

Total No. of Questions :10]

[Total No. of Printed Pages :4

Roll No

CS/IT - 304

B.E. III Semester

Examination, December 2013

Electronics Devices and Circuit

Time : Three Hours

Maximum Marks : 70

- Note:** 1. Attempt any one question from each unit.
2. All questions carry equal marks.

Unit - I

1. a) Explain V-I characteristics of a PN junction diode and show that PN diode works as a Rectifier.
- b) Explain the reasons for the following with reference to a transistor
 - i) Emitter region is highly doped
 - ii) Base region is narrow and lightly doped

Also explain how a transistor is used as an Amplifier

OR

2. a) Draw the V-I characteristics of zener diode and explain its operation, Also show that zener diode can be used as a voltage regulator.
- b) With the help of characteristic curves and neat sketches explain the operation of the junction FET.

Unit - II

3. a) i) What do you understand by feedback in amplifiers? What are the types of feedback? What are the advantages and disadvantages of negative feedback?
- ii) Describe with necessary derivations the effect of negative feedback on the bandwidth and distortion in an amplifier.
- b) Draw the circuit diagram of a Wien bridge oscillator and briefly explain its operation. Derive the expression for frequency of oscillation.

OR

4. a) What is the effect of a voltage series negative feedback in the following performance measures of a BJT amplifier.
 - i) Input resistance ii) Output resistance
 - iii) Bandwidth iv) Distortion and noise
 - v) Gain Stability
- b) Why do three RC networks are needed for RC phase shift oscillator. Describe the construction of RC phase shift oscillator and explain its working. Also derive the expression for frequency of oscillation.

Unit - III

5. a) How transistor is used as a switch explain. Discuss its switching characteristics.
- b) With a neat sketch, explain the working of an astable multivibrator on what factors does the frequency of the output waves depend.

OR

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[3]

6. a) What is clipper? With the help of circuit diagram and waveforms describe the operation of positive and negative clipper.
- b) Define differential gain, common mode gain and CMRR. Derive the relationship between them.

Unit - IV

7. a) Define the following terms
- i) Slow rate
 - ii) CMRR
 - iii) Input offset voltage
 - iv) Input bias current
 - v) Gain bandwidth product
- b) Draw the circuit of an OP-AMP integrator and explain its working. Indicate the input and output waveforms.

OR

8. a) Draw the inverting and non-inverting amplifier circuits of an OP-AMP in closed loop configuration. Obtain the expressions for the closed loop gain in these circuits.
- b) Draw an Op-AMP based comparator circuit and explain the operation. Give its applications.

Unit - V

9. a) List three reasons why an unregulated supply is not enough for some applications define line regulation and load regulation in a voltage regulator.
- b) Explain the principle of obtaining regulated power supply. Mention advantages of IC voltage regulators.

OR

[4]

10. a) Draw the short-circuit, overload protection circuit and explain its operation.
- b) Explain the operation of switched mode power supply in detail with a block diagram. List out the advantages of SMPS.
