BBEE103/203

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2024
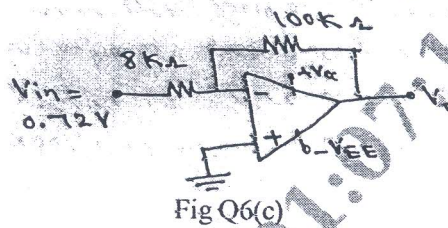## Basic Electronics for EEE Stream

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.

			M	L	C
Module – 1					
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 $\alpha = 0.98$ and $I_B = 100\mu A$.	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 $V_{BE} = 0.7V$	6	L3	CO2

Fig Q2(c)

			M	L	C
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.	8	L3	CO2

Fig Q6(c)

		Module – 4			
Q.7	a.	Perform the following : i) $(532.65) = (\quad)_{16} = (\quad)_{2}$ ii) $(ABCD)_{16} = (\quad)_{2} = (\quad)_{8}$.	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) $\overline{A}\,\overline{B}\,\overline{C} + \overline{A}B\overline{C} + A\overline{B}\,\overline{C}$.	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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