

# 17213

21415

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 :**

**20**

- (a) Define passive component. Give its examples.
- (b) Draw the symbol of n-channel and p-channel JFET.
- (c) Give the two applications of varactor diode.
- (d) List the types of coupling used in amplifier.
- (e) Draw symbol of Zener diode and Schottky diode.
- (f) Give two advantages and two disadvantages of IC's.
- (g) List the types of filters.
- (h) Define the following FET parameters :
  - (i) Amplification factor
  - (ii) Transconductance
- (i) Give the classification of IC's.
- (j) Draw the symbol of fixed and variable inductor.
- (k) State any four applications of LED.
- (l) What are non-linear resistors ? State its types.

**P.T.O.**

**2. Attempt any FOUR :****16**

- (a) State any four applications of electronics.
- (b) Explain the operating principle of tunnel diode.
- (c) Draw the neat diagram of PNP transistor and describe its working.
- (d) Distinguish between PN junction diode and zener diode.
- (e) Define oscillator. State its need and condition required for sustained oscillations.
- (f) Draw the neat diagram of two stage transformed coupled amplifier. Give its two advantages.

**3. Attempt any FOUR :****16**

- (a) Draw the characteristics of LDR. Explain how variation of resistance takes place with intensity of light.
- (b) Explain the mechanism of avalanche break down in P-N junction diode.
- (c) Draw the construction of p-channel FET and describe its working.
- (d) Draw the input and output characteristics of CE configuration and label them.
- (e) Draw the circuit diagram of crystal oscillator and explain its operating principle.
- (f) A transistor has a typical  $\beta$  of 100. If the collector current is 40 mA, what is the value of base current and emitter current ?

**4. Attempt any FOUR :****16**

- (a) Draw the forward and reverse characteristics of PN junction diode and describe in brief.
- (b) Explain with the help of a diagram the effect of input field on the output current of JFET.
- (c) Differentiate between Half wave rectifier and Bridge full wave rectifier (any four points).

- (d) Draw the circuit diagram of single stage CE amplifier. Give function of each component.
- (e) Define the following for CE amplifier :
  - (i) Bandwidth
  - (ii) Current gain
  - (iii) Power gain
  - (iv) Voltage gain
- (f) Draw diagram of half wave rectifier with shunt capacitor filter. Draw input and output waveforms.

**5. Attempt any FOUR :**

**16**

- (a) Differentiate between varactor diode and LED.
- (b) Define (in words) :
  - (i) Reverse saturation current
  - (ii) Knee voltage
  - (iii) Depletion layer
  - (iv) Static resistance of diode
- (c) With the help of waveform explain the working of Bridge type full wave rectifier.
- (d) Draw the circuit diagram of bistable multivibrator using transistor and give its two applications.
- (e) Draw and explain the V–I characteristics of zener diode.
- (f) Draw the neat circuit diagram of direct coupled amplifier. Give its two applications.

**6. Attempt any FOUR :**

**16**

- (a) Explain the formation of depletion layer in PN junction with neat sketch.
- (b) Draw block diagram of Regulated power supply and state its need.
- (c) Draw circuit diagram of voltage divider bias. How operating point stability is obtained in this circuit ?

17213

[ 4 ]

- (d) Draw the circuit diagram of a transistor as a switch. Explain how the transistor work as a open switch in cut-off region and close switch in saturation region.
- (e) Draw the transfer characteristics of JFET. Give the meaning of  $I_{d_{ss}}$  and  $V_{gs_{off}}$ .
- (f) An A.C. supply of 230 V is applied to Half wave rectifier circuit through a transformer of turns ratio 2 : 1. Calculate
- (i) DC output voltage
  - (ii) PIV of diode
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