**Subject Code: R10202/R10** **Set No - 1**

**I B.Tech II Semester Supplementary Examinations May - 2016**

# MATHEMATICS-II

**(Common to All Branches)**

**Time: 3 hours** **Max. Marks: 75**

**Answer any FIVE Questions**
**All Questions carry equal marks**

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1. (a) Evaluate $L\left(t^2u(t-2)\right)$
   (b) Find The Laplace transform of sinht/t

[8+7]

2. (a) Find inverse Laplace transform of $\frac{1+e^{-\pi s}}{s^2+1}$
   (b) Solve the equation $y^{111}+2y^{11}-y^{1}-2y=0$, $y(0)=y^{1}(0)=y^{11}(0)=6$ using Laplace transform method.

[7+8]

3. (a) Find the Half range cosine series of $f(x)=e^x$ in $[0,\pi]$
   (b) Expand f(x) = xsinx (-1, 1) as a Fourier series

[7+8]

4. (a) Find the Fourier sine transform of $f(x)=\frac{1}{x(x^2+a^2)}$
   (b) Find the Fourier transforms $f(x)=e^{-a|x|}(a>0)$ and hence deduces that $\frac{\pi}{2a}e^{-a|x|}=\int_0^\infty \frac{\cos sx}{s^2+a^2}ds$

[7+8]

5. (a) Solve the PDE $\left(\frac{y-z}{yz}\right)p+\left(\frac{z-x}{xz}\right)q=\left(\frac{x-y}{xy}\right)$
   (b) Solve the PDE $z^2(x^2p^2+q^2)=1$

[7+8]

6. (a) Solve by method of separation of variables $2x\frac{\partial z}{\partial x}-3y\frac{\partial z}{\partial y}=0$
   (b) Solve the one dimensional wave equation.

[5+10]

7. (a) Find Z transform of (i) coshat (ii) sinhat
   (b) Find $Z^{-1}\left[\frac{z^3-20z}{(z-2)^3(z-4)}\right]$

[8+7]

8. (a) Prove that $\Gamma(n)\Gamma(1-n)=\frac{\pi}{\sin n\pi}$
   (b) Evaluate $\int_0^\infty \sqrt{x}e^{-x^2}dx$ [7+8]



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