

# 17321

**16172**

**3 Hours / 100 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.
  - (5) 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) Define intrinsic and extrinsic semiconductor with examples.
- (b) Draw the symbol of LED and photodiode.
- (c) List the four specification of zener diode.
- (d) State the need of biasing of BJT.
- (e) Define gain and bandwidth of an amplifier.
- (f) What is oscillator ? Give its classification.
- (g) Why BJT is called as bipolar junction transistor.
- (h) Give the different types of amplifier coupling.
- (i) Draw symbol of D-MOSFET. (n-channel and P-channel)
- (j) Write down output voltage for IC 7805 and IC 7912.
- (k) State Barkhausen's Criterion for sustained oscillations.
- (l) What do you mean by universal gate ? Give its type.
- (m) Convert :
  - (i)  $(2F9A)_{16} = (?)_2$
  - (ii)  $(110101)_2 = (?)_{10}$
- (n) Give the difference between RC and LC oscillator.

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

- (a) Draw and label VI characteristics of p-n junction diode in forward bias and reverse bias.
- (b) Draw symbol of point contact diode. State its working principle give any two applications.
- (c) Give the classification of rectifier and filter.
- (d) Draw and explain working principle of NPN transistor.
- (e) Explain direct coupled amplifier with circuit diagram and frequency response.
- (f) What is the need of regulated power supply ? Define load regulation and line regulation.

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

- (a) Draw and explain forward biasing of p-n junction diode.
- (b) Draw the circuit diagram of bridge rectifier with LC filter.
- (c) List various biasing circuit of BJT. Draw voltage divider bias type.
- (d) Draw and explain VI characteristics of UJT.
- (e) Explain with diagram constructional details of n-channel JFET(FET).
- (f) Give symbol and truth table of AND and OR gate.

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

- (a) Compare half wave, centre tap, and bridge type full wave rectifier on the basis of
  - (i) Ripple factor,
  - (ii) Rectification efficiency
  - (iii) TUF and
  - (iv) PIV
- (b) Draw output characteristics of CE configuration and show various regions of BJT.
- (c) Draw two stage RC coupled amplifier and draw its frequency response.
- (d) Explain working principle of N-channel depletion type MOSFET with construction diagram.
- (e) Explain how zener diode can be used as a voltage regulator.
- (f) Draw neat circuit diagram of RC phase shift oscillator. State its equation for output frequency.

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

- (a) Explain single stage CE amplifier with the help of circuit diagram.
- (b) Explain the operation of class A push-pull amplifier with circuit diagram.
- (c) Compare between BJT and FET (Four points)
- (d) Draw the block diagram of DC regulated power supply and explain the function of each block.
- (e) Draw circuit diagram of Hartley oscillator give its two applications.
- (f) Draw block diagram of micro processor and state the function of each block.

**P.T.O.**

6. Attempt any FOUR of the following :

16

- (a) Describe transistor as a switch with neat diagram.
  - (b) Define  $\alpha$  &  $\beta$  and derive the relation between  $\alpha$  and  $\beta$  w.r.t. BJT.
  - (c) Classify different types of power amplifiers w.r.t. period of conduction of input signal.
  - (d) Define :
    - (i) Drain resistance
    - (ii) Mutual capacitance
    - (iii) Amplification factor
    - (iv) Pinch-off voltage of FET
  - (e) Draw transistorized series voltage regulator and explain its working.
  - (f) Write advantages and disadvantages of positive and negative feedback.
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