Basaveshwar Engineering College, Bagalkot

UCS402C: Datastructures and Algorithms

Max Marks: 100

Note : Answer any five full questions selecting atleast one from each unit

UNIT I

1. (a) What is a datastructure? Give the formal definition with an example. (8)
   (b) What is stack? Give the linked list implementation of stack, also write a main program that displays the menu options, push, pop, stacktop and exit. (12)

2.
   (a) Give the postfix and prefix form of the following infix expressions. (8)

   i) $a^2b + b^2c\left(\frac{c(d-f)}{gh}\right)$

   ii) $(a+bc)^2\frac{\left(d-f\,g/h\right)}{e}+\frac{a+b}{2}$

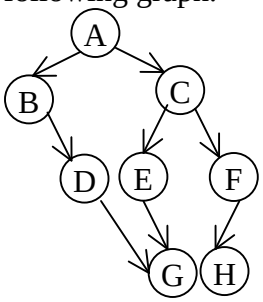
   (b) What is a Queue Data structure? Give and explain the circular queue implementation (12)

UNIT II

3 (a) What is a Binary Tree? Give and explain the pseudo codes for the different traversal techniques of a binary tree. (10)

(b) What is a threaded binary tree. Give and explain the iterative procedure for inorder traversal of a right in threaded binary tree. (10)

4 (a) What is a Graph Data Structure? Give the adjacency matrix and linked adjacency list representation of the following graph. (10)



(b) Depth First Search of Graph using Graph Traversal. (10)

UNIT III

5 (a) What are asymptotic notations? Explain the different asymptotic notations. (8)

(b) Give the Solution to Tower of Hanoi Problem and hence find its Time Complexity. (12)

6 (a) Explain the Exhaustive search technique wrt the Knapsack problem and assignment problem. (10)

(b) What is topological Sorting ? What is the time efficiency of the DFS-based algorithm for topological sorting, Derive. (10)

UNIT IV

7 (a) What is Mergesort? Give and explain the Mergesort algorithm, also state its time complexity. (10)

(b) What is Binary Search? Give the Binary Search algorithm and derive its time Complexity. (10)

8 (a) Give and explain the Dijkstra's algorithm for single source shortest paths (10)

(b) Explain the following : i) NP Complete Problems ii) Warshalls Algorithm (10)

Basaveshwar Engineering College ,Bagalkot

Department of Computer Science and Engineering

MODEL QUESTION PAPER

4th semester B.E Degree Examination

MICROPROCESSOR AND INTERFACING(UCS403C)

Max. marks- 100 **Duration: 3hrs**

Note : Answer any five full questions, choosing at least one from each unit

UNIT-I

Q 1a. Explain internal architecture of 8086 microprocessor with neat diagram. (10marks)

b. Explain the functions of the following signals of 8086 microprocessor. (10marks)

i)ALE ii)DT/R iii)DEN iv) LOCK v) NMI

Q 2a. What are addressing modes? Explain the following addressing modes with examples. (10marks)

i) Register Indirect
ii)Indexed
iii) Based Indexed
iv)Relative Based Indexed

b. Construct the binary code for each of the following 8086 instructions. (10marks) i) MOV BL,CL ii) MOV [BX],CX iii) SUB [2048],DH
iv) ROR AX,1 v)AND AL,0FH

UNIT-II

Q 3a.Explain the following instructions with examples. (10marks)

i)DAA ii)RCL iii)PUSH iv)MOV v)LEA

b. Implement if-then, if-then-else, while-do and repeat-until program structures in 8086 Assembly language program. (10marks)

Q 4a. Define procedure. Write assembly language program which calls a far procedure. (10marks)

b. Define Macros. Write an assembly language program to read character from keyboard and to display using separate macros. (10marks)

UNIT-III

Q.5) a. What are 8086 interrupts? Explain the structure of interrupt vector table. (10marks)

b. Explain different types of interrupts. Give the priority of interrupts. (10marks)

Q.6) a .Describe how address decoding circuitory gives a specific address to each device in a system and makes sure that only one device is enabled at a time. (10marks)

b. Show the truth table you would use for a 3625 PROM decoder to produce CSI signals for 4k*8 RAMS in an 8086 system. Assume the first RAM starts out at address 00050H. don't forget A0 & BHE. (10marks)

UNIT-IV

Q.7) a. Explain different methods of parallel data transfer of 8255A (10marks)

b. With neat diagram, explain the 8255A internal block diagram. (10marks)

Q.8 a. Show the bit set/reset control word needed to initialize port A interrupt request & port B interrupt request. (10marks)

b. Write an assembly language program to drive the stepper motor interface to rotate motor in clockwise direction by N steps. Introduce suitable delay between successive steps. (10marks)

Course : IV sem B.E. Computer Science and Engineering .

Sub-Code : UCS404C **Sub : Computer Organization**

MODEL QUESTION PAPER

Instructions : Answer any Five full questions by choosing at least one question from each unit.

All question equal carry marks.

UNIT – I

1) a) Explain different functional units of a computer. Mention the function of the processor registers.

i) PC ii) MAR. iii) IR 06

b) Explain

i) Byte addressability. ii) Big – endian assignment. iii) Little- endian assignment. 06

c) Write an ALP to add a list of **n** numbers using indexed addressing more. Write remark or comment for each instruction in the program 08

2. a) what are assembler directives ? Explain any two directives. 06

b) Differentiate between Memory Mapped I/O and I/O Mapped I/O 04

c) what you do understand by stack frames ? Explain the operation of stack frame using suitable example of subroutine 10

UNIT – II

3. a) For a simple example of I/O operations involving a keyboard and a display device, write a assembly language program that reads one line from the keyboard, stores it in memory buffer and echoes it back to the display. 08

b) what is the need for disabling interrupts ? what are the different ways in which interrupts can be disabled and enabled? 08

c) Briefly explain interrupt hardware method of handling multiple I/O devices. 04

4. a) which type of I/O devices are interfaced through DMA ? Explain bus arbitration process used in DMA 10

b) Discuss the main phases involved in the operation of SCSI bus in detail. 10

UNIT – III

5. a) Mention any two differences between static and dynamic RAMS. Explain the internal organization of a memory chips consisting of 16 words of 8 bit each 06

b) Explain with block diagram and timing diagram synchronous DRAM. 08

c) What is secondary storage ? Explain in brief magnetic hard disk. 06

6. a) How do you design fast adders ? Explain 4 bit carry look ahead adder 05

b) Explain sequential binary multiplier with the use of block diagram 05

c) Explain how Booth's algorithm is suitable for signed number multiplication in comparisons of conventional shift and add method.

UNIT – IV

7. a) Explain Booth's multiplication algorithm with in example 10

b) Explain IEEE standards for floating point numbers 10

8. a) Explain

i) Multiple bus organization ii) Hardware control. 05+05

b) Explain basic concepts of micro programmed control. 10

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Model Question Paper
FOURTH SEMESTER B.E (CSE)
Object Oriented Programming with C++ (UCS405C)

Duration: 3 Hours **Max marks: 100**

Note: Answer any FIVE full questions choosing at least ONE from each unit.

UNIT –I

1. **a) List out the difference between object oriented paradigm and procedure Oriented paradigm. 5**

   b) What are the default arguments? Explain with suitable examples. State and explain the rules applying the default arguments. 10

   c) Write the function definition and function call to swap the contents of two integer I & J using call by reference. 5

2. **a) What is class? Explain the structure of a class with the help of an example Differentiate between class and structure. 8**

   b) With example, explain this pointer. 4

   c) What is a friend class? With an example explain the working of friend class. 8

UNIT –II

3. **a) Explain the new and delete operator with example. 6**

   b) What is memory leak? Explain with an example how it can be prevented? 4

   c) What are constructors? Explain different types of constructors with suitable example. 10

4. **a) Draw figures to illustrate the different types of inheritance & explain them. 6**

b) Write a C++ program to create a class student with data members regno and name. Create a derived class marks having marks in 3 subjects as

member variables. Let the program display the average marks scored by the student. 10

c) List the effect on the accessibility of members when a base class is derived different access specifiers. 4

UNIT –III

5. a) What is virtual function ? Explain with an example its usage. 8

b) What are IO streams in C++? Give the stream class hierarchy. 8

c) What are pure virtual functions? When they are needed. 4

6. a) What is operator overloading ? Explain its general syntax and rules along with an example. 10

b) Write a C++ program to read a text file and display the contents, number of lines and number of words and alphabets on the screen. 10

UNIT –IV

7. a) Create a class FLOAT that contains two float data members. Write a C++ program to overload all the four arithmetic operators so that they operate on the objects of FLOAT. 10

b) What function template? Write a C++ program to swap two integer, float and character type data using template function. 10

8. a) What is class template and class template instantiation? Give suitable example. 10

b) Briefly define the four new style casts provided in C++. 5

c) Write a C++ program to input two numbers and divide the first by second Apply exception handling to mange divide by zero error. 5

UHS406C

Department of Computer Science & Engineering

Model Question paper

4th Semester B.E. Degree Examination

Engineering and Technology Management

Max.Marks:100 **Duration: 3hrs**

Note: Answer any 5 full questions, choosing at least one from each unit.

Unit I

1. a. Define the term *engineer*. Is engineering really a profession? Justify. (07)
   b. Define management. Explain the different levels of management. (08)
   c. List and explain the various managerial skills. (05)

2. a. List and explain the various roles played by managers. (08)
   b. List and explain the different functions of managers. (06)
   c. Explain the various philosophies of management (06)

Unit II

3. a. Mention the key result areas on which the organization's survival depends as per Peter Drucker. (08)
   b. Sales of a particular product (in thousands of dollars) for the years 1997 through 2000 have been 48, 64, 67 and 83 respectively.
      I. What sales would you predict for 2001 using a simple four year moving average?
      II. What sales would you predict for 2001 using a weighted moving average with weights of 0.3, 0.15 and 0.05 for the three years before that? (04)
   c. You operate a small wooden toy company making two products: alphabet blocks and wooden trucks. Your profit is $30 per box of blocks and $40 per box of trucks. Producing a box of blocks required one hours of wood working and two hours of painting; producing a box of trucks takes three hours of wood working but only one hours of painting. You employ three wood workers and two painters, each working 40 hours a week. How many boxes of blocks (B) & trucks (T) should you make each week to maximize profit? (08)

4. a. Explain the types of decisions that managers are normally concerned with, in organizational context. (06)
   b. Briefly outline the concept of mathematical models in management science. (04)
   c. You must decide whether to buy new machinery to produce product X or to modify the existing machinery. You believe the probability of a prosperous economy next year is 0.6 and of a recession 0.4. Prepare a decision tree and use it to recommend the best course of action. The applicable pay off table of profits (+) and losses (-) is (10)

	N_1 (Prosperity)	N_2 (Recession)
A_1 (Buy new)	$+950,000	$-200,000
A_2 (Modify)	$+700,000	$-300,000

Unit III

5 a. Explain Maslow's hierarchy of needs. (05)
b. Explain expectancy theory of motivation (10)
c. What is MBTI in measuring the personal preferences? (05)

6 a. With a neat block diagram, mention and explain the four steps of the control process. (06)
b. What are the characteristics of effective control system? (06)
c. What are the legal means to protect an organization (or an individual's) idea and right to benefit from those ideas? (08)

Unit IV

7 a. With a neat diagram, explain the stages in Technology life cycle. (06)
b. Comment on the proposal to invest $1,000,000 in a new product now, which is projected to generate $2,00,000 profit at the end of each year for eight years, assuming that your company requires 15% return on investment before taxes. (14)

8 a. What are the characteristics of creative people? Explain. (08)
b. Explain the benefits of automated version control and configuration management. (08)
c. What is "Bathtub Curve" model as applied to pattern of hazard rate versus time? (04)