PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2024
(First Semester)

Branch - APPLIED ELECTRONICS

ANALOG AND DIGITAL CIRCUIT DESIGN

Time: Three Hours   Maximum: 75 Marks

SECTION-A (10 Marks)
Answer ALL questions
ALL questions carry EQUAL marks $(10 \times 1 = 10)$

Module No.	Question No.	Question	K Level	CO
1	1	Define input offset current of op-amps _____. (a) $I_{B1} - I_{B2}$ (b) $I_{B1} + I_{B2}$ (c) $I_{B1} * I_{B2}$ (d) I_{B1} / I_{B2}	K1	CO1
	2	Choose the correct formula for input bias current. (a) $(I_{B1} - I_{B2}) / 2$ (b) $(I_{B1} + I_{B2}) / 2$ (c) $I_{B1} - I_{B2}$ (d) $I_{B1} + I_{B2}$	K2	CO1
2	3	Choose the correct feature of an instrumentation amplifier. (a) high gain accuracy (b) low CMRR (c) high dc offset (d) high output impedance	K1	CO1
	4	Find the type of amplifier that cannot be considered in differential configuration. (a) Summing amplifier (b) Scaling amplifier (c) Averaging amplifier (d) Subtractor.	K2	CO1
3	5	Which of the following is the characteristics of clipper circuit? (a) clips off waves (b) zero distortion while clipping (c) removes a portion of waves (d) All the above	K1	CO1
	6	How a triangular wave can be generated? (a) integrating square wave (b) differentiating sine wave (c) inverting sine wave (d) differentiating square wave	K2	CO1
4	7	Which of the following can be represented for decoder? (a) sequential circuit (b) combinational circuit (c) logical circuit (d) none of the above	K1	CO1
	8	Which gate is used as a half adder? (a) AND and EXOR (b) EXOR and NOR (c) OR and NOT (d) NOR and NAND	K2	CO1
5	9	Choose the correct answer for D-flip-flop used as (a) Differentiator (b) Divider circuit (c) Delay a switch (d) All of these	K1	CO1
	10	Which of the following are the components of a 3-bit synchronous counter? (a) JK flip-flop (b) AND gates (c) OR gates (d) Both (a) and (b)	K2	CO1

SECTION - B (35 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** Marks   (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain the importance of slew rate.	K5	CO1
		(OR)		
	11.b.	Justify the concept of input offset voltage.		
2	12.a.	Analyze the importance of instrumentation amplifier.	K4	CO1
		(OR)		
	12.b.	List the key features of LDO regulators.		
3	13.a.	List the different types of clippers and explain any one.	K4	CO1
		(OR)		
	13.b.	Distinguish between V/F and F/V converters.		
4	14.a.	Design a 1:8 demultiplexer using two 1:4 demultiplexers.	K6	CO4
		(OR)		
	14.b.	Design a 2-bit comparator using logic gates.		
5	15.a.	Explain the block diagram of Moore model.	K5	CO5
		(OR)		
	15.b.	Determine the state table for 'JK flip-flop.		

SECTION -C (30 Marks)
Answer **ANY THREE** questions
ALL questions carry **EQUAL** Marks   (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Analyze the importance of input bias current and input offset current.	K4	CO1
2	17	Classify the different type's voltage regulators and explain it.	K4	CO1
3	18	Explain the different types of clampers and explain with neat sketch.	K5	CO2
4	19	Compare the difference between demultiplexer and decoder.	K5	CO4
5	20	Design and explain the working of a synchronous mod-4 up counter.	K6	CO5

Z-Z-Z   END