SOUTHEAST UNIVERSITY

Department of CSE (Diploma)

Spring Final Examination

Time: 2.20 minutes Marks: 40

Course code: MATH-241.3

Course tittle: Complex Variables and Transforms (Laplace and Fourier)

Instructions:

1. Answer each question properly.
2. After 2 hours, you are suggested to upload your pdf file within next 30 minutes. In case of late submission, may be the reason of deduction of your marks.

Q1. Define Laplace transform and inverse Laplace transform. Using formula obtain the following results

i) $\mathcal{L}\{-5e^{-2t} + cos5t + 1\}$

ii) $\mathcal{L}\{5t^{61} - sin5t + 4t - 71\}$

Q2. Using definition, show that

$$i)\ \mathcal{L}\{sinat\} = \frac{a}{s^2+a^2} \qquad ii)\ \mathcal{L}\{t\} = \frac{1}{s}$$

Q3. Solve the following differential equations $Y'' + Y = t,\ Y(0) = 1,\ Y'(0) = 2.$

Also state convolution theorem with an example.

Q4. Define Fourier series with Dirichlet's conditions at the point of continuity. What will be happened at the point of discontinuity? Also define half range Fourier sine and cosine series.