

Roll No.

24142

B. Tech. 4th Semester (EE)
Examination – May, 2017

ANALOG ELECTRONICS

Paper : EE-202-F

Time : Three Hours] [Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is *compulsory*.
All questions carry equal marks.

1. (a) Why is silicon preferred over germanium in the manufacturing of semiconductor devices ? 4
- (b) Make a difference between E-MOSFET and DE-MOSFET. 4
- (c) What is the requirement of biasing circuit in BJT ? 4

P. T. O.

(d) Why transistor is called current controlled device ? 2

(e) What is differential amplifier ? 2

(f) Define the concept of virtual ground in an Op-Amp. 4

SECTION - A

2. (a) Explain the behaviour of PN junction at no bias, reverse bias and forward bias. Sketch V-I characteristics of PN junction diode. 10

(b) A simple full wave bridge rectifier circuit has an input voltage of 240 V ac rms. Assume the diodes to be ideal. Find the output dc current, dc voltage and rms values of output currents and voltages. Assume load resistance to be $10\text{ K}\Omega$. 10

3. (a) What is meant by a clamping circuit ? Give different types of clamping circuits along with their output waveforms. 10

(b) Explain the following : 10

- Filter circuits
- Peak to peak detector

SECTION – B

4. Write short note on the following : 10

- (a) High frequency MOSFET model. 10
- (b) MOSFET internal capacitances. 10

5. (a) Draw and explain MOSFET as an amplifier. 10

(b) Develop small signal equivalent circuit of NMOS device including body effect. 10

SECTION – C

6. (a) Write short note on transistor as a switch. 10

(b) Discuss analysis of transistor amplifier in CE configuration using its hybrid- π model. 10

7. (a) Draw and explain circuit diagram of transistor CE amplifier. Also plot its frequency response curve. 10

(b) Write in detail about transistor internal capacitances. 10

SECTION – D

8. (a) Discuss large signal operation of Op-Amp. 10

(b) Write a short note on shunt-shunt feedback amplifier. 10

9. (a) Draw the circuit diagram of an Op-Amp used as inverting amplifier and derive the expression for its voltage gain, input resistance and output resistance. 10

(b) Explain the small signal operation of MOS differential amplifier. 10