Veer Surendra Sai University of Technology
Department of Electrical &Electrical and electronics engineering
Mid Term Examination 2016
1St Semester B.Tech (H,I,J,K,L,M,N)
Sub: Basic Electrical Engg.

Max. Marks: 20

Time : 2Hrs.

Note: Q. No. 1 is Compulsory Answer any three from the rest of the questions

Q 1.   Answer the following questions.   5×1

a)   State and explain Thevenin's theorem?

b)   A capacitor of 8µF capacitance is connected to a D.C source through a resistance of 1mega Ω. Calculate the time constant of the circuit.

c)   What do you understand by the Quality factor of a series resonance circuit?

d)   A current wave is given by i=100+25 sin3θ+10 sin5θ amp. Find the R.M.S value of this current waveform.

e)   Given v=200 sin 300t volt & i= 8 sin (300t-60⁰) amp for an AC circuit. Determine the True Power and Reactive Power of the circuit.

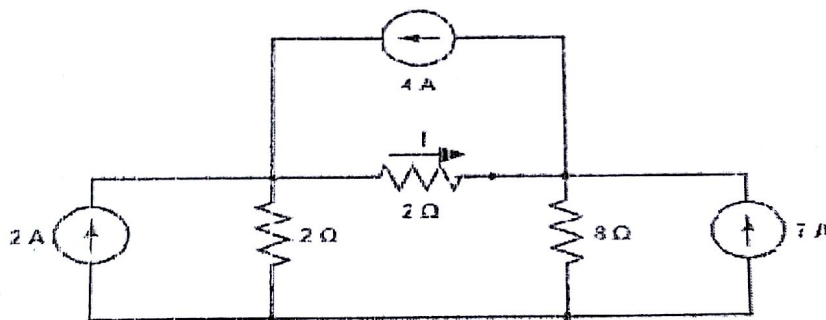Q 2.(a)   Using nodal analysis,find 'I' in the circuit diagram of fig 2.1   2.5×2

Fig. 2.1

(b)   Determine the current through the 3 Ω resistor in the circuit shown in figure 2.2 by using superposition theorem.
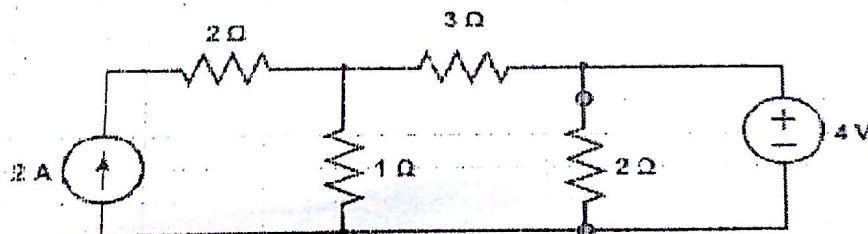

Fig. 2.2

Q 3.(a)   Derive the charging current of RCCircuit and plot its required graph.   2.5×2

(b) Find the steady current in the circuit when S is open. Also calculate the current at t=0.8 s after closing the switch S.
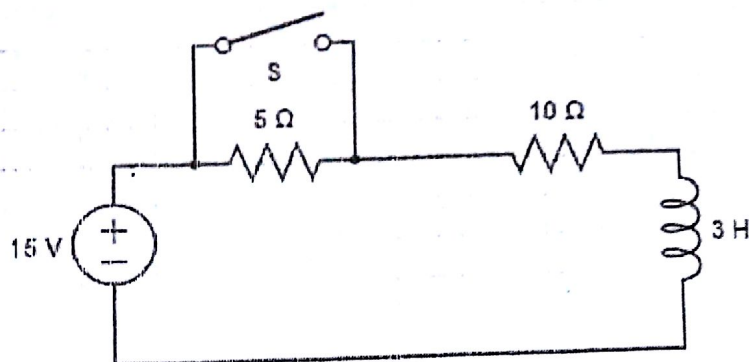

Fig.2.3

Q 4.(a) A series RC circuit having R=4Ω and C=120 μF is connected to 230 V, 50 Hz single phase supply. Calculate (i) the reactance (ii) the impedance, (iii) the current drawn by the circuit and (iv) the power factor of the circuit. 2.5×2

(b) Derive the expression of the single phase alternating voltage?

Q 5.(a) Two impedances $Z_1=8+6j$ and $Z_2=3-4j$ are connected in parallel across 230V, 50Hz supply. Calculate (i) current in each branch (ii) line current (iii) circuit power factor and power taken by the circuit? 2.5×2

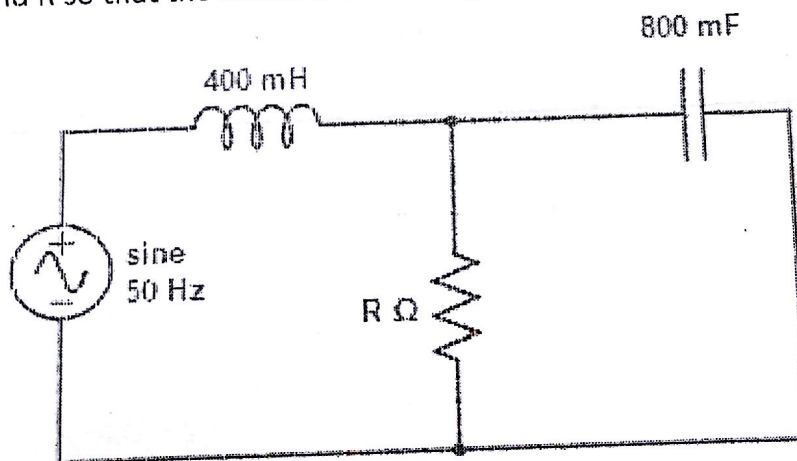**(b)** Find R so that the circuit shown in Fig. 2.4 resonates at supply frequency.

Fig. 2.4

Q 6.(a) Derive the expression of power factor of a balanced 3-phase load from two wattmeter method. 2.5×2

(b) A delta connected balanced three phase load is supplied from a three phase, 400 V supply. The line current is 20 A and the total power taken by the load is 10,000 W. Calculate (i) the impedance in each branch (ii) the line current, power factor and the total power consumed if same load is connected in star.