Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 51392

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2014.

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)

(Regulation 2008/2010)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State Kirchoff's current law.
2. State Thevenin's theorem.
3. Write the expression for the quality factor of a resonant circuit.
4. If a coil has 500 turns linked with a flux of 50 mWb when carrying a current of 125A, calculate the inductance of the coil.
5. Define Electron volt.
6. Write any two applications of Zener diode.
7. Define α_{dc} and β_{dc} of a transistor.
8. Draw the structure and symbol for a n-channel JFET.
9. Mention any two applications of DIAC.
10. What is Photovoltaic effect?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Find the current through each resistor of the circuit shown in Figure (a) using nodal analysis. (10)

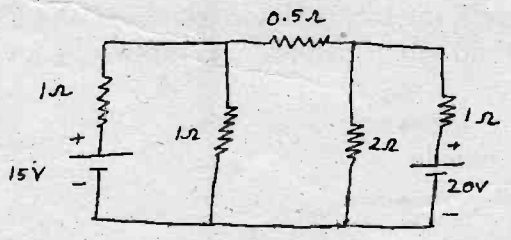

Figure (a)

(ii) State and prove maximum power transfer theorem. (6)

Or

(b) (i) Find the Thevenin's equivalent circuit for the network in Figure (b) at terminals AB. (10)

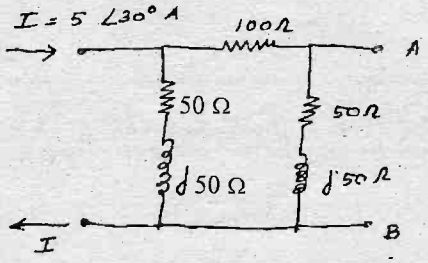

Figure (b)

(ii) Explain superposition theorem, assuming a suitable circuit. (6)

12. (a) (i) Derive expressions for resonant frequency and bandwidth of a series resonant circuit. Draw its frequency response. (8)

(ii) Discuss the response of a series RL circuit to sinusoidal input. (8)

Or

(b) With a neat sketch define the following terms in respect of step response of a second order system. (16)

(i) Delay time (ii) Rise time

(iii) Peak time (iv) Peak overshoot

(v) Settling time.

Also write the equation for the response.

13. (a) Explain the working of a PN junction diode derive the expression for the current through a PN junction diode and explain its VI characteristics.

Or

(b) (i) Define the following with respect to a diode

(1) Cut in voltage

(2) Reverse breakdown voltage

(3) Diffusion capacitance

(4) Transition capacitance.

(5) Intrinsic and extrinsic semiconductors. (10)

(ii) Distinguish between Zener breakdown and Avalanche breakdown. (6)

14. (a) (i) Explain the working of a CE transistor configuration. Explain its input and output characteristics. (10)

(ii) Compare the characteristics of CE, CB and CC configuration of transistors. (6)

Or

(b) (i) Explain the working of n-channel enhancement MOSFET. (10)

(ii) Compare the characteristics of BJT, JFET and MOSFET. (6)

15. (a) (i) Draw the VI characteristics of SCR and explain its operation. Explain the terms Holding current and Latching current. (10)

(ii) Explain the principle of operation of photo transistor. (6)

Or

(b) Write short notes on :

(i) Photodiode (5)

(ii) LED. (5)

(iii) UJT. (6)
