

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-III (New) EXAMINATION – WINTER 2018

Subject Code: 2131006

Date: 01/12/2018

Subject Name: Electronic Devices and Circuits

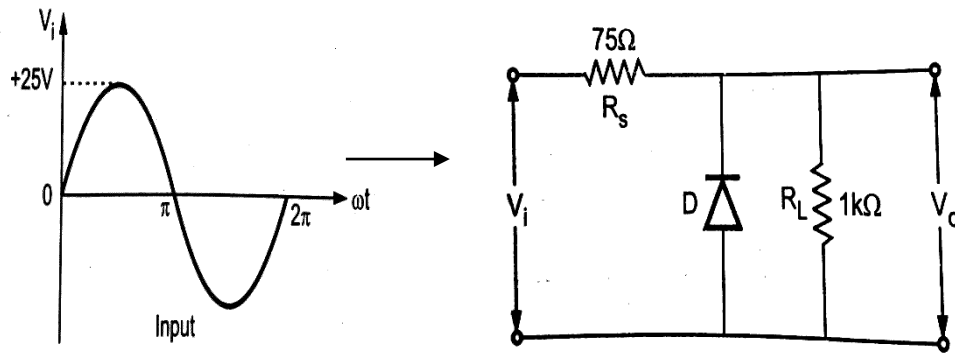
Time: 10:30 AM TO 01:00 PM

Total Marks: 70

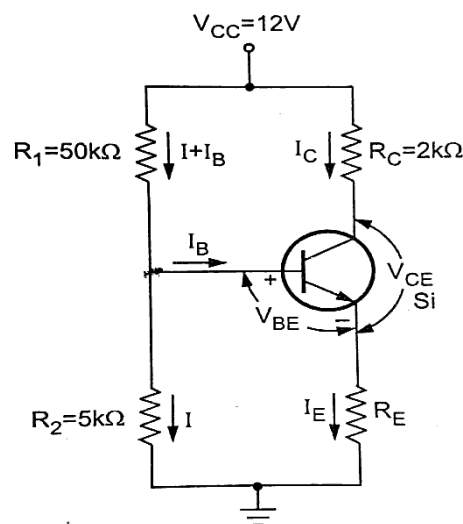
Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Define Semiconductor. Explain the Formation of P-type Semiconductor.	03
	(b) Explain AC and DC Resistances for Diode.	04
	(c) Draw and explain bridge rectifier circuit with capacitor filter.	07
Q.2	(a) Compare Zener Diode and PN junction Diode.	03
	(b) With the help of neat figure, explain the operation of a N-P-N transistor.	04
	(c) A full-wave rectifier circuit is fed from a transformer having a centre-tapped secondary winding. The rms voltage from either end of secondary to center tap is 30V. If the diode forward resistance is $2\ \Omega$ and that of the half secondary is $8\ \Omega$, for a load of $1\ \text{K}\Omega$, calculate	07
	(1) Power delivered to load	
	(2) % Regulation at full load	
	(3) Efficiency of rectification	
	(4) TUF of secondary.	
	OR	
	(c) Analyze the given circuit and sketch the nature of its output voltage. Assume silicon diode with cut in voltage 0.6V.	07



Q.3	(a) Explain Transistor as a switch.	03
	(b) Draw a fixed bias circuit, write the advantages and disadvantages of fixed bias circuit.	04
	(c) Draw the base biased amplifier circuit and explain its operation.	07
	OR	
Q.3	(a) Explain DC load line and Q-point for any transistor Configuration.	03
	(b) Define following terms.	04
	(1) Surge current (2) Drift Current (3) Pinch off voltage	
	(4) Ripple Factor	
	(c) For the Circuit given below, $I_C=2\text{mA}$, $\beta=100$, calculate R_E , V_{CE} and stability factor S.	07



- Q.4** (a) State and Describe Miller's Theorem **03**
(b) Discuss the working of a series voltage Regulator. **04**
(c) Explain the working of a transformer coupled class A power amplifier and show the efficiency of class A transformer coupled amplifier is 50%. **07**
- OR**
- Q.4** (a) Explain the effect of coupling and bypass capacitors on the bandwidth. **03**
(b) Compare different types of power amplifier based on conduction angle, position of Q-point, efficiency and distortion. **04**
(c) Define Voltage Regulation. Explain working of two transistor Regulator. **07**
- Q.5** (a) Explain Principal of operation of Photodiode. **03**
(b) Write the advantages and disadvantages of negative feedback. **04**
(c) Explain construction, operation and characteristic of P-channel Enhancement type MOSFET in detail. **07**
- OR**
- Q.5** (a) If the base current in a transistor is $20\mu\text{A}$ when the emitter current is 6.4mA , calculate the values of α and β . Also calculate the collector current. **03**
(b) Differentiate Ohmic region and Saturation region of JFET **04**
(c) Derive the expression of the input resistance with feedback for voltage shunt feedback amplifier. **07**
