

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION MAY 2026
(Fifth Semester)

Branch - PHYSICS

PRINCIPLES OF DIGITAL ELECTRONICS

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 Excess-3 value for the decimal number 6? a) 0110 b) 0011 c) 1101 d) 1001	K1	CO1
	2	Identify the correct one for two's complement. a) 1's complement adds 1 at the end b) 2's complement flips bits only c) 2's complement adds 1 to the 1's complement d) 1's complement give the same result as 2's	K2	CO1
2	3	Which of the following is correct one for NOT gate? a) output same as input b) outputs high for any input c) inverts the input d) it have two inputs	K1	CO2
	4	Classify the group that contains 4 adjacent 1's in a 4 variable K-map. a) pair b) quad c) octet d) grouped cells	K2	CO2
3	5	Recall how many bits are added using a 4-bit binary adder. a) 8 b) 6 c) 4 d) 2	K1	CO3
	6	Predict the role of parity generator in digital communication. a) generate error connection code b) decode data signals c) multiplex data signals d) produce a parity bit based on input data bits	K2	CO3
4	7	Choose the main function of shift register. a) store data temporarily b) shifts data bits serially or parallelly c) counts pulses d) decodes binary inputs	K1	CO4
	8	Show the outcome that occurs when both inputs of a NAND latch are low. a) holds previous state b) sets output high c) resets output low d) produce invalid state	K2	CO4
5	9	Identify the main component used in a counter type A/D converter. a) shift register b) flip flops c) comparator and counter d) multiplexer	K1	CO5
	10	Indicate the type of output pulse generated in monostable mode by the 555 timer IC. a) single fixed pulse b) repeated toggling output c) continuous pulses d) constant low output	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.	Explain BCD code and Excess-3 code.	K2	CO1
		(OR)		
	11.b.	Outline the concept of signed binary numbers with examples		
2	12.a.	Construct the logical circuit for Ex-OR and Ex-NOR gates and explain their operations.	K3	CO2
		(OR)		
	12.b.	Develop 2, 3 and 4 variable K-map for minterms.		
3	13.a.	Analyze how a four bit adder operates, when adding two binary numbers.	K4	CO3
		(OR)		
	13.b.	Examine the working of multiplexer with neat sketch.		
4	14.a.	Inspect how an SR flip flop responds to different input conditions.	K4	CO4
		(OR)		
	14.b.	Elaborate the working of shift register.		
5	15.a.	Sketch the diagram of successive approximation A/D converter and explain the functions.	K3	CO5
		(OR)		
	15.b.	Explain how 555 timer IC act as a Schmitt trigger.		

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 different types of Number systems with example.	K4	CO1
2	17	Illustrate how NOR gates can be combined to construct the functions of an inverter, an AND gate and OR gate.	K4	CO2
3	18	Distinguish between a decoder and encoder.	K4	CO3
4	19	Elaborate on the role of the J and K inputs in J-K flip flops.	K4	CO4
5	20	Analyze the operation of a 555 timer configuration as a monostable multivibrator.	K4	CO5

Z-Z-Z

END