CBCS SCHEME

USN | | | | | | | | | | |

BBEE103/203

First/Second Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025

Basic Electronics for EEE Stream

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Explain the VI characteristics of PN junction diode.	06	L2	CO1
	b.	Explain the operation of center tapped full wave rectifier.	08	L2	CO1
	c.	Design the zener diode regulator for the following specification. I_L = 10 mA , V_0 = 5 V, I_{zmin} = 1 mA , I_{zmax} = 25 mA and V_i = 10 V.	06	L3	CO1
		OR			
Q.2	a.	Explain the halfwave rectifier with 'C' filter.	07	L2	CO1
	b.	Explain the operation of zener voltage regulator.	07	L2	CO1
	c.	With relevant circuit explain the concept of Load line analysis of a diode.	06	L2	CO1
		Module – 2			
Q.3	a.	Explain common emitter input and output characteristics of a BJT.	08	L2	CO2
	b.	Explain various voltages and currents of BJT.	07	L1	CO2
	c.	With neat circuit diagram, explain DC line concept of a transistor amplifier to fix the Q point.	05	L2	CO2
		OR			
Q.4	a.	Explain the construction and operation of a JFET.	08	L2	CO2
	b.	Explain the construction and operation of a enhancement MOSFET.	08	L2	CO2
	c.	Mention any four differences between BJT and JFET.	04	L1	CO2
		Module – 3			
Q.5	a.	Define (i) CMRR (ii) Slew rate (iii) Input offset voltage (iv) Input offset current.	08	L1	CO2
	b.	Design a op-Amp circuit to get output voltage $V_0 = -(3V_1 + 2V_2 + 0.5V_3)$. Assume R_f = 10 kΩ.	06	L1	CO2
	c.	Derive the expression for the output voltage of a non-inverting amplifier.	06	L2	CO2

		OR			
Q.6	**a.**	Mention any six ideal characteristics of an opamp.	**06**	**L1**	**CO2**
	b.	Derive the expression for output voltage of a differentiator circuit.	**07**	**L2**	**CO2**
	c.	Derive the expression for the output voltage of a three input inverting summing amplifier.	**07**	**L2**	**CO2**
		Module – 4			
Q.7	**a.**	Convert : (i) $(23.25)_{10} = (\quad)_2 = (\quad)_{16}$ (ii) $(3250)_{10} = (\quad)_8 = (\quad)_{16}$	**06**	**L2**	**CO3**
	b.	Given the two binary numbers X = 1010100 and Y = 1000011, perform the subtraction (i) X – Y (ii) Y – X, using two's complement.	**08**	**L2**	**CO3**
	c.	Design Half adder using basic gates.	**06**	**L2**	**CO3**
		OR			
Q.8	**a.**	Prove Demorgan's theorem for two variables.	**06**	**L2**	**CO3**
	b.	Design full adder using basic gates.	**08**	**L2**	**CO3**
	c.	Express the Boolean function $F = xy + \overline{x}z$.	**06**	**L2**	**CO3**
		Module – 5			
Q.9	**a.**	Explain the operation of LVDT.	**08**	**L2**	**CO4**
	b.	Explain breifly block diagram of a communication.	**08**	**L2**	**CO5**
	c.	Mention the applications of optoelectric transducer.	**04**	**L1**	**CO2**
		OR			
Q.10	**a.**	Explain the operation of photodiode transducer.	**06**	**L2**	**CO4**
	b.	Explain briefly Thermistor transducers.	**08**	**L2**	**CO4**
	c.	Define Modulation. Explain the need for modulation.	**06**	**L1**	**CO5**

* * * * *