CBCS SCHEME

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

BBEE103/203

First/Second Semester B.E./B.Tech. Degree Supplementary Examination, June/July 2024

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. 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 the forward and reverse characteristics of a silicon diode.	08	L2	CO1
	b.	Describe the working of a two diode full wave rectifier with neat circuit diagram and waveforms.	08	L2	CO1
	c.	Explain the working of a capacitor filter for a half wave rectifier with neat circuit diagram and waveforms.	04	L2	CO1
		OR			
Q.2	a.	Explain the working of a full wave bridge rectifier with neat circuit diagram and waveforms.	08	L2	CO1
	b.	Illustrate how Zener diode can be used as voltage regulator in load and no load conditions.	08	L2	CO1
	c.	Write a note on ideal, practical and piecewise linear characteristics of a pn junction diode.	04	L2	CO1
		Module – 2			
Q.3	a.	Explain the input and output characteristics of a transistor in common Emitter configuration.	08	L2	CO2
	b.	Indicate the various voltages and currents in a transistor circuit and derive β_{dc} interms of α_{dc}.	06	L2	CO2
	c.	Explain the operating principle of an n channel JFET.	06	L2	CO2
		OR			
Q.4	a.	Explain the working of an n-channel enhancement type MOSFET.	08	L2	CO2
	b.	Describe the input and output characteristics of a transistor connected in common base configuration.	06	L2	CO1
	c.	Explain how the DC load line can be constructed with respect to a BJT.	06	L2	CO1
		Module – 3			
Q.5	a.	Define the following with respect to an opamp: (i) Slew rate (ii) CMRR (iii) Input Offset Voltage	06	L2	CO1
	b.	Explain how an opamp can be used as an integrator and differentiator.	08	L2	CO2
	c.	An opamp inverting amplifier has a feedback resistor of 15 KΩ and a input resistor of 2KΩ. Calculate the gain of the opamp and the output voltage if it is supplied with an input of 0.75V.	06	L3	CO2
		OR			
Q.6	a.	List the characteristics of an ideal opamp.	06	L2	CO1
	b.	Describe how an opamp can be used as a difference amplifier/subtracting circuit.	08	L2	CO2
	c.	Show how an opamp summing circuit can be used to produce an output voltage: $V_0 = -(3V_1 + 3V_2 + 3V_3)$	06	L3	CO2

		Module – 4			
Q.7	**a.**	Perform binary subtraction using 2's complement method on the following: (i) $(1101)_2 - (1010)_2$ (ii) $(10101.101)_2 - (01110.111)_2$	**04**	**L3**	**CO3**
	b.	Perform the following conversions: (i) $(82.25)_{10} = (?)_2$ (ii) $(46)_{10} = (?)_8$ (iii) $(126)_{10} = (?)_{16}$ (iv) $(111011.1001)_2 = (?)_{10}$	**08**	**L3**	**CO3**
	c.	Simplify the following Boolean functions: i) $(A + \overline{B}C)(\overline{A} + B + \overline{C})(A + \overline{B})$ ii) $A + A\overline{B} + \overline{A}B$	**08**	**L3**	**CO3**
		OR			
Q.8	**a.**	With neat diagram, explain Half adder.	**02**	**L2**	**CO3**
	b.	Explain how a full adder can be realized using two half adders.	**08**	**L2**	**CO3**
	c.	List the Boolean laws. Also state and prove Demorgan's theorem.	**10**	**L2**	**CO3**
		Module – 5			
Q.9	**a.**	Describe the working of a LVDT with neat diagram.	**08**	**L2**	**CO5**
	b.	Explain the general block diagram of communication system.	**06**	**L2**	**CO4**
	c.	Define modulation. What are the needs of modulation.	**06**	**L2**	**CO4**
		OR			
Q.10	**a.**	Explain the working of potentiometer-type resistive transducer.	**08**	**L2**	**CO5**
	b.	Describe piezo electric transducer.	**06**	**L2**	**CO5**
	c.	Write a short note on photodiodes.	**06**	**L2**	**CO5**

* * * * *