PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION DECEMBER 2022
(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 x 1 = 10)

1   The binary equivalent of the octal number 25 is -------
(i) 010101   (ii) 001011   (iii) 001101   (iv) 010111

2   The 1s complement of the given number 001010 is ----
(i) 001011   (ii) 110101   (iii) 110010   (iv)111000

3   The output of the AND gate is represented by the equation------
(i)A*B   (ii) A+B   (iii).A-B   (iv) A/B

4   The sum of product form for the following Boolean expression is(A+C)(B+AC) is----
(i) AB+AC   (ii) AB+AC+BC   (iii)AB+BC   (iv)A+BC

5   The output gates of a half adder circuit are------
(i) AND gate   (ii) AND gate and OR gate
(iii) AND & EX-OR gate   (iv) EX-OR gate

6   A multiplexer has----
(i) One data input,several data outputs and selection inputs
(ii) One data input, one data output and one selection input
(iii) Several data inputs, several data outputs and selection inputs
(iv) Several data inputs, one data output and selection inputs.

7   S=1, R=1 state in SR Flip Flop Circuit is-----
(i) Forbidden state   (ii) Toggle state
(iii) SET State   (iv) RESET State

8   Which of the statement is false regarding the Asynchronous Counter?
(i) Divide by N counter   (ii) Ripple counter
(iii) Receives pulses at the same time
(iv) receive pulses from the preceding output.

9   Astable multivibrator has-----
(i) No stable state   (ii) One stable state
(iii) Two stable states   (iv)Three stable states

10   The output wave form of Schmitt trigger circuit is ----
(i) Sine wave   (ii) Square wave
(iii) Triangular wave   (iv) Sawtooth wave

SECTION - B (35 Marks)
Answer ALL Questions
ALL Questions Carry EQUAL Marks (5 x 7 = 35)

11   (a) Convert the decimal number 650_{10} to its equivalent hexa decimal number. Also write down the steps to be followed for converting the decimal number to hexa decimal number.

(Or)

(b) Perform the following in 2s complement system. Use eight bits for each number (including the sign bit) i) ADD 36 to -84   ii) ADD -48 to -80

Cont...

12 (a) Draw the logic circuit for the following Boolean expressions

    i) $Y=A+BC$ ii)$Y= A'+BD$

(Or)

  (b) Draw the symbol and truth table of NAND GATE and show how NAND gate is called as an universal gate by proper logic circuits and truth tables.

13 (a) With the help of a circuit diagram explain the action of Four bit adder circuit.

(Or)

  (b) Taking any four bit binary number and with the help of EX-OR gate , explain the steps involved in the conversion of binary number to Gray and Vice versa.

14 (a) With the help of a neat circuit diagram, explain the Working of JK Flip Flop.

(Or)

  (b) What are registers? Explain the action of left shift register with a neat circuit.

15 (a) Explain the working of Binary weighted D/A converter.

(Or)

  (b) Explain the application of 555 timer as monostable multivibrator.

SECTION - C (30 Marks)
Answer any THREE Questions
ALL Questions Carry EQUAL Marks (3 x 10 = 30)

16   Discuss the 8421 codes, 2421 code, Graycode and ASCII code.

17   Simplify the Boolean function $f(A,B,C,D)=\sum(0,1,2,4,5,6,8,9,12,13,14)$ and draw the logic diagram for simplified Boolean expression.

18.   Define Decoder. Explain 7442 1-of-10 decoder circuit with truth table. Write the applications of decoder.

19.   With the help of a circuit and truth table, explain the working of Synchronous Binary Counter.

20.   Explain the working of successive approximation A/D converter.

        Z-Z-Z   END