CBCS SCHEME

USN | | | | | | | | | | BBEE103/203

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2023
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.***
3. ***Assume missed data.***

		Module – 1	M	L	C
Q.1	a.	Explain forward and reverse characteristics of semiconductor diode.	8	L2	CO1
	b.	Calculate forward and reverse resistances offered by a silicon diode with I_f = 100mA at V_R = 50V. Assume V_F for silicon diode to be 0.75V and reverse current $I_R \simeq$ 100nA.	4	L3	CO1
	c.	What is piecewise linear characteristic? With neat diagram explain diode approximation of Ideal diode and practical diode.	8	L2	CO1
		OR			
Q.2	a.	Describe the working of full wave bridge rectifier.	8	L2	CO1
	b.	Explain zener diode as voltage regulator with no load and with load.	6	L2	CO1
	c.	Illustrate RC- π filter.	6	L2	CO1
		Module – 2			
Q.3	a.	Explain output characteristics of a transistor in common base configuration.	6	L2	CO2
	b.	Describe the procedure for drawing dc – load line on transistor CE output characteristics.	8	L2	CO2
	c.	Calculate I_c and I_E for a transistor that has α_{DC} = 0.98, I_B = 100μA. Also determine the value of β_{DC} for the transistor.	6	L3	CO2
		OR			
Q.4	a.	Explain common Emitter input characteristics.	6	L2	CO2
	b.	Explain how transistor can be used as current amplifier.	6	L2	CO2
	c.	Explain the working of N-channel JFET.	8	L2	CO2

		Module – 3			
Q.5	**a.**	Explain Inverting and Non-inverting amplifier.	**8**	**L2**	**CO2**
	b.	Define Op-Amp. Mention any 5 ideal characteristics of an op-amp.	**6**	**L2**	**CO2**
	c.	Draw a summer circuit with $V_1 = +1V$, $V_2 = +3V$, $V_3 = +2V$, $R_1 = R_2 = R_3 = 2K\Omega$. Determine the output voltage when $R_F = 3K\Omega$.	**6**	**L3**	**CO2**
		OR			
Q.6	**a.**	Explain the working of op-amp as Differentiator.	**8**	**L2**	**CO2**
	b.	Define : i) Input offset current ii) Input bias current iii) slew rate iv) CMRR	**6**	**L2**	**CO2**
	c.	With block diagram, explain basic structure of an Op amp. Also write its equivalent circuit diagram.	**6**	**L2**	**CO2**
		Module – 4			
Q.7	**a.**	Convert the following : i) $(2AB.8)_{16} = (\ )_{10}$ ii) $(416.12)_{10} = (\ )_8$ iii) $(25.375)_{10} = (\ )_2$ iv) $(16.2)_8 = (\ )_{16}$	**6**	**L2**	**CO3**
	b.	Find complement of the function i) $F_1 = x'yz' + x'y'z$ ii) $F_2 = x(y'z' + yz)$ Using De-Morgan's theorem.	**8**	**L2**	**CO3**
	c.	Explain the working of Half adder.	**6**	**L2**	**CO3**
		OR			
Q.8	**a.**	Express the Boolean function $F = A + B'C$ in sum of minterms.	**6**	**L3**	**CO3**
	b.	Mention the postulates and theorems of Boolean algebra.	**8**	**L2**	**CO3**
	c.	Explain the working of full adder.	**6**	**L2**	**CO3**
		Module – 5			
Q.9	**a.**	Describe the working of LVDT.	**6**	**L2**	**CO4**
	b.	Explain the working principle of capacitive pressure transducer.	**6**	**L2**	**CO4**
	c.	With neat block diagram, explain the working of communication system.	**8**	**L2**	**CO4**
		OR			
Q.10	**a.**	Describe a Thermistor and sketch approximate resistance/temperature characteristics for a thermistor.	**6**	**L2**	**CO1**
	b.	Write a short notes of photo diodes	**6**	**L2**	**CO5**
	c.	What is modulation? Describe the need of modulation in communication system.	**8**	**L2**	**CO5**