Nagar Yuwak Shikshan Sannstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)
Hingna Road, Wanadongri, Nagpur.

ODD Term—2021-22	**Mid Semester Exam - II**
Semester I	**Date:- 5/4/2022**
Subject Code CSD2101/AIML2101/AIDS2101	**Subject : Calculus, Sequence and series**
Time :1½ Hours	**Max. Marks: 30**

Note:-

- Each Question is Compulsory.
- NON programmable calculators are only allowed.
- Assume suitable data wherever it is necessary.

Q.1 (A)	Show that $\int_0^{\frac{\pi}{2}} \sqrt{\tan\theta}\, d\theta = \frac{\pi}{\sqrt{2}}$	[5]	CO-3	L3
Q.1 (B)	Trace the curve $y^2 = x^2(1 - x^2)$	[5]	CO-3	L3
Q.2 (A)	Evaluate by changing the order of integration $\int_0^4 \int_y^4 \frac{x}{x^2 + y^2} dxdy$	[5]	CO-3	L3
Q.2 (B)	Evaluate $\int_{-1}^{1} \int_0^z \int_{x-z}^{x+z} (x + y + z) dydxdz$	[5]	CO-3	L3

Q.3 (A)	Solve $\frac{d^2y}{dx^2}+5\frac{dy}{dx}+6y=e^{-2x}+\sin x$	[5]	CO-4	L3
Q.3 (B)	The radial displacement u in a rotating disc at a distance r from the axis is given by $r^2\frac{d^2u}{dr^2}+r\frac{du}{dr}-u+Kr^3=0$, where K is a constant. Solve the equation under the condition u = 0 when r = 0, u = 0 when r = a.	[5]	CO-4	L3