ADAMAS UNIVERSITY PURSUE EXCELLENCE	**ADAMAS UNIVERSITY** **END-SEMESTER EXAMINATION : JANUARY 2021** (Academic Session: 2020 – 21)		
Name of the Program:	B.Tech	**Semester:**	III
Paper Title :	Electric Circuits	**Paper Code:**	EEE42101
Maximum Marks :	40	**Time duration:**	3 Hrs
Total No of questions:	8	**Total No of Pages:**	3
(Any other information for the student may be mentioned here)			

Answer all the Groups

Group A

Answer all the questions of the following $5 \times 1 = 5$

1. **a)** Explain independent and dependent sources with examples.

b) Two voltmeters A and B having resistance of 5.2 kΩ and 15 kΩ respectively are connected in series across 240V supply. What are the reading in each voltmeter?

c) Find the energy stored in an inductor of value 5 mH, if the current in it varies from 1A to 5A in 10 sec.

d) What is Q factor? Find value of Q factor for an inductor.

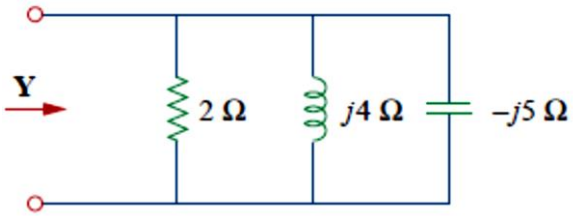
e) What is coefficient coupling?

GROUP –B

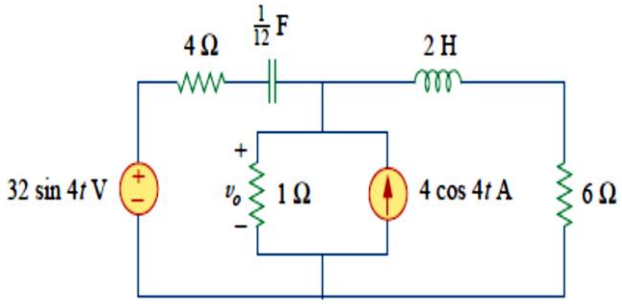
Answer *any three* of the following $3 \times 5 = 15$

2. A current source in a linear circuit has $i_z = 8\cos(500\pi t - 25^o)$A. (a) What is the amplitude of the current? (b) What is the angular frequency? (c) Find the frequency of the current. (d) Calculate i_z at t=2ms.

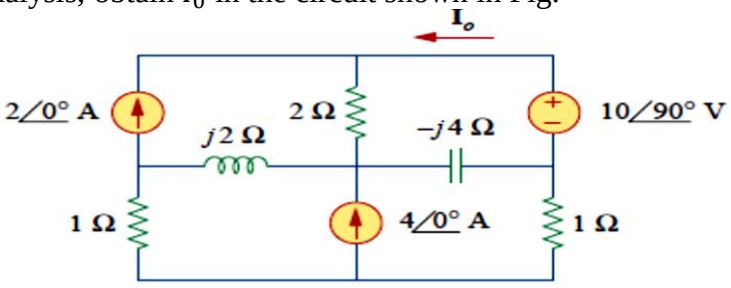
3. Determine the admittance Y for the circuit in Figure.



4. Determine Vo in the circuit by nodal analysis.



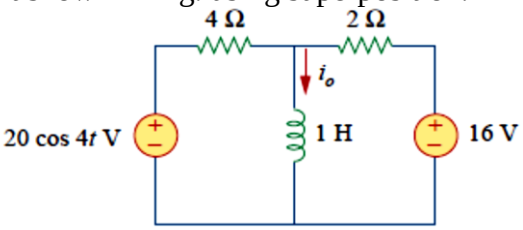
5. Using mesh analysis, obtain I_0 in the circuit shown in Fig.



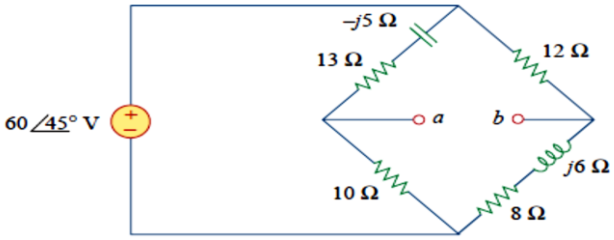
GROUP –C

Answer *any two* of the following $2 \times 10 = 20$

6. (a) Find i_0 in the circuit shown in Fig. using superposition.

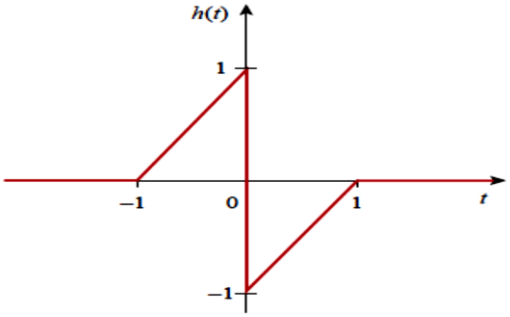


(b) Find the Thevenin and Norton equivalent circuits at terminals a-b in the circuit.

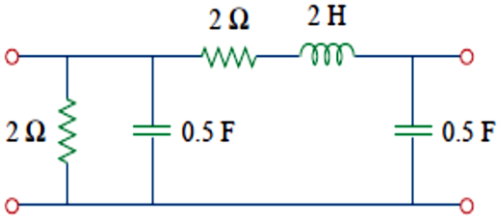


7. (a) Two coils connected in series-aiding fashion have a total inductance of 250 mH. When connected in a series-opposing configuration, the coils have a total inductance of 150 mH. If the inductance of one coil (L_1) is three times the other, find L_1, L_2 and M. What is the coupling coefficient?

(b) Obtain the Fourier transform of the signal shown in Fig.



8. (a) Obtain the z parameters for the network in Fig. as functions of s.



(b) For a two-port, let A=4, B=30Ω, C=0.1 S and D=1.5. Calculate the input impedance $Z_{in} = {}^{V_1}/_{I_1}$, when: (i) the output terminals are short-circuited, (ii) the output port is open-circuited, (iii) the output port is terminated by a 10-Ω load.