PGIS-N 1040 B-2K13

M.Sc. Ist Semester (CBCS) Degree Examination

Computer Science

(Digital Logic and Computer Design)

Paper - HCT-1.1

(New)

Time : 3 Hours   Maximum Marks : 80

Instructions to candidates:

　　1.　　*Q. No.1 in section A is **compulsory**.*

　　2.　　*Answer any **five** questions from section B.*

Section - A

1.　Answer the following questions: (10×2=20)

　a)　Convert decimal 205.125 to binary.

　b)　Convert binary 11001100.001 to octal and hexadecimal.

　c)　Represent $(-15)_{10}$ in a 6-bit register using 1's and 2's complement.

　d)　Write the BCD and excess-3 codes for the decimal 5071.

　e)　What are basic logic gates and their functions?

　f)　What is a combinational logic circuit? Give examples.

　g)　What is a D flip-flop?

　h)　What is a ROM? What are its variants?

　i)　What is an isolated I/O?

　j)　What is memory hierarchy?

Section - B

2.　a)　Assuming 6-bit registers to store numbers in signed-magnitude representation using 2's complement form, perform the following decimal arithmetic operations in binary:

　　i.　14-12

　　ii.　-14∓12   (6)

　b)　State De Morgan's theorems for three variables and verify the same using truth tables.
                                                      (6)

3. a) What are NAND and NOR gates? Show that these are universal gates. (6)

   b) Simplify the Boolean function:

      $F(w, x, y, z) = \Sigma(1, 2, 3, 6, 7, 8, 9) + \Sigma_d(0, 4, 5, 11)$ using Karnaugh map and obtain its NAND implementation. (6)

4. a) Define half adder and full adder. Design a full adder using two half adders. (6)

   b) Define multiplexer, Implement the Boolean function:

      $F(A, B, C) = \Sigma(1, 3, 5, 6)$, using a multiplexer. (6)

5. a) Explain a clocked RS flip-flop and its operations. (6)

   b) What is a binary counter? Design a 3-bit binary counter using T flip-flops. (6)

6. a) Describe the logic design of arithmetic logic unit (ALU). (6)

   b) What is a basic memory cell? Design a 4×3 RAM unit. (6)

7. a) What is an I/O interface? Explain serial communication interface with a neat block diagram. (6)

   b) What is an interrupt? Explain DMA interface. (6)

8. Write notes on any two of the following:

   a) Decoder

   b) XOR and XNOR gates

   c) Microprogram control

   d) 8086 internal architecture. (6+6)

PGDIS 1381 B-2K13

P.G.D.C.P & S.A Ist Semester Degree Examination
Computer Science
(Computer Concepts)
Paper - HC 1.1

Time : 3 Hours   Maximum Marks : 80

Instructions to candidates:

1)   Answer any *five* questions.

2)   All questions carry **equal** marks.

1.   a)   Explain the functions of various components of a computer with a neat block diagram.   **(8)**

     b)   Write a note on classification of computers.   **(8)**

2.   a)   What is Bit? Explain the procedure to convert decimal number to binary and vice versa with examples.   **(8)**

     b)   Convert $(5657)_8$ to Decimal and then Binary.   **(8)**

3.   a)   What is an input device? List out the various input devices and explain any one.   **(8)**

     b)   What are storage devices? Explain compact disk.   **(8)**

4.   a)   Write a short note on computer languages.   **(8)**

     b)   What is an operating system? What are its functions? Explain. **(8)**

5.   a)   What is an algorithm? Write an algorithm to find the largest of three numbers.   **(8)**

     b)   What are the various steps involved in problem analysis? Explain.   **(8)**

6.   a)   Explain the different options available with microsoft word to format the text.   **(8)**

     b)   What are benefits of power point presentation? Explain the procedure to insert an image into a slide.   **(8)**

7. a) Explain

       i.   Work book

       ii.   Work sheet,

       iii. Cell and

       iv. Any five mathematical functions of microsoft excel.   **(8)**

   b) What is computer networking? What are the advantages of networking?   **(8)**

8. a) Write a note on computer virus.   **(8)**

   b) Write a note on computer security.   **(8)**

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PGIS-N 1047 B-2K13

M.Sc. Ist Semester (CBCS) Degree Examination
Computer Science
(Operating System Principles)
Paper -SCT-1.1
(New)

Time : 3 Hours   Maximum Marks :80

Instructions: 1)   Q. No. 1 in Section A is Compulsory.

2)   Answer any **five** questions from Section **B**.

Section-A

1.   Answer the following in brief: (10x2=20)

a)   What is process control block?

b)   What is the use of inter process communication?

c)   Define thread.

d)   Define race condition.

e)   What is virtual memory?

f)   What is meant by demand paging?

g)   List any four types of file.

h)   What are the drawbacks of contiguous allocation of disk space?

i)   What is spooling?

j)   What are the major problems in implementation of demand paging?

Section-B

2.   a)   What is a process? Discuss different process scheduling algorithms.   (6+6)

b)   State any one classical problem of synchronization and give the remedial technique to overcome it.

3   a)   Where kernel attaches the buffer to the free list? Justify with reason.   (6+6)

b) Explain Bankers algorithm. What are the problems in its implementation?

4. a) What is the role of process control Block? Explain the function of each attribute in PCB. (6+6)

   b) What is deadlock? Explain how deadlock is prevented.

5. a) Define following with example: (6+6)

   i) Semaphore

   ii) Weak Semaphore

   iii) Binary Semaphore

   b) State and explain different mechanisms for interprocess communication.

6. a) What are the advantages and disadvantages of buffer cache? (6+6)

   b) State and explain different operating system services.

7. a) What is disk scheduling? Discuss various scheduling algorithms. (6+6)

   b) Explain typical structure of Unix file system.

8. Write notes any **two** of the following: (6+6)

   a) Time sharing system

   b) Page replecement algorithms

   c) Shell porgramming

   d) Linux internals

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PGIS-N 1042 B-2K13

M.Sc. Ist Semester (CBCS) Degree Examination

Computer Science

(Mathematical Foundation for Computer Science)

Paper - HCT-1.2

(New)

Time : 3 Hours   Maximum Marks : 80

Instructions to candidates:

　1.　　*Q. No.1 in section A is compulsory.*

　2.　　*Answer any five questions from section B.*

Section - A

1.　Answer the following questions: **(10×2=20)**

　a)　Write down the converse of the implication: "If it rains then the crops will grow".

　b)　Let A={1,2,3,4,6} and R be the relation on A defined by $(a,b) \in R$ if and only if a is a multiple of b. Write down R as a set of ordered pairs.

　c)　Compute $^{10}P_5$ and $^6C_4$.

　d)　Implement OR using NAND gate only.

　e)　State Pigeonhole principle.

　f)　Define equivalence relation and partial ordering relation.

　g)　Draw graph G given that: $V(G)=\{V_1, V_2, V_3, V_4, V_5\}$
　　　$E(G)=\{(V_1,V_4), (V_2,V_4), (V_2,V_3), (V_2,V_5), (V_4,V_5), (V_3,V_5)\}$

　h)　Define Eulerian graph. Give an example.

　i)　Define the distance between two codes. Illustrate with an example.

　j)　Define Poset.

Section - B

2.　a)　Consider the function $f: R \to R$ defined by $f(x) = 2x+5$. Let a function $g: R \to R$ be defined by $g(x) = \frac{1}{2}(x-5)$. Prove that g is an inverse of f.　　**(6)**

　b)　Construct the truth tables for the following compound propositions:

　　i.　$(p \wedge q) \to -r$

　　ii.　$q \wedge (-r \to p)$　　**(6)**

3. **a)** Prove by mathematical induction: $1.2 + 2.3 + 3.4 + ... + n.(n+1) = \frac{1}{3}n(n+1)(n+2)$. **(6)**

b) State and prove De-Morgan's theorems in Boolean algebra. **(6)**

4. **a)** If R is a relation on the set $A = \{1,2,3,4\}$ defined by xRy if x divides y. Prove that (A,R) is a poset. Draw its Hasse diagram. **(6)**

b) Solve the recurrence relation:

$a_{r+2} - 5a_{r+1} + 6a_r = 2$ with the initial conditions $a_0 = 1$ and $a_1 = 2$. **(6)**

5. **a)** Let $(A, \leq)$ be a lattice with universal upper and lower bounds 0 and 1. Then prove the following:

i. $a \vee 1 = 1$ ii. $a \wedge 1 = a$

iii. $a \vee 0 = a$ iv. $a \wedge 0 = 0$ **(6)**

b) Show that the sum of the degrees of the vertices of a graph is equal to twice the number of edges. **(6)**

6. **a)** Define a tree. Prove that a tree T with 'n' vertices has $(n-1)$ edges. **(6)**

b) Show that $A \oplus B = \left((A.B')'.(A'.B)' \right)'$ and hence design a logic circuit of XOR gate using NAND gate only. **(6)**

7. **a)** Define abelian group. Show that, for arbitrary elements a,b of a graph G, $(ab)^2 = a^2 b^2$ if G is abelian. **(6)**

b) Obtain the grammar that generates the language $L = \{a^n ba^n : n \geq 1\}$. **(6)**

8. **a)** Find the distance between x and y in each of the following cases:

i. x=110110 y=000101

ii. x=001100 y=010110

iii. x=11100011 y=01101100. **(6)**

b) Write short notes on the following:

i. Error detection and correction.

ii. Finite state machine. **(6)**

PGDIS 1382 B-2K13

P.G.D.C.P. & S.A. Ist Semester Degree Examination
Computer Science
(C and C++ Programming)
Paper - HC 1.2

Time : 3 Hours   Maximum Marks : 80

Instructions to Candidates:-
     i)   Answer any **five** questions
     ii)   All questions carry **equal** marks.

1.   a)   Explain the basic structure of C - program with an example.   **(8)**

     b)   What is constant? Explain the different types of constants with examples.   **(8)**

2.   a)   What is data type? Explain the various data types supported by C - Language.   **(8)**

     b)   What is an operator? Explain various operators available in C - Language.   **(8)**

3.   a)   What are the formatted input/output statements in C - Language? Explain them.   **(8)**

     b)   What is control statement? Explain if and if-else statements of C - Language.   **(8)**

4.   a)   What is a function? What are the advantages of using functions? Discuss.   **(8)**

     b)   Write a note on nesting of functions with example.   **(8)**

5.   a)   How structure is different from an array? Explain array within structure.   **(8)**

     b)   What is pointer? Explain pointers and arrays with example.   **(8)**

6.   a)   Write a note on file handling in C - Language.   **(8)**

     b)   How C is different from C++? Explain.   **(8)**

7. a) Explain any two looping statements of C++ language (8)

   b) Explain class object and member function with an example. (8)

8. a) What is inheritance? Explain types of inheritance. (8)

   b) Write a note on Polymorphism. (8)

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PGDIS 1383 B-2K13

P.G.D.C.P.& S.A. Ist Semester Degree Examination
Computer Science
(Database Management System)
Paper - HC 1.3

Time : 3 Hours   Maximum Marks : 80

Instructions to Candidates:-

    i)   Answer any **five** questions.

    ii)   All questions carry **equal** marks.

1.   a)   Explain different database functions.   **(8+8)**

       b)   Give comparison between relational and object oriented database model.

2.   a)   Explain different types of relationships between different entities with suitable examples.   **(8+8)**

       b)   Draw ER diagram for EMPLOYEE database.

3.   a)   Explain relational data structure.   **(8+8)**

       b)   Explain functional dependency.

4.   a)   Describe the fourth and fifth normal forms with examples.   **(8+8)**

       b)   What are different database languages? Explain each of them.

5.   a)   What are the different types of JOINS? When each one is used? Discuss.   **(8+8)**

       b)   Write a PL/SQL program to create a table and insert data and modify data.

6.   a)   What are different information systems? Explain each of them.   **(8+8)**

       b)   Discuss different Concurrency control techniques.

7. a) What are the managerial expectations of client/server system? (8+8)

   b) Describe client/server databases.

8. a) What is the role of database in any organization? Explain. (8+8)

   b) What are the database administration strategies? How to develop them? Discuss.

PGIS-N 1044 B-2K13

M.Sc. Ist Semester (CBCS) Degree Examination
Computer Science
(Data Structures Using C++)
Paper - HCT 1.3
(New)

Time : 3 Hours   Maximum Marks : 80

Instructions to Candidates:

 1)   *Q.No.1* in Section A *is compulsory*

 2)   Answer any **five** questions from Section B

Section - A

1. Answer the following questions: (10×2=20)

    a)   Define classes and objects

    b)   What is friend function? How it is defined in a class?

    c)   Define Inheritance and explain the types of Inheritance.

    d)   Explain pointers and arrays.

    e)   What are prefix and postfix notation? Convert the $A+(B \wedge C)/D-E$ into prefix expression.

    f)   Explain how queue linked list is a particular case of single linked list

    g)   Define recursion with suitable example.

    h)   Explain the node structure of a binary tree

    i)   State the difference between insertion sort and selection sort.

    j)   Define a graph and state the operations performed on it.

Section - B

2. a)   What are the conditional and loop control statements? Explain with examples

    b)   Write a C++ Program to compute the sum and average of n given numbers   (6+6)

3. a) What is Operator Overloading? Write a C++ program to overload an operator ( ) by using the member function.

    b) Distinguish between base class and derived class   (6+6)

4. a) What do you mean by single and double linked lists? Explain the operations performed on them.

    b) Design an algorithm to replace the data content KEY of a node by ITEM in a single linked list.   (6+6)

5. a) Define stack. Explain how stack can be viewed as a single linked list.

    b) Design an algorithm to delete an element from a queue and to insert an element into it by using dynamic memory allocation.   (6+6)

6. a) Define tree, binary tree and binary search tree. Explain the process of building a binary tree by using linked list representation.

    b) How do you traverse a binary tree? Write C++ code to traverse a binary tree. (6+6)

7. a) Write a C++ program to sort the list by using selection sort.

    b) Explain the graph storage structures and advantages of adjacency matrix   (6+6)

8. Write short notes on any two of the following

    a) Exception Handling

    b) Sequential Search

    c) Insertion Sort

    d) Huffmann Code   (6+6)

PGDIS 1384 B-2K13

P.G.D.C.P. & S.A. Ist Semester Degree Examination
Computer Science
(Information System Design and Implementation)
Paper - SC 1.4

Time : 3 Hours   Maximum Marks : 80

Instructions to Candidates:-
   i)   Answer any **five** questions
   ii)   All questions carry **equal** marks.

1. a)   What is a system? Explain different types of systems.   (8+8)

    b)   Define information system and explain its characteristics.

2. a)   What is the role of information in decision making? Explain.   (8+8)

    b)   Describe roles of EDP, MIS and DSS.

3. a)   Explain components of MIS.   (8+8)

    b)   What are the different frame works for under standing MIS? Briefly explain them.

4. a)   Describe levels of management for MIS.   (8+8)

    b)   Define formal and informal systems with suitable examples.

5. a)   Discuss methodologies for development of information system.   (8+8)

    b)   Explain process modeling concept.

6. a)   What are entity life histories? Explain.   (8+8)

    b)   Write a note on user Interface.

7. a) What are the factors considered for system design? Discuss them. (8+8)

   b) What is system partitioning? How to do system partitioning? Explain.

8. a) Briefly explain different software testing methods. (8+8)

   b) Discuss functional MIS for a marketing system.