Code No: 152AA **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year II Semester Examinations, November/December - 2020
MATHEMATICS-II
(Common to CSE, IT, ITE)

Time: 2 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks

1.a) Solve the D.E $xp^2+2yp+x=0$ for p.

b) The temperature of the hot body reduces from 120^0C to 80^0C in 12 minutes. Find when the temperature will be reduced to 40^0C if the temperature of the surrounding air is 30^0C. [7+8]

2.a) Solve the differential equation $\frac{dy}{dx}-\frac{y}{x}=x^3$.

b) The number of bacterial in a culture doubled in 2 hrs. When it will be tripled? [7+8]

3.a) Solve the D.E $(D^2-3D+2)y=2\cos(2x+3)+2e^x$

b) Solve the D.E $(x+2)^2y''-(x+2)y'+y=3x+4$. [7+8]

4.a) Solve the D.E $(D^2+4)y=\cos^2 x+x^4$

b) Solve the D.E $x^2y''+3xy'+5y=x\cos(\log x)$ [7+8]

5. Evaluate $\int_0^a \int_{a-x}^{\sqrt{a^2-x^2}} y\,dx\,dy$ by change of order of integration. [15]

6.a) Evaluate $\int_{y=0}^{1} \int_{x=y}^{a} \frac{x}{x^2+y^2}\,dx\,dy$ by changing into polar co-ordinates.

b) Evaluate $\int_0^{\pi/2} \int_0^{a\sin\theta} \int_0^{(a^2-r^2)/a} r\,dr\,d\theta\,dz$ [7+8]

7. Find the constants 'a' and 'b' such that the surfaces $5x^2-2yz-9x=0$ and $ax^2y+bz^3=4$ cuts orthogonally at (1,-1, 2). [15]

8. Verify stoke's theorem to evaluate $\oint_c (y\,dx+z\,dy+x\,dz)$ where c is the curve of intersection of the sphere $x^2+y^2+z^2=a^2$ and $x+z=a$. [15]

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