CBCS SCHEME

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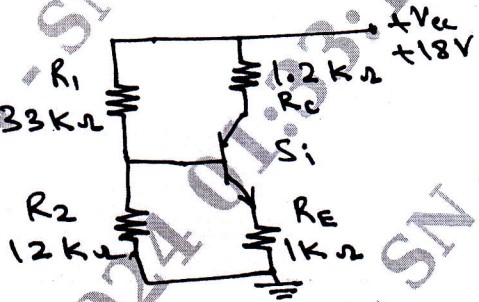
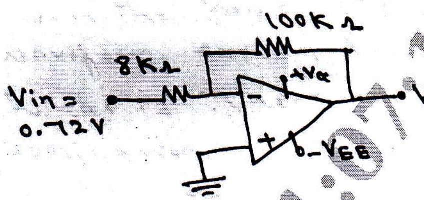
BBEE103/203

First/Second Semester B.E./B.Tech. Degree 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. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Sketch the forward and Reverse characteristics for a Silicon diode and explain it.	6	L2	CO1
	b.	Explain the working of a Half wave rectifier with input and output waveform.	8	L2	CO1
	c.	What is Filter? Mention the types of Filter.	6	L1	CO1
		OR			
Q.2	a.	Write the various Diode Approximations.	8	L1	CO1
	b.	With circuit diagram and waveform, explain the working of a RC – π filter using Bridge rectifier.	6	L2	CO1
	c.	Explain the working of a Zener diode as a voltage Regulator with no load.	6	L2	CO1
		Module – 2			
Q.3	a.	Calculate I_c, I_E, and β for a Transistor that has α = 0.98 and I_B = 100μA.	6	L3	CO2
	b.	Draw the input and output characteristics of a common – Emitter of a Transistor and explain it.	8	L2	CO2
	c.	For the voltage divider bias circuit shown in Fig Q2(c), determine V_B, V_E, I_E and V_{CE}. Assume V_{BE} = 0.7V  Fig Q2(c)	6	L3	CO2
		OR			
Q.4	a.	Explain the operation of an n-channel JFET for various bias voltages.	6	L2	CO2
	b.	Mention the advantages of FET over a BJT.	6	L1	CO2
	c.	Explain the construction of Enhancement MOSFET.	8	L2	CO2
		Module – 3			
Q.5	a.	Mention the ideal characteristics of Op-Amp.	10	L2	CO2
	b.	Define the following parameters of Op-Amp i) CMRR ii) Slew rate iii) PSRR iv) Input offset voltage.	4	L1	CO2
	c.	Derive the expression of voltage Gain of a Non-inverting Op-Amp.	6	L2	CO2
		OR			
Q.6	a.	How Op-Amp can be used as an integrator.	6	L2	CO2

	b.	Draw the block diagram of Typical Op-Amp and mention the function of each block.	6	L1	CO2
	c.	For the circuit shown in Fig Q6(c), find output voltage and voltage gain.  Fig Q6(c)	8	L3	CO2
		Module – 4			
Q.7	a.	Perform the following : i) $(532.65) = (\ )_{16} = (\ )_2$ ii) $(ABCD)_{16} = (\ )_2 = (\ )_8$.	8	L3	CO3
	b.	State and prove the De Morgan's theorem for two variables.	8	L1	CO3
	c.	Using basic Boolean theorem prove that $(x + y)(x + z) = x + yz$.	4	L3	CO3
		OR			
Q.8	a.	Draw the logic circuit for the Boolean expression $Y = \overline{A}BC + A\overline{B}C + ABC$.	4	L1	CO4
	b.	Implement full adder using Two half adder and an OR-Gate.	8	L3	CO4
	c.	Simplify the following Boolean expressions $(A+B)(\overline{A}+B)$ ii) $\overline{A}\,\overline{B}\,\overline{C} + \overline{A}BC + AB\overline{C}$.	8	L3	CO4
		Module – 5			
Q.9	a.	What is strain Gauge? Explain the construction of unbounded strain gauge.	8	L2	CO5
	b.	With the help of circuit diagram and waveform, explain the operation of LVDT.	8	L2	CO5
	c.	What is Thermistor? Mention its applications.	4	L1	CO5
		OR			
Q.10	a.	Explain the working of Photodiode.	7	L2	CO5
	b.	Draw the block diagram of Superhetrodyne receiver and mention the function of each block.	10	L2	CO5
	c.	Mention the need for modulation.	3	L1	CO5

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