

Day and Date: Tuesday, 18/01/2022
Time: 11.00am to 12.30 pm

Seat No :

Max. Marks- 50

Instructions:

1. Question No.1 is compulsory.
2. Figure to the right indicate **full marks**.
3. Use of **non-programmable** calculator is allowed.

BT	CO's	Q. No.		Marks														
		Q.1	Attempt the following	20														
L3	201.1	a	Solve $(D^2 + 3D + 2)y = e^{2x} \sin x$	6														
L3	201.2	b	If $\vec{f} = 3x^2i + 5xyj + xyz^3k$ then Find 1) Divergence of \vec{f} at (1,2,3) 2) Curl of \vec{f} at (1,2,3)	7														
L3	201.3	c	Find both equations of line of regression of x on y and y on x from the following data. Also find r. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>x</td> <td>2</td> <td>4</td> <td>6</td> <td>8</td> <td>12</td> <td>14</td> </tr> <tr> <td>y</td> <td>4</td> <td>2</td> <td>5</td> <td>10</td> <td>11</td> <td>12</td> </tr> </table>	x	2	4	6	8	12	14	y	4	2	5	10	11	12	7
x	2	4	6	8	12	14												
y	4	2	5	10	11	12												
		Q.2	Attempt the following	15														
L3	201.6	a	Find Fourier series expansion of the function $f(x) = x $, $\pi \leq x \leq \pi$	7														
	OR		OR															
	201.4		From a box containing 100 transistors 20 of which are defective, 10 are selected at random. Find the probability that (i) all are defective (ii) all are non-defective (iii) at least two are defective.															
	201.5	b	Find (1) $L\left\{\frac{1-\cos 2t}{t}\right\}$ (2) $L^{-1}\left\{\frac{s}{(s^2+5s+6)}\right\}$ by Partial fractions.	8														
		Q.3	Attempt the following.	15														
	201.4	a	The income distribution of a group of 10000 persons was found to be normal with mean Rs.7500 & Standard deviation Rs. 500.What is the number of persons of this group who have income (i) Exceeding Rs.6680 (ii) Exceeding Rs.8320 (Given area under the normal curve between ordinates ± 1.64 is 0.8990)	7														

201.5 OR 201.6	b	Find (1) $L\{te^{3t} \sin 2t\}$ (2) $L^{-1}\left\{\frac{s}{(s^2+4)(s^2+9)}\right\}$ by Convolution theorem. OR Find Fourier series expansion of the function $f(x) = e^{-x}$ in $(0, 2\pi)$.	8
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