

JK Lakshmipat University Jaipur

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination December 2022-23

1st Year B. Tech. II semester (All)

Roll No.....

Course: ES1113 Fundamental of Automation Engineering II

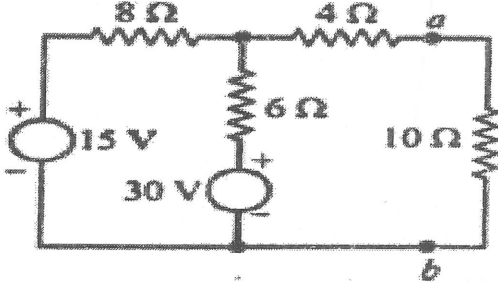
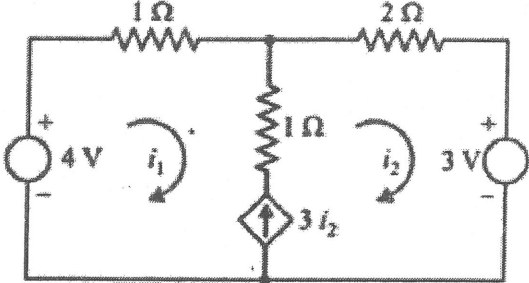
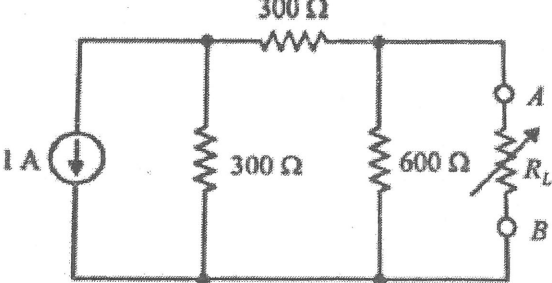
Time: 2:30 Hrs

Max. Marks: 30

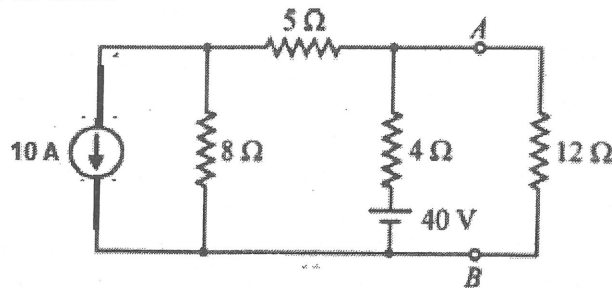
Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics wherever, required are an integral part of the answer.

Answer all questions.

1	Use nodal analysis to find the voltage across $10\ \Omega$ and current through $4\ \Omega$ resistor which is shown in figure. 	(2.5) LO1
2	Find currents i_1 and i_2 in the electric circuit shown in below figure. 	(2.5) LO1
3	Determine the following for the given network: (i) Load resistance R_L for maximum power transfer (ii) Maximum power that can be delivered by the circuit 	(05) LO1 & LO2
4	For the given circuit shown in figure, determine: (a) Thevenin equivalent resistance	(05)

- (b) Thevenin equivalent voltage
(c) Load current in $12\ \Omega$.



LO1
&
LO2

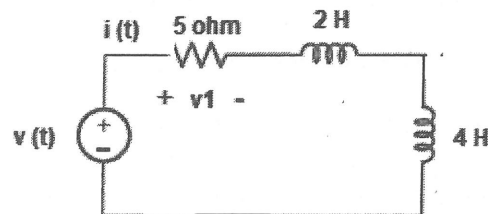
5 Find the Laplace Transformations of the following:

- (i) $f(t) = 3t^4 - 2t^3 + 4e^{-3t} - 2 \sin 5t + 3 \cos 2t$
(ii) $f(t) = e^{-2t}(\cos t + 6 \sin t)$
(iii) $f(t) = 5 u(t-2) + 6 \delta(t-5) + 4 t u(t-1)$

(05)

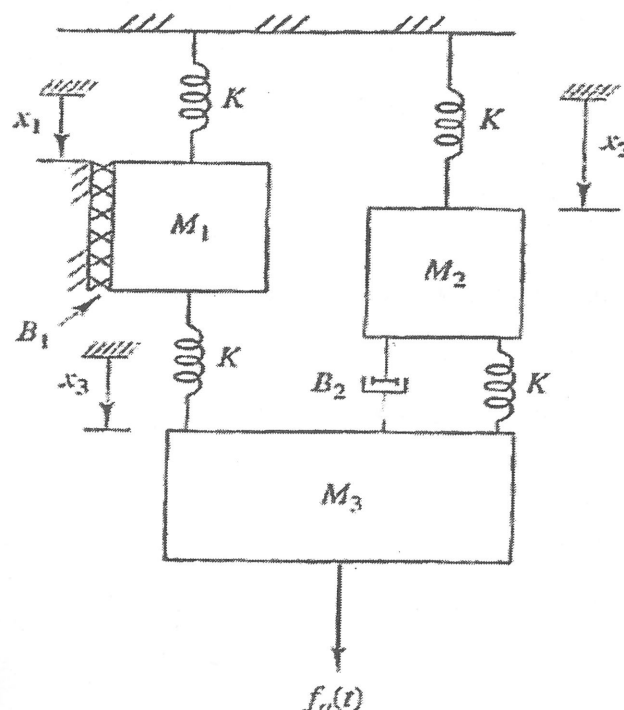
LO3

6 Find the current $I(s)$ and $V1(s)$ in the circuit where the voltage $v(t)$ is given by $e^{-2t} \sin 5t u(t)$,



(05)
LO3
&
LO4

7 Draw the free-body-diagram for each mass and write the differential equations describing the system. Also find transfer function $X_1(s)/F(s)$.



(05)
LO3
&
LO4