FACULTY OF ENGINEERING, UNIVERSITY OF LUCKNOW
Mid-Term Examination - II
B.TECH. SEMESTER - II, 2019-20
Branches: CS, CE, EE, EC, ME

Student's Roll No.

……

Subject Code: AS - 203 **Subject Title: Engineering Mathematics-II**
Time: 1 Hrs. **Full Marks: 20**

Instructions: ***Attempt all sections.***

SECTION A

1. ***Attempt all of the following parts.*** **(1X5 = 5)**

a) Write the statement of Convolution theorem for Inverse Laplace transformation.

b) Evaluate $\int_0^\infty e^{-2t}\delta(t-3)dt = ??$.

c) Find $L\left\{e^{3t}(\sin 2t)\right\} = ??$.

d) Write the expression of Fourier Series for arbitrary interval.

e) Write the value of Fourier coefficient a_0, a_n *and* b_n for even and odd function $f(x)$ defined in the interval $-\pi \le x \le \pi$.

SECTION B

Answer any THREE parts from the following. **(5X3 = 15)**

2. Solve by Laplace transform $\frac{d^2x}{dt^2} + 9x = \cos 2t,\ if\ \ x(0) = 1,\ x'(0) = 3.$

3. Apply convolution theorem to evaluate $L^{-1}\left\{\frac{1}{p(p^2+4)}\right\}$.

4. Evaluate $L\left\{\frac{e^{-at} - e^{-bt}}{t}\right\}$.

5. Obtain Fourier series for function $f(x) = x^2, -\pi \le x \le \pi$. **Hence show that** $\frac{\pi^2}{12} = \frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2}$ .....

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