

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– III(OLD) EXAMINATION – SUMMER 2019****Subject Code: 131101****Date:07/06/2019****Subject Name: Basic Electronics****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.

- Q.1** (a) Draw the circuit diagram of full wave bridge rectifier and draw its input and output waveforms. Also derive the expression for the D.C. current. **07**
(b) Explain Hall effect. Derive expression of Hall voltage and state its applications. **07**
- Q.2** (a) State the role of voltage regulators in power supplies? Discuss working of a series voltage regulator. **07**
(b) How does the designer minimize the percentage variation in I_C , due to Variation in I_{CO} and V_{BE} and due to variation in β in transistor amplifier circuit. **07**
- OR**
- (b) Prove that current density is proportional to product of charge density, mobility of charge and electric field intensity. **07**
- Q.3** (a) Draw the circuit of CE configuration of transistor. Explain Input and output characteristics. Also derive $\alpha = \beta / \beta + 1$ **07**
(b) Explain the h-parameter model of CE amplifier with Bypass resistor R_E and derive the expression for A_i , A_v , R_i , R_o **07**
- OR**
- Q.3** (a) What is biasing? Why biasing is required for transistor? List biasing methods for transistor. Draw and explain the circuit of voltage divider biasing **07**
(b) Draw circuit of an idealized class-B push-pull power amplifier and explain its operation with the help of necessary waveforms. **07**
- Q.4** (a) Explain the different types of clipping circuits. **07**
(b) Explain DC load line and Q-point for any transistor configuration. Also state the necessity of biasing. **07**
- OR**
- Q.4** (a) Explain the principle of operation of JFET. Also compare FET with BJT. **07**
(b) Explain with the help of circuit diagram the working of Tunnel Diode in detail. **07**
- Q.5** (a) State the limitations of Rutherford model and explain Bohr atomic model. **07**
(b) Briefly discuss the term mobility in connection to charged carriers and derive equation for point form of Ohm's law. **07**
- OR**
- Q.5** (a) Explain in detail the base-width modulation or 'early effect' for common-base configured transistor and draw its output and input characteristics. **07**
(b) Define and prove the Miller's theorem and its dual alternative **07**
