Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–I • EXAMINATION – WINTER • 2014

Subject Code: X11101 **Date: 01-01-2015**

Subject Name: Basic Electronics

Time: 10:30 am - 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.**

Q.1	**(a)**	Explain the formation of potential barrier in a PN junction. Why silicon is preferred to germanium in the manufacturing of semiconductor devices?	**07**
	(b)	Explain the concept of potential energy barrier.	**07**
Q.2	**(a)**	Define the term rectification and describe the full wave bridge rectifier with the help of neat circuit diagram and waveforms.	**07**
	(b)	Explain construction and working of Tunnel diode.	**07**
		OR	
	(b)	State and explain Miller's theorem and its duality.	**07**
Q.3	**(a)**	Explain the principle of operation of photodiode. List its applications.	**07**
	(b)	Explain CC configuration of transistor with its input and output Characteristics.	**07**
		OR	
Q.3	**(a)**	Give the differences between clipper and clamper. And explain the positive clipping and negative clamper circuit.	**07**
	(b)	A transistor with $\beta = 100$ is to be used in common emitter configuration with collector to base bias. The collector circuit resistance is $R_C = 1k\Omega$ and $V_{CC} = 10$ V. Assume $V_{BE} = 0$, Choose R_B so that the quiescent collector to emitter voltage is 4 V. also find the stability factor.	**07**
Q.4	**(a)**	What is the need of biasing in case of transistor? List different biasing method and explain any one.	**07**
	(b)	Explain the output characteristic of NPN transistor in CE configuration also indicate the different region.	**07**
		OR	
Q.4	**(a)**	Explain the h-parameter model of CE amplifier with bypass resistance R_E and derive expression for A_i, A_v, R_i and R_o.	**07**
	(b)	Define the term voltage gain, current gain and power gain for the transistor. If a transistor have value of $\alpha = 0.96$ and emitter to base resistance 80 Ω is placed in common emitter configuration. Determine A_I,A_V and A_P.	**07**
Q.5	**(a)**	Write a brief note on Thermal Runaway and Thermal Stability.	**07**
	(b)	Explain the principle of operation of JFET. Also compare FET with BJT.	**07**
		OR	
Q.5	**(a)**	Classify the power amplifiers based on the position of Q-point on the ac load line. Also explain Class B push pull amplifier.	**07**
	(b)	Explain the cross section of N channel enhancement MOSFET with the help of neat sketch. Draw and explain the symbol of this device.	**07**

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