Reg. No.



## THIRD SEMESTER B. TECH. (INSTRUMENTATION AND CONTROL ENGG.) END SEMESTER DEGREE EXAMINATIONS, DECEMBER - 2018 SUBJECT: ELECTRICAL CIRCUIT ANALYSIS [ICE 2101]

|    | TIME: 3 HOURSMAX. MARKS: 50  |    |
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|    | <ul> <li>Instructions to candidates</li> <li>Answer ALL questions.</li> <li>Missing data may be suitably assumed.</li> </ul> |    |
| 1A | Determine the mesh currents for the circuit shown in Fig. Q1A.   | 4M |
| 1B | Using Superposition Theorem, determine the value of $v_x$ in the circuit shown in Fig. Q1B                                   | 3M |
| 1C | For the circuit shown in Fig. Q1C, find the power dissipated in $10\Omega$ using Thevenin's theorem                          | 3M |
| 2A | Find complementary function, particular solution and the total solution for the current shown in Fig. Q2A                    | 4M |
| 2B | Determine $v(0+)$ , $\frac{dv(0+)}{dt}$ and $\frac{d^2v(0+)}{dt^2}$ for the circuit shown in Fig. Q2B                        | 3M |
| 2C | For the circuit shown in Fig. Q2C, determine the value for resonance frequency.  | 3M |
| 3A | For the RC circuit given in Fig. Q3A, find the values of $v_c(t)$ and $v_o(t)$ at (i) $t=0^-$ (ii) $t=0^+$                   | 3M |
| 3B | For the circuit shown in Fig. Q3B, find the expression for $v(t)$ after t=0 <sup>+</sup> .                                   | 2M |
| 3C | Express the waveform shown in Fig. Q3C in terms of basic signals.  | 2M |
| 3D | For the circuit shown in Fig. Q3D, find the expression for $i(t)$ after $t \ge 0^+$ .  | 3M |
| 4A | Use Laplace transform method to find the expressions for $i_1(t)$ and $i_2(t)$ shown in Fig. Q4A                             | 5M |
| 4B | Find the h-parameters of the circuit shown in Fig. Q4B.  | 3M |
| 4C | Obtain impedance parameters in terms of admittance parameters  | 2M |
| 5A | Obtain Z-parameters for the circuit shown in Fig. Q5A  | 5M |
| 5B | Draw the graph for the circuit shown in Fig. Q5B. Also, construct the cut-set matrix and determine the node voltages.        | 5M |

