

THIRD SEMESTER DIPLOMA EXAMINATION IN ELECTRICAL AND  
ELECTRONICS ENGINEERING—MARCH, 2014

**ELECTRONIC DEVICES AND CIRCUITS**

[Time : 3 hours

(Maximum marks : 100)

Marks

PART—A

(Maximum marks : 10)

- I Answer all questions in one or two sentences. Each question carries 2 marks.
1. Define diffusion current.
  2. List any two applications of Zener diodes.
  3. Define regulation of a rectifier.
  4. List four different coupling methods used in amplifiers.
  5. List any two applications of Schmitt trigger.

(5x2=10)

PART—B

(Maximum marks : 30)

- II Answer any *five* of the following. Each question carries 6 marks.

1. Analyse the behaviour of a forward biased PN Junction with neat sketches.
2. Draw a suitable rectifier which give approximately 200V DC voltage at the output with a supply source of 230V rms, AC and explain working.
3. One of the four diodes in a bridge rectifier circuit is open. Analyze with the aid of wave forms, the operation of this circuit when a sinusoidal voltage is applied at the input.
4. Explain the working of a common base, single stage NPN transistor amplifier, with a neat diagram.
5. Explain the working of a two stage, RC coupled, Common emitter NPN transistor amplifier, with a neat diagram.
6. Describe the operation of a 'Hartley Oscillator' with a neat diagram.
7. Clarify with the support of suitable curves, the meaning of the terms UTP and LTP related with the schmitt trigger circuit.

(5x6=30)

## PART—C

(Maximum marks : 60)

(Answer *one full* question from each unit. Each *full* question carries 15 marks.)

## UNIT – I

- III (a) Analyze the behaviour of a PNP transistor when 'emitter-base junction is forward biased' and 'base-collector junction is reverse biased'. 7
- (b) Draw typical output characteristics of a common base PNP transistor and define 'cut off' and 'saturation' regions. 8

OR

- IV (a) Derive an expression which give the value of DC current gain ' $\alpha$ ' in common base configuration in terms of DC current gain ' $\beta$ ' in CE configuration. 7
- (b) Explain with the output characteristics, the significance of selecting proper operating point for the faith full operation of a transistor amplifier in CE configuration. 8

## UNIT – II

- V (a) Explain the operation of a  $\pi$  filter with a neat schematic diagram. 7
- (b) Demonstrate the operation of a +5V, DC power supply having a suitable voltage regulator. Input supply is 230V AC. 8

OR

- VI (a) Explain a double ended diode clipping circuit with a neat diagram. 7
- (b) Analyze (with the help of circuit diagram and waveforms) the operation of a positive clamper when a sinusoidal input voltage is applied at the input. 8

## UNIT – III

- VII (a) Draw a 'typical frequency response curve' of a transformer coupled amplifier and comment on it. 7
- (b) Explain the working of a complimentary symmetry push pull amplifier with a neat diagram. 8

OR

- VIII (a) Show the suitable operating points on the output characteristics of the transistor for Class B and Class C amplifier operation in CE configuration. 7
- (b) Explain operation of a Class B push pull amplifier with a neat diagram. 8

## UNIT – IV

- IX (a) Describe the operation of a RC phase shift oscillator with a neat diagram. 7
- (b) Explain working of an Astable multi vibrator circuit. 8

OR

- X (a) Describe the operation of the Schmitt trigger circuit with a neat diagram. 7
- (b) Explain the functions of transistor and crystal in a crystal oscillator (with a neat circuit diagram). 8