	DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE			
	Supplementary Examination – Summer 2022			
	Course: B. Tech.Branch:Semester: III			
	Subject Code & Name: BTBS301(Engineering Mathematics III)			
	Max Marks: 60Date:Duration: 3 Hr			
	 Instructions to the Students: All the questions are compulsory. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in () in front of the question. Use of non-programmable scientific calculators is allowed. Assume suitable data wherever necessary and mention it clearly. 			
		(Level/CO)	Marks	
Q. 1	Solve Any Two of the following.			
A)	Find the Laplace Transform of $e^{4t}sin^3t$	CO1	6	
B)	Evaluate $\int_0^\infty \frac{\cos at - \cos bt}{t} dt$ by using Laplace transform.	CO1	6	
C)	Express in terms of Heaviside unit step function and find its Laplace transform. $f(t) = sint, \text{ for, } 0 < t < \pi$ $= sin2t, \text{ for, } \pi < t < 2\pi$ $= sin3t, \text{ for, } t > 2\pi$	CO1	6	
Q.2	Solve Any Two of the following.			
A)	Find the inverse Laplace transform of $log(\frac{s+a}{s+b})$	CO2	6	
B)	Find the inverse Laplace transform of $\frac{5s^2 - 15s - 11}{(s+1)((s-2^2))}$	CO2	6	
C)	Solve using Laplace transform	CO2	6	
	$3\frac{dy}{dt} + 2y = e^{3t}, y = 1 at t = 0.$			
0.2	Solve Any Two of the following			
Q. 3	Solve Any 1 wo of the following. Find the Equation Transform of $f(u) = 1$ for $ u < 1$			
A)	Hence evaluate that $\int_0^\infty \frac{\sin x}{x} dx$.	CO3	6	
B)	Find the Fourier cosine transform of e^{-x^2}	CO3	6	
C)	Using Parseval's Identity, prove that $\int_0^\infty \frac{t^2}{(t^2+1)^2} dt = \frac{\pi}{4}$	CO3	6	
Q.4	Solve Any Two of the following.			

A)	Form the partial differential equation by eliminating the arbitrary function	CO4	6
	from: $f(x + y + z, x^2 + y^2 + z^2)$		
B)	Solve the partial differential equation: $(mz - ny)p + (nx - lz)q = ly - ly$	CO4	6
	mx.		
C)	If the initial displacement and velocity of a string stretched between		
	$x = 0 \& x = l$ are given by $y = f(x) \& \frac{dy}{dt} = g(x)$, determine the	CO4	6
	displacement y of any point at a distance x from one end at time t.		
Q. 5	Solve Any Two of the following.		
A)	If $f(z) = u + iv$ is an analytic function and $u - v = e^{x}(cosy - siny)$, find	CO5	6
	f(z) in terms of z .		
B)	Find the bilinear transformation that maps the points $z=0, -1, i$ into the	CO5	6
	points $w=i,0, \infty$ respectively.		
C)	Use Cauchy's Integral formula to evaluate $\oint_c \frac{e^{2z}}{(z+1)^4} dz$, Where C is the	205	-
	circle $ z = 2$	CO5	6
	*** End ***		

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