22225

23124

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 symbols of Capacitor and Inductor. State their units.

(b) Define filter and state need of filter.

(c) Define (i) P/V (ii) Rectificaton efficiency.

(d) Define operating point (Q point) of a transistor.

(e) Draw symbol of N-channel JFET.

(f) Draw constructional diagram of Piezo-electric transducer and label it.

(g) State the difference between active transducer and passive transducer (any 2 points).

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

(a) Determine the value of resistance for the following colour code :

(i) Green yellow orange gold

(ii) Red violet brown gold

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

(c) Sketch the constructional diagram of LED & describe its working.

(d) Explain the working of NPN transistor with the help of constructional diagram.

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

(a) Explain the working of P-channel JFET with suitable diagram.

(b) Explain :

(i) Seeback effect

(ii) Peltier effect

(c) Differentiate between CE & CB on the basis of

(i) Input resistance

(ii) Output resistance

(iii) Current gain

(iv) Voltage gain

(d) Sketch input and output V-I characteristics of CE configuration and label various regions on characteristics.

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

(a) With suitable diagram, explain the working of photodiode.

(b) Draw the block diagram of regulated power supply and explain its working.

(c) Compare BJT and FET (any four).

(d) In full wave bridge rectifier Vm = 10 V, R_L = 10 kΩ, find out V_{DC}, I_{DC}, ripple factor and P/V.

(e) Explain the working of transistor as a switch.

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

(a) Calculate peak to peak amplitude, frequency and wavelength of waveform shown in fig (a) and fig (b).

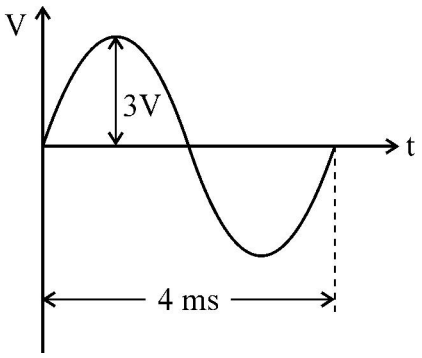

Fig. (a)

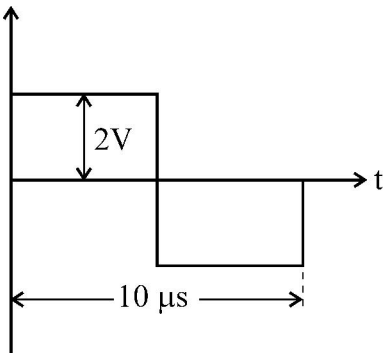

Fig. (b)

(b) (1) Compare half wave rectifier and centre tapped full wave rectifier based on given parameter.

(i) P/V

(ii) Rectification efficiency

(iii) Ripple factor

(iv) DC voltage

(2) State applications of zener diode (any two).

(c) (i) Define α & β. Explain the relation between α and β.

(ii) In NPN transistor, I_{CEO} = 100 μA, β = 50, I_B = 20 μA. Find collector current (IC) and emitter current (IE).

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

(a) The following readings were obtained from the experiment of JFET :

V_{GS}	0V	0V	–0.5V
V_{DS}	6V	12V	12V
I_D	10 mA	10.2mA	9.4 mA

Determine :

(i) Ac drain resistance,

(ii) Trans-conductance

(iii) Amplification factor

(b) Identify the circuit shown in fig. (a) and explain it in brief.

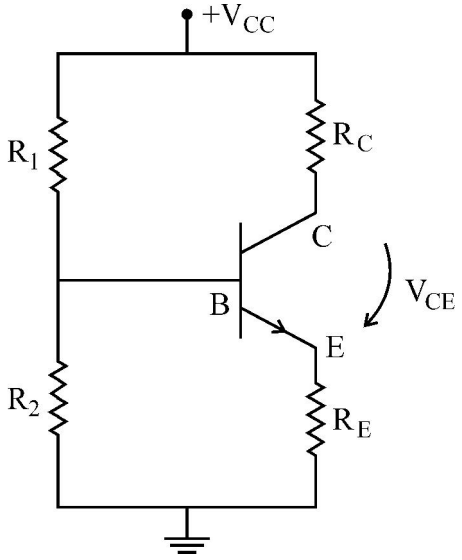

Fig. (a)

(c) List four types of electrical pressure transducer and describe working of any one of it.