

22213

11819

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.
 - (5) Use of Non-programmable Electronic Pocket Calculator is permissible.

Marks

1. Attempt any FIVE of the following :

10

- (a) Draw the symbol of LED & photodiode.
- (b) Define rectifier and list its types.
- (c) List configurations of BJT.
- (d) State the output voltage for IC 7824 and IC 7906.
- (e) Suggest the suitable diode type for rectifier circuit.
- (f) Define the term line regulation.
- (g) Draw the symbol, logic expression and truth table of NOR gate.

2. Attempt any THREE of the following :

12

- (a) Draw experimental circuit diagram and characteristics for forward biased P-N junction diode.
- (b) Explain Center-tapped full wave rectifier with the help of circuit diagram and draw input-output waveforms.
- (c) Describe the operation of NPN transistor with neat diagram.
- (d) Draw block diagram of IC 723. Write the functions of IC 723.

3. Attempt any THREE of the following :

12

- (a) Draw the block diagram of regulated DC power supply and explain the function of each block.
- (b) Differentiate between positive and negative feedback on the basis of :
- (i) overall phase shift (ii) voltage gain
- (iii) stability (iv) applications
- (c) Describe transistor as a switch with neat sketch.
- (d) An AC supply of 230 V is applied to half wave rectifier circuit. A transformer turns ratio is 20 : 1. Find
- (i) Output DC voltage (ii) Peak Inverse Voltage (PIV)

4. Attempt any THREE of the following :

12

- (a) List the applications of RC oscillator and crystal oscillator. (two each)
- (b) Draw the circuit diagram of bridge rectifier with π filter. Draw its input and output waveform.
- (c) In a common base connection, current amplification factor (α) is 0.9. If the emitter current is 1 mA, determine the value of base current.
- (d) Describe the working principle of photodiode with proper diagram.
- (e) In a full wave rectifier $V_m = 10$ V, $R_L = 10$ k Ω . Find out V_{dc} , I_{dc} and Ripple factor. [Refer Fig. 1]

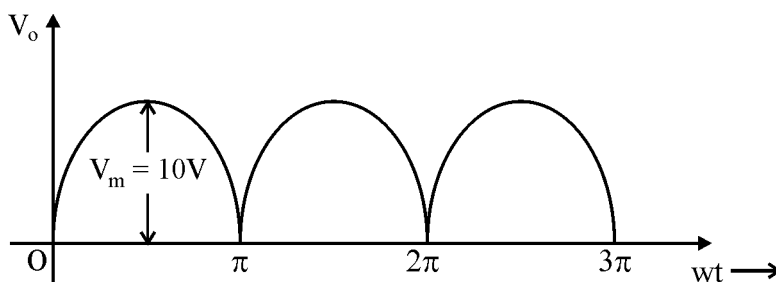


Fig. 1

5. Attempt any TWO of the following :

12

- (a) Identify type of BJT configuration having following features :
- BJT configuration having the least current gain.
 - BJT configuration called as voltage follower.
 - BJT configuration having current gain less than one.
 - BJT configuration suitable for impedance matching.
 - BJT configuration suitable for voltage amplification.
 - BJT configuration having the least output impedance.
- (b) Find out the input voltage of the zener regulator shown in Fig. 2. Assume $R_S = 200 \Omega$ and $I_{Z(\max)} = 25 \text{ mA}$.

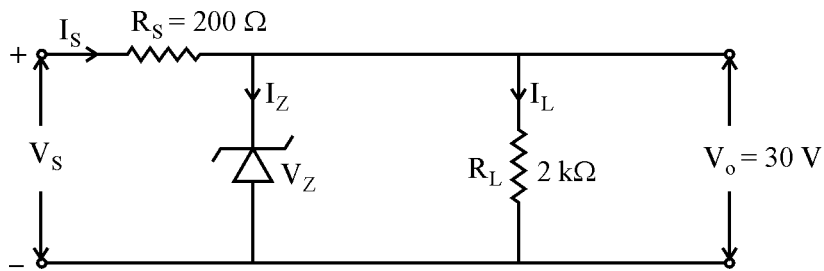


Fig. 2

- (c) Convert the following numbers :
- $(456)_{10} = (\quad)_2$
 - $(5A)_{16} = (\quad)_{10}$
 - $(43)_8 = (\quad)_2$
 - $(101011)_2 = (\quad)_{16}$
 - $(204)_{10} = (\quad)_8$
 - $(259)_{10} = (\quad)_{16}$

P.T.O.

6. Attempt any TWO of the following :

12

- (a) Identify the circuit shown in Fig. 3. Find out frequency of oscillator of the circuit.

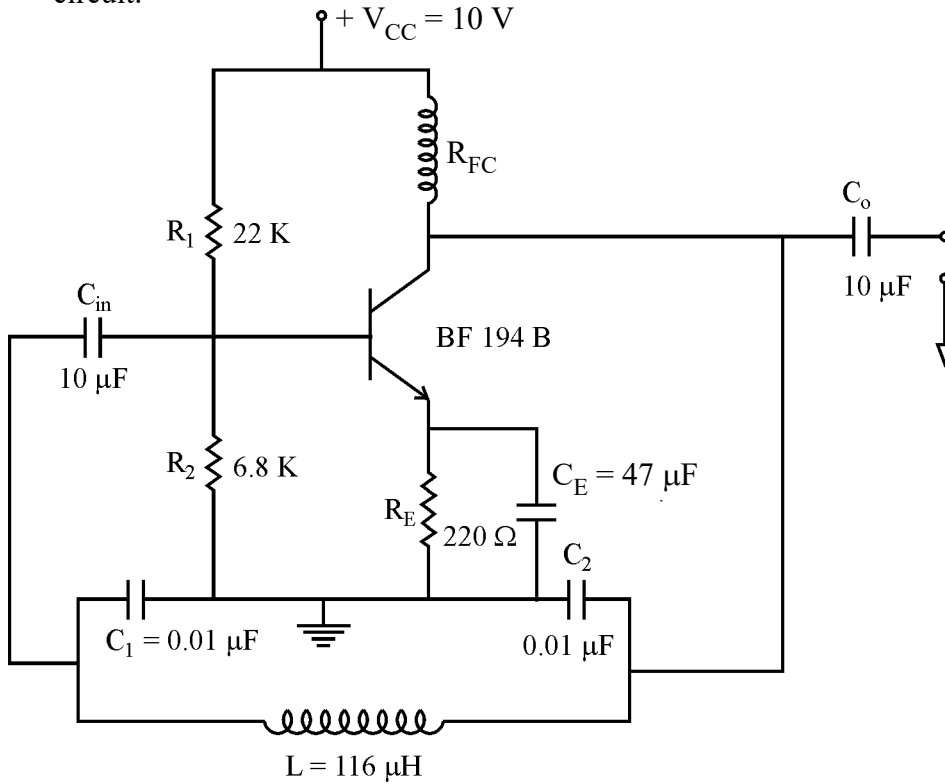


Fig. 3

- (b) Draw output characteristics of common emitter [CE] configuration and explain active, saturation and cut-off regions in detail.
- (c) Refer the diagram shown in Fig. 4. What should be logic level at D input to make :
- (i) LED ON
 - (ii) LED OFF
 - (iii) Justify your answer by giving step-by-step output of each stage.

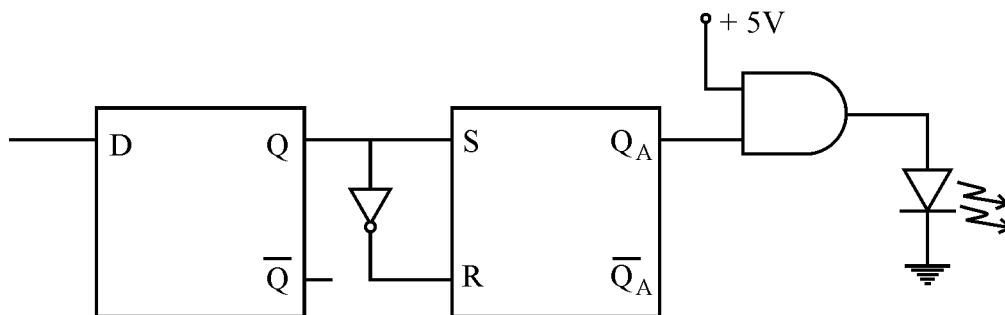


Fig. 4