

## Questions for Module # 5

Q.1 Evaluate  $\int 12t^7 - t^2 - t + 3 dt$ . [Solution](#)

Q.2 Evaluate  $\int \frac{x^4 - \sqrt[3]{x}}{6\sqrt{x}} dx$ . [Solution](#)

Q.3 Evaluate  $\int t^3 - \frac{e^{-t} - 4}{e^{-t}} dt$ . [Solution](#)

Q.4 Evaluate  $\int \sin^3\left(\frac{2}{3}x\right) \cos^4\left(\frac{2}{3}x\right) dx$ . [Solution](#)

Q.5 Evaluate  $\int \cos^4(2t) dt$ . [Solution](#)

Q.6 Use a trig substitution to eliminate the root in  $\sqrt{4 - 9z^2}$ . [Solution](#)

Q.7 Determine the value of  $\int_6^{11} 6g(x) - 10f(x) dx$  given that  $\int_6^{11} f(x) dx = -7$  and

$$\int_6^{11} g(x) dx = 24.$$

Q.8 For  $\int_1^4 3x - 2 dx$  sketch the graph of the integrand and use the area interpretation of the definite integral to determine the value of the integral. [Solution](#)

Q.9 Differentiate the following integral with respect to  $x$ . [Solution](#)

$$\int_7^{\sin(6x)} \sqrt{t^2 + 4} dt$$

Q.10 Evaluate the following integral, if possible. If it is not possible clearly explain why it is not possible to evaluate the integral. [Solution](#)

$$\int_2^1 \frac{2y^3 - 6y^2}{y^2} dy$$

Q.11 Evaluate the following integral, if possible. If it is not possible clearly explain why it is not possible to evaluate the integral. [Solution](#)

$$\int_{-5}^{-2} 7e^y + \frac{2}{y} dy$$

Q.12 Evaluate the following integral, if possible. If it is not possible clearly explain why it is not possible to evaluate the integral. [Solution](#)

$$\int_{-1}^0 |4w + 3| dw$$

Q.13 Evaluate the following integral, if possible. If it is not possible clearly explain why it is not possible to evaluate the integral. [Solution](#)

$$\int_{-2}^0 t\sqrt{3+t^2} + \frac{3}{(6t-1)^2} dt$$

Q.14 Determine the area to the left of  $g(y) = 3 - y^2$  and to the right of  $x = -1$ . [Solution](#)

Q.15 Determine the area of the region bounded by  $y = x^2 + 2$ ,  $y = \sin(x)$ ,  $x = -1$  and  $x = 2$ . [Solution](#)

Q.16 Determine the area of the region bounded by  $y = x\sqrt{x^2 + 1}$ ,  $y = e^{-\frac{1}{2}x}$ ,  $x = -3$  and the  $y$ -axis. [Solution](#)

Q.17 Evaluate  $\int 4x \cos(2 - 3x) dx$ . [Solution](#)

Q.18 Evaluate  $\int e^{2z} \cos\left(\frac{1}{4}z\right) dz$ . [Solution](#)

Q.19 Evaluate the integral  $\int \frac{4}{x^2 + 5x - 14} dx$ . [Solution](#)

Q.20 Evaluate the integral  $\int_{-1}^0 \frac{w^2 + 7w}{(w + 2)(w - 1)(w - 4)} dw$ . [Solution](#)