22216

12425

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

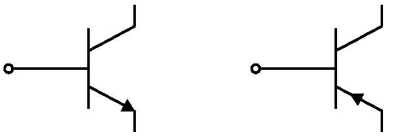
Marks

1. Attempt any FIVE of the following : **10**

(a) State knee voltage value of Si and Ge Diode.

(b) State the different types of filters used in Rectifiers.

(c) Identify the following symbol of the components :



(d) Define following terms w.r.t FET :

(i) Transconductance (Im)

(ii) Amplification factor (μ)

(e) List types of JFET and draw their symbols.

(f) State the need of DC Regulated Power Supply.

(g) Define Line Regulation and Load Regulation.

2. Attempt any THREE of the following : **12**

(a) Define energy band and state the effect of temperature on it for a semiconductor with an example.

(b) Sketch and explain the circuit diagram of Bridge Rectifier with input and output waveforms.

(c) Explain the need of stabilization of Q point in case of transistor.

(d) Sketch neat block diagram of a regulated power supply and explain the function of each block.

3. Attempt any THREE of the following : **12**

(a) Compare P-N junction diode and Photodiode with the following parameters :

(i) Circuit Symbol

(ii) Material used

(iii) Biasing

(iv) Application

(b) Define the following terms :

(i) Transformer Utilization factor

(ii) Ripple factor

(iii) Peak inverse voltage

(iv) Efficiency

(c) Sketch and explain self-bias in transistor.

(d) A 2N5668 JFET has $V_{GS(off)} = -4$ Volt and If $I_{DSS} = 5$ mA, what are the Gate voltage and drain current at half of cut-off point ?

4. Attempt any THREE of the following : **12**

(a) Explain the working of Zener Voltage regulator with neat circuit diagram.

(b) Compare Inductor filter and capacitor filter with the following parameters :

(i) Circuit diagram

(ii) Waveforms

(c) Distinguish in between BJT and FET any four points.

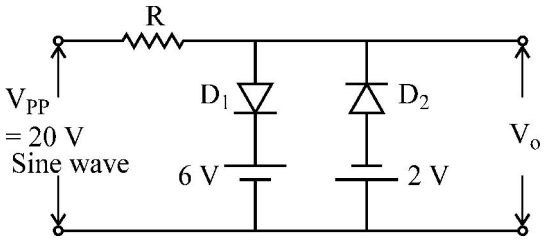
(d) Describe the principle of working D-MOSFET with neat circuit diagram.

(e) Compare CB, CE and CC configuration.

5. Attempt any TWO of the following : **12**

(a) Sketch the constructional diagram of LED and state the applications of LED.

(b) Identify the following circuit and draw input and output waveforms :



(c) Define α and β of BJT and derive the relation between α and β.

6. Attempt any TWO of the following : **12**

(a) What is the operating point Q of transistor ? Draw DC load line on Output characteristics of BJT, and show different operating points on DC load line.

(b) Explain Drain characteristics of JFET with Ohamic region, saturation region, cut-off region, breakdown region.

(c) Draw the circuit diagram of transistorized series voltage regulator and explain its working.