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**Question Paper Code : P 1242**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2009.

Third Semester

(Regulation 2004)

Electrical and Electronics Engineering

EC 1211 — ELECTRONIC DEVICES

(Also common to Third Semester – Electronics & Instrumentation Engineering and Instrumentation & Control Engineering)

(Common to Second Semester – Electronics and Instrumentation Engineering and Instrumentation and Control Engineering)

(Common to B.E. (Part-Time) Second Semester Electrical and Electronics Engineering Regulation 2005)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the diode current equation.
2. Sketch the diode switching characteristics.
3. Draw the output characteristics of the CE configuration and indicate the various operating regions.
4. If the output of a transistor amplifier is 5V rms and the input is 100 mV rms, calculate the voltage gain.
5. Draw the symbol for the p channel depletion MOSFET.
6. Draw the equivalent circuit of UJT.
7. What does the term programmable mean as used in PUT?

8. How the SCR could be turned off?
9. How does a phototransistor differ from a conventional BJT?
10. List any four types of output devices used in opto couplers.

PART B — (5 × 16 = 80 marks)

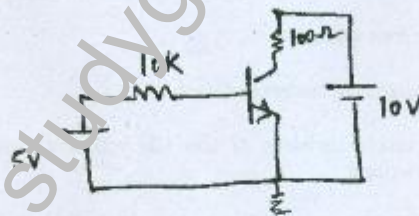
11. (a) (i) Explain the behaviour of PN junction in unbiased, forward biased and reverse biased conditions. (12)
- (ii) Draw the VI characteristics of a PN junction. (4)

Or

- (b) (i) Explain why a PN junction possesses capacitance. (6)
  - (ii) Discuss the effect of temperature on VI characteristics of a diode. (6)
  - (iii) Define static resistance and ac resistance of a diode. (4)
12. (a) With the hybrid equivalent circuit define the various h parameters of the CE transistor configuration and derive the analytical expression for each of them. (16)

Or

- (b) (i) Discuss how a transistor is used as an electronic switch. (4)
- (ii) Determine  $I_b$ ,  $I_c$ ,  $I_g$ ,  $V_{BE}$ ,  $V_{CB}$  and  $V_{CE}$ . Given  $\beta = 150$ . (12)



13. (a) (i) Compare pinchoff and cutoff in JFET. (6)
- (ii) Discuss how voltage controls the current in JFET. (10)

Or

- (b) (i) Explain how D MOSFETs and E MOSFETs differ? (6)
- (ii) In a basic UJT relaxation oscillator, which three factors determine the period of oscillations? Discuss. (10)
14. (a) (i) How LED emits light? (5)
- (ii) Explain how a photo diode detects light? (5)
- (iii) Describe the laser diode and how it differs from a LED. (6)

Or

- (b) Detail the following :
- (i) Photo electric Theory
- (ii) 7 segment display
- (iii) Solar cell
- (iv) Liquid crystal cell. (4 × 4 = 16)
15. (a) (i) Explain the operation of SCR in terms of its transistor equivalents. (8)
- (ii) Discuss the construction, operation and VI characteristics of Tunnel diode. (8)

Or

- (b) Describe one application of each of the following :
- (i) Zener diode
- (ii) LDR
- (iii) SCR
- (iv) CPE (4 × 4 = 16)