

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2023
(Third Semester)

Branch – INFORMATION TECHNOLOGY

FUNDAMENTALS OF DIGITAL COMPUTERS

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 The octal equivalent of the binary number $(10010110)_2$ is _____.
(i) $226_{(8)}$ (ii) $228_{(8)}$
(iii) $230_{(8)}$ (iv) $240_{(8)}$
- 2 In Boolean Algebra, $(A.A') + A =$ _____.
(i) A (ii) 0
(iii) 1 (iv) A'
- 3 A multiplexer is a _____.
(i) Combinational circuit (ii) Flip flop
(iii) Sequential circuit (iv) Comparator
- 4 In J-K flip flop, no change condition appears when _____.
(i) $J=1, K=1$ (ii) $J=1, K=0$
(iii) $J=0, K=1$ (iv) $J=0, K=0$
- 5 How many types of modes of I/O Data Transfer?
(i) 2 (ii) 3
(iii) 4 (iv) 5

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a Sketch the block diagram of digital computer.
OR
b State two types of complements used in digital computers.
- 7 a Explain the basic logic gates with example.
OR
b State the representation of 2 & 3 variable maps.
- 8 a Write short notes on full subtractor.
OR
b Outline the 4 bit full adder with example.

Cont...

- 9 a Compare RS and JK flip flop
OR
b Describe about the shift registers.
- 10 a Bring out the source initiated strobe for data transfer.
OR
b Narrate the characteristics of cache memory.

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 6 = 30)

- 11 a Convert the following:
(i) $(0.6875)_{10} = (?)_2$
(ii) $(0.513)_{10} = (?)_8$
OR
b Summarize the transfer of information with registers with neat sketch.
- 12 a Categorize the six theorems of Boolean algebra.
OR
b Simplify the Boolean function:
 $F(A,B,C,D,E) = \sum(0,2,4,6,9,11,13,15,17,21,25,27,29,31)$
- 13 a Narrate the steps for design procedure of combinational circuits.
OR
b Elucidate the block diagram of multiplexer.
- 14 a Discuss about the design of counters.
OR
b Outline the diagram of 4-bit binary ripple counter.
- 15 a Explain the working principle of DMA transfer.
OR
b Describe the associative memory with neat diagram.

Z-Z-Z

END