

2056

B. Voc. (Hardware and Networking) FYUP
Fourth Semester
BHN-401: Digital Electronics and Computer Organisation

Time allowed: 3 Hours

Max. Marks: 80

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting one question from each Unit.

x-x-x

- Q1** a) Differentiate between analog and digital systems with suitable examples.
b) Convert the following numbers:
i) $(101101)_2$ to decimal
ii) $(7A)_{16}$ to binary
c) Write the truth table of NAND gate and explain why it is called a universal gate.
d) Define Arithmetic Logic Unit (ALU) and state its functions. (4*4=16)

UNIT-I

- Q2** a) Explain binary number system and its importance in digital electronics. (8)
b) Perform the following:
i) Binary addition: $101011 + 110110$
ii) Binary subtraction: $11110 - 10101$ (8)
Q3 a) Explain NOR gate and prove that it is a universal gate. (8)
b) Describe the basic computer architecture with a neat block diagram. (8)

UNIT-II

- Q4** a) Explain the working of Decoders and Encoders with examples. (8)
b) Describe Demultiplexer and its applications. (8)
Q5 a) Explain different types of CPU registers (Accumulator, Program Counter, Instruction Register). (8)
b) Explain data lines, address lines, and control lines in internal communication. (8)

UNIT-III

- Q6** a) Explain D flip-flop and T flip-flop with their truth tables? (8)
b) What are control instructions and branching instructions? Give examples. (8)
Q7 a) Explain the concept of shift registers and their types? (8)
b) Describe up counters and down counters with suitable examples. (8)

UNIT-IV

- Q8** a) Explain the memory hierarchy in computer organization. (8)
b) Discuss Cache memory levels and hit/miss ratio. (8)
Q9 a) Explain Direct Memory Access (DMA) and its advantages. (8)
b) Discuss processor performance metrics and methods of performance optimization. (8)