frac{1}{4+x^2} dx = \frac{\pi}{8}$ then a is
 (a) 4 (b) 1 (c) 3 **(d) 2**
- 12) The volume of solid of revolution of the region bounded by $y^2 = x(a-x)$ about x-axis is
 (a) πa^3 (b) $\frac{\pi a^3}{4}$ (c) $\frac{\pi a^3}{5}$ **(d) $\frac{\pi a^3}{6}$**

- 13) If $f(x) = \int_1^x \frac{e^{\sin u}}{u} du$, $x > 1$ and $\int_1^3 \frac{e^{\sin x^2}}{x} dx = \frac{1}{2}[f(a) - f(1)]$, then one of the possible value of a is
 (a) 3 (b) 6 **(c) 9** (d) 5
- 14) The value of $\int_0^1 (\sin^{-1} x)^2 dx$ is
 (a) $\frac{\pi^2}{4} - 1$ (b) $\frac{\pi^2}{4} + 2$ (c) $\frac{\pi^2}{4} + 1$ **(d) $\frac{\pi^2}{4} - 2$**
- 15) The value of $\int_0^a (\sqrt{a^2 - x^2})^3 dx$ is
 (a) $\frac{\pi a^3}{16}$ **(b) $\frac{3\pi a^4}{16}$** (c) $\frac{3\pi a^2}{8}$ (d) $\frac{3\pi a^4}{8}$
- 16) If $\int_0^x f(t) dt = x + \int_x^1 t f(t) dt$, then the value of $f(1)$ is
(a) $\frac{1}{2}$ (b) 2 (c) 1 (d) $\frac{3}{4}$
- 17) The value of $\int_0^{\frac{2}{3}} \frac{dx}{\sqrt{4-9x^2}}$ is
(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{2}$ (c) $\frac{\pi}{4}$ (d) π
- 18) The value of $\int_{-1}^2 |x| dx$ is
 (a) $\frac{1}{2}$ (b) $\frac{3}{2}$ **(c) $\frac{5}{2}$** (d) $\frac{7}{2}$
- 19) For any value of $n \in \mathbb{Z}$, $\int_0^\pi e^{\cos^2 x} \cos^3[(2n+1)x] dx$ is
 (a) $\frac{\pi}{2}$ (b) π **(c) 0** (d) 2
- 20) The value of $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin^2 x \cos x dx$ is
 (a) $\frac{3}{2}$ (b) $\frac{1}{2}$ (c) 0 **(d) $\frac{2}{3}$**
- 21) The value of $\int_0^{\frac{\pi}{2}} \frac{dx}{1+\tan x}$ _____
 (a) π (b) $\frac{\pi}{2}$ **(c) $\frac{\pi}{4}$** (d) 0
- 22) If $\int_0^{2a} f(x) dx = 2 \int_0^a f(x) dx$ then _____
 (a) $f(2a-x) = -f(x)$ **(b) $f(2a-x) = f(x)$** (c) $f(x)$ is odd (d) $f(x)$ is even
- 23) The value of $\int_{-\pi}^{\pi} \sin^3 x \cos^3 x dx$ is _____
(a) 0 (b) π (c) 2π (d) 4π
- 24) The area enclosed by the curve $y = \frac{x^2}{2}$, the x-axis and the lines $x = 1$, $x = 3$ is _____
(a) 4 (b) $8\frac{2}{3}$ (c) 13 (d) $4\frac{1}{3}$
- 25) The area bounded by the parabola $y = x^2$ and the line $y = 2x$ is _____
(a) $\frac{4}{3}$ (b) $\frac{2}{3}$ (c) $\frac{51}{3}$ (d) $\frac{30}{3}$
- 26) If $\int_0^a f(x) dx + \int_0^a f(2a-x) dx =$ _____
 (a) $\int_0^a f(x) dx$ (b) $2 \int_0^a f(x) dx$ **(c) $\int_0^{2a} f(x) dx$** (d) $\int_0^{2a} f(a-x) dx$
- 27) $\int_{-1}^1 x dx =$
 (a) -1 (b) 1 **(c) 0** (d) 2
- 28) The area enclosed by the curve $y^2 = 4x$, the x-axis and its latus rectum is _____ sq.units.
 (a) $\frac{2}{3}$ (b) $\frac{4}{3}$ **(c) $\frac{8}{3}$** (d) $\frac{16}{3}$
- 29) The volume generated by the curve $y^2 = 16x$ from $x = 2$ to $x = 3$ rotating about x-axis cu. units
 (a) 72π (b) $\frac{256 \times 19}{3} \pi$ **(c) 40π** (d) 80π

- 30) $\int_a^b f(x)dx = \dots\dots\dots$
 (a) $2 \int_0^a f(x)dx$ (b) $\int_a^b f(a-x)dx$ (c) $\int_b^a f(b-x)dx$ **(d) $\int_a^b f(a+b-x)dx$**
- 31) $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \frac{\sin x}{2+\cos x} dx = \dots\dots\dots$
(a) 0 (b) 2 (c) $\log 2$ (d) $\log 4$
- 32) The value of $\int_0^{\frac{\pi}{3}} \tan x dx$ _____
 (a) $-\log 2$ **(b) $\log 2$** (c) $-\log 3$ (d) $\log 3$
- 33) $\int_0^{\frac{\pi}{2}} \frac{\sin x - \cos x}{1 + \sin x \cos x} dx = \dots\dots\dots$
 (a) $\frac{\pi}{2}$ **(b) 0** (c) $\frac{\pi}{4}$ (d) π
- 34) The volume when $y = \sqrt{3+x^2}$ from $x = 0$ to $x = 4$ is rotated about x-axis is _____
 (a) 100π (b) $\frac{100\pi}{9}$ **(c) $\frac{100\pi}{3}$** (d) $\frac{100}{3}$
- 35) $\int_{-1}^1 \log\left(\frac{3-x}{3+x}\right) dx = \dots\dots\dots$
 (a) 3 (b) $\frac{3}{2}$ **(c) 0** (d) 6
- 36) $\int_{-\pi/2}^0 \sin^7 x dx = \dots\dots\dots$
 (a) $\frac{\pi}{2}$ **(b) $\int_{-\pi/2}^0 \cos^7 x dx =$** (c) 0 (d) 1
- 37) The volume of the solid obtained by revolving $\frac{x^2}{9} + \frac{y^2}{16} = 1$ about the minor axis is _____
 (a) 48π **(b) 64π** (c) 32π (d) 128π
- 38) The volume, when the curve $y = \sqrt{3+x^2}$ from $x = 0$ to $x = 4$ is rotated about x axis is _____
(a) 100π (b) $\frac{100}{9}\pi$ (c) $\frac{100}{3}\pi$ (d) $\frac{100}{3}$
- 39) The volume, when the region bounded by $y = x$, $y = 1$, $x = 0$ is rotated about y axis _____
 (a) $\frac{\pi}{2}$ (b) $\frac{\pi}{6}$ **(c) $\frac{\pi}{3}$** (d) π
- 40) The value of $\int_0^{\pi} \frac{dx}{1+6^{\tan x}}$ _____
(a) $\frac{\pi}{2}$ (b) π (c) $\frac{3\pi}{2}$ (d) 2π
- 41) The value of $\int_{-3}^3 \left[\sin^{-1}\left(\frac{x^2+1}{2}\right) + \sec^{-1}\left(\frac{2}{x^2+1}\right) \right] dx$ _____
 (a) π (b) 2π **(c) 3π** (d) 4π
- 42) The value of $\int_0^1 x^5(1-x)^5 dx$ _____
(a) $\frac{1}{2772}$ (b) $\frac{15}{126}$ (c) $\frac{5}{126}$ (d) $\frac{25}{625}$
- 43) The value of $\int_0^2 (\sqrt{4-x^2})^3 dx$ is _____
 (a) $\frac{\pi}{2}$ **(b) 3π** (c) $\frac{3\pi}{2}$ (d) 6π
- 44) The value of $\int_0^{\pi} (\sin x + \cos x) dx$ _____
 (a) 1 **(b) 2** (c) 0 (d) 4
- 45) The value of $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \frac{\sin x}{2+\cos x} dx$ _____
(a) 0 (b) 2 (c) $\log 2$ (d) $\log 4$
- 46) The differential equation of all circles with centre at the origin is _____
(a) $xdy + ydx = 0$ (b) $xdy - ydx = 0$ (c) $xdxy + ydy = 0$ (d) $xdx - ydy = 0$

- 47) The area bounded by the parabola $y^2 = x$ and its latus rectum is _____
- (a) $\frac{4}{3}$ **(b) $\frac{1}{6}$** (c) $\frac{2}{3}$ (d) $\frac{8}{3}$
- 48) The area bounded by the line $y = x$, x axis $x = 1$ and $x = 2$ is _____
- (a) $\frac{3}{2}$** (b) $\frac{5}{2}$ (c) $\frac{1}{2}$ (d) $\frac{7}{2}$
- 49) The ratio of the volumes generated by revolving the ellipse $\frac{x^2}{9} + \frac{y^2}{4} = 1$ about major and minor axes is _____
- (a) 4 : 9 (b) 9 : 4 **(c) 2 : 3** (d) 3 : 2
- 50) The value of $\int_0^{\infty} e^{-x} x^n dx$ is
- (a) a) 2**