USN										

FIRST Semester B. E. Degree Semester End Examination (SEE), Jan/ Feb 2024

Introduction to Electronics

(Model Question Paper - 1)

[Time: 3 Hours] **[Maximum Marks: 100]**

Instructions to students:

i. **Answer FIVE FULL Questions as per choice.**
ii. **Use BLACK ball point pen for text, figure, table, etc.**
iii. **Assume missing data, if any.**

			Marks	CO	RBT Level
1.	**a)**	Define diode and Explain the working of diode under Forward and Reverse bias conditions along with VI Characteristic .	**[08Marks]**	**CO1**	**L1**
	b)	Explain DC Load line and Quiescent point. With an example illustrate how to identify points A and B to draw DC Load line with necessary equations and DC loadline .	**[08 Marks]**	**CO1**	**L1**
	c)	Write short notes on Zener diode.	**[04 Marks]**	**CO1**	**L1**
		OR			
2.	**a)**	With relevant circuit diagram and waveforms explain the working of Bridge wave Rectifier.	**[08 Marks]**	**CO1**	**L1**
	b)	Compare three methods of diode approximation	**[08 Marks]**	**CO1**	**L1**
	c)	Determine the dc resistance levels for a diode with following parameters; A.) I_D = 2mA , V_D= 0.5 V B.) I_D = -1 µA , V_D= - 10 V	**[04 Marks]**	**CO1**	**L1**
3.	**a)**	Choose a NPN transistor ,draw the circuit showing the various current and voltage components and arrive at the equation for α and β (current gains)	**[08 Marks]**	**CO2**	**L2**
	b)	Outline the input and output characteristics waveform for a transistor connected in Common Emitter configuration and explain the 3 regions of operation.	**[08 Marks]**	**CO2**	**L2**
	C)	Calculate α_{dc} and β_{dc} for the transistor if Ic is 1mA and I_B is 25µA. Also determine the new base current given I_C is 5mA	**[04 Marks]**	**CO2**	**L2**
		OR			
4.	**a)**	Explain the Operation of n-channel JFET under following conditions a.) V_{GS} = 0V b.) V_{GS} < 0	**[07 Marks]**	**CO2**	**L2**
	b)	List the types of MOSFET and Explain the operation of N- type enhancement MOSFET	**[07 Marks]**	**CO2**	**L2**
	c)	Compare BJT , FET and MOSFET	**[06 Marks]**	**CO2**	**L2**

5.	**a)**	What is op-Amp? Explain the various parameters of Operational Amplifier.	**[07 Marks]**	**CO3**	**L2**
	b)	Sketch the circuits of each of the following based on the use of Op-amp along with input and output waveforms: i)Integrator ii)Voltage follower iii)Comparator	**[07 Marks]**	**CO3**	**L2**
	c)	List the characteristics of Operational Amplifier.	**[06 Marks]**	**CO3**	**L2**
		OR			
6.	**a)**	With neat circuit diagram explain inverting and non inverting Amplifier.	**[08Marks]**	**CO3**	**L2**
	b)	With neat circuit diagram explain the summing Amplifier and Differential Amplifier.	**[08 Marks]**	**CO3**	**L2**
	c)	An inverting op-amp is to operate according to the following specifications, Voltage gain=100,Input resistance=10k,Lower cutoff frequency=250Hz, upper cutoff frequency=15kHz ,Design the circuit to satisfy the above specification using an Operational Amplifier.	**[04 Marks]**	**CO3**	**L2**
7.	**a)**	Convert a) $(AC12)_{16}= (?)_8= (?)_2$ b) $(3276.3607)_8 = (?)2=(?)_{16}$.	**[08 Marks]**	**CO4**	**L2**
	b)	State and prove De Morgan's theorem for two variables.	**[06 Marks]**	**CO4**	**L2**
	c)	Write the typical schematic arrangement of microprocessor and Explain.	**[06 Marks]**	**CO4**	**L2**
		OR			
8.	**a)**	Explain different addressing modes of microprocessor with an example	**[08 Marks]**	**CO4**	**L2**
	b)	Draw the symbol, truth table and expression for output for (i) NOT gate (ii) AND gate (iii) OR gate	**[06 Marks]**	**CO4**	**L2**
	c)	Describe the working of the full adder using basic gates.	**[06 Marks]**	**CO4**	**L2**
9.	**a)**	Explain the schematic block diagram of basic communication system in detail.	**[08 Marks]**	**CO5**	**L2**
	b)	What is noise ? Explain the types of external noise.	**[06 Marks]**	**CO5**	**L2**
	c)	Define the following . A.) Critical Frequency B.) Skip Distance C.) MUF D.) Fading	**[06 Marks]**	**CO5**	**L2**
		OR			
10.	**a)**	Explain 1.)Handoff management 2.) Location management	**[10 Marks]**	**CO5**	**L2**
	b)	With neat block diagram explain GSM architecture in detail.	**[10 Marks]**	**CO5**	**L2**