22232

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) Assume suitable data, if necessary.

(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) Draw symbol of zener diode and photo diode.

(b) State any two applications of FET.

(c) In BJT, what is a thermal runway ?

(d) Draw Transfer characteristics for N-channel depletion MOSFET and label it.

(e) Define line and load regulation.

(f) State the need of DC regulated power supply.

(g) List any two applications of LED.

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

(a) Compare photo diode and LED on the basis of definition, function, type of biasing and application.

(b) Draw and explain input and output characteristics of CE configuration of BJT.

(c) Draw basic block diagram of DC regulated power supply and explain each block with output wave form.

(d) Explain load line concept and dc biasing of a transistor.

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

(a) Draw positive clipper circuit, explain operation with waveform.

(b) State necessity of filter. Draw and explain working of bridge rectifier connected with π (pi) filter with output waveform.

(c) A JFET has a drain current of 5 mA. If I_{DSS} = 10 mA and V_{GS} (off) = – 5 V, find the value of (i) V_{as} (ii) V_p.

(d) Explain zener diode as a voltage regulator.

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

(a) Draw and explain the working of negative clamper with circuit diagram and waveform.

(b) Describe operation of voltage divider biasing with circuit diagram.

(c) (i) In CE config., if β = 99, I_{CEO} = 50 μA. If base current is 0.5 mA, determine I_C and I_E.

(ii) Derive relation between α and β.

(d) Calculate input impedance of JFET if reverse gate source voltage is V and gate current is 10^{-3} μA.

(e) Differentiate between Zener and Avalanche Breakdown.

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

(a) Justify, FET is called as 'Voltage operated device.'

(b) An AC supply of 230 V is applied to HWR through transformer with turns ratio 10 : 1. Find Avg. DC O/P voltage, current and P/V of diode and RMS voltage.

(c) Draw and explain VI characteristics of photodiode. Also define term dark current in photo diode.

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

(a) Differentiate PN junction and zener diode on basis of current flow, Breakdown voltage, Doping, applications.

(b) Compare CB, CE, CC on the basis of phase shift, voltage gain, input impedance, output resistance.

(c) Compare half wave and full wave bridge rectifier and centre tap rectifier on the basis of no. of diodes, ripple frequency, ripple factor, efficiency of rectifier.
