22225

21222

3 Hours / 70 Marks

Seat No. | | | | | | | | |

15 minutes extra for each hour

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

(7) 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 the symbols of resistor & capacitor. State the unit of measurement of resistance & capacitor.

(b) Give two points of distinction between half wave & full wave rectifier.

(c) Define α & β of a transistor.

(d) Draw the symbols of N channel & P channel JFET.

(e) Give two points of distinction between active & passive components.

(f) Give two points of distinction between active & passive transducers.

(g) State the selection criterion of transducers.

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

(a) With suitable graph, define voltage source & current source.

(b) Draw a neat diagram of bridge rectifier. Draw input & output waveforms.

(c) With suitable diagram, explain the working of P-N junction diode.

(d) With suitable diagram, explain the working of NPN transistor.

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

(a) Draw the drain & transfer characteristics of JFET.

(b) Give the steps followed to measure temperature of metal using given transducer. Draw suitable diagram.

(c) List two advantages of Integrated Circuits. Distinguish between analog & digital ICs.

(d) With suitable diagram, explain the working of transistor as an amplifier.

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

(a) Explain :

(i) Seebeck effect

(ii) Peltier effect

(b) Draw block diagram of regulated power supply. Explain function of each block.

(c) With suitable diagram, explain the working of transistor as a switch.

(d) A JFET has a drain current of 3 mA. If I_{DSS} is 10 mA & V_{GS} (OFF) is – 6V. Find V_{GS} & Vp.

(e) With suitable diagram, explain the working of capacitor filter with full wave rectifier. Draw i/p & o/p waveforms.

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

(a) (i) From the sinusoidal wave given below, in fig. (i) & fig. (ii) calculate Amplitude, Frequency.

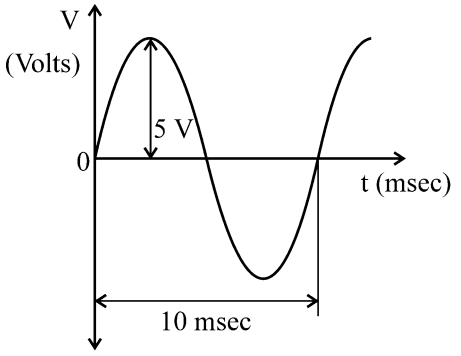

Fig. (i)

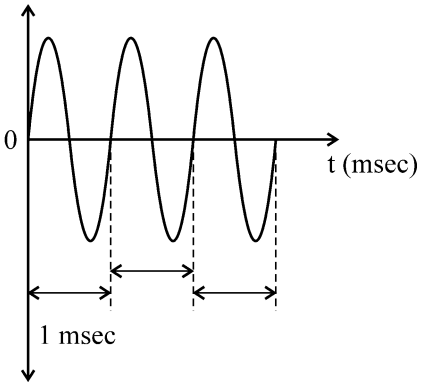

Fig. (ii)

(ii) Give the value of resistance for the following colour codes –

Red Blue Green Gold.

(b) (i) In NPN transistor,

I_{CE0} = 1000 μA, β = 50, I_B = 10 μA

Find I_C & I_E.

(ii) Define operating point of a transistor.

(c) (i) Identify the given circuit in fig. (iii) and explain its working.

(ii) Draw the input and output for the same circuit.

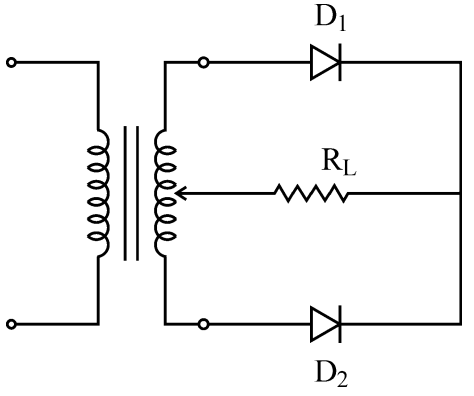

Fig. (iii)

(iii) State application for the given circuit.

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

(a) Draw suitable diagrams showing depletion regions before & after pinch-off for N channel JFET.

(b) Distinguish between CB, CC, CE (four points). Explain, why CE configuration is the most preferred combination.

(c) With suitable diagram, explain how photodiode & phototransistor can be used as control device for the given application.

———————