



12th Science- 2020 : Maths
Definite Integration

DATE:

TIME: 1 Hours

MARKS: 25

SEAT NO:

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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. $\int_1^2 \frac{1}{x} dx =$

- A) $\sqrt{e} + 1$ B) $\sqrt{e} - 1$
C) $\sqrt{e} - (\sqrt{e} - 1)$ D) $\frac{\sqrt{e} - 1}{e}$

2. $\int_4^9 \frac{1}{\sqrt{x}} dx =$ _____

- A) 2 B) $\frac{1}{2}$
C) -2 D) $\frac{-1}{2}$

Q.2 Answer the following.

(3)

1. Evaluate $\int_{-a}^a \frac{x + x^3}{16 - x^2} \cdot dx$

2. Evaluate $\int_0^{\pi/4} \cot^2 \cdot dx$

3. Evaluate $\int_0^1 \left(\frac{1}{1 + x^2} \right) \sin^{-1} \left(\frac{2x}{1 + x^2} \right) \cdot dx$

Section B
Attempt any Four

Q.3 Evaluate $\int_0^{\pi} x \cdot \sin x \cdot \cos^4 x \cdot dx$

(2)

Q.4 Evaluate $\int_0^3 x^2(3 - x)^{\frac{5}{2}} \cdot dx$

(2)

Q.5 Evaluate $\int_0^4 \left[\sqrt{x^2 + 2x + 3} \right]^{-1} \cdot dx$ (2)

Q.6 Evaluate $\int_0^{\infty} x \cdot e^{-x} \cdot dx$ (2)

Q.7 Evaluate $\int_0^{\pi/2} x \cdot \sin x \cdot dx$ (2)

Q.8 Evaluate $\int_{-4}^2 \frac{1}{x^2 + 4x + 13} \cdot dx$ (2)

Section C
Attempt any Two

Q.9 Evaluate $\int_{-1}^1 \frac{1}{a^2 e^x + b^2 e^{-x}} \cdot dx$ (3)

Q.10 Evaluate $\int_0^{\pi/4} \frac{\cos 2x}{1 + \cos 2x + \sin 2x} \cdot dx$ (3)

Q.11 Evaluate $\int_0^{\pi/2} \frac{\sin x - \cos x}{1 + \sin x \cdot \cos x} \cdot dx$ (3)

Section D
Attempt any One

Q.12 Evaluate $\int_0^{\pi/2} \frac{1}{6 - \cos x} \cdot dx$ (4)

Q.13 Evaluate $\int_0^a \frac{1}{a^2 + ax - x^2} \cdot dx$ (4)