22ELP101N / 22ELP101

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2023
(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 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	What is the open loop gain of an ideal op-amp is _____? (a) Infinity (b) zero (c) unity (d) none of the above	K1	CO1
	2	What is the input bias current for 741 op-amp? (a) 50 nA (b) 500nA (c) 5mA (d) 50mA	K2	CO2
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	How many inputs having a summing amplifier? (a) No more than two input signals (b) Two or more input signals (c) A closed loop input impedance of infinity (d) A small open-loop voltage gain.	K2	CO2
3	5	Which of the following is the basic function of clipper? (a) shape wave (b) clip wave (c) introduce noise (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	CO2
4	7	Which gate is used as a full adder? (a) AND, OR and EXOR (b) AND, EXOR and NOR (c) AND, OR and NOT (d) EXOR, NOR and NAND	K1	CO1
	8	Choose the correct answer for to construct decoder. (a) Inverter (b) AND gates (c) EXOR gates (d) None of the above	K2	CO2
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	CO2

Cont...

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.	Justify the concept of CMRR.	K5	CO1
		(OR)		
	11.b.	Explain the importance of a slew rate.		
2	12.a.	Compare fixed and adjustable voltage regulators.	K4	CO1
		(OR)		
	12.b.	Categories of active filter and briefly explain it.		
3	13.a.	Classify the different types of comparator and explain any one.	K4	CO1
		(OR)		
	13.b.	Compare V/F and F/V converters.		
4	14.a.	Design and explain the working of a 4 to 1 multiplier.	K6	CO4
		(OR)		
	14.b.	Design and explain the working of a full adder.		
5	15.a.	Compare Moore and Mealy models.	K5	CO5
		(OR)		
	15.b.	Determine the state diagrams 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	Explain the terms of input bias current and input offset current.	K5	CO1
2	17	Explain an instrumentation amplifier using op-amp.	K5	CO2
3	18	Classify the different types of clippers and explain it.	K4	CO2
4	19	Compare decoder and demultiplexer.	K4	CO4
5	20	Design and explain the working of a synchronous mod-3 up counter.	K6	CO5

Z-Z-Z

END