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Note:-

1. All Questions are compulsory.
2. Numbers on the right indicate full marks.

Section A

Q.1 Select and write the correct answer.

(4)

1. $\int x^x (1 + \log x) \cdot dx =$

- A) $\frac{1}{2} (1 + \log x)^2 + c$ B) $x^{2x} + c$
C) $x^x \log x + c$ D) $x^x + c$

2. If $\int \tan^3 x \cdot \sec^3 x \cdot dx = \left(\frac{1}{m}\right) \sec^m x - \left(\frac{1}{n}\right) \sec^n x + c$, then $(m, n) =$

- A) (5, 3) B) (3, 5)
C) $\left(\frac{1}{5}, \frac{1}{3}\right)$ D) (4, 4)

Q.2 Answer the following.

(3)

1. Evaluate $\int \sqrt{1 + \sin 2x} \cdot dx$

2. Evaluate $\int \sqrt{1 - \cos 2x} \cdot dx$

3. Integrate $(2 + \cot x - \operatorname{cosec}^2 x) \cdot e^x$ w. r. t. x

Section B
Attempt any Four

Q.3 Evaluate $\int \frac{\sin 4}{\cos 2x} \cdot dx$

(2)

Q.4 Integrate $x^9 \cdot \sec^2(x^{10})$ w. r. t. x

(2)

Q.5 Evaluate $\int \frac{3}{\sqrt{7x-2} - \sqrt{7x-5}} \cdot dx$

(2)

Q.6 Integrate $\log(\log x) + (\log x)^{-2}$

(2)

Q.7 Integrate $(6x + 5)^{\frac{3}{2}}$ with respect to the respective variable.

(2)

Q.8 Integrate $e^{3 \log x} \cdot (x^4 + 1)^{-1}$ w. r. t. x

(2)

Section C
Attempt any Two

Q.9 Integrate $\int \frac{1}{3 - 2 \cos 2x} \cdot dx$ w. r. t. x (3)

Q.10 Integrate $x^5 \cdot \sqrt{a^3 + x^3}$ w. r. t. x (3)

Q.11 Integrate $e^{2x} \cdot \sin 3x$ w. r. t. x (3)

Section D
Attempt any One

Q.12 Evaluate $\int \frac{\sin x}{\sin 3x} \cdot dx$ (4)

Q.13 Evaluate $\int \frac{3 \cos x}{4 \sin^2 x + 4 \sin x - 1} \cdot dx$ (4)