

International Islamic University Chittagong
Department of Electrical and Electronic Engineering

Final Examination Spring-2018
 Course Code: EEE 1201
 Time: 2 hours 30 minutes

Program: B.Sc. Engg. (EEE)
 Course Title: Electrical Circuit-II
 Full Marks: 50

Part A

[Answer any two questions from the followings; figures in the right margin indicate full marks.]

- 1(a). What do you know about series resonance? How a series resonance circuit can be used as a selector? Derive the expression for bandwidth for a selector circuit. 05
- 1(b). For a series RLC circuit $R=1 \Omega$, $L=0.1 H$, $C=100 \mu F$. If the applied voltage is $100 V$ (rms). Calculate the frequency, power, power factor, and voltage drop across each element of the circuit at resonance. 05

- 2(a). What is meant by magnetic coupling? Define Mutual Inductance and show that mutual inductance is given by 05

$$M = K_M \sqrt{L_1 L_2}$$

Where, K_M = co-efficient of magnetic coupling, L_1 = self - inductance of primary winding, L_2 = self-inductance of secondary winding.

- 2(b). Determine the current I_1 and I_2 of the circuit in Fig.1. 05

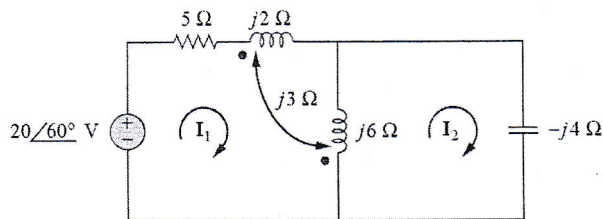


Fig.1

- 3(a). Classify filters according to their frequency response curves. Explain about a low pass RC filter. 05
- 3(b). Calculate the resonant frequency of the given network of Fig.2. 05

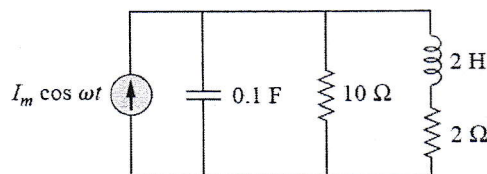


Fig.2

Part B

[Answer any three questions from the followings; figures in the right margin indicate full marks.]

- 4(a). What is polyphase system? How three phase voltage is generated? Describe in details with proper diagram. 04

- 4(b). Show that, in a balanced three phase system, 03

$$\dot{V}_{an} + \dot{V}_{bn} + \dot{V}_{cn} = 0;$$
 where symbols have their usual meaning.
- 4(c). What is meant by phase sequence? Given that, $V_{an} = 100 \angle 30^\circ$. Assuming 03
 negative sequence, determine the phase voltages.
- 5(a). A balanced abc-sequence Y-connected source with $V_{an} = 100 \angle 10^\circ$ V is 05
 connected to a delta-connected balance load $(8+j4) \Omega$ per phase. Calculate the phase and line currents.
- 5(b). The unbalance Δ -load of Fig.3 is supplied by balanced line-to-line voltages 05
 of 240 V in the positive sequence. Find the line currents. Take V_{ab} as reference.

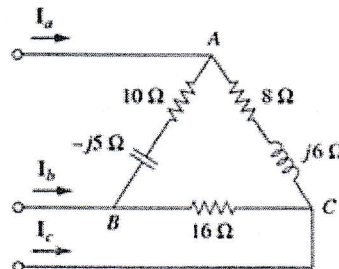


Fig.3.

- 6(a). Determine the h -parameter for the following two port network of Fig.4. 05

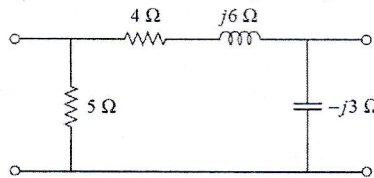


Fig.4.

- 6(b). Determine the sinusoidal expression of the voltage V_3 using superposition 05
 theorem from the following network in Fig.5.

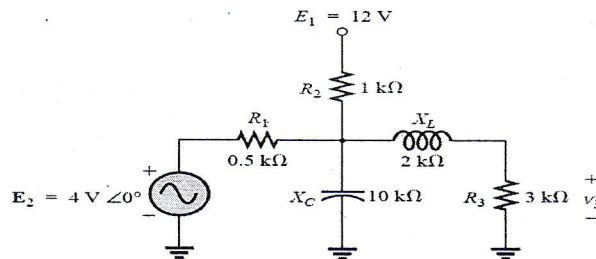


Fig.5

- 7(a). Show that, instantaneous three phase power is constant. 03
- 7(b). Find the voltages between alternate lines of a balanced six-phase, star 04
 connected system if the phase voltages are 132.8 volts in magnitude.
- 7(c). Define 'two port network'? Write about the significance of learning 'two 03
 port network'?