2023 III 23 1200 Seat No. | | | | | |

Time : 1 Hour **SECOND-TERM** **MATHEMATICS (Vocational)**

Subject Code

V	4	3	1	1

Total No. of Questions : 11 **(Printed Pages : 2)** **Maximum Marks : 20**

INSTRUCTIONS : (*i*) The paper consists of 11 questions divided in 3 Sections A, B and C numbered from 1 to 11.

(*ii*) Section A has 4 questions of **1** mark each.

(*iii*) Section B has 5 questions of **2** marks each.

(*iv*) Section C has 3 questions of **3** marks each.

(*v*) In Section C, there is a choice for question No. **11**.

(*vi*) Use only Blue pen for answering on the answer book.

SECTION – A

1. Find the derivative of $3\log x + 2\sqrt{x}$ with respect to x.

2. Evaluate :

$$\int (\sec x \tan x + 5e^x)\, dx.$$

3. Evaluate :

$$\int \left(\frac{4x^2 + x + 2}{x^2}\right) dx.$$

4. If

$$\int_0^2 (2x + \mathrm{K})\, dx = 8,$$

find the value of K.

SECTION - B

5. Differentiate $\sin(x.3^x)$ with respect to x.

6. Evaluate :

$$\int \frac{4}{\sqrt{x+4}-\sqrt{4}}\,dx.$$

7. Evaluate :

$$\int \frac{e^x}{1+5e^x}\,dx.$$

8. Evaluate :

$$\int_1^4 (x+1)\,dx$$

using Trapezoidal rule with $x=3$.

9. Evaluate :

$$\int_0^4 5x\,dx$$

using Simpson's rule, with $n = 4$.

SECTION - C

10. Using Lagrange's Interpolation formula, find $f(2)$, given that $f(0) = 3$, $f(1) = 4$ and $f(3) = 6$.

11. Differentiate $y=(\sin x)^{\tan x}$ with respect to x.

Or

Differentiate $(3x+1)^2 \sin 3x$ with respect to x.