Reg. No.									

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

III SEMESTER B.TECH (ELECTRICAL & ELECTRONICS ENGINEERING)

GRADE IMPROVEMENT / MAKE UP EXAMINATIONS, JULY 2021

ELECTRICAL CIRCUIT ANALYSIS [ELE 2153]

Time: 2 Hours **Date: 19 July 2021** **Max. Marks: 40**

Instructions to Candidates:

- Answer **any four** full questions.
- Missing data may be suitably assumed.

1A. For the circuit shown in Fig.Q1A, draw the Thevenin`s & Norton's equivalent circuit across R_L. ***(05)***

1B. For the circuit shown in Fig.Q1B, find the current through (3+j4) Ω using Superposition theorem. ***(05)***

2A. A continuous time, aperiodic signal x(t) is shown in Fig.Q2A. Sketch the following:

$(i) x[-\frac{2}{3}t - 1]$ (ii) $x\left(\frac{1}{2}t\right)\partial(t-1)$ ***(05)***

2B. Find the response $y(t) = x(t) * h(t)$

Where $x(t) = 2u(t) - u(t-1) - u(t-2)$ and $h(t) = u(t) - u(t-3)$ ***(05)***

3A. For the network shown in Fig.Q3A, switch is moved from position 1 to 2 at t = 0. Switch is in position 1 for a long time. Determine i(t) for t>0 using time domain analysis. ***(05)***

3B. A parallel RLC circuit with R = 5Ω, L =1mH and C =10μF is excited by a current source of 10 u(t). Find the voltage across the capacitor using time domain analysis. ***(05)***

4A. Find the Laplace Transform of the periodic waveform shown in Fig.Q.4A ***(04)***

4B. For the circuit shown in Fig.Q.4B, find the voltage $v_o(t)$ using Laplace Transform technique. The circuit is under steady state for t<0 and the switch is opened at t=0. ***(06)***

5A. Determine the admittance parameters of the two-port network shown in Fig.Q5A. Hence, compute the values of the parameters at s = j0.5 rad/sec. ***(05)***

5B. Decompose the network shown in Fig.Q.5B into two, 2 port networks connected in cascade and hence find the overall T parameters. ***(05)***

6A. Write the exponential Fourier Series of the waveform shown in Fig.Q6A. Also, plot the magnitude and phase spectra. ***(06)***

6B. Find the Fourier transform of the function $f(t) = t.\, e^{-2t}\, u(t-2)$. ***(04)***

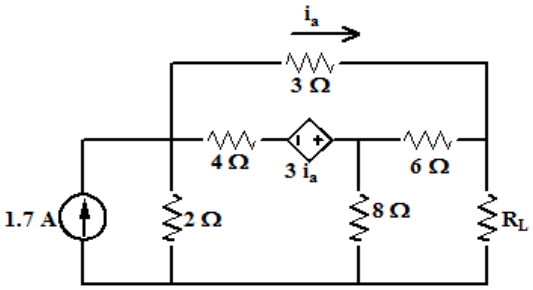

Fig.Q1A

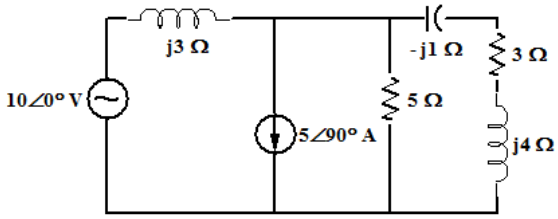

Fig.Q1B

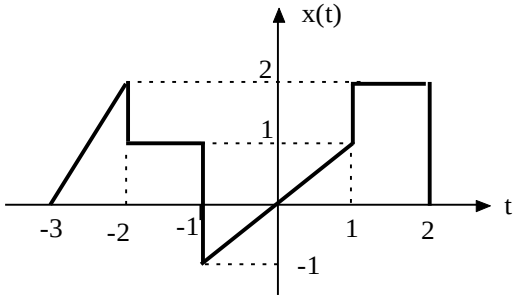

Fig 2A

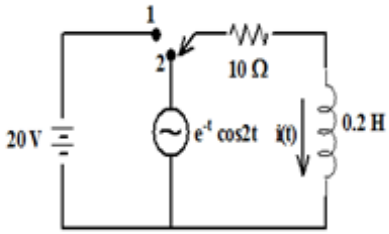

Fig.Q **3A**

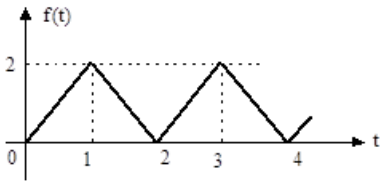

Fig.Q.4A

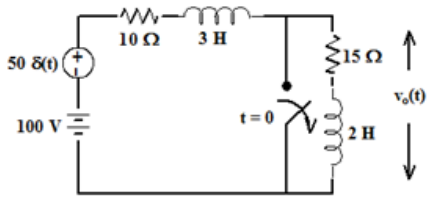

Fig.Q.4B

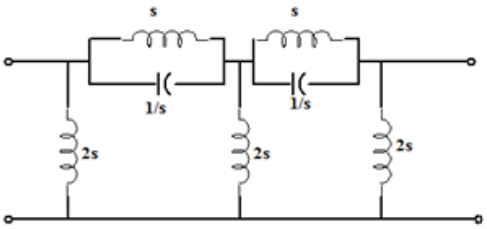

Fig.Q.5A

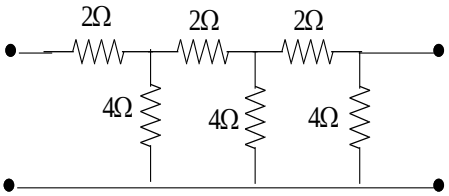

Fig.Q.5B

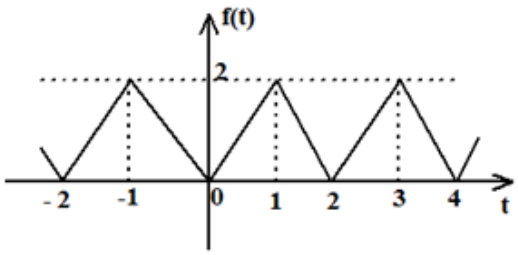

Fig.Q6A