

17213

13141

3 Hours / 100 Marks

Seat No.

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- 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 TEN of the following: 20
- a) List out two active components and two passive components.
 - b) Draw symbol of JFET (n-channel)
 - c) What is Zener Breakdown?
 - d) Draw circuit diagram of single stage CE amplifier.
 - e) Draw V-I characteristics of an ideal p-n junction diode.
 - f) Write any four advantages of IC's.
 - g) What is Filter? State its need.
 - h) State the types of field effect transistor.

P.T.O.

- i) Draw symbol of
 - 1) Zener Diode
 - 2) LED
- j) State the classification of IC's.
- k) What is knee voltage?
- l) Give classification of resistors.

2. Attempt any FOUR of the following: 16

- a) State four applications of electronics.
- b) Describe operating principle of Tunnel Diode.
- c) Explain the experimental set-up for obtaining the input and output characteristics of NPN transistor in CE configuration
- d) Draw the circuit diagram of transformer coupled 2 stage amplifier and state function of each component.
- e) Draw symbol of Varactor diode and describe its operating principle.
- f) Explain operating principle of crystal oscillator with neat sketch.

3. Attempt any FOUR of the following: 16

- a) Give classification of Electronic Components. Hence define Active and Passive components.
- b) Draw VI characteristics of Zener diode and mark portion used for obtaining constant voltage.
- c) State advantages, disadvantages and applications of JFET (02 Each)
- d) Draw and explain output characteristics of NPN transistor in CE configuration.

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Marks

- e) Find I_B , for a transistor, if $\alpha_{dc} = 0.99$ $I_C = 6\text{mA}$ and $I_{CBO} = 15\mu\text{A}$.
- f) Define Oscillator. State necessary conditions required for sustained oscillations.

4. Attempt any FOUR of the following:

16

- a) Compare conventional P-N junction diode and LED depending on following parameters.
 - i) Symbol
 - ii) Material used
 - iii) On-state voltage drop
 - iv) Applications
- b) Explain the working of full wave bridge rectifier with circuit diagram and waveforms.
- c) What is Transistor? Explain working of PNP transistor in common emitter mode.
- d) Draw two stage RC coupled amplifier and explain it's working.
- e) Draw circuit diagram of CLC filter and explain function of each component.
- f) Draw circuit diagram of direct coupled amplifier and explain its working.

P.T.O.

5. Attempt any FOUR of the following: 16

- a) Draw experimental set up to study V-I characteristics of P-N junction diode in forward and reverse biased conditions.
- b) Differentiate between HWR and FWR depending on any four points of the following :
 - i) DC Load Current
 - ii) RMS Load Current
 - iii) DC Load Power
 - iv) Ripple factor
 - v) Ripple frequency
 - vi) PIV
- c) Explain with the help of waveforms operation of Astable Multivibrator using NPN transistor.
- d) Explain formation of Depletion layer in P-N junction of a diode with neat sketch.
- e) Draw neat circuit diagram of transformer coupled amplifier and give its two applications.
- f) Explain operating principle of Schottky diode and state its two applications.

6. Attempt any FOUR of the following: 16

- a) Explain operation of PN junction under reverse bias condition.
 - b) Draw block diagram of regulated power supply and describe function of each block.
 - c) Explain Thermal Runaway phenomenon in a BJT.
 - d) Explain working of Bistable Multivibrator with the help of a neat sketch.
 - e) Explain working of n-channel JFET.
 - f) Calculate V_{DC} and current I_{DC} flowing through a 100Ω resistor connected to a 240V supply through HWR.
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