

# 17213

16117

**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) 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 TEN of the following: 20
- a) Give the classification of capacitor. State the unit of capacitor.
  - b) Define amplification factor and transconductance of JFET.
  - c) Give the applications of zener diode.
  - d) Define frequency and bandwidth of an amplifier.
  - e) State the typical values of knee voltage for silicon and germanium diode.
  - f) Give the classification of integrated circuits.
  - g) State the need of filters. Define filters.
  - h) State the types of JFET. Draw their symbol.
  - i) Draw a transfer characteristics of JFET.
  - j) State the two advantages and disadvantages of Integrated circuits.

P.T.O.

- k) Draw the symbols of LED and varactor diode.
- l) Define resistor. Give classification of resistor.

**2. Attempt any FOUR of the following: 16**

- a) Define electronics and explain its applications in atleast three fields.
- b) Draw and explain V-I characteristics of zener diode.
- c) Draw the output characteristics of CE configuration of BJT and show all three regions.
- d) Draw and explain working of crystal oscillator.
- e) Draw a setup for operation of p-n junction diode in forward and reverse bias mode. Describe its operation with the characteristics.
- f) Draw a single stage common emitter amplifier. Draw its DC equivalent circuit and state the function of each component.

**3. Attempt any FOUR of the following: 16**

- a) Describe construction and working of LED.
- b) Define inductance. State the unit of inductor and give specifications of inductor.
- c) Draw and explain construction of NPN transistor.
- d) Compare CB, CE and CC configurations of BJT.
- e) Derive the relation between  $\alpha$  and  $\beta$ .
- f) Describe the operation of two stage RC coupled amplifier with the help of neat circuit diagram and frequency response.

- 4. Attempt any FOUR of the following:** **16**
- a) Draw and explain zener diode as a voltage regulator.
  - b) Describe the operation of bridge rectifier with the help of neat circuit diagram and waveforms.
  - c) Compare JFET and BJT.
  - d) Draw and explain astable multivibrator using transistor.
  - e) Draw a block diagram of regulated power supply. State the need of each block.
  - f) State the need of multistage amplifier. Compare RC and direct coupled amplifiers with its frequency response and applications.
- 5. Attempt any FOUR of the following:** **16**
- a) Define the following for P-N junction diode.
    - (i) Knee voltage
    - (ii) Peak inverse voltage
    - (iii) Reverse saturation current
    - (iv) Maximum forward current
  - b) Draw a circuit diagram centre tap full wave rectifier with LC filler and explain the operation with waveforms.
  - c) Draw a frequency response of single stage common emitter amplifier. Explain the effect of coupling capacitor and junction capacitor.
  - d) Explain Tunnel diode with its symbol, construction and working.
  - e) Draw a circuit diagram of transistor as a switch and explain how transistor acts as a closed switch and open switch.
  - f) Differentiate between P-N junction diode and zener diode.

**6. Attempt any FOUR of the following:****16**

- a) Describe the formation of unbiased P-N junction diode with suitable diagram.
  - b) Compare half wave, centre tap and bridge type full wave rectifier on the basis of-
    - (i) Ripple factor
    - (ii) Rectification efficiency
    - (iii) TUF
    - (iv) PIV
  - c) Draw and explain voltage divider bias network.
  - d) An amplifier has signal input voltage of 0.25 V and draws 1 mA from the source. The amplifier delivers 8 V to load at 10 mA. Determine
    - (i) Current gain
    - (ii) Voltage gain
    - (iii) Power gain
    - (iv) Input resistance of this amplifier.
  - e) Draw and explain constructional details of N-channel JFET.
  - f) In full wave bridge rectifier  $V_m = 10 \text{ V}$ ,  $R_L = 10 \text{ K}\Omega$ . Find out VDC, IDC, ripple factor and PIV.
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