Code No.: CS403ES	R20	H.T.No.			8	R						

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
II–B.TECH–II–Semester End Examinations (Supply) -June- 2025
ANALOG & DIGITAL ELECTRONICS
(Common to CSE, CSC)

[Time: 3 Hours] **[Max. Marks: 70]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 20 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A **(20 Marks)**

1.	a)	What is meant by "Acceptor" and "Donor".	[2M]
	b)	Define Form factor and Peak factor.	[2M]
	c)	What is the need for biasing a transistor	[2M]
	d)	Give the differences in performance of an RC coupled amplifier over single stage amplifier.	[2M]
	e)	Why a field effect transistor is called so?	[2M]
	f)	Write the features CMOS technology.	[2M]
	g)	What is a Karnaugh map?	[2M]
	h)	List out the differences between DEMUX and MUX	[2M]
	i)	What is a sequential circuit? List the types of sequential circuits.	[2M]
	j)	Define synchronous counter.	[2M]

PART-B **(50 Marks)**

2.	a)	What is meant by tunneling? From the energy band diagram explain the V-I characteristics of a tunnel diode.	[5M]
	b)	Discuss the effect of temperature on PN Junction diodes.	[5M]
		OR	
3.	a)	Draw the circuit diagram of an Full wave rectifier and explain its operation.	[5M]
	b)	A full wave rectifier has a load of 3.5 kΩ .If the diode resistance and secondary coil resistance together have a resistance of 800 Ω and the input voltage has a signal voltage of peak value 240 V, Calculate D.C. Power output, A.C. Power Input, Efficiency of the Rectifier	[5M]
4.	a)	Draw a self bias circuit and derive the expression for the stability factor.	[5M]
	b)	What is thermal runaway? How can it be avoided? What are three factors contribute to thermal instability	[5M]
		OR	
5.		Derive the equation for the overall voltage gain of a multistage amplifier in terms of the individual voltage gains	[10M]
6.		Draw the small signal equivalent circuit of FET amplifier in CS connection and derive the equations for voltage gain ,Input impedance and output Impedance	[10M]
		OR	
7.	a)	Convert octal number in binary (i)7013 (ii)1234	[5M]
	b)	Define logic gate and logic circuit? What are called universal logic gates? Why they are called so?	[5M]

8.a)	What is a multiplexer? Explain the operation of 4 to 1 line multiplexer.	[5M]
b)	Explain how a digital Demultiplexer cab be realized using logic gates.	[5M]

OR

9.a)	Design a logic circuit with four input variables that will produce a 1 output when any three input variables are 1s.Use K-Map for simplifying the logic expression.	[5M]
b)	Draw the truth table of full adder circuit and design using NAND gates.	[5M]
10.a)	Show how a SR flip-flop can be constructed using NOR Gates? Explain the different states of the SR flip-flop.	[5M]
b)	What is Race-arround condition? How can you overcome this effect in J-K flip-flop? Explain.	[5M]

OR

11.	Explain the operations of S-R Flip-Flop, J-K Flip-Flop with circuit diagrams and excitation tables.	[10M]

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