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J 3176

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2009.

Second Semester

Mechatronics Engineering

EC 1161 — ELECTRONIC DEVICES AND CIRCUITS

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

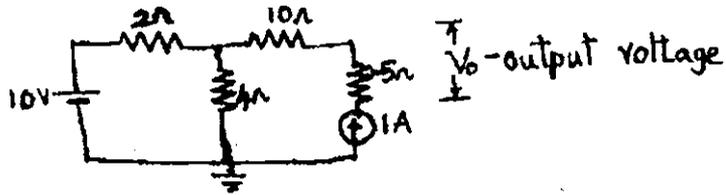
Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State Kirchoff's current and voltage laws.
2. Write the transmission parameter equations.
3. How do semiconductors differ from conductors and insulators?
4. What are the operating regions of JFET?
5. What is the ripple factor of Half wave rectifier?
6. Draw a clipper circuit using diode.
7. List the features associated with MOSFET.
8. What are the conditions to be satisfied to get sustained oscillations in a circuit?
9. What are the ideal characteristics of operational amplifier?
10. Mention the applications of multivibrators.

PART B — (5 × 16 = 80 marks)

11. (a) (i) For the circuit shown below find the output voltage using superposition theorem. (12)



- (ii) State Thevenin's and Norton's theorem. (4)

Or

- (b) Derive the equivalent Z parameter of a series-series connected two port network and Y parameter of parallel-parallel connected two port network. (16)

12. (a) (i) Draw and explain the VI characteristics of PN junction diode. (8)
- (ii) Compare the energy levels of conductors, insulators and semiconductors. (8)

Or

- (b) (i) With neat circuit diagram, explain the characteristics of CB Transistor configuration. (8)
- (ii) Draw and explain the drain characteristics of JFET. (8)

13. (a) (i) Explain the principle of operation of a full wave rectifier and also derive an expression for its ripple factor. (8)
- (ii) Explain the working of voltage multiplier with a neat diagram. (8)

Or

- (b) (i) Explain voltage regulation against variations in input voltage and load current, using zener diode. (10)
- (ii) Discuss the various applications of clippers and clampers. (6)

14. (a) Draw a Common Emitter Amplifier circuit with biasing network. Draw the input and output waveforms and explain how amplification takes place. (16)

Or

- (b) (i) Explain the working of Hartley Oscillator with neat circuit diagram. (8)
- (ii) Discuss in detail the types of feedback amplifiers. (8)
15. (a) (i) Using Op-Amp draw and explain the circuit for the following Adder Multiplier, Integrator and Subtractor. (8)
- (ii) With neat diagram, explain the working of Wein bridge oscillator. (8)

Or

- (b) Classify multivibrators and explain the working principle of Schmitt trigger. (16)
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(12)

(4)

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port
(16)

(8)

and
(8)

CB
(8)

(8)

also
(8)

(8)

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(10)

(6)

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