

RAMRAO ADIK INSTITUTE OF TECHNOLOGY, NERUL.

Term Test-I

Sub:AM-II

F. E. (SEM-II)

Time:1 Hr

Div:All

Marks:30

Note: All questions are compulsory.

Q.1 a) Evaluate, $\int_0^1 (x \log x)^4 dx$. [5]

b) Evaluate, $\int_0^{\frac{\pi}{2}} \frac{d\theta}{\sqrt{\sin\theta}} \cdot \int_0^{\frac{\pi}{2}} \sqrt{\sin\theta} d\theta$. [5]

OR

Q.1 a) Prove that, $\Gamma \frac{1}{2} = \sqrt{\pi}$ [5]

b) Show that $\int_0^{\infty} \frac{\tan^{-1}(ax)}{x(1+x^2)} dx = \frac{\pi}{2} \log(1+a)$ [5]

Q.2 Solve, $(2xy^4e^y + 2xy^3 + y)dx + (x^2y^4e^y - x^2y^2 - 3x)dy = 0$. [10]

OR

Q.2 Determine the value of y for i) $x=0.05$ ii) $x=0.01$ given that $y(0)=1$ and $\frac{dy}{dx} = x^2 + 1$,

By Euler's modified method [10]

Q.3 Solve; $\frac{d^3y}{dx^3} - 4 \frac{dy}{dx} = 2 \cosh^2 2x$. [10]

OR

Q.3 Solve, $(D^4 - a^4)y = \cos ax$. [10]

Qijayam