Code No: R10202 **R10** **SET-1**

I B. Tech II Semester Supplementary Examinations, April/May - 2019
MATHEMATICS-II
(Com. to All Branches)

Time: 3 hours Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
~~~~~~~~~~~~~~~~~~~~~~~~~~~

1. a) Find the $L\left\{\int_0^t e^{-2t}\sqrt{t}\,dt\right\}$ (8M)
   b) Find $L\{f'(t)\}$ of the function $f(t)=\begin{cases}3, & 0\le t<2\\ 0, & t\ge 2\end{cases}$ (7M)

2. a) Find $L^{-1}\left\{\frac{s+2}{s^2(s+3)}\right\}$ (8M)
   b) Find $L^{-1}\left\{log\left(\frac{s+1}{s-1}\right)\right\}$ (7M)

3. a) Find the Fourier series of f(x) = cosx in (-π, π). (8M)
   b) Find the Half range cosine series of $f(x) = x^2$ in [0,2]. (7M)

4. a) Find the Fourier cosine transform of $\frac{1}{1+x^2}$ (8M)
   b) Find the Fourier transform of $f(x)=\begin{cases}x & if\ 0<x<1\\ 1-x & if\ 1<x<2\end{cases}$ (7M)

5. a) Prove that $\Gamma(n)\Gamma(1-n)=\frac{\pi}{\sin n\pi}$ (8M)
   b) Evaluate $\int_0^1 x^4\left(\log\frac{1}{x}\right)^4 dx$ (7M)

6. a) Form the PDE from z = f(2x+3y)+g(3x-y) by eliminating arbitrary functions. (8M)
   b) Solve the PDE p cosecx + q cosecy = cosecz. (7M)

7. A bar of length l with insulated sides is initially 0^0c temperature throughout the end x = 0 is kept at 0^0c for all time and heat is suddenly applied such that $\frac{\partial u}{\partial x}=10$ at x= l for all time. Find the temperature function u(x, t). (15M)

8. a) Solve the difference equations $u_{n+1}+\frac{1}{4}u_n=\left(\frac{1}{4}\right)^n, n\ge 0\ u(0)=0, u_1=1$ using Z-transform method. (8M)
   b) Find $Z[\sin(3n+5)]$ (7M)

www.manaresults.co.in
~~~~~~~~~~~~~~~~~~~~~~~~~~~