NORTH MAHARASHTRA UNIVERSITY, JALGAON

SECOND YEAR B.Sc.(COMPUTER SCIENCE)

PAPER I SECTION - I

PROGRAMMING IN COBOL

1. COBOL : History. Coding Sheet. Character Set. Reserved words Datanames/paragraph names. Rules for forming these types of names. Four divisions and brief description of each clauses. Sentence/Statement/Clauses. (2)

2. The IDENTIFICATION DIVISION : PROGRAM-ID. AUTHOR. DATE-WRITTEN. DATE-WRITTEN. DATE-COMPILED. INSTALLATION. SECURITY. (1)

3. Concept of File and Record. (1)

4. The ENVIRONMENT DIVISION :
   CONFIGURATION SECTION :
   (a) SOURCE-COMPUTER
   (b) OBJECT-COMPUTER
   INPUT-OUTPUT SECTION :
   FILE-CONTROL - Organisation. access mode. file status. (1)

5. The DATA DIVISION : **** FILE SECTION ***** Elementary and Group item. Concept of levels including level numbers 66. 77. 88.
   File Description Entry : Following Clauses are to be covered
   (a) BLOCK CONTAINS. (b) RECORD CONTAINS.
   (c) LABEL RECORDS. (d) VALUE OF FILE-ID.
   (e) DATA RECORDS ARE (g) LINAGE.
   Record description Entry. :
   A. PICTURE clause for data description using 9.V.A.X (2)

6. The DATA DIVISION : **** WORKING STORAGE SECTION *****
   Level 77.01 etc. along with value clause. (1)

7. The PROCEDURE DIVISION : OPEN. CLOSE. READ. MOVE. WRITE. GO TO

8. Arithmetic verbs : ADD. SUBTRACT. MULTIPLY. DIVIDE. COMPUTE and a small program with use of GO TO statement. (3)

9. IF clause : Relational conditions. Class conditions. Sign conditions. Condition names. (2)

10. One program in class : Condition using IF's completely to be written in class. (2)

11. PERFORM : Simple and Times. Until options. Concept of structured program. (1)

12. Write same program as in 10 suing PERFORM. (1)

13. CONDITION NAMES. SWITCHES. LITERALS. FIGURATIVE CONSTANTS (1)

14. Validation program for common file processing tasks. (2)

15. Two Programs for common file processing tasks. (5)

16. Edit Symbols : Use of following picture characters
    S, P, Z, CR, DB, - $, +, -, B, *, /,
    , (COMMA), . (PERIOD), Ø (ZERO)
    Various Move operations. (1)

17. Accept, Display. (1)

18. Formatted Printing of a report using editing features in COBOL (1)

19. Multiple records in a file. (1)

20. Multiple Key-break logic and program. (2)

21. Occurs clause. (2)

22. Programs using Occurs. (3)

23. Redefines, Renames with Occurs.
    (Creation of table of constants). (1)

24. Program on item no 23. (2)

25. Indexed/Relative Files : REWRITE, DELETE, START. (2)

26. Program using Indexed files. (2)

27. Random Update of files. (2)

28. Screen Section : ***** SCREEN SECTION ****** (2)

    FOR IBM COMPATIBLES ONLY.
    Use of following clauses.
    (a) BLANK SCREEN
    (b) LINE NUMBER IS (PLUS)
    (c) COLUMN NUMBER IS (PLUS)
    (d) FOREGROUND-COLOUR
    (e) BACKGROUND-COLOUR
    (f) BLANK LINE
    (g) BELL
    (h) UNDERLINE
    (i) REVERSE-VIDEO
    (j) HIGHLIGHT
    (k) BLINK
    (l) VALUE
    (m) PIC
    (n) BLANK WHEN ZERO
    (o) JUSTIFIED
    (p) AUTO
    (q) SECURE
    (r) REQUIRED
    (s) FULL. (2)

29. Revision.

(21)

=- BOOKS =-

1) Cobol Programming - Rov & Ghosh-Dastidar.
2) Cobol Programming - Rajaraman & Sahasrabuddhe.
3) Management Information Systems through COBOL - Philippakias and Kazmier.

Paper I SECTION II

SYSTEMS ANALYSIS

General Business Environment :
EDP setup & role of Systems Analysis & MIS. (4)

Systems Analysis :
Systems Life Cycles. Fact finding, Fact gathering. Feasibility study. How to interview user & how to find facts. (Cost benefit analysis. tangiable and intangiable benefit). (4)

Structured Systems. Analysis :
String diagrams. Dataflow diagrams. (4)

Systems Designing :
Entity/Attribute relationship. normalisation of data. File designing. Input output design. data capture and control data. security and control. (4)

Design of online systems and backup and recovery. (4)

Code design and form design. decision tables. (4)

Systems control. system implementation. systems evaluation (post implementation). continuous evaluation. (4)

Case Studies : To be discussed in class.
1) Payroll
2) Inventory Control for stock inventory. (10)

Case Study to be discussed in class: Payroll.
from the following systems one will be selected and designed by a group of 4 to 6 students for lab work (assignment).

1. Inventory control.
2. reservation system.
3. Purchase.
4. Sale.
5. Fixed deposit.
6. library system.

This is to be certified and submitted alongwith journals during practical examination.

Students must do following work :
Preparation of questionare.
Progress report.
System report : I/O design, program specification. (10)

-= *BOOKS* =-

1) Working Engineering - Pressman.
2) System Analysis and Designing Vol. I and II - NCC Publications.

PAPER II SECTION - I

DATA STRUCTURES - I

1) Introduction :
   Algorithmatic notation
   Introduction to algorithm analysis for time & space requirement
   - Rate of growth
   - Basic time analysis of an algorithms
   - Order notation
   - Space analysis of an algorithms (6)

2) Informations & its Storage Representations :
   Nature of information
   The transmission of information
   The storage of information
   Primitive data structure
   - Operations on data statements
   - Number system
   - Integers
   - Reals
   - Character information
   - Logical information
   - Pointer information (6)

3) Linear Data Structures and their Sequential Storage Representation :
   Concepts & terminology for nonprimitive data structures
   Storage structure for arrays
   Stacks - definitions, operations (POP, PUSH) and applications
   Queues. (15)

4) Linear Data Structures & their Linked Storage Representation
   Pointer and Linked allocation
   Linked linear lists
   - Operations on linear lists using singly linked storage structures
   - Circularly linked linear list
   - Doubally linked list.

   Applications-Polynomial manipulation (2Ø)

=- BOOKS =-

1) Algorithms + Data Structures = Structured Programming
   N. Wirth.
2) Data Structures - Rick Deker.
3) Data Structures - Krutz.

PAPER II SECTION II

DATA STRUCTURES II

1) NonLinear Data Structures :
   Trees
   - Definition and concepts
   - Operations on binary trees
   - Storage representation & manipulation of binary tree
   - Sequential and other representation of trees
   - Applications - manipulation of arithmatic expressions.

   Graphs
   - Matrix representation of graphs
   - List structures

   Applications. (20)

3) Sorting and Searching :
   Sorting
   - Notation
   - Selection sort
   - Bubble sort
   - Merge sort
   - Tree sort
   - Partition exchange sort
   - Radix sort
   - Address calculation sort

   (14)

   Searching
   - Sequential search
   - Binary search (4)

4) Symbol Tables :
   Hash tables (over flow handling), Static tree tables, dynamic trees, regimented trees, AVL trees. (6)

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PAPER III

FIRST TERM

LAB WORK

COBOL :

1. Validation of Sequential files.
2. Matching two sequeantial files and Production of report.
3. Sequantial file updation.
4. Table handling (one and two dimensional)
5. Sorting of sequential files.

DATA STRUCTURES : (in 'C')
1) Implement POP, PUSH operations of stack
2) Spiral array filling
3) Implement insert and delete operations on Queue.
4) Program to convert infix to postfix expression.

SECOND TERM

LAB WORK

1)Linked list using pointers.
2)Construct a hash table.
3)Radix sort.
4)Merge sort .
5)Quick sort.
6)Based on all tree traversal methods.
7)Binary search.
8)Implement shortest path algorithm.
9)Circular linked list using pointers.