GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– III (New) EXAMINATION – WINTER 2019

Subject Code: 2131006   **Date: 30/11/2019**

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.

			MARKS
Q.1	**(a)**	Explain the second approximation of diode VI characteristics and equivalent circuit.	**03**
	(b)	How the depletion layer is formed in unbiased diode?	**04**
	(c)	Draw the circuit of Bridge rectifier and explain the operation of circuit for positive and negative half cycle of input signal.	**07**
Q.2	**(a)**	What is the difference between rectifier diode and small signal diode?	**03**
	(b)	Write a short note on Varactor diode.	**04**
	(c)	For a negative biased clipper circuit, input voltage is 5V peak to peak sine wave with frequency of 1KHz. Biased voltage is set at 1.1V. Draw the circuit and input – output waveform for second approximation of germanium diode.	**07**

OR

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	(c)	For a positive biased clipper circuit, input voltage is 6V peak to peak sine wave with frequency of 1KHz. Biased voltage is set at 0.9V. Draw the circuit and input – output waveform for second approximation of silicon diode.	**07**
Q.3	**(a)**	Explain the T Model of a transistor.	**03**
	(b)	Use the second approximation to calculate the base current in bellow circuit. What is the voltage across the base resistor? Find the collector current if $\beta_{dc} = 200$.	**04**
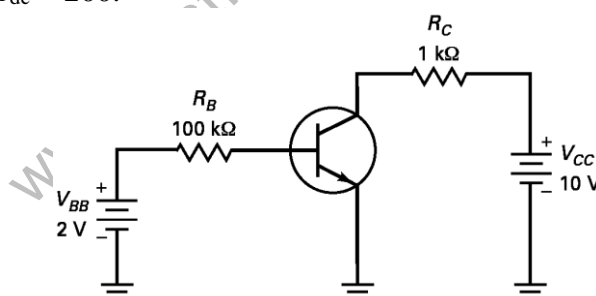
	(c)	Explain the voltage divider bias circuit in detail.	**07**

OR

Q.3	**(a)**	Draw the circuit of emitter follower and find its AC emitter resistance.	**03**
	(b)	For voltage divider bias CE amplifier, find the equation of voltage gain using π Model.	**04**

(c) Find the Q point of bellow circuit. **07**
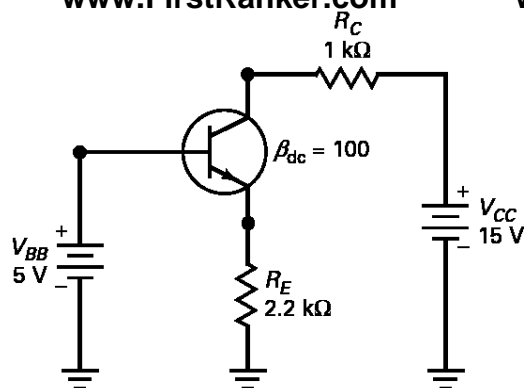
Q.4 **(a)** Explain Darlington pair connections of two transistors. **03**
   (b) Explain the difference of class A and class B operation of an amplifier. **04**
   (c) Draw the circuit of class B push – pull amplifier and explain its working. List the advantages and disadvantages. **07**

OR

Q.4 **(a)** Draw the symbol of JFET, depletion MOSFET and enhancement MOSFET. **03**
   (b) Explain the common source amplifier using JFET. **04**
   (c) What is the frequency response of an amplifier? Explain the decibel power gain and decibel voltage gain with examples. **07**

Q.5 **(a)** Why JFET is called as voltage controlled device? **03**
   (b) Explain the four types of negative feedback connections. **04**
   (c) Explain the structure and biasing arrangements of Enhancement Mode MOSFET for obtaining I_D – V_{DS} curve. **07**

OR

Q.5 **(a)** Explain the transconductance curve for JFET. **03**
   (b) What is the role of bypass capacitor in voltage divider bias amplifier? **04**
   (c) Explain the self bias technique for JFET. **07**

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