

22225

23242

3 Hours / 70 Marks

Seat No.

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- 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 resistor and inductor.
- (b) List any two advantages of JFET.
- (c) Write two applications of Zener diode.
- (d) Define transducers and name two passive transducers.
- (e) State two advantages of Integrated Circuits.
- (f) Draw the symbol of N & P channel MOSFET.
- (g) Draw symbol of LED and Zener diode.

2. Attempt any THREE of the following :

12

- (a) Determine the value of resistance with following colour code :
 - (i) Red, Black, Brown, Gold
 - (ii) Brown, Red, Black, Silver



- (b) Draw and explain forward biased V-I characteristic of P-N Junction diode.
- (c) Draw circuit diagram of transistor as switch and describe its working.
- (d) A JFET has a drain current of 5 mA. If $I_{DSS} = 10 \text{ mA}$ and $V_{GS(OFF)} = -6 \text{ V}$. Find value of (i) V_{GS} (ii) V_P

3. Attempt any THREE of the following :

12

- (a) Draw the circuit diagram and describe the working of transistor as an amplifier.
- (b) Draw neat and labelled DC load line of transistor. Mention importance of Q point if it is at center and at cutoff.
- (c) Define rectification. List types of rectifiers.
- (d) Draw a sketch and describe the working of potentiometer as a resistive transducer.

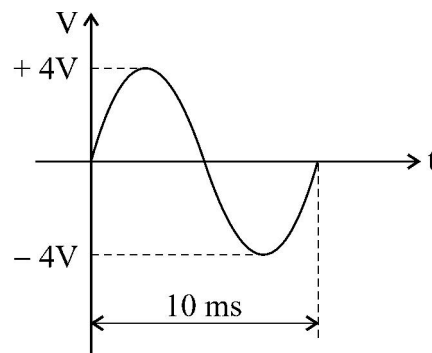
4. Attempt any THREE of the following :

12

- (a) In CE configuration if $\beta = 100$, leakage current $I_{CEO} = 100 \text{ } \mu\text{A}$, base current is 0.2 mA, determine collector current I_C and emitter current I_E .
- (b) Draw block diagram of regulated power supply. Draw the waveforms at the output of each block.
- (c) Draw the constructional details of n-channel JFET and describe the working principle.
- (d) State any four selection criteria of transducer.
- (e) Draw circuit diagram of bridge full wave rectifier and describe its working.

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

- (a) Draw output characteristic of CE configuration. Define α and β of transistor.
- (b) List types of filter. Draw the circuit diagram of C filter and describe its working.
- (c) (i) List types of signal.
(ii) In the waveform shown in Fig. (1), state its (i) peak amplitude (ii) frequency.

**Fig. (1)****6. Attempt any TWO of the following :****12**

- (a) (i) Differentiate BJT and JFET (any three points).
(ii) Differentiate JFET and MOSFET (any three points).
- (b) Draw the drain characteristic and transfer characteristic of JFET.
- (c) Draw construction of photo diode and phototransistor. State any two difference between them.
