PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2024
(Fifth Semester)

Branch – **PHYSICS**

PRINCIPLES OF DIGITAL ELECTRONICS

Time: Three Hours Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1 Representation 14_{10} in gray code
(i) 1000 (ii) 1010
(iii) 1001 (iv) 1011

2 Which of the following gates cannot function on a double input?
i) NOT (ii) AND
(iii) OR (iv) NAND

3 The full subtractor can be implemented using _____
(i) Two XOR and an OR gates
(ii) Two half subtractors and an OR gate
(iii) Two multiplexers and an AND gate
(iv) Two comparators and an AND gate

4 When both inputs of a J-K flip-flop cycle, the output will _____
(i) be invalid (ii) change
(iii) not change (iv) toggle

5 A 555 timer in astable (free-running) mode can be used for
(i) electronic oscillator (ii) light emitting diode
(iii) logic clocks (iv) all the above

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 a Explain about binary addition with example.
OR
b Compare 4221 and 2421 BCD code.

7 a Draw the symbols of basic logic gates and write their truth tables.
OR
b State the associative and commutative laws of Boolean algebra.

8 a Explain Half adder with neat circuit diagram.
OR
b Why EXOR is used in gray to binary code? Give examples.

9 a Give the circuit diagram and truth table of T flip flop.
OR
b With a neat sketch, show the condition of shift register with truth table.

10 a Draw the counter type D/A converter circuit and explain it.
OR
b Construct Schmitt trigger circuit using 555 timer.

Cont...

SECTION -C (30 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 x 6 = 30)

11 a Convert the following hexadecimal number into decimal number.
(i) $(A37E)_{16}$
(ii) $(1A)_{16}$

OR

b Solve the following by using binary multiplication rules.
i. 110_2 X 101_2
ii. 11101_2 X 1001_2

12 a Show that NOR is universal building block.

OR

b Elucidate 3 variable K-map using minterms with appropriate examples.

13 a Enumerate the function of Full adder with truth table.

OR

b Justify the working of Demultiplexer with necessary logic circuits and truth table.

14 a Describe the working of a SR flip flop with neat circuit diagram.

OR

b Describe the working principle of Asynchronous counter.

15 a Draw binary weighted resistor D/A converter circuit and explain it.

OR

b Discuss the circuit of 555 timer as Astable multivibrator.

Z-Z-Z END