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Question Paper Code : 77110

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2015.

Third Semester

Electrical and Electronics Engineering

EC 6202 – ELECTRONIC DEVICES AND CIRCUITS

(Common to Electronics and Instrumentation Engineering, Instrumentation and Control Engineering, Robotics and Automation Engineering)

(Regulation 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is diffusion capacitance of PN junction diode?

2. What is a rectifier? Name it's types.

3. Write any two points of comparison between JFET with BJT.

4. What is a thyristor? Mention two of them.

5. Draw the hybrid model of BJT in CE configuration.

6. What are amplifiers? Write it's uses.

7. What are cascaded amplifiers?

8. Draw the ideal tuned circuit and write the expression for it's resonant frequency.

9. Write the disadvantages of negative feedback in amplifiers and how it can be overcome?

10. What is the expression for the frequency of oscillations of a wein-bridge oscillator?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the action of a full-wave rectifier using diodes and give waveforms of input and output voltages. (8)

(ii) Derive an expression for a ripple factor in a full-wave rectifier with resistive load. (8)

Or

(b) Briefly discuss about the following :

(i) Laser diodes.

(ii) Zener diode as a voltage regulator. (8 + 8)

12. (a) With the help of suitable diagram, explain the working of enhancement MOSFET. (16)

Or

(b) Describe the construction and working of UJT with it's equivalent circuit and V-I characteristics. (16)

13. (a) Draw the h-parameter model of a BJT-CE amplifier and derive the equations for voltage gain, current gain, input impedance and output impedance. (16)

Or

(b) Describe about small signal MOSFET amplifiers (NMOS) and obtain the expression for it's transconductance. (16)

14. (a) Draw the circuit of emitter coupled BJT differential amplifier, and derive expressions for differential gain, common mode gain and CMRR. (16)

Or

(b) What is Neutralization? Explain any one method in brief. (16)

15. (a) Draw circuit of CE amplifier with current series feedback and obtain the expression for feedback ratio, voltage gain, input and output resistances. (16)

Or

(b) Explain the operation of Colpitts oscillator with neat circuit diagram. Also derive the expressions for the frequency of oscillation and the condition for maintenance of oscillation. (16)