Jaypee Institute of Information Technology, Noida

Test-1 Examination, 2021-22

B.Tech, 3rd Semester

Course Title: Electrical Science 2 — Maximum Time: 01 Hr

Course Code: 15B11EC211 — Maximum Marks: 20

Note:

1. This is a pen paper examination. Answers have to be written in your own hand writing. No answer has to be given on Google form.
2. On the top of your answer sheet write your Name, Enrollment Number, Course Title and Course Code.
3. The steps to obtain the answers should be written in answer sheet.
4. Answers should be uploaded collectively in sequence at the end of the exam in .pdf format.
5. Each student must keep his camera and mic 'ON' through Google Meet during exam.

1. **[CO1]** For R = 1 Ω, L = 2 H, C = 2 F, the source free parallel RLC circuit will operate under the …….. damped condition. **[1 Mark]**
2. **[CO1]** The RLC circuit shown in Fig.1 has R = 2 Ω, L = 1 H and C =1/2 F. Find the value of $dv(0)/dt$ if initial conditions are as follows: $v(0) = 4$ V and $i(0) = -6$ A. **[1 Mark]**

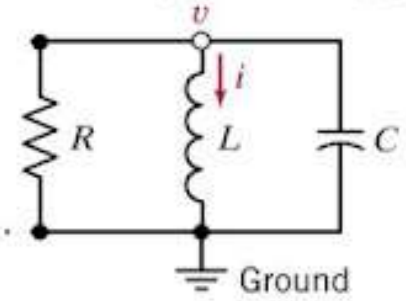

Fig. 1

3. **[CO1]** Find the characteristic equation for voltage $v(t)$ for the source free parallel RLC circuit where R = 2 Ω, L = 4 H and C = 1/4 F. **[1 Mark]**
4. **[CO1]** A switch is connected in between a 10 V battery and a series combination of a fully discharged capacitor and a 1000 Ω resistor. The switch has been in open condition since a long time. What will be the voltage across the capacitor at the time instant when the switch is closed? **[1 Mark]**
5. **[CO2]** What is the condition of reciprocity in Transmission or ABCD-parameters? **[1 Mark]**
6. **[CO2]** What are the independent variables in Y-parameters? **[1 Mark]**
7. **[CO2]** In a two port network if Z_{11} = 7 Ω, Z_{12}= 1 Ω, Z_{21}=1 Ω and Z_{22}=6 Ω. Then, Y_{12} will be equal to…… **[1 Mark]**
8. **[CO2]** If Transmission parameters are $T = \begin{bmatrix} 4 & 3 \\ 1 & 2 \end{bmatrix}$, then equivalent Z parameters will be…… **[1 Marks]**
9. **[CO2]** When port 1 of a two port network is short circuited, $I_1=4I_2$ and $V_2=0.25I_2$. Value of Y_{12} will be……. **[1 Mark]**

10. **[CO2]** When two two-port networks N_a and N_b are connected in cascade manner, then transmission parameters for the overall network will be defined as..... **[1 Mark]**

11. **[CO1]** For the circuit shown in Fig.2 switch has been closed for a long time. At t = 0, the switch is opened. Find i(t) for t > 0. **[2 Marks]**

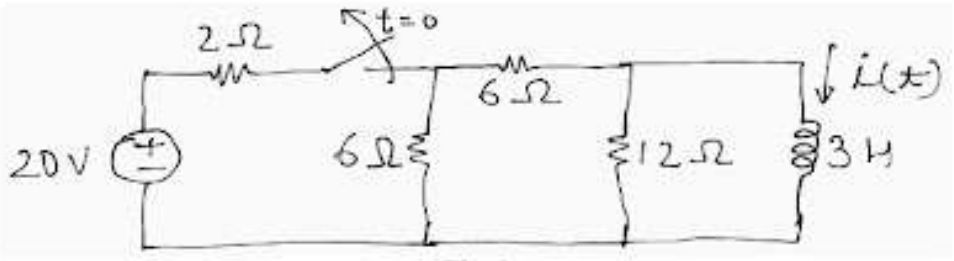

Fig. 2

12. **[CO1]** In the circuit shown in Fig. 3 the source voltage is given by $v_s(t)=5\sin 10tu(t)$ V. Assume $V_o(0-)=0$. Determine the complete response V(t) for t>0. **[3 Marks]**

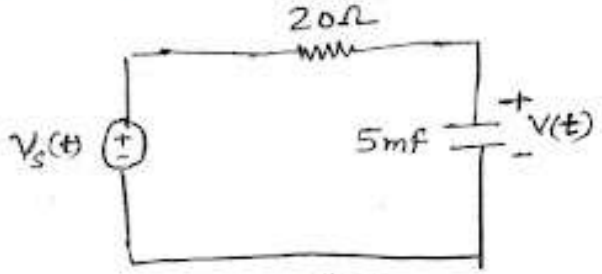

Fig. 3

13. **[CO1]** Find the natural response of $i(t)$ in the circuit shown in Fig. 4 for $t > 0$. Assume steady state at t=0-. Given the following initial conditions: $i(0-) = 1A$ and $v_o(0-) = 0$. **[3 Marks]**

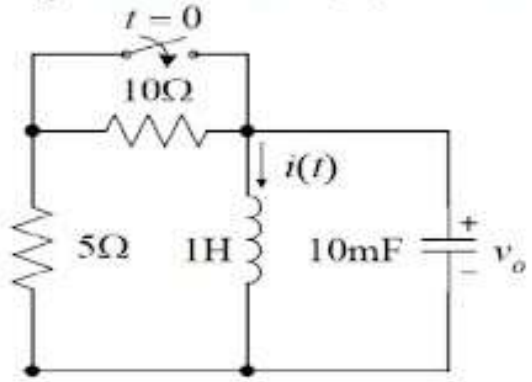

Fig. 4

14. **[CO2]** Determine the h parameters for the circuit shown in Fig. 5. **[2 Marks]**

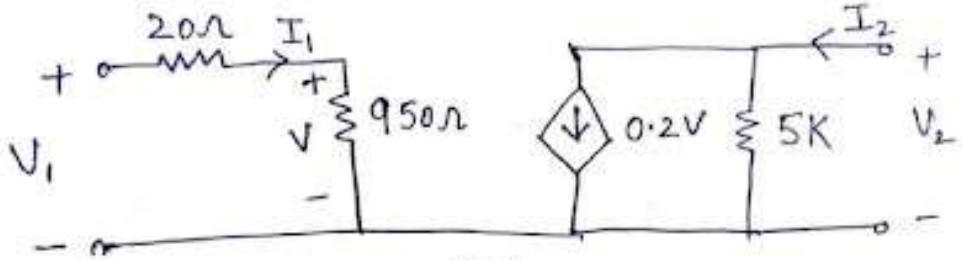

Fig. 5