CS/IT 222

Hall Ticket Number:

II/IV B.Tech (Supplementary) DEGREE EXAMINATION

April, 2017 — **Common for CSE & IT**

Fourth Semester — **Electronic Devices & Circuits**

Time: Three Hours — **Maximum :** 60 Marks

Answer Question No.1 compulsorily. (1X12 = 12 Marks)

Answer ONE question from each unit. (4X12=48 Marks)

1. Answer all questions (1X12=12 Marks)
   a) What do you mean by cut in voltage in a diode?
   b) What are the applications of UJT?
   c) What is Zener mechanism?
   d) Draw the pin diagram of 741 IC.
   e) Define PIV. What is PIV of a halfwave rectifier?
   f) For a JFET, I_{DSS} = 15mA, V_p= -5V, determine I_D for V_{GS} = -3V.
   g) What are the characteristics of JFET?
   h) What are the characteristics of a trans-conductance amplifier?
   i) Give the expression for frequency of operation for (i) RC Phase shift oscillator (ii) Hartley Oscillator.
   j) What are the ideal characteristics of an op-amp?
   k) Define Slew rate.
   l) Draw the circuit of differentiator using op-amp and write the expression for output voltage.

UNIT I

2. a) Explain the working principle of a centre tapped full wave rectifier with neat waveforms. 6M
   b) Derive the expressions for input resistance, output resistance, voltage gain and current gain of a CE transistor amplifier using h-parameters. 6M

(OR)

3. a) Derive the stability factor S for an (i) Emitter stabilized bias circuit (ii) Fixed Bias circuit for a BJT. 8M
   b) What is Early effect? What are its consequences? 4M

UNIT II

4. a) Explain the operation of Enhancement type MOSFET. 6M
   b) A self-biased p-channel JFET has a pinch off voltage V_p = 5V, I_{DSS} = -12mA, V_{DD} = -12V. Determine the values of R_D and R_S so that the drain current I_D=-5mA and V_{DS} = 6V. 6M

(OR)

5. a) Explain the operation of UJT and also plot emitter characteristics indicating various regions. 6M
   b) Explain the operation of n-channel JFET indicating its regions of operation. 6M

UNIT III

6. a) Explain the concept of feedback. Derive an expression for transfer gain with feedback. 8M
   b) What are the general characteristics of negative feedback amplifier? 4M

(OR)

7. a) State and explain Barkhausen criteria. 4M
   b) Derive the expression for the frequency of oscillations of a Wien Bridge oscillator. 8M

UNIT IV

8. a) Derive an expression for Common Mode Rejection Ratio for a differential amplifier using BJT. 6M
   b) Explain the operation of the following circuits built using op-amp (i) Summing Amplifier (ii) Subtractor. 6M

(OR)

9. a) Explain the operation of Voltage Controlled Oscillator with a neat block diagram. 6M
   b) Design a differentiator circuit that will differentiate an input signal with f_{max} = 200Hz. Also, draw the output waveform for a sine wave of 1V at 200Hz applied to the differentiator. 6M