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T 3435

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Second Semester

(Regulation 2004)

Computer Science and Engineering

PH 1157 — PHYSICS — II

(Common to Information Technology)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention any two applications of a loop.
2. A load resistance may vary from 270Ω to $100 \text{ k}\Omega$. If a stiff current source drives this load resistance, what is the internal resistance of the source?
3. A circuit has a Thevenin voltage of 15 V and a Thevenin resistance of $3 \text{ k}\Omega$. What is the Norton circuit?
4. Define power factor.
5. What is an ideal diode?
6. Write any two differences between conductor and semiconductor.
7. A transistor has a current gain of 125 and a base current of $30 \mu\text{A}$. What is the collector current?
8. What are the timer circuits?
9. The output of an amplifier is a square wave output even though the input is a sine wave. Why?
10. Define relaxation time.

PART B — (5 × 16 = 80 marks)

15

11. (a) (i) State and explain the Kirchoff's current law. (8)
- (ii) Five points are connected by ten wires, each pair being joined by a wire of the same resistance R . Show that the resistance to a current entering at one of the points and leaving at any other point is $2/5 R$. (8)

Or

- (b) Write an essay on voltage and current division. (16)
12. (a) Discuss how Thevenin's theorem can be used to study the charging of a capacitor when a voltage divider arrangement is used and capacitor itself is used as a load. Also determine the time constant and the voltage across the capacitor ($C = 1000 \mu F$) at the end of the period. (16)

Or

- (b) State and explain the construction and working of 3 phase circuit with the suitable diagram. (16)
13. (a) (i) Define Zener effect. (4)
- (ii) Explain the working and construction and working of Zener diode. (12)

Or

- (b) Write the equation for the enhancement mode MOSFET transconductance equation with the suitable diagram. (16)
14. (a) Explain the working and derive the peak voltage for the following :
- (i) Half wave rectifier (8)
- (ii) Bridge wave rectifier. (8)

Or

- (b) Compare the resonance frequency and voltage conditions between Hartley and Colpitts oscillators. (16)

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15. (a) Explain how the inverting and non inverting amplifiers act as voltage or current sources. Give the suitable examples. (16)

Or

- (b) (i) Define active filters (4)
- (ii) Explain any one of them in detail. (12)
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