

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-III (New) EXAMINATION – WINTER 2015

Subject Code:2131006**Date:21/12/2015****Subject Name: Electronic Devices and Circuits.****Time: 2:30pm to 5:00pm****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	Short Questions	14
	1 How much forward diode voltage is there with the ideal diode Approximation?	
	2 Which device is work as voltage controlled?	
	3 What is the maximum efficiency of a class B push-pull amplifier?	
	4 What is the maximum peak to peak unclipped output if an emitter follower has $V_{CEQ}=6V$, $I_{CQ}=200mA$ and $r_e=10\Omega$?	
	5 What is the total ac emitter resistance of an emitter follower?	
	6 Write down the use of a common base amplifier.	
	7 Which feedback is used by the swamped amplifier?	
	8 What kind of the effect on the output voltage if bypass capacitor is not present?	
	9 What is the value of the ac resistance of the emitter diode if the ac voltage across the emitter diode is 1mV and emitter current is 100 μ A?	
	10 Which circuit is removing positive or negative parts of a wave form?	
	11 What is the value of base current if the current gain is 100 and collector current is 10mA?	
	12 Which diode has a negative resistance region?	
	13 Which diode has a forward voltage drop of approximately 0.25V?	
	14 If $N_1/N_2 = 4$ and the primary voltage is 120V, what is the secondary voltage?	
Q.2	(a) What is semiconductor? Define n-type semiconductor.	03
	(b) Give minimum four comparison of LED and photo diode.	04
	(c) Explain bridge rectifier in detail.	07
	OR	
	(c) Explain parallel clipper circuit in detail.	07
Q.3	(a) If the base current of transistor is 30 μ A when the emitter current is 7.2 mA, what are the values of β and α ?	03
	(b) Write the advantages of transistor, and explain why it is called "Bipolar Transistor"?	04
	(c) Explain biased and unbiased NPN transistor in detail.	07
	OR	
Q.3	(a) Explain applications of optocoupler.	03
	(b) Explain advantages and disadvantages of photo transistor.	04
	(c) Explain Voltage Divider Bias biasing in detail with its circuit	07

- operation and required equations .
- Q.4** (a) Draw T model and π model circuit for CE amplifier. **03**
 (b) State and Explain miller's theorem. **04**
 (c) Explain Darlington pair in detail, also derive its current gain **07**
- OR**
- Q.4** (a) A JFET has a pinch off voltage of -4 volts and the saturation current of 9 mA. calculate the drain current if $V_{GS}=-2$ volts. **03**
 (b) State the advantages and disadvantages of FET over BJT. **04**
 (c) Explain construction, operation and characteristic of n-channel Depletion MOSFET in detail. **07**
- Q.5** (a) What is the difference between voltage amplifier and power amplifier? **03**
 (b) Compare different types of power amplifier based on conduction angle, position of Q-point, efficiency and distortion. **04**
 (c) Explain operation of class B-push pull amplifier with the help of circuit and wave form. **07**
- OR**
- Q.5** (a) In a negative feedback amplifier $A=100$, $\beta=0.02$ and input voltage is 40 mV. Determine voltage gain with feedback, output voltage and feedback voltage. **03**
 (b) Obtain the expression for transistor gain for negative feedback. **04**
 (c) Derive the expression of the input resistance with feedback for current series feedback amplifier. **07**
