22225

11819

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.

Marks

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

(a) Draw the symbol of inductor and capacitor. State the unit of inductor and capacitor.

(b) State the need of filters. Define filter.

(c) Define α and β of transistor.

(d) Define amplification factor and trans-conductance of JFET.

(e) State the two advantages and disadvantages of integrated circuits.

(f) Define transducer and name two passive transducers.

(g) State seebeck and Peltier effect.

2. Attempt any THREE : **12**

(a) Determine the value of capacitance with the following colour code.

(i) Orange, Orange, Blue

(ii) Yellow, Violet, Yellow

(b) Draw the neat sketch of center tap full wave rectifier. Draw i/p and o/p waveforms.

(c) Draw and explain zener diode as a voltage regulator.

(d) Describe the working principle of npn transistor with the help of diagram.

3. Attempt any THREE : **12**

(a) Sketch the construction of n-channel JFET and explain its working principle.

(b) Differentiate active and passive transducer on the basis of any four points.

(c) State the different types of resistors. State any four specifications of resistors.

(d) Explain the working of two stage RC coupled amplifier with neat circuit diagram.

4. Attempt any THREE : **12**

(a) Explain any four selection criteria of transducers for temperature measurement.

(b) Differentiate between P-N junction diode and zener diode.

(c) Draw DC load line of transistor. Explain working of transistor as a switch.

(d) Draw the Drain characteristics of JFET showing different operating regions. If drain current is 5 mA, I_{DSS} = 10 mA & Vas $_{(off)}$ = –6V. Find the value of V_{as}.

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

5. Attempt any TWO : **12**

(a) Solve the following :

(i) In the waveform shown in fig. (1). State it's amplitude, frequency, phase and wavelength.

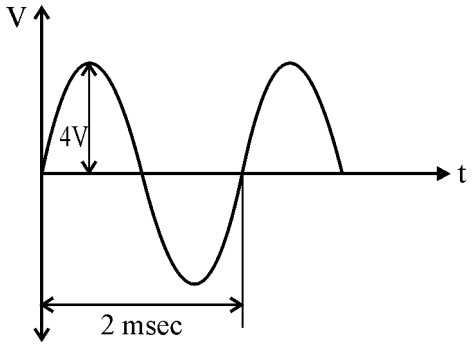

Fig. 1

(ii) Define : amplitude and frequency

(b) (i) In Circuit shown in fig. (2), a silicon transistor with $\beta = 50$ is used. Take $V_{BE} = 0.7$ V. Find Q point value.

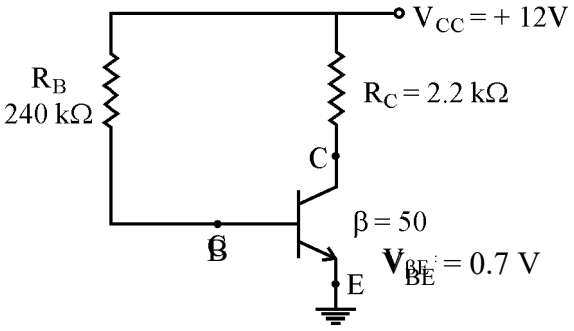

Fig. 2

(ii) Define operating point of the transistor.

(c) In full wave bridge rectifier $V_m = 10$V, RL = 10 KΩ

find out V_{DC}, I_{DC}, ripple factor and PIV.

6. Attempt any TWO : **12**

(a) Explain working principle of N-Channel depletion type MOSFET with construction diagram. Compare depletion type MOSFET & enhancement type MOSFET.

(b) Differentiate CE, CB, CC w.r.t. to

(i) Input resistance

(ii) Output resistance

(iii) Current gain

(iv) Voltage gain

(v) Phase shift between input and output

(vi) Applications

(c) List four types of electrical pressure transducers and describe one application of each one.

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