HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

PAPER : MCA32 System Programming

Examination Scheme					
Internal		External		Total	
Th. (Marks)	Pr. (Marks)	Th. (Marks)	Pr. (Marks)	Th. (Marks)	Pr. (Marks)
30	20	70	30	100	50

UNIT I (25%)

Introduction to System Software with Assemblers, Macro Processor & Linking Techniques

Assemblers :

General Design Procedure, Design of Assembler: Statement of Problem, Data Structure, Format of Data Bases, Algorithm, Look for Modularity. Introduction to Assembly Programming: Simple Arithmetic Calculation, Subroutine and Parameter Passing

Macro Processor:

Macro Instructions, Feature of Macro facility: Macro Instruction Arguments, Conditional Macro Expansion, Macro Calls within Macros, Macro Instructions Defining Macros. Implementation: Implementation of a Restricted Facility- A Two-Pass Algorithm, A Single-Pass Algorithm, Implementation of Macro Calls within Macros, Implementation within an Assembler.Linkers: Relocation and Linking Concepts, Design of a linker,Self Relocating Programs, Linking for Overlays

UNIT II (25%)

Loaders Techniques, Compilers & Device Drivers:

Loaders:

Loaders Schemes, Design of an absolute loader, Design of direct linking loader, Compilers: Introduction to Compilation Process, Lexical Analysis, Syntax Phase, Interpretation Phase, Intermediate Form, Storage allocation, Code Generation

Device Driver:

Introduction, Request Processing, Basic Device Driver Types

UNIT III (25%)

Introduction to Parallel Processing & Implementation Methodology: Need of Parallel Processing, M. J. Flynn's Classification for Computer Architecture, Introduction to Shared Memory, Multiprocessing, Distributed Memory, Parallel Processing Architecture, Programmability issues, Data Dependency Analysis, Shared Memory Programming, Thread Based Implementation, Distributed Computing: Message Passing & Remote Procedure Call

UNIT IV (25%)

Parallel Programming : Basic Parallel Programming Techniques, Barriers and Race Condition, Introduction to scheduling, Overcoming Data Dependencies

BOOKS :

Unit 1 & 2: System Programming: John J Donovan- TMH, System Programming and Operating System: Dhamdhare D.M- TMH

Unit 3 & 4: Introduction to Parallel Processing: Sasikumar, M, Shikhare, Dinesh,Ravi Prakash - PRENTICE HALL

Introduction to Parallel Programming: By Steven Brawer

Question Paper Scheme:

Section – I		Section – II	
Q.1 - Objective Type Unit I & II	(11) Marks	Q.4 - Objective Type Unit III & IV	(11) Marks
Q.2 - Unit-I OR Q.2 Unit-I	(12) Marks	Q.5 - Unit-III OR Q.5 Unit-III	(12) Marks
Q.3 - Unit-II OR Q.3 Unit-II	(12) Marks	Q.6 - Unit-IV OR Q.6 Unit-IV	(12) Marks

Practical List

1. Program to add two words & store the result in ax register.
2. Program to calculate the sum of n numbers stored in memory & the final result should be stored in memory location named sum.
3. Write a simple macro, which take argument & process them.
4. Write an assembly procedure to perform sum of two numbers.
5. Program for sum of given numbers using loop splitting.
6. Program for average of given numbers using loop splitting.
7. Program to find minimum and maximum of given numbers using loop splitting.
8. Program for sum of given numbers using spin lock.
9. Program for average of given numbers using spin lock.
10. Program to find minimum and maximum of given numbers using spin lock.
11. Program to find standard deviation using barriers condition.
12. Program to show simple dependency using induction variable.
13. Program for removal of simple dependency.
14. Program for forward dependency problem.
15. Program for backward dependency problem.
16. Program for forward dependency solution.
17. Program for backward dependency solution.