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**Question Paper Code : 21441**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015

Second Semester

Electronics and Communication Engineering

EC 2151/EC 25 /080290007/EE 1152/10144 EC 205 — ELECTRIC CIRCUITS AND  
ELECTRON DEVICES

(Common to Computer Science and Engineering , Biomedical Engineering , Medical  
Electronics Engineering and Information Technology)

(Regulations 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State Kirchoff's law and voltage law.
2. State Maximum power transfer theorem.
3. Write the condition for resonance.
4. A load consisting of  $6\Omega$  resistance and  $8\Omega$  inductive resistance draw a current of 20A when connected to a sinusoidal source. Determine the voltage and power in the load.
5. What is the diffusion capacitance?
6. Compare PN diode and Zener diode.
7. What is avalanche breakdown?
8. Compare N-channel and P-channel JFET.
9. Draw the two transistor model of SCR.
10. Write the application of UJT.



PART B — (5 × 16 = 80 marks)

11. (a) (i) For the circuit shown in figure 11 (a)(i). Find the voltage across  $20\Omega$  resistor and current passing through it. (8)

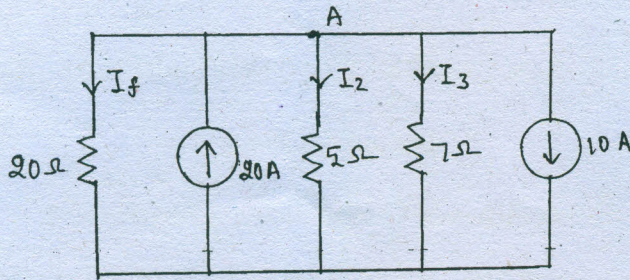


Fig. 11 (a)(i)

- (ii) In the circuit shown, determine the current through the  $40\Omega$  resistor and total current delivered by the battery. Use Kirchoff's laws. (8)

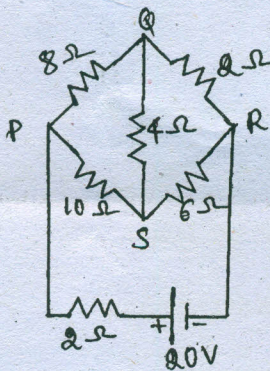


Fig. 11 (a)(ii)

Or

- (b) (i) Find the current through  $6\Omega$  resistance in circuit shown in figure 11 (b)(i) using Superposition theorem. (8)

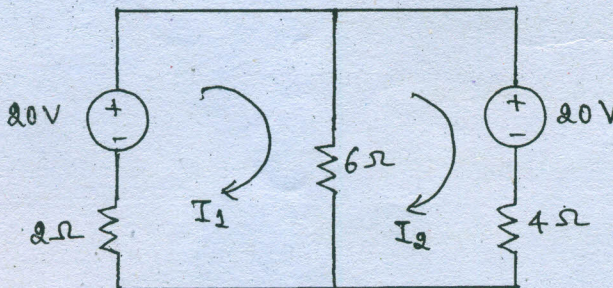


Fig. 11 (b)(i)



- (ii) Use Thevenin theorem find the current through  $4+j10\Omega$  impedance for the Figure 11(b) (ii). (8)

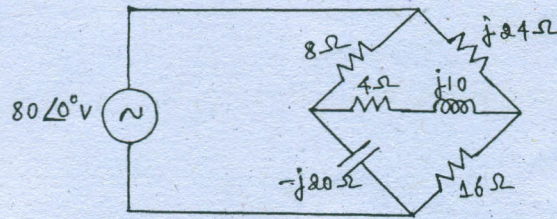


Fig. 11(b)(ii)

12. (a) (i) A RLC series circuit consists of  $R=75\Omega$ ,  $L=125\text{mH}$  and  $C=200\mu\text{F}$ . The circuit is excited by a sinusoidal source of value 115V, 60Hz. Determine the voltage across various elements and calculate the current and power. (10)
- (ii) A series RC circuit has  $R=10\Omega$  and  $C=0.1\text{F}$ ,  $f=50\text{Hz}$ . A constant voltage of 20V is applied to the circuit at  $t=0$ . Determine the voltage across the resistor and voltage across the capacitor. (6)

Or

- (b) (i) A series circuit has  $R=100\Omega$ ,  $L=50\text{mH}$  and  $C=100\mu\text{F}$  and is supplied with 200V, 50 Hz. Find the following impedance, current, power factor, power and voltage drops across each element. (10)
- (ii) Compare the series and parallel resonance circuit. (6)
13. (a) With a neat sketch explain the construction, operation and characteristics of PN junction diode. (16)

Or

- (b) With a neat sketch explain the construction, operation and characteristics of Zener diode. (16)
14. (a) Explain the construction and operation of NPN transistor and also discuss about its characteristics. (16)

Or

- (b) (i) Explain the construction and operation of Enhancement MOSFET. (12)
- (ii) Compare BJT and FET. (4)



15. (a) Explain the construction and operation of Triac. List its advantages, disadvantages and its applications. (16)

Or

- (b) Explain the following (8+8)

- (i) Photoconductive cells
- (ii) LCD