HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

FIRST YEAR B.C.A.

BCA-103 : Digital Computer System Architecture

Teaching Scheme (per week)		Examination Scheme					
Th. (hours)	Pr. (hours)	INT		EXT		TOTAL	
		Th. (marks)	Pr. (marks)	Th. (marks)	Pr. (marks)	Th. (marks)	Pr. (marks)
3	--	30	--	70	--	100	--

UNIT: I (Marks 18)

Data Representation and Number System:
   • Representation of numbers (Only for Introduction)
   Decimal, Binary, Octal, Hexadecimal numbers
   • Conversation of number from one number system to another
   Binary to Decimal, Decimal to Binary, Octal to Decimal, Decimal to Octal, Octal to Binary, Binary to Octal, Hexadecimal to Binary, Binary to Hexadecimal, Hexadecimal to decimal, Decimal to Hexadecimal, Hexadecimal to Octal, Octal to Hexadecimal
   • Binary Arithmetic
   Addition, Subtraction (Simple method, using 1's and 2's complement method)
   Multiplication, Division (Simple method and using register method)
   • Representation, Error detection and correction codes
   The 8421 BCD code, Excess-3 Code, Grey Code

Main Ref.Book – Fundamentals of digital circuits –A.Anand Kumar

UNIT: II (Marks 17)

Logic Gates:
Introduction, AND Gates, OR Gate, NOT Gate, Universal Gates – NAND, NOR Gate, Exclusive-OR Gate, Exclusive-NOR Gate.
Karnaugh MAP (Up to 4 variable):
 Introduction Karnaugh maps SOP&POS Expression, Two, Three, Four Variable k-map, Karnaugh Simplifications, Don't care Combinations.
Combinational circuits :
Half adder, Full adder, Half subtractor, Full subtractor
Data Processing circuit:
Decoder ,BCD-to-Seven-segment), Encoder ,Multiplexed ,De-multiplexer
(Main Ref. Book – Fundamentals of digital circuits –A.Anand Kumar)
Arithmetic – Logic Unit:
Half adder, Full adder, Binary adder, Signed binary numbers, 2's compliment adder-subtracter.

Main Ref.Book – Fundamentals of digital circuits –A.Anand Kumar

UNIT: III   (Marks 17)

Computer Peripherals:

- **Magnetic Storage Device**
  - Magnetic disk
  - Floppy Disk
  - Hard Disk
  - CT (Cartridge Tape)
  - DAT (Digital Audio Tapes)
  - **• Input Devices**
  - Key Board
  - Mouse
  - Touch screen
  - Scanner
- **Output Devices**
  - VDU (Computer Graphics, Working of CRT, Resolution of different VDU)
  - Printer (Characteristic, Classification, Working, principle, Uses)
  - CD-ROM, DVD (Basic principle, How to read and write)
- **Communication Devices**
  - MODEM
  - NIC (Network Interface Card) (Principles, Baud rate, Application)
- **• Memory**
  - Ram, Rom, Characteristics of memory

Main Ref. :- Book O-Level (Information Technology) - By Satish Jain (Module-1)

UNIT: IV   (Marks 18)

➔ **SAP (Simple-as-possible) Computers:**

Architecture, Instruction set, Programming SAP-1, Fetch cycle, Execution cycle, The SAP-1 micro-program, The SAP-1 schematic diagram (Schematic diagram of → Program Counter, MAR, 2 to 1 Multiplexer, 16 X 8 RAM, Instruction Register, Accumulator, Adder / Subtractor, B Register, Output Register, Ring Counter), Microprogramming.
Elements of computer system – capabilities of computer, Limitations Of Computer, computer classification, Categories of Computers, Personal Computer, Super Computer, Mainframe Computer.

(Main Ref. Book –Digital Computer Electronics – Malvino & Brown, Third Edition)
(O-Level (Information Technology) - By V.K.Jain (Module- M1.1))

Main Ref. Book:
(1) Fundamentals of digital circuits –A.Anand Kumar
(2) Digital Computer Electronics – Malvino & Brown, Third Edition.
(3) Digital Principles and Applications by Malvino & Leach.
(4) O-Level (Information Technology) - By V.K.Jain (Module- M1.1)
(5) O-level (Information Technology) – By Satish Jain (Module-1)

Question Paper Scheme:

University Examination Duration : 3 Hours.

Q.1 - Unit-I   (18 Marks)
    A. Objective/ Short Questions.
    B. Descriptive/ Long questions.
Q.2 - Unit-II   (17 Marks)
    A. Objective/ Short Questions.
    B. Descriptive/ Long questions.
Q.3 - Unit-III   (17 Marks)
    A. Objective/ Short Questions.
    B. Descriptive/ Long questions.
Q.4 - Unit-IV   (18 Marks)
    A. Objective/ Short Questions.
    B. Descriptive/ Long questions.

Note: Options should be given in all questions.

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