Model Question Paper- I with effect from 2022

CBCS SCHEME

First/ Second Semester B.E Degree Examination, _____

Basic Electronics (BBEE103/203)

TIME: 03 Hours **Max.Marks:100**

Notes:

1. *Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE***
2. *VTU Formula Hand Book is Permitted*
3. *M: Marks, L: Bloom's level, C: Course outcomes.*

		Module - 1	M	L	C
Q.1	**a**	Explain forward and reverse biasing VI characteristics of PN junction.	**6**	**L2**	**CO1**
	b	A Zener diode has a breakdown voltage of 10V. it is supplied from a voltage source varying between 20 to 40 V in series with a resistance of 820Ω. Using ideal Zener diode model obtain minimum and maximum zener currents.	**7**	**L2**	**CO1**
	c	With neat circuit diagram and waveforms explain the working of bridge rectifier.	**7**	**L2**	**CO1**
		OR			
Q.2	**a**	Explain how zener diode can be used as a voltage regulator.	**6**	**L2**	**CO1**
	b	Explain with neat diagram and waveform working of the half wave rectifier and also derive an expression for the efficiency and ripple factor	**7**	**L2**	**CO1**
	c	In a full-wave rectifier, the input is from 30-0-30 V transformer. The load and diodeforward resistance are 100 Ω and 10 Ω respectively. Calculate the average load current,average load voltage and rectifier efficiency.	**7**	**L2**	**CO1**
		Module – 2			
Q.3	**a**	Explain input and output characteristics of the common emitter configuration	**6**	**L2**	**CO2**
	b	Make use of N-channel enhancement type MOSFET and describe the construction and working.	**7**	**L2**	**CO2**
	c	Explain various currents and voltages flowing through the BJT transistor.	**7**	**L3**	**CO2**
		OR			
Q.4	**a**	Explain the transistor biasing circuit with relevant expressions.	**7**	**L2**	**CO2**
	b	Make use of n-channel JFET to describe its operation and characteristics.	**7**	**L2**	**CO2**
	c	Define α and β. Determine the relationship between α and β	**6**	**L2**	**CO2**

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Module – 3					
Q5	**a**	Briefly discuss the ideal characteristics of the Opamp.	**7**	**L2**	**CO2**
	b	Design the circuit diagram for the output voltage $Vo = -5(0.1V_1 + .2V_2 + 10V_3)$.Also draw the neat circuit diagram.	**7**	**L3**	**CO2**
	c	Derive an expression for integrator or differentiator.	**6**	**L2**	**CO2**
OR					
Q.6	**a**	Design the circuit for the output voltage $v_o = 2\int v_1 dt + 0.4\frac{dv_2}{dt} + 10\ v_3$	**7**	**L2**	**CO2**
	b	Derive an expression for integrator or differentiator.	**6**	**L3**	**CO2**
	c	Derive an expression for the 3 input summing circuit.	**6**	**L2**	**CO2**
Module – 4					
Q.7	**a**	Solve a) $(725.25)_{10} = (\ ?\ )_2 = (\ ?\ )_{16}$ b) $(111100111110001)_2 = (\ ?\ )_8 = (\ ?\ )_{16}$	**6**	**L2**	**CO3**
	b	Build the equation Y = AB + CD + E to realize using a) NAND Gates b) NOR Gates	**7**	**L2**	**CO3**
	c	Construct and describe Full Adder with neat logic diagram and truth table.	**7**	**L3**	**CO3**
OR					
Q.8	**a**	State and prove *DeMorgan0s* theorem for three input variable.	**6**	**L2**	**CO3**
	b	Subtract $(101)_2$ from $(1101)_2$ using 1's and 2's complement method.	**7**	**L3**	**CO3**
	c	Construct and describe Half Adder with neat logic diagram and truth table.	**7**	**L2**	**CO3**
Module – 5					
Q.9	**a**	Explain potentiometric type transducer	**6**	**L2**	**CO5**
	b	A strain gauze with gauze factor of 2 is subject to a 0.28mmstarin. the wire dimensions are 50 cm length and 30µm diameter, and unstrained wire resistance is 55Ω. Calculate the change in wire resistance and diameter if the entire length of the wire is strained positively.	**7**	**L3**	**CO5**
	c	Define Modulation Explain the need of modulation	**7**	**L3**	**CO4**
OR					
Q.10	**a**	Explain LVDT with relevant diagrams.	**8**	**L3**	**CO5**
	b	A parallel plate capacitive transducer has a plate area $(l\ x\ w) = (40mm\ x\ 40mm)$ and plate spacing d=0.5mm. Calculate the device capacitance and displacement that causes the capacitance to change by 5 pF. Also determine the transducer sensitivity,	**5**	**L2**	**CO5**
	c	Describe the blocks of the basic communication system.	**7**	**L3**	**CO4**