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Question Paper Code : Q 2377

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

Second Semester

Computer Science and Engineering

PH 1157 — PHYSICS — II

(Common to Information Technology)

(Regulation 2004)

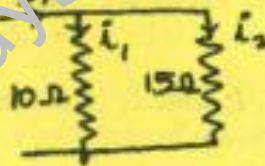
Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are active and passive elements? Give an example for each.
2. Find i_2 in the circuit given.



3. State maximum power transfer theorem.
4. What are the advantages of three phase system?
5. Calculate the conductivity of intrinsic germanium at 300 K using the following data :

$$n_i = 2.4 \times 10^{19} / \text{m}^3$$

$$\mu_e = 0.39 \text{ m}^2 \text{V}^{-1} \text{s}^{-1}$$

$$\mu_h = 0.19 \text{ m}^2 \text{V}^{-1} \text{s}^{-1}$$

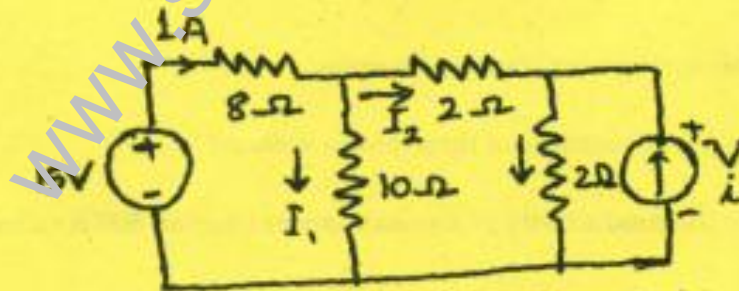
6. Distinguish between FET and conventional transistor.
7. In a common base connection, the emitter current is 1 mA, collector-to-base leakage current $I_{CBO} = 50 \mu\text{A}$, $\alpha = 0.92$. Calculate the total collector current.
8. What is meant by thermal runaway of a transistor?
9. Mention any four functional applications of op-amp.
10. Mention any four applications of a 555 timer.

PART B — (5 × 16 = 80 marks)

11. (a) (i) State and explain Kirchoff's current law and Kirchoff's voltage law. (6)
- (ii) Find the current i in the circuit given below. (4)

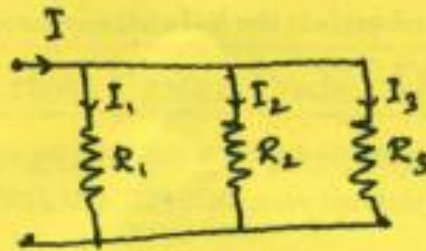


- (iii) Determine V , I_1 and I_2 in the circuit given below. (6)

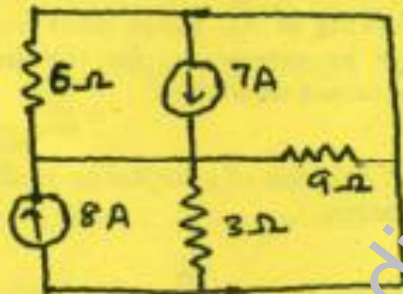


Or

- (b) (i) Calculate the branch current values in a multi resistor parallel circuit given (8)



- (ii) Find the power absorbed by each element in the single pair circuit given. (8)



12. (a) (i) In a Delta (or) mesh connection show that line current (I_L) = $\sqrt{3}$ times phase current (I_{ph}). (8)
- (ii) A star-connected alternator supplies to a delta connected load. The impedance of the load branch is $(8 + j6)$ ohm/phase. The line voltage is 230 V. Determine (1) current in the load branch, (2) power consumed by the load, (3) power factor of the load and (4) reactive power of the load. (8)

Or

- (b) (i) State and explain principle of superposition. (10)
- (ii) Apply superposition theorem to determine the current I in the circuit given. (6)



13. (a) (i) Discuss the behaviour of PN junction under forward and reverse biasing. (8)
(ii) Draw and explain the V-I characteristics of a PN junction. (8)

Or

- (b) (i) Explain the construction and working of a MOSFET. (8)
(ii) Distinguish between MOSFET and JFET. (8)
14. (a) Describe the principle of operation of a full wave rectifier with capacitor filter and derive an expression for its ripple factor.

Or

- (b) Explain the working of RC phase shift oscillator with a neat circuit diagram. Derive an expression for the frequency of oscillation and condition for sustained oscillation.
15. (a) Draw the circuit diagram of a digital to analog converter and explain its conversion operation.

Or

- (b) With theory explain the working of high pass filter. Draw the frequency response curve and explain.