PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2025
(First Semester)

Branch - **COMPUTER TECHNOLOGY**

DIGITAL ELECTRONICS AND COMPUTER SYSTEM ARCHITECTURE

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	Convert the binary equivalent 10101 to its decimal equivalent a) 31 b) 10 c) 21 d) 12	K1	CO1
	2	Which of the following is a logic gates are known as universal gates? a) XOR, NAND b) NOR, NAND c) AND, OR d) NOT, XOR	K2	CO1
2	3	Which logic circuit would you use for addressing memory? a) Full adder b) Multiplexer c) Direct Memory Access d) Decoder	K1	CO2
	4	In JK Flip flop, the function K=J is used to realize a) D flip flop b) T flip flop c) SR flip flop d) Maser Slave flip flop	K2	CO2
3	5	Digital circuit that forms the arithmetic sum of 2 bits and the previous carry is called a) Full Adder b) Full Subtractor c) Half Adder d) Half Subtractor	K1	CO3
	6	Name the Boolean function of F←A⊕B Micro operations a) OR b) AND c) Exclusive OR d) Complement	K2	CO3
4	7	The addressing mode, where you directly specify the operand value is _____ a) Immediate b) Direct c) Definite d) Relative	K1	CO4
	8	Identify the following is the transformation from the instruction code bits to an address in control memory where the routine is located a) mapping b) routine c) Scaling d) converting	K2	CO4
5	9	Select the following memory is used to increase the speed of processing a) Virtual b) RAM c) Cache d) Secondary	K1	CO5
	10	The performance of cache memory is frequently measured in _____ a) Access ratio b) hit ratio c) no of hits d) transfer rate	K2	CO5

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.	Convert below into a binary equivalent $(255)_{10}$ $(214)_8$ $(3A)_{16}$	K2	CO1
		(OR)		
	11.b.	Perform following Binary addition and Subtraction a) 11011 + 10001 b) 10101.01 + 110001.11 c) 11011 from 11110 d) 111000 from 1101101		
2	12.a.	Simplify the following using K-map f(A, B, C, D) = (2, 3, 5, 6, 7, 9, 11, 13)	K3	CO2
		(OR)		
	12.b.	With neat sketch, explain the operations of JK flip flop		
3	13.a.	Design Bus system for Four-bit register using 4x1 Mux.	K3	CO3
		(OR)		
	13.b.	Write short note on following i) Memory Bus ii) Handshaking		
4	14.a.	Point out various addressing modes of CPU.	K3	CO4
		(OR)		
	14.b.	Specify different instruction formats with examples.		
5	15.a.	Elucidate DMA controller and its mode of data transfer.	K3	CO5
		(OR)		
	15.b.	Write a note on virtual memory.	K2	

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	Classify different types of logic gates and explain in detail.	K3	CO1
2	17	Illustrate with neat diagram of Full adder and Full subtractor.	K3	CO2
3	18	Write in detail about Logic Micro Operations with neat representations?	K4	CO3
4	19	Explain in detail the different instruction formats with examples.	K4	CO4
5	20	Discuss the cache memory concept with diagram.	K4	CO5

Z-Z-Z END