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EAST POINT COLLEGE OF ENGINEERING & TECHNOLOGY
An Autonomous Institution Affiliated to Visvesvaraya Technological University (VTU) Belagavi

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EPESK104C/EPESK204C

First/Second Semester B.E. Degree Examination, May 2026
ELECTRONIC PRINCIPLES AND CIRCUITS

TIME:3 hrs. Max.Marks:100

Note: 1. Answer any FIVE full questions, choosing ONE question from each MODULE
2. Formula Hand Books Permitted
3. M: Marks, L: Bloom's level, C: Course outcomes.

		Module-1	M	L	C
Q.1	a	Explain the working principle of Bridge rectifier with a neat circuit diagram and waveforms.	7	L2	CO1
	b	With a neat block diagram explain power supply circuit.	5	L2	CO1
	c	In a Zener voltage regulator Vin =18V, Rs=270Ω, Zener Voltage=10V and load resistance=10 KΩ. Determine i) load current ii) Zener current iii) Power dissipated in resistor Rs iv) Power dissipated in load resistor iv) Power dissipated in Zener diode.	8	L3	CO1
		OR			
Q.2	a	Describe with neat diagram, a voltage multiplier circuit.	6	L2	CO1
	b	Define the following terms: i) Gain ii) Bandwidth iii) Frequency response iv) Phase shift v) Input and Output Resistance	6	L2	CO1
	c	An amplifier produces an output voltage of 2V and input of 50mV. If the input and output currents in this condition are respectively 4mA, and 200mA. Determine the following: i) Voltage gain ii) Current gain iii) Power gain	8	L3	CO1
		Module–2			
Q.3	a	Define operational amplifier? Illustrate the reason for its name.List the characteristics of Op-amp.	7	L2	CO2
	b	For a Wein bridge oscillator, determine the output frequency if C1=C2=100Nf i) When R1=R2=1KΩ ii) When R1=R2=6KΩ	7	L3	CO2
	c	Describe the working of Op amp as an inverting amplifier.	6	L2	CO2
		OR			
Q.4	a	Explain how Op-amp can be used as an integrator. Derive an expression for Op amp as an integrator circuit.	6	L2	CO2
	b	The tuned collector oscillator circuit used in the local oscillator of a radio receiver makes use of an LC tuned circuit with $L_1 = 58.6\ \mu H$ and $C_1 = 300$ pF. Calculate the frequency of oscillations.	6	L3	CO2
	c	Derive an expression for Op-amp as a Summing amplifier.	8	L2	CO2
		Module–3			
Q.5	a	Convert the following: i) $(1101101)_2 = (?)_{10}$ ii) $(11110110011)_2 = (?)_{16}$ iii) $(431.12)_{10} = (?)_8$ iv) $(45)_{10} = (?)_{16}$ v) $(ABC4)_{16} = (?)_2$	10	L3	CO3
	b	Design Full adder using two half adders with its logic diagram and truth table.	5	L2	CO3

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	c	Explain the Commutative, Associative, and Distributive laws in Boolean algebra. Illustrate each law with appropriate truth tables.	5	L3	CO3
		OR			
Q.6	a	Explain De Morgan's Law in Boolean algebra. Provide an example and illustrate it with a truth table.	4	L2	CO3
	b	Realize AND, OR, XOR and XNOR gate using truth table and symbol	6	L2	CO3
	c	(a) Simplify (i)A+AB+ABC (ii) (A+B)(A+C)=AC+AB (b) Perform (i) $(101011)_2$-$(10000)_2$ using 1's complement method and 2's complement method.	10	L3	CO3
		Module–4			
Q.7	a	Define an embedded system. How does it differ from a general computing system?	6	L2	CO4
	b	What are the main elements of an embedded system? Explain each block with diagram.	6	L2	CO4
	c	Explain the working of a 7-segment LED display.	8	L2	CO4
		OR			
Q.8	a	Differentiate between microprocessors and microcontrollers in the context of embedded systems.	5	L2	CO4
	b	List the major application areas of embedded system.	5	L2	CO4
	c	Define the following terms: i) ROM ii) Sensor iii) Actuator iv) RISC v) CISC	10	L2	CO4
		Module–5			
Q.9	a	Explain modern communication systems with block diagram.	6	L2	CO5
	b	Define digital modulation and list out types of digital modulation techniques.	6	L2	CO5
	c	Briefly describe Frequency modulation (FM) with waveform.	8	L2	CO5
		OR			
Q.10	a	Explain the basic concept of Amplitude modulation (AM) with waveform.	5	L2	CO5
	b	List and explain the key advantages of digital communication over analog communication.	5	L2	CO5
	c	Explain different types of digital modulation schemes with waveforms.	10	L2	CO5

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