22225

12526

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

Instructions – (1) All Questions are *Compulsory.*

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

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(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) Define the terms –

i) Amplitude

ii) Frequency

b) State the need of filters and list any two types of filter.

c) Draw labelled symbol for N-Channel and P-Channel FET.

d) Draw neat sketch for input characteristics of CE configuration.

e) State any two selection criteria for transducer.

f) Give any two points of comparison between Active and Passive transducer.

g) List any two advantages of Integrated circuits.

P.T.O.

Marks

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

a) State different types of resistor.

b) Compare BJT and FET.

c) Sketch the labelled forward and reverse characteristic of P–N junction diode.

d) Explain working principle of Half wave rectifier.

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

a) Determine the value of resistance with the following colour code –

i) Brown Black Black Silver

ii) Red Red Orange Gold

b) Draw a neat sketch of piezoelectric transducer and describe the working of the same.

c) Draw and explain construction of N-Channel JFET with diagram.

d) Draw the circuit of single stage R–C amplifier and state the function of coupling capacitor and Emitter bypass capacitor used in circuit.

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

a) In CE configuration if β = 100, leakage current $I_{CEO} = 150\,\mu A$ and if the base current is 0.2 mA. Calculate value of IC, IE.

b) Explain –

i) Seebeck and

ii) Peltier effect

c) Draw the block diagram of regulated power supply and explain working of each block.

d) Draw and explain with diagram L–C filter in detail.

e) A JFET has a drain current of 10 mA. If I_{DSS} = 20 mA and $V_{GS(off)} = -8V$. Find the value of–

i) V_{GS} and

ii) V_p

Marks

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

a) Define terms α and β of transistor and derive the relation between α and β.

b) Calculate peak to peak amplitude, frequency and wavelength of waveforms shown in Fig. No. 1(a) (b).

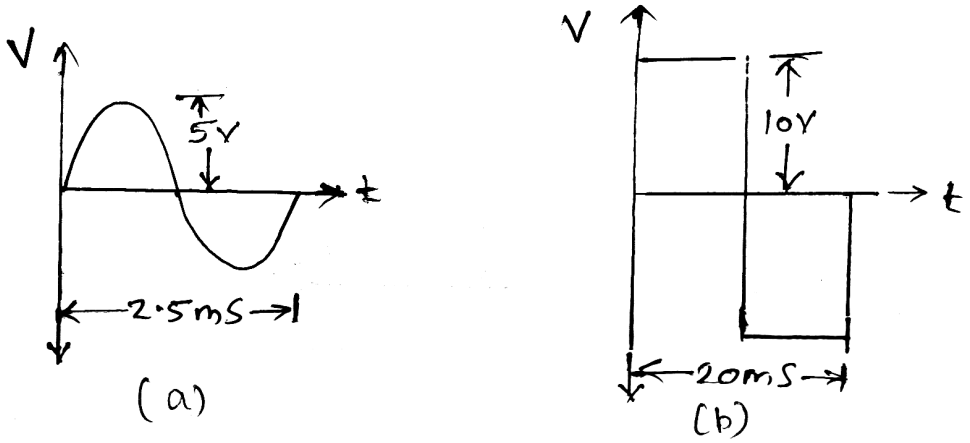

Fig. No. 1(a) (b)

c) Identify the given circuit shown in the Fig. No. 2 and explain working with input - output waveforms for a sinusoidal input.

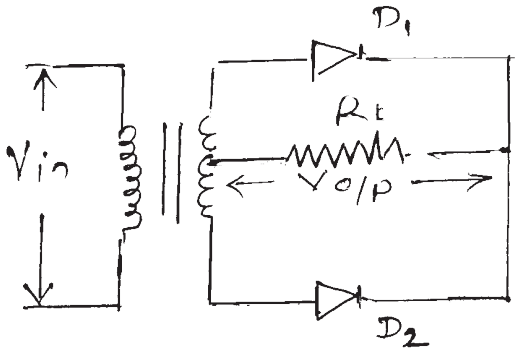

Fig. No. 2

Marks

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

a) State the terms related to field effect transistor –

i) Drain resistance

ii) Transcondutance

iii) Amplification factor

b) Differentiate CB, CE and CC w.r.t. points –

i) Input resistance

ii) Output resistance

iii) Current gain

iv) Phase shift between input and output.

c) Identify the active and passive transducer from the following :

i) Capacitive transducer

ii) Thermistor

iii) Photovoltaic cell

iv) Thermocouple

v) Strain guage

vi) Piezoelectric transducer
