

SE(IT)(SEM-III)  
COURSE CODE:ITC301

XAVIER INSTITUTE OF ENGINEERING  
TERM TEST-I

AUG,2018 MM-20  
COURSE NAME: APPLIED MATHEMATICS-III

Note: Attempt any one subpart for every question.

CO1 Q.1 Find the Laplace transform of  
i)  $\int_0^t \frac{\sin u}{ue^u} du$

ii)  $(1 + e^{-t})^3$

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CO1 Q.2 i) If  $\mathcal{L}(J_0(t)) = \frac{1}{\sqrt{1+s^2}}$ , find  $\mathcal{L}(te^{-3t}J_0(4t))$

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ii) Evaluate  $\int_0^\infty \frac{\cos 6t - \cos 4t}{t} dt$

P.T.O

CO2 Q.3 Find the inverse Laplace transform of

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i)  $\frac{s^2+s}{(s^2+1)(s^2+2s+2)}$

ii)  $\tan^{-1}\left(\frac{2}{s^2}\right)$

CO3 Q.4 i) Find the analytic function  $f(z) = u + iv$  if  $v = \frac{x}{x^2+y^2} + \cosh x \cos y$

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ii) Find the orthogonal trajectories of the curves given by  $x^3y - xy^3 = c$

CO3 Q.5 Find the bilinear transformation which maps

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i)  $z=1, i, -1$  onto  $w=i, 0, -1$

ii)  $z=1, i, -1$  onto  $w=0, 1, \infty$