

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III(NEW) EXAMINATION – SUMMER 2023****Subject Code:2131006****Date:28-07-2023****Subject Name:Electronic Devices and Circuits****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

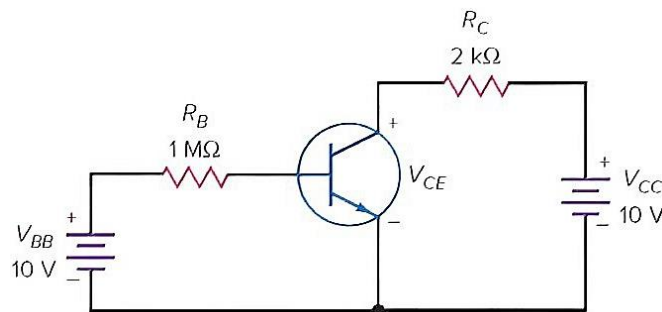
1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

- Q.1**
- (a) With reference to pn junction diode, define: (i) Knee voltage (ii) Bulk resistance (iii) Maximum DC forward current. **03**
- (b) Define the following terms: (1) Semiconductor (2) Doping (3) Depletion region (4) Breakdown **04**
- (c) Draw and explain bridge rectifier circuit with capacitor filter. **07**
- Q.2**
- (a) What is a voltage multiplier? Draw and explain voltage doubler. **03**
- (b) Draw and explain the characteristics and equivalent circuit for ideal diode, second approximation and third approximation. **04**
- (c) Write a short-note on following: **07**
- (i) Varactor diode (ii) Schottky diode.

OR

- (c) Explain transistor input and output characteristics for CE connection and also explain saturation, active and cut off region of operation. **07**
- Q.3**
- (a) Explain the working principle of Light-Emitting Diode (LED)? **03**
- (b) Calculate I_B , I_C , V_{CE} , and P_D for below circuit. The value of $\beta_{dc} = 300$ for given transistor. **04**

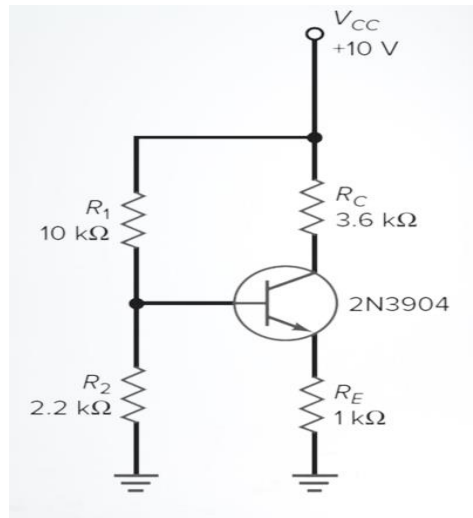


- (c) Write a short note on transistor as switch **07**

OR

- Q.3**
- (a) How photo-transistor works? Also states the difference between photo-transistor and photo-diode. **03**

- (b) Briefly describe Two-stage amplifier and define total voltage gain for it. **04**
 (c) Calculate the collector-emitter voltage for given circuit. **07**



- Q.4** (a) Briefly explain the role of bypass capacitors in an emitter-biased amplifier. **03**
 (b) Briefly explain the operation of Emitter-Biased LED Driver circuit. **04**
 (c) Draw the base biased amplifier circuit and explain its operation. **07**

OR

- Q.4** (a) What is transconductance in JFETs? State its importance. **03**
 (b) Write a short-note on Common-Base Amplifier circuit. **04**
 (c) Explain in detail Frequency Response of an Amplifier and also define cut-off frequencies and mid-band. **07**

- Q.5** (a) Differentiate between depletion-mode and enhancement-mode MOSFET. **03**
 (b) Write a short-note on application of JFET as analog switch. **04**
 (c) Explain in detail Class-B push-pull amplifier, also state its advantages and disadvantages. **07**

OR

- Q.5** (a) Briefly explain Class-A Operation for power amplifier. **03**
 (b) Briefly explain different types of negative feedback connections. **04**
 (c) What is negative feedback in amplifier circuits, and how does it affect the gain and bandwidth of the circuit? **07**
