Enrol. No. | S | R | H | U | | | | | | | Regn. No. | D | D | | | | | | | | |

END SEMESTER EXAMINATION, JANUARY-2018
PROGRAM : DIPLOMA   FIRST SEMESTER

| COURSE CODE : DCST106 | COURSE TITLE : FUNDAMENTALS OF INFORMATION TECHNOLOGY |

[Time allotted: Three hours] | **[Max.Marks: 100]**

Note: Attempt all Sections & Questions.

Section (A)

Q. 1.   Attempt **all** questions.   (2 x 10 = 20)
   a.   What is a base of a number system? Explain.
   b.   Convert a number 756_8 into $(\ldots\ldots\ldots\ldots)_{16}$.
   c.   Convert a number 25.25_{10} into $(\ldots\ldots\ldots\ldots)_2$.
   d.   The symbol for input/output and for processing in a flowchart is .... and ....
   e.   What is spreadsheet? Explain with a suitable example.
   f.   Give the 5-names of input and output devices.
   g.   The computer can perform various tasks at the same time, it is known as ....
   h.   The extension for a MS power point file and a MS excel file is .... and .... respectively.
   i.   The shortcut key for italic is .... and for redo is ....
   j.   Convert a binary number $(10111101111)_2$ into a hexadecimal number as ....

Section (B)

Q. 2.   Attempt **any 5** questions.   (7 x 5 = 35)
   a.   Explain any three functions of an operating system.
   b.   What is DOS? Explain the following DOS commands with their syntax:
       i.   Type   iii.   Make directory
       ii.   Copy   iv.   Rename a file
   c.   Write the four disadvantages of a computer.
   d.   Write a short note on RAM and ROM.
   e.   Write a short note on e-mail.
   f.   What do you understand by multimedia? Explain different types of multimedia used in a real-life.
   g.   Differentiate between PROM and EPROM.

Section (C)

   Attempt **any 3** questions.   (3 x 15 = 45)
Q. 3.   a.   What is internetworking? Explain the different types of internetworking devices.   (8)
           b.   Explain the characteristics of a computer.   (7)

Q. 4.   a.   What is word-processing? How to create a short-cut on a desktop?   (7)
           b.   Describe the various types of database models with a neat- diagram.   (8)

Q. 5.   What is a number system? Convert the following: (1+2×7=15)
   a. $(100101111.1011101)_2$ into $(\ldots\ldots\ldots\ldots)_{16}$
   b. $(675221.6372)_8$ into $(\ldots\ldots\ldots\ldots\ldots)_{10}$.
   c. $(AB04FF.FB56F)_{16}$ into $(\ldots\ldots\ldots\ldots)_8$.
   d. $(674932.108645)_{10}$ into $(\ldots\ldots\ldots\ldots\ldots)_2$.
   e. $(1010111101.1010101)_2$ into $(\ldots\ldots\ldots\ldots)_{10}$.
   f. $(5672340.0045764)_8$ into $(\ldots\ldots\ldots\ldots)_2$.
   g. $(75231622.7352301)_8$ into $(\ldots\ldots\ldots\ldots)_{16}$.

Q. 6.   State the differences between: (3×5=15)
   a.   LAN, MAN, WAN
   b.   Hardware and Software
   c.   MS Word and MS Excel

Q. 7.   a.   What is a computer? Explain with the help of a block diagram. Also state the areas where computer can be used today.   (8)
           b.   Discuss in brief the different generations of computer with example.   (7)

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Enrol. No. | S | R | H | U | | | | | | Regn. No. | D | D | | | | | | | |

END SEMESTER EXAMINATIONS, JULY-2018
PROGRAM : POLYTECHNIC (CSE)   FIRST SEMESTER

| COURSE CODE : DCST106 | COURSE TITLE : FUNDAMENTALS OF INFORMATION TECHNOLOGY |

[Time allotted: Three hours]   **[Max. Marks: 100]**

Note: Attempt all Sections & Questions.

SECTION A

Q.1. Attempt **all** questions.   **(2 x 10 = 20)**

   a. What are output devices?
   b. Define electronic mail in short.
   c. What is Internet?
   d. Write short note on base of a number system.
   e. Write short note on Gateway.
   f. What is a high level language? Why it is required?
   g. Write short note on: note pad & MS-Access.
   h. Give introduction to MS-PowerPoint.
   i. Explain the repeater in details.
   j. What is the difference between non-positional number system and positional number system?

SECTION B

Q.2. Attempt **any 5** questions.   **(7 x 5 = 35)**

   a. Write a command for creating a file & rename it. Explain with an example.
   b. Explain the use of different types of computer.
   c. Define network in details.
   d. What is computer? Why it is also known as a data processor?
   e. Differentiate between the characteristics of primary and secondary storage of a computer system.
   f. What is information technology? Describe application of information technology.
   g. What is the MS-Windows? Explain features & version of windows.

SECTION C

Attempt **any 3** questions.   **(15 x 3 = 45)**

Q.3. a. Define 'Computer'. Explain block diagram of computer with functions of each unit.   **(7)**

   b. Describe the generations of computer systems. Also write the characteristics of each generations of computer system.   **(8)**

Q.4. a. What types of number system supported by computer system? Explain with examples.   **(5)**

   b. Convert the following: **(2*5=10)**
        i. $(111100)_2 = (?)_{10}$
        ii. $(C2A)_{16} = (?)_8$
        iii. $(3487)_{10} = (?)_2$
        iv. $(334)_6 = (?)_4$
        v. $(7654)_{10} = (?)_{16}$

Q.5. a. What is a multimedia computer system? What are its typical characteristics? Do all multimedia systems need to have all these characteristics?   **(8)**

   b. What is the difference between animation and video? Explain in briefly.   **(7)**

Q.6. **a.** What is computer animation? Write three examples of its use in multimedia application. **(9)**

b. Write with justifications which of the following are unimedia or multimedia devices: **(2+2+2=6)**

   i. TV system

   ii. A modern PC

   iii. A book having only text (no diagram)

Q.7. **a.** Differentiate among- bridge, router, and gateway. **(7)**

b. Write short notes on: **(4+4=8)**

   i. JPEG & MPEG.

   ii. Client Server Model.

Enrol. No. | S | R | H | U | | | | | | | Regn. No. | D | D | | | | | | | | |

END SEMESTER EXAMINATION, JUNE-2018
PROGRAM : POLYTECHNIC   SECOND SEMESTER

COURSE CODE : DCST114   **COURSE TITLE : PROGRAMMING USING 'C' LANGUAGE**

[Time allotted: Three hours]   **[Max. Marks: 100]**

Note: Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt **all** questions.   **(2 x 10 = 20)**
  a. Give the name of any three header files?
  b. What is unary operator?
  c. What is algorithm?
  d. What is the meaning of function **getch( )**?
  e. What is the difference between **int a** and **int *a**?
  f. Write the rules for constructing an identifier.
  g. What is a flowchart?
  h. Define the conditional operator.
  i. Differentiate between primitive data types and derived data types.
  j. What is use of function **clrscr( )**?

SECTION B

Q. 2. Attempt **any 5** questions.   **(7 x 5 = 35)**
  a. Write a program to calculate the sum of two numbers using function.
  b. What are data types? Explain the various data types in detail.
  c. Explain the **continue** and **break** statement with help of program.
  d. Define various storage classes in detail.
  e. Write the syntax of while, do while and for loop and differentiate with help of examples.
  f. What is string? How to declare and initialize a string? What is a null character?
  g. Draw five symbols of a flow chart? Draw a flowchart to find greatest number among three numbers.

SECTION C

Attempt **any 3** questions.   **(15 x 3 = 45)**

Q. 3. a. Write a C program to add two matrices.   (7.5)
  b. What is call by value? Write a program to calculate factorial of a number using function with no argument and no return value.   (7.5)

Q. 4. a. Write a program to show call by reference in the function parameter passing.   (7.5)
  b. What are pointers? How to declare and initialize a pointer?   (7.5)

Q. 5. a. What is structure? How it is different from union? Give an example.   (7.5)
  b. Write an algorithm to check weather a number is a palindrome or not.   (7.5)

Q. 6. a. What is algorithm? Write its properties? What are the steps involved to write an algorithm?   (7.5)
  b. Create a structure STUDENT with the following data members:- S_Name, S_Age, S_address and a S_DOB   (7.5)

Q. 7. a. What are C tokens? Explain all.   (7.5)
  b. Write a C program to check whether a year is leap year or not. Draw the flow chart for the same.   (7.5)

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END SEMESTER EXAMINATIONS, JANUARY-2018
PROGRAM : DIPLOMA (CSE)   THIRD SEMESTER

COURSE CODE: DCST205	COURSE TITLE: COMPUTER HARDWARE

[Time allotted: Three hours]   [Max.   Marks: 100]

Note: Attempt all Sections & Questions.

Section (A)

Q. 1.   Attempt **all** questions.   (2 x 10 = 20)
- a.   What is VDU?
- b.   1 gigabyte is equal to ……… kilobyte
- c.   Write a short note on super computer and mainframe computer.
- d.   Describe dot matrix printer.
- e.   What is RAM? Discuss its type.
- f.   Differentiate between CD and DVD.
- g.   Write a short note on Mouse and Keyboard.
- h.   Explain non volatile memory.
- i.   Explain EEPROM.
- j.   What do you mean by distributed system?

Section (B)

Q. 2.   Attempt **any 5** questions.   (7 x 5 = 35)
- a.   Draw a block diagram to illustrate the basic organization of a computer system and explain the function of various units.
- b.   What is the use of secondary memory in computer? Describe structure of hard disk.
- c.   What do you mean by computer network? Differentiate between LAN and WAN.
- d.   What is software? Explain System software and application software.
- e.   What is input device? Describe Scanner.
- f.   What do you mean by processor? Explain its type in detail.
- g.   What is computer memory? Explain memory hierarchy.

Section (C)

Attempt **any 3** questions.   (15 x 3 = 45)

Q. 3.   a. What is Operating system? Write down the differences between DOS and Windows.   (7.5)

b. What do you mean by Printer? Explain ink jet printer in detail.   (7.5)

Q. 4.   a. Define the different types of topologies.   (7.5)

b. What do you mean by computer hardware and software? Explain with example.   (7.5)

Q. 5.   a. What do you mean by network addressing? Explain IP addressing in detail.   (7.5)

b. Write step to convert analog signal to digital signal. Explain each step in detail.   (7.5)

Q. 6.   a. Explain different types of communication mediums in network.   (7.5)

b. What do you mean by switch, router and gateway? Also explain MAC address.   (7.5)

Q. 7.   a. What do you mean by parallel computing? Also explain process, program and thread.   (7.5)

b. What do you mean by cloud computing? Explain the types of cloud computing.   (7.5)

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END SEMESTER EXAMINATION, JANUARY-2018
PROGRAM : DIPLOMA(CSE)   THIRD SEMESTER

COURSE CODE : DCST206	COURSE TITLE : COMPUTER ORGANIZATION

[Time allotted: Three hours]   **[Max. Marks: 100]**

Note: Attempt all Sections & Questions.

Section (A)

Q. 1.   Attempt **all** questions.   **(2 x 10 = 20)**
   a. List the four phases of instruction cycle.
   b. What is control word?
   c. Specify few memory references instruction.
   d. What is multiplexer?
   e. Define micro-operation?
   f. Mention the purpose of program counter and accumulator.
   g. What is an assembler?
   h. Define associative memory and virtual memory.
   i. What is the difference between direct and an indirect instruction?
   j. What is the role of decoder?

Section (B)

Q. 2.   Attempt **any 5** questions.   **(7 x 5 = 35)**
   a. Discuss the operation of full adder with circuit diagram and truth table.
   b. Define register transfer language.
   c. Explain various types of addressing modes.
   d. Define stack organization.
   e. Explain the function of 3*8 decoder?
   f. What is interrupt priority?
   g. Define peripheral. What are the three types of peripherals?

Section (C)

Attempt **any 3** questions.   **(15 x 3 = 45)**
Q. 3.   a. Discuss Direct Memory Access in detail.   (7.5)

   b. Draw the Timing diagram for an Instruction cycle and explain?   (7.5)

Q. 4.   a. What is the need for an I/O interface? Discuss.   (7.5)

   b. Discuss Asynchronous data transfer in detail.   (7.5)

Q. 5.   a. Explain the register organization with neat block diagram?   (7.5)

   b. Discuss the input output processor (IOP).   (7.5)

Q. 6.   a. Write the algorithm to perform binary division.   (7.5)

   b. Design a serial adder circuit using shift register and a full adder.   (7.5)

Q. 7.   a. Discuss Robertson algorithm for 2's complement integer.   (7.5)

   b. With the help of a neat diagram explain 4 to 1 multiplexer.   (7.5)

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END SEMESTER EXAMINATION, JANUARY-2018
PROGRAM: DIPLOMA (CSE/EE/BME/ECE)   THIRD SEMESTER

COURSE CODE : DCST202/DEET202/DBMT206/DECT206

COURSE TITLE : OBJECT ORIENTED PROGRAMMING USING C++/ OBJECT ORIENTED PROGRAMMING

[Time allotted: Three hours]   **[Max. Marks: 100]**

Note: Attempt all Sections & Questions.

Section (A)

Q. 1.   Attempt **all** questions.   **(2 x 10 = 20)**
   a.   How can we manage output with manipulators?
   b.   What do you understand by inline functions?
   c.   What is meant by function overloading? Give example.
   d.   What is a virtual base class?
   e.   How do the properties of the following derived classes differ:
        i. class A : public B, protected C   ii. class A : protected C, public B
   f.   What do you understand by tokens? Name 5 tokens used in C++.
   g.   What do you understand by reference variable?
   h.   Write any 15 keywords in C++.
   i.   What are class and object?
   j.   State whether true or false:
        i. Operator functions never return a value.   ii. Constructors do not return any value.

Section (B)

Q. 2.   Attempt **any 5** questions.   **(7 x 5 = 35)**
   a.   What are the basic concepts of Object Oriented Programming? Explain each with an example.
   b.   Write a program to calculate xy using function.
   c.   Write a program to find the largest of three numbers using conditional operator.
   d.   What is the difference between constructor and destructor? What are the different types of constructors? Explain each with the help of example.
   e.   Write a program to check whether a number is Palindrome or not.
   f.   What is the difference between static member functions and static data members? Write a program to illustrate the concept of static functions.
   g.   Describe the mechanism of operator overloading with the help of example. Mention the operators which cannot be overloaded.

Section (C)

Attempt **any 3** questions.   **(15 x 3 = 45)**

Q.3.   a. What do you understand by data types? Explain the various categories of data types used in C++.   **(8)**
          b. What are operators? What are the different operators in C++? Explain with the help of example.   **(7)**

Q.4.   a. What is an exception? Describe the mechanism of exception handling in C++.   **(8)**
          b. Differentiate between logic errors and syntactic errors in C++.   **(7)**

Q.5.   a. Differentiate between C and C++.   **(7)**
          b. What is inheritance? Explain different types of inheritance used in C++.   **(8)**

Q.6.   a. Write a program to overload + operator to perform addition of two numbers.   **(8)**
          b. What do you understand by polymorphism? Explain the different types of polymorphism with the help of example.   **(7)**

Q.7. Explain the following with the help of example: **(5*3=15)**
          i. type casting
          ii. getline ( ) and putline ( )
          iii. stream classes

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END SEMESTER EXAMINATION, JANUARY-2018
PROGRAM : DIPLOMA(CSE)   THIRD SEMESTER

COURSE CODE : DCST203	COURSE TITLE : DATA STRUCTURES USING C

[Time allotted: Three hours]   **[Max. Marks: 100]**

Note: Attempt all Sections & Questions.

Section (A)

Q. 1.   Attempt **all** questions.   **(2 x 10 = 20)**
   a.   State the principle of stack.
   b.   List the basic operation performed on Data Structures.
   c.   Compare and contrast between binary and binary search tree.
   d.   What is Primitive Data Structure?
   e.   Differentiate between searching and sorting.
   f.   What is 2D array?
   g.   What is dequeue? Explain its two variants.
   h.   Describe strictly binary tree.
   i.   Define the terms node, root, height and degree for a tree.
   j.   Discuss pros and cons of array.

Section (B)

Q. 2.   Attempt **any 5** questions.   **(7 x 5 = 35)**
   a.   Sort the following elements by using Selection Sort :
        48, 29, 8, 59, 72, 88
   b.   The in-order traversal of a tree produced the sequence D,B,H,E,A,I,F,J,C,G and the preorder traversal of
        the same tree produced A,B,D,E,H,C,F,I,J,G. Draw the binary tree. Give a linear array representation of the
        above binary tree.
   c.   Write short note in any two:
        i)   Sparse matrix representation
        ii) Addition of two polynomial using linked list
        iii) Linear Search and Binary search
   d.   Explain circular queue with example. Also show insertion and deletion operation in circular queue.
   e.   Write an algorithm to show insertion and deletion at specific location in an array.
   f.   Differentiate between array and linked list.
   g.   What is binary tree? Draw an expression tree of given expressions
        i)   A-B/(C^D)+(E*F)
        ii) A*B^C-(D/E+F)

Section (C)

Attempt **any 3** questions.   **(15 x 3 = 45)**
Q.3.   a. Differentiate between static and dynamic memory allocation.
           b. An array A[5][5] is stored in the memory with each element occupying 4 bytes of space. Assuming the base
              address of A is 110, Compute the address of A[2][2] when array is stored **(i)** row wise **(ii)** column wise.

Q.4.   a. Define stack with suitable example. Implementsstack in C in which each item on the stack is a varying
              number of integers. Choose a C data structure for such a stack and design push and pop function for it.
           b. Convert the given Infix expression to Prefix expression using Stack and show the details of Stack at each
              step of conversion. **Expression:**
              ((A+B)+C*(D+E)+F)*(G+H)

Q.5.   a. Write an algorithm for deleting a node from the beginning of a doubly linked list.

b. Write a short note on circular linked list and explain the insertion and deletion of a node from the circular linked list.

Q.6. **a.** For the given binary tree perform Inorder, Preorder and Postorder traversal
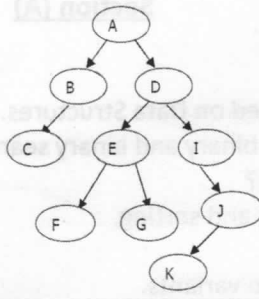
b. Sketch the binary search tree resulting from the insertion of the following integer keys: 39, 24, 12, 11, 43, 73, 26, 35, 29, 13, 6
   i) Is the tree a complete tree?
   ii) What is the height of the sketched tree?
   iii) Show the array representation of the above designed tree.

Q.7. **a.** Sort the following list using insertion and bubble sort:
   44 33 11 55 77 90 40 60
   b. WAP in C or function in C or algorithm for matrix multiplication.

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END SEMESTER EXAMINATIONS, JULY-2018
PROGRAM : POLYTECHNIC (CSE)   THIRD SEMESTER

| COURSE CODE : DCST204 | COURSE TITLE : DIGITAL ELECTRONICS |

[Time allotted: Three hours]   [Max. Marks: 100]

Note: Attempt all Sections & Questions.

SECTION A

Q. 1.   Attempt **all** questions:-   (2*10=20)
   a.   What is ASCII code?
   b.   What is NOR gate?
   c.   What is Tri state switch?
   d.   What are 7400 &7432?
   e.   What is volatile memory?
   f.   What is invalid condition?
   g.   What is Register?
   h.   What is 2's compliment of 1011?
   i.   What is EX-OR gate?
   j.   What is bistable multivibrator?

SECTION B

Q. 2.   Attempt **any five** questions :   (5*7=35)
   a.   Convert following number into -
       i. $(2048)10$ =   (?)8
       ii. $(FDC2) 16$ =   (?) 2
       iii. $(90))10$ =   (?)2
       iv. $(1101)2$ =   (?)gray
       v. $(0.125)10$ =   (?)2
       vi. $(32)10$ =   (?) Excess -3
       vii. $(429) 10$ =   (?) BCD
   b.   What is multiplexer? Write the applications of Mux. Draw the 4x1 Mux logic circuit.
   c.   Draw the logic circuit for following Boolean expression with the help of K- Map.
       i. $F(A,B,C,D) = \sum [m0,m1,m4,m5,m8,m9,m12,m13+d(2,3,6,7,10,11,14,15)]$
       ii. $F(A,B,c) = \sum(m3,m6,m7)$
   d.   Answer the following:
       i.   Proove Boolean equation $(A+B.C) = (A+B)(A+C)$
       ii.   What is DeMorgan's theorem? Explain with truth table.
   e.   What is the difference between combinational & sequential logic circuit. Explain JK flip-flop with truth table.
   f.   What is the application of 2's compliment? Draw the logic circuit gate of full subtractor with the help of K-Map.
   g.   Add the following numbers:-
       i. $(257)16 + (752)16$
       ii. $(346)8 + (643)8$
       iii. $(257)BCD + (145)BCD$
       iv. $(101011)_2 + (111111)_2$

Attempt **any three** questions: - (3*15=45)

Q. 3.

a. What is memory? Write the type of memory and define RAM, PROM, ROM, and EEPROM. (7.5)

b. If the reference voltage is 3V, convert the 4 bit binary number from 0000 to 1111 corresponding to analog voltage. (7.5)

Q. 4.

a. What is the difference between synchronous and Asynchronous counter. Explain 4 bit ripple counter. (7.5)

b. If we count 32 state then how many flip flop required for counting. Explain R-S Flip-Flop with timing diagram. (7.5)

Q. 5.

a. What is the advantage of R-2 R ladder network over binary weighted network? Define accuracy, resolution factor. If number of binary bit is 4, what is its resolution factor? (7.5)

b. What is the limitation of K-map? Prove Boolean equation: A+Ā.B = A+B (7.5)

Q. 6.

a. Draw the 2 input diode logic circuit for AND gate and OR gate and also define the Duality theorem. (7.5)

b. Define D Flip Flop with truth table and timing diagram. (7.5)

Q. 7.

a. Draw the K-map for following Boolean functions:- (7.5)

(1) F (A,B,C) = ∑(m0,m3,m4,m5,m7)

(2) F (A,B,C) = ∑(mo,m1,m2,m6)

(3) F (A,B,C) = ∑(m0,m1,m2,m5,m6)

b. Define demultiplexer and decoder circuit. Design 3x8 decoder circuit. (7.5)

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END SEMESTER EXAMINATIONS, JULY-2018
PROGRAM : POLYTECHNIC(CSE)   THIRD SEMESTER

COURSE CODE : DCST206	COURSE TITLE : COMPUTER ORGANIZATION

[Time allotted: Three hours] | **[Max. Marks: 100]**

Note: Attempt all Sections & Questions.

SECTION A

Q. 1.   Attempt **all** questions.   (2 x 10 = 20)
   a.   What is decoder?
   b.   Differentiate between micro-operation and micro-instruction.
   c.   What is the role of multiplexer?
   d.   List all the type of register reside in CPU.
   e.   Define Associative memory and virtual memory.
   f.   Explain all the field of instruction format.
   g.   What is the difference between direct and an indirect instruction.
   h.   What is interrupt?
   i.   Define assembler?
   j.   Define virtual memory?

SECTION B

Q. 2.   Attempt **any 5** questions.   (7 x 5 = 35)
   a.   Explain the function of 4*16 decoder?
   b.   Explain various types of addressing modes.
   c.   Discuss the operation of full subtractor with circuit diagram and truth table.
   d.   Define peripheral. What are the three types of peripherals?
   e.   What is interrupt priority?
   f.   Explain basic computer organization.
   g.   Define Handshaking Method of data transfer scheme?

SECTION C

Attempt **any 3** questions.   (15 x 3 = 45)
Q. 3.   a.   Design a serial adder circuit using shift register and a full adder.   (7.5)
        b.   Discuss in detail about DMA Controller and its functionality.   (7.5)

Q. 4.   a.   Draw the timing diagram for an instruction cycle and explain.   (7.5)
        b.   Discuss Robertson algorithm for 2's complement integer.   (7.5)

Q. 5.   a.   Write a short note on register organization.   (7.5)
        b.   Explain various data transfer schemes.   (7.5)

Q. 6.   a.   Write the algorithm to perform binary multiplication.   (7.5)
        b.   Discuss the input output processor (IOP) in detail.   (7.5)

Q. 7.   a.   Draw the diagram of 4 bit adder-subtractor and explain its operation.   (7.5)
        b.   Explain the instruction format and instruction cycle in detail.   (7.5)

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END SEMESTER EXAMINATIONS, JULY-2018
PROGRAM : POLYTECHNIC (CSE /EE)   THIRD SEMESTER

COURSE CODE : DCST202 / DEET202	COURSE TITLE : OBJECT ORIENTED PROGRAMMING USING C++

[Time allotted: Three hours]   **[Max. Marks: 100]**

Note: Attempt all Sections & Questions.

SECTION A

Q. 1.   Attempt **all** questions.   (2 x 10 = 20)

a.   What is the difference between new and delete operator?

b.   Explain abstract data-type (ADT) with a suitable example.

c.   Define this pointer.

d.   When will you make a function inline? Why?

e.   How to create a reference variable of a given variable? Explain with a suitable example.

f.   Name the operators that can't be overloaded in C++.

g.   What is the difference insertion (<<) and extraction (>>) operators?

h.   Describe the importance of destructor function.

i.   How to use memory-allocation and de-allocation in C++?

j.   What is an object? How is it created in C++?

SECTION B

Q. 2.   Attempt **any 5** questions.   (7 x 5 = 35)

a.   Write a program containing a possible exception, use a try block to throw it and a catch block to handle it properly.

b.   What is a class? How does it accomplish data hiding?

c.   What is a friend function? What are the merits and de-merits of using friend function?

d.   When do we make a class virtual? Explain with a suitable example.

e.   What is stream? Explain different types of stream classes used in C++.

f.   Explain exception handling. Differentiate between logic errors and syntactic errors.

g.   What is virtual function? Explain with an example.

SECTION C

Attempt **any 3** questions.   (15 x 3 = 45)

Q. 3.   a.   What do you mean by Object Oriented Programming (OOPs)? List out the different concepts of oriented   programming used in C++.   (8)

b.   Describes the different applications of object oriented programming.   (7)

Q. 4.   a.   What is reusability? How do you achieve reusability in an object oriented programming?   (7)

b.   What are the different forms of inheritance? Explain each with a suitable example.   (8)

Q. 5.   a.   What is constructor? Explain different types of constructors with suitable examples.   (7)

b.   List some of the special properties of the constructor functions.   (8)

Q. 6.   a.   What is an inline function? How is it different from macro substitution?   (8)

b.   Write a program to area of a circle using inline function.   (7)

Q. 7.   a.   Define operator overloading. Write a program to overload ++ operator.   (8)

b.   Write a program to add two complex numbers using operator overloading, where complex is a class and numbers are objects of that class.   (7)

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END SEMESTER EXAMINATIONS, JULY-2018
PROGRAM : POLYTECHNIC (CSE) THIRD SEMESTER

COURSE CODE : DCST203	COURSE TITLE : DATA STRUCTURE USING C

[Time allotted: Three hours]   **[Max. Marks: 100]**

Note: Attempt all Sections & Questions.

SECTION A

Q. 1.   Attempt **all** questions.   **(2 x 10 = 20)**

   a.   Define linked list data structure in details.
   b.   Difference between primitive & non-primitive data structure.
   c.   Define tree terminology in details.
   d.   What do you mean by hashing?
   e.   What do you mean by traversing?
   f.   Define data structure. Differentiate between linear and non linear data structure.
   g.   Explain limitation of singly linked list
   h.   What is complete binary tree?
   i.   What are the limitations of linear queue?
   j.   What are the advantages of linked list over an array?

SECTION B

Q. 2.   Attempt **any 5** questions.   **(7 x 5 = 35)**

   a.   Consider the following infix expression X:
        X : ((P+Q)*S)^(T-U)
        Using algorithm translate X into its equivalent prefix expression Y.
   b.   Explain tree representation in details with example.
   c.   Define heap sort with the help of example.
   d.   WAP in C or function or algorithm for linear search & also explain with the help of example.
   e.   Explain doubly linked list in details.
   f.   Define quick sort with the help of example.
   g.   Explain implementation of 1D-array in memory with the help of example.

SECTION C

Attempt **any 3** questions.   **(15 x 3 = 45)**

Q. 3.   a.   Define priority queue. Write an algorithm or C-function for a circular queue insertion & deletion.
        b.   WAP in C or C-function or algorithm for Circular Singly Linked List for any three operation-
              i.   Insertion at beginning
              ii.   Deletion at beginning
              iii. Insertion at end
              iv.   Deletion at end

Q. 4. **a.** Sketch the binary tree with the help of given order:
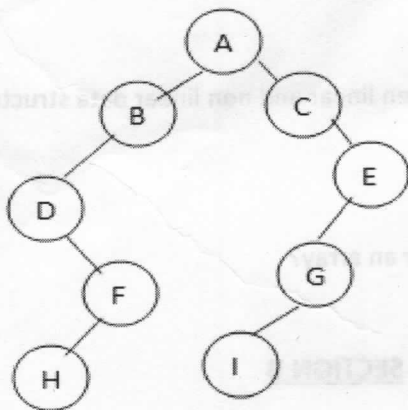
Postorder: E C K A H B G D F

Inorder: E A C K F H D B G

Write the PREORDER traversal of the sketched tree.

b. Write an algorithm or C-function for each of the following:

    i. Inorder traversal

    ii. Preorder traversal

    iii. Postorder traversal

Find inorder, preorder & postorder traversal for given tree:

Q. 5. **a.** WAP in C or function for singly queue operation-

    i. Enqueue

    ii. Dequeu

    iii. Traverse

b. Write a algorithm for bubble sort. Sort the following elements by using bubble sort(write result pass by pass):

    48, 29, 8, 59, 72, 88

Q. 6. **a.** What is searching? Explain the linear search with program.

b. Each element of an array **DATA[25][25]** requires **4** bytes of storage. Base address of DATA is **3000**, determine the location of **DATA[17][19]** when the array is stored as

    i. Row major

    ii. Column major

Q. 7. **a.** WAP in C or function in C or algorithm for matrix multiplication.

b. Write algorithm for conversion infix expression to postfix expression.

Convert given infix expression into postfix expression-

$$A \wedge B * C - D + E / F / (G + H)$$

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END SEMESTER EXAMINATIONS, JUNE-2018
PROGRAM: POLYTECHNIC (CSE)   FOURTH SEMESTER

COURSE CODE : DCST211	COURSE TITLE : DATABASE MANAGEMENT SYSTEMS

[Time allotted: Three hours]   **[Max. Marks: 100]**
Note: Attempt all Sections & Questions.

SECTION A

Q. 1.   Attempt **all** questions.   **(2 x 10 = 20)**
   a.   With an example explain what is a composite attribute.
   b.   Define schema.
   c.   Differentiate between ALTER and UPDATE command.
   d.   Describe data redundancy.
   e.   Distinguish between partial and full functional dependency.
   f.   Define null values.
   g.   Distinguish the term primary key and foreign key.
   h.   What is transaction?
   i.   Explain (*) keyword in SQL.
   j.   What do you mean by relation?

SECTION B

Q. 2.   Attempt **any 5** questions.   **(7 x 5 = 35)**
   a.   A hospital patient registration system maintains data about the following entities :
         Patient,   Disease,   Registration
         Construct an E-R diagram for the above system. Explain the mapping cardinality used.
         Assume suitable attributes
   b.   What are domain constraints? Discuss the importance of constraints in relational model.
   c.   Discuss briefly the advantages of DBMS.
   d.   Explain different types of database languages and their functions in database systems.
   e.   What are different types of locks used in transaction? Explain with the help of example.
   f.   What is functional dependency? How does it play an important role in normalization?
   g.   Write a note and list down aggregate and scalar functions.

SECTION C

Attempt **any 3** questions.   **(15 x 3 = 45)**

Q. 3.   a.   What is data model? Explain with help of example various types of data models.   (7.5)
         b.   Explain in detail with the help of neat diagram DBMS architecture.   (7.5)

Q. 4.   a.   Differentiate between ER model and relational model   (5)
         b.   Write SQL queries for the following: (10)
                  ORDERS (O_ID, ORDERNO, P_ID, CATEGORY)
                  PERSONS (P_ID   LASTNAME   FIRSTNAME   ADDRESS   CITY)
            i.   Write DDL commands to create the above relations.
            ii.   Get the name of person where P_ id is "P10048" and bought order number "OD102"
            iii.   Change the lastname from 'kumar' to 'Singh 'of the person.
            iv.   Retrieve the sum of 'cost' (total cost) offered by each order category.
            v.   Retrieve the name of a person living in city name staring from "K"

Q. 5. **a.** What is data abstraction? Explain different levels of data abstraction. (5)

b. What are the various constraints used in database implementation? Explain with the help of SQL query. (10)

Q. 6. **a.** Define Normal forms. List the definitions with suitable example of First, Second and Third Normal Form. (10)

b. Consider the following relation and the given functional dependencies: (5)

R1(A,B,C,D,E,F,G), A and B are key attributes

FD1: (A,B)→ (D,E)

FD2: B→F

FD3: F→G

  i. Which normal form is the above relation? Justify your answer.

  ii. Normalize the above relation.

Q. 7. **a.** What is transaction? Draw a state diagram of a transaction showing its states. Explain ACID properties of a transaction with suitable examples. (10)

b. Differentiate between serial and non serial transactions with the help of example.

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END SEMESTER EXAMINATIONS, JUNE - 2018

PROGRAM : POLYTECHNIC (CSE)   FOURTH SEMESTER

COURSE CODE : DCST209	COURSE TITLE : WEB TECHNOLOGY

[Time allotted: Three hours]   **[Max. Marks : 100]**

Note: Attempt all Sections & Questions.

SECTION A

Q.1.   Attempt all questions.   (2x 10 = 20)
- **a.**   What do you mean by DHTML?
- **b.**   What is Extranet?
- **c.**   Why do we use prompt ( )?
- **d.**   Describe img tag with its attributes. Why do we use alt attribute?
- **e.**   What is the structure of HTML?
- **f.**   Write an HTML code for creating a table of two rows and three columns. Use at least three table attributes.
- **g.**   Write the syntax for inserting image.
- **h.**   What are GET and POST method?
- **i.**   What is repeater?
- **j.**   What are the different methods of specifying colors in HTML?

SECTION B

Q.2.   Attempt **any 5** questions.   (7 x 5 = 35)
- **a.**   What is a website? What do you mean by Client-side scripting and Server-side scripting language?
- **b.**   Give one example of each scripting language.
- **c.**   What is front page editor? Write its key features.
- **d.**   What are web browsers? Write any three web browser name.
- **e.**   Design a form to enter name, email, mobile no., and date of birth and confirm before submitting. Validate if the form is filled correctly or not.
- **f.**   Explain CGI. What is the basic structure of CGI script? Write CGI example.
- **g.**   What is Web Search Engine? Explain its working process. Give examples.
- **h.**   What is OSI Model? Explain all its layers with the help of a diagram.

SECTION C

Attempt **any 3** questions.   (15 x 3 = 45)
Q.3.   **a.** Write a short note on the history and evolution of Internet.
          b. What are the advantages and disadvantages of internet?

Q.4.   **a.** What is URL? Explain its types and differentiate between them.
          b. Differentiate between SMTP and POP.

Q.5.   **a.** Write a JavaScript code to illustrate alert( ), confirm( ) and prompt( ).
          b. Write a HTML code to illustrate inline, internal and external CSS.

Q.6.   **a.** What do you mean by cookies? How does a cookie work? What are the five fields used in cookies?
          b. Write a java script program to set a cookie?

Q.7.   **a.** What do you mean by JSP? Write its advantage? Draw its architecture and explain.
          b. Write a JSP program to create a table Student in the database.

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END SEMESTER EXAMINATIONS,   JUNE - 2018)
PROGRAM: POLYTECHNIC(CSE)   FOURTH SEMESTER

COURSE CODE : DCST208	COURSE TITLE : VB.NET
[Time allotted: Three hours]	**[Max. Marks : 100]**

Note: Attempt all Sections & Questions.

SECTION A

Q. 1.   Attempt **all** questions.   (2 x 10 = 20)
   a.   Write down the "Helloworld " program by using console application in VB.Net
   b.   What is assembly metadata in .NET?
   c.   What are the different features provided by CLR?
   d.   Explain any four advantages of .NET Framework.
   e.   Write a statement that declares iNum and iSum as integer.
   f.   List major components of .Net framework.
   g.   How to declare the constant in VB.NET?
   h.   What is the difference between declaration statement and executable statement?
   i.   What are the decision making statements?
   j.   Draw the block diagram of the loop Statement.

SECTION B

Q. 2.   Attempt **any 5** questions.   (7 x 5 = 35)
   a.   Explain two dimensional arrays with example
   b.   What is the functioning of JUST IN TIME in .NET? Explain in short.
   c.   Explain any four data type in VB.Net with example.
   d.   What is array? Explain the creation and using of different type of Array.
   e.   What is operators? Discuss about the assignment operators.
   f.   Write the program for "FOR…Next" loop statement.
   g.   Write the program uses a nested for loop.

SECTION C

Attempt **any 3** questions.   (15 x 3 = 45)
Q. 3.   a. What is String? Write down the Program for joining the Strings.   (7.5)
         b. What do you mean by jump statement? Explain GOTO with help of example.   (7.5)

Q. 4.   a. What is function? Write down the function that return the maximum integer among the two.   (7.5)
         b. Describe garbage collection in .net framework with example.   (7.5)

Q. 5.   a. What is select case? Explain select case with help of example.   (7.5)
         b. What is exceptional handling? implement error handling blocks by using the **Try**, **Catch** and **Finally**
            keywords. (for implementation of a program use system exception)   (7.5)

Q. 6.   a. Design window form and write code in VB.Net to create two text boxes and use the Click event of a button to
            display the entered text using a message box.   (7.5)
         b. What is recursive function? Write down recursive function for the factorial of a given number.   (7.5)

Q. 7.   Explain the following:-   (15)
      i.   Messaging
     ii.   Param array
    iii.   Localization
     iv.   WWW
      v.   Cross language integration

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END SEMESTER EXAMINATIONS, JUNE-2018
PROGRAM : POLYTECHNIC (CSE)   FOURTH SEMESTER

COURSE CODE : DCST212   **COURSE TITLE : SOFTWARE ENGINEERING**

[Time allotted: Three hours]   **[Max. Marks: 100]**

Note: Attempt all Sections and Questions.

SECTION A

Q. 1.   Attempt **all** questions.   **(2 x 10 = 20)**
   a.   What is a software?
   b.   Name any 4 categories of software.
   c.   What are software framework activities?
   d.   What do you understand by verification?
   e.   What is PSP?
   f.   State the factors on which software maintenance activities depend.
   g.   What do you mean by CASE tools?
   h.   Explain briefly what is software reverse engineering.
   i.   Write quality system activities.
   j.   Write advantages and disadvantages of statistical testing.

SECTION B

Q. 2.   Attempt **any 5** questions.   **(7 x 5 = 35)**
   a.   What are the properties of a good SRS document?
   b.   Explain 5 maturity levels of SEI CMM.
   c.   What are the features of good prototyping CASE tools? State the requirements of prototyping CASE tools.
   d.   State the differences between function-oriented and object-oriented design approach.
   e.   What are six reliability metrics?
   f.   Write about control flow based criteria of white box testing.

SECTION C

Attempt **any 3** questions.   **(15 x 3 = 45)**

Q. 3.   a.   Explain people concept of management spectrum.   (7.5)
        b.   Explain basic principles of project scheduling.   (7.5)

Q. 4.   a.   Explain different types of ISO 9000 quality standards. What are its shortcomings?   (7.5)
        b.   What are the types of risk associated with the software project? Why software configuration management is necessary?   (7.5)

Q. 5.   a.   Classify cohesion in detail.   (7.5)
        b.   Explain any 3 software life cycle models.   (7.5)

Q. 6.   a.   Explain brute force, backtracking, cause elimination and program slicing method for debugging.   (12)
        b.   What is orthogonal testing?   (3)

Q. 7.   a.   Write about unit testing, system testing, acceptance testing and regression testing.   (10)
        b.   What are test deliverables? Write how test team decides item pass/fail criteria.   (5)

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END SEMESTER EXAMINATION, JANUARY-2018
PROGRAM : DIPLOMA(CSE)   SEMESTER : FIFTH

| COURSE CODE : DCST304 | COURSE TITLE : OPERATING SYSTEM |

[Time allotted: Three hours]   **[Max. Marks: 100]**

Note: Attempt all Sections & Questions.

Section (A)

Q.1.   Attempt **all** questions.   (2 x 10 = 20)
   a. What is critical section?
   b. What is safe sequence?
   c. What is thrashing?
   d. What is system call?
   e. Explain run time address binding?
   f. Explain CPU bound and input output bound process?
   g. What are monitors in synchronization?
   h. Why do we do page replacement? Explain.
   i. Define Belady's anomaly problem in FIFO.
   j. What is compaction?

Section (B)

Q.2.   Attempt **any 5** questions.   (7 x 5 = 35)
   a. Consider a system with 4 processes. Each requires 2 units of resources to complete the execution, then what is the minimum no of resources required to avail deadlock free environment?
   b. In disk scheduling algorithm, following is the track requests.
      98, 183, 37, 122, 14, 124, 65, 67
      Compute the seek time using C-SCAN scheduling algorithm if the r/w head presently is on 53.
   c. What is the difference between kernel level thread and user level thread?
   d. What is process? Explain with the help of process transition diagram
   e. Under what circumstances page faults occur? Describe the actions taken by the operating system when a page fault occurs.
   f. Consider the following page reference string:
      1,2,3,4,2,1,5,6,2,1,3,7,6,3,2,1,2,3,6
      How many page faults would occur for the algorithm optimal page replacement using four frames.
   g. What is scheduler and explain various types of schedulers in details.

Section (C)

   Attempt **any 3** questions.   (15 x 3 = 45)
Q.3. a. Explain the following:
      i. Context switching
      ii. Compile time address binding
      iii. Throughput.
      iv. Dispatcher
      v. Deadlock.
   b. Using shortest Job First scheduling technique calculates the average Turn Around Time for the following processes.

PROCESS	ARRIVAL TIME	BURST TIME
1	5	3
2	7	1
3	6	2
4	1	1
5	1	2
6	8	3

Q.4. a. Using Longest Job First scheduling technique calculates the average Waiting Time for the following processes.

PROCESS	ARRIVAL TIME	BURST TIME
1	9	5
2	7	1
3	6	7
4	1	1
5	1	5
6	8	3

b. A disk with 1000 cylinders, numbers 0 to 999, compute the number of tracks the disk arm must move to satisfy all the request in the disk queue. Assume the last request serviced was at track 345 and the head is moving towards track 0. The queue in FIFO order contains request for the following tracks:
    123,874,692,475,105,376
    Perform the computation for the following scheduling algorithms:
    i) FIFO   ii) SSTF

Q.3. a. Consider a system where a counting semaphore value is initializing to +17. The various operations like 23P, 18V, 16P, 14V, 1P are performed. Then what is the final value of semaphore.

b. What is the difference between multitasking and multiprogramming operating system? Explain.

Q.4. Consider the following snapshot of a system:

	ALLOCATION	MAX	AVAILABLE
	A B C D	A B C D	A B C D
PO	0 0 1 2	0 0 1 2	1 5 2 1
P1	1 0 0 0	1 7 5 0	
P2	1 3 5 4	2 3 5 6	
P3	0 6 3 2	0 6 5 2	
P4	0 0 1 4	0 6 5 6	

Answer the following questions using the banker's algorithm:
    i. Is the system in the safe state?
    ii. Provide the safe sequence of the above.

Q.5. a. Explain the various partition allocation policies with the help of suitable examples.
b. Consider a system with logical address space is 128M words and physical address is of 24 bits. The physical address is divided into 8K frames. What is the page size and how many pages in logical address space?

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SECTION A

Q. 1.   Attempt **all** questions.   **(2 x 10 = 20)**

   a.   What is Rasterization?

   b.   Name two line drawing algorithms?

   c.   Write applications of computer graphics.

   d.   What is resolution?

   e.   Define Concave polygons.

   f.   Write two point about polygon filling algorithms.

   g.   What is 2D transformation?

   h.   Define translation.

   i.   What is clipping.

   j.   Write the use of windowing.

SECTION B

Q. 2.   Attempt **any 5** questions.   **(7 x 5 = 35)**

   a.   Find a transformation matrix that transforms a given square ABCD to half its size with centre still remaining at the same position. The coordinates of the square are A(1,1),B(3,1),C(3,3),D(1,3) centre at (2,2).

   b.   Scan convert a line with end points (10,5) & (15,9) using both DDA and Bresenham algorithm

   c.   Explain Cohen-Sutherland algorithm of line clipping. Use it to clip the line P1 (70,20) and P2 (100,10) against a window lower left hand corner (50,10) and upper right hand corner (80,40)

   d.   Plot a circle using midpoint circle algorithm where radius= 10 and center is at (0,0).What is the difference between geometric and co-ordinate transformation?

   e.   Write In detail about winding number rule for polygon. Give two examples to show its use.

   f.   In how many types, we can fill a polygon. Write flood fill algorithm in detail

   g.   Deduce the matrix for rotation about arbitrary point in 2D. What is composite matrix?

SECTION C

Attempt **any 3** questions.   **(15 x 3 = 45)**

Q. 3.   What are display devices? How they can be classified? Elaborate them with example. How is raster scan different from random scan?

Q. 4.   a.   Name two line clipping algorithm. Write a procedure to clip a point.

   b.   Explain mirror reflection. Write down the matrix of mirror reflection (about x-axis, y-axis).

Q. 5.   a.   Explain 2D viewing-transformation pipeline with the help of diagram.

   b.   Write a 2X2 transformation matrix for each of the following rotation about the origin,

        i.   counterclockwise by 120^0

        ii.   clockwise by 60^0

Q. 6.   **a.**   Explain Sutherland-Hodgeman algorithm and using the algorithm clip the following polygon against the rectangle.
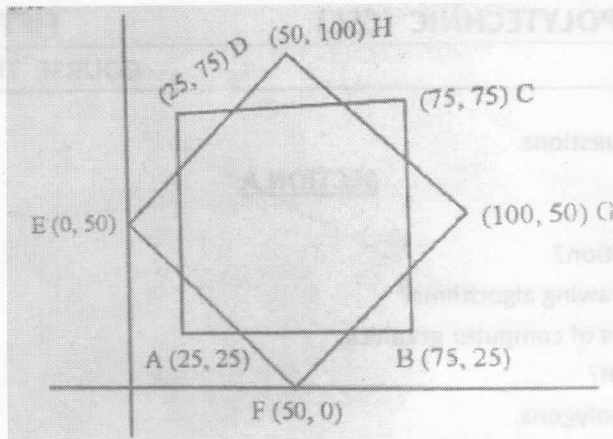
b.   How is 2D transformation different from 3D transformation? Write the matrix for scaling & translation in 3D.

Q. 7.   **a.**   What do you mean by Window to Viewport mapping?

   b.   Write short notes on
      i.   Bit depth
      ii.   Aspect ratio

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END SEMESTER EXAMINATIONS, JANUARY-2018
PROGRAM : POLYTECHNIC (CSE)   FIFTH SEMESTER

COURSE CODE:DCST301   **COURSE TITLE: PROGRAMMING IN JAVA**

[Time allotted: Three hours]   **[Max. Marks: 100]**

Note: Attempt all Sections & Questions.

Section (A)

Q. 1.   Attempt **all** questions: **(2 x 10 = 20)**
   a. Why does java not support pointers?
   b. What is runtime polymorphism?
   c. What is instance variable?
   d. What do you understand by type casting?
   e. Write at least four String methods.
   f. What is multithreading?
   g. Why we use AWT package?
   h. Write a program to count no of command line arguments.
   i. Define super keyword.
   j. Differentiate between final, finally and finalize( ).

Section (B)

Q. 2.   Attempt **any 5** questions: **(7 x 5 = 35)**
   a. Discuss the features of Java.
   b. Describe the different components of JRE.
   c. Write a program to input the information of a student and display it using Scanner class.
   d. Write applets to draw the following shapes: Eclipse, Triangle, Pentagon and Circle.
   e. Write a program to demonstrate method overloading.
   f. What is an exception? How is it different from an error? Is it possible to include your own exception in a program? Explain with suitable code for the purpose.
   g.   What are packages in Java? What is the purpose of packages? Explain with the help of an example.

Section (C)

   Attempt **any 3** questions: **(15 x 3 = 45)**
Q. 3.   a. What are applets? How applets differ from applications? What are local and remote applets?   (7.5)
            b. Write an applet to input three numbers as input from the user and then displays the largest
               of the three on the screen. Write an HTML page and test the applet.   (7.5)

Q. 4.   a. Explain the working of JVM.   (7.5)
            b. How to declare and initialize a 1 D array in java? Write a program to check that how many elements
               are prime in an integer 1-D array.   (7.5)

Q. 5.   a. What are interface? What are the different forms of interface?   (7.5)
            b. Write a program to create an interface Area. Also create three different classes namely Rectangle,
               Circle and Square to implement the Area interface.   (7.5)

Q. 6.   a. How concurrency is implemented in Java? Explain.   (7.5)
            b. What are the two methods to create thread? Create a thread using both the methods.   (7.5)

Q. 7.   a. Describe the various stream classes in Java.   (7.5)
            b. Write a program to copy characters from one file into another.   (7.5)

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END SEMESTER EXAMINATIONS, JANUARY 2018
PROGRAM : DIPLOMA (CSE)   FIFTH SEMESTER

| COURSE CODE : DCST303 | COURSE TITLE : DATA COMMUNICATION & COMPUTER NETWORK |

[Time allotted: Three hours]   **[Max. Marks: 100]**

Note: Attempt all Sections & Questions.

Section (A)

Q. 1. Attempt **all** questions.   **(2 x 10 = 20)**
     a. What is the similarity and difference between congestion control and flow control?
     b. Discuss the issues in transport layer.
     c. Why are standards needed?
     d. Distinguish between peer-to-peer relationship and a primary-secondary relationship.
     e. What are header and trailers and how do they get added and removed?
     f. Give the relationship between propagation speed and propagation time?
     g. What are the responsibilities of data link layer?
     h. What is piggy backing?
     i. What is time-to-live or packet lifetime?
     j. What are the four internetworking devices?

Section (B)

Q. 2. Attempt **any 5** questions.   **(7 x 5 = 35)**
     a. Explain two types of guided media and two types of unguided media transfer in networks.
     b. What are the Transmission Impairments? Explain all Impairments. The loss in a cable is usually defined in decibels per kilometer (dB/km). If the signal at the beginning of a cable with -0.3 dB/km has a power of 2mW, what is the power of the signal at 5 km?
     c. Define the Bandwidth. A periodic composite signal with a bandwidth of 3000Hz is composed of two sine waves. The first one has a frequency of 100Hz with maximum amplitude of 30V; the second one has maximum amplitude of 10V. Draw the bandwidth.
     d. What is protocol? What are the different protocols used in data link layer for error control and flow control? Explain all the different Kinds of protocols.
     e. Given IP address 168.90.80.66 and mask 255.255.255.192, then find:
         i. How many bits for network subnet or Host
         ii. Total no. of Host
         iii. Total no. of subnet
         iv. Subnet address
         v. Broadcast address
     f. Show the Forwarding process if a packet arrives at R1 in with the destination address 180.70.65.140

Mask	Network Address	Next Hop	Interface
/26	180.70.65.192	-	M2
/25	180.70.65.192		M0
/24	201.4.22.0		M3
/24	201.4.16.0		M1
/0	0.0.0.0	180.70.65.200	M4

Routing Table for Router R1

     g. Explain the HTTP Transaction.

Section (C)

Attempt **any 3** questions.   **(15 x 3 = 45)**

Q. 3. Explain in details the working of Electronic Mail.   **(15)**

Q. 4. a. In a Leaky Bucket used to controls liquid flow , How many gallons of liquid are left in the bucket if the output rate is 6 gal/min, there is an input burst of 100 gal/min for 11s and there is no input for 49 s? **(7.5)**

b. Differentiate between the ISO OSI Reference Model and TCP/IP Reference Model. **(7.5)**

Q. 5. Explain the switching method used in the data communications. **(15)**

Q. 6. What is Checksum? A sender needs to send the four data items 0x3456, 0xABCC, 0x02BC, and 0xEEEE. Answer the following: **(15)**

    i. Find the checksum at the sender site
    ii. Find the checksum at the receiver site if there is no error
    iii. Find the checksum at the receiver site if the second data item is changed to 0xABCE.
    iv. Find the checksum at the receiver site if the second data item is changed to 0xABCE and the third data item is changed to 0x02BA.

Q. 7. a. Write short notes on the following: **(3 x 3=9)**
    i. TDM
    ii. FDM
    iii. WDM

b. How are the guided media differing from unguided transmission media? Elaborate two-two medium from the both media. **(6)**

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END SEMESTER EXAMINATIONS, JANUARY-2018
PROGRAM : DIPLOMA(CSE)   FIFTH SEMESTER

COURSE CODE : DCST302	COURSE TITLE : COMPUTER GRAPHICS

[Time allotted: Three hours]   **[Max. Marks: 100]**

Note: Attempt all Sections & Questions.

Section (A)

Q. 1.   Attempt **all** questions.   (2 x 10 = 20)
    a. What is frame buffer?
    b. What is DDA? Write its full form.
    c. Write applications of computer graphics.
    d. What is aspect ratio?
    e. What is a polygons?
    f. Name two polygon filling algorithms.
    g. What is 3D transformation?
    h. Define reflection transformation?
    i. What is line clipping?
    j. Write the use of windowing?

Section (B)

Q. 2.   Attempt **any 5** questions.   (7 x 5 = 35)
    a. Perform a 90° rotation of triangle A(0,0), B(1,1) and C(-1,-1) about point P(1,0).
    b. Write in detail about even-odd test for polygon. Give two examples to show its use Explain midpoint subdivision algorithm in details.
    c. In how many types, we can fill a polygon? Write flood fill algorithm in detail.
    d. Find a transformation matrix that transforms a given square ABCD to half its size with centre still remaining at the same position. The coordinates of the square are A(1,1),B(3,1),C(3,3),D(1,3) centre at (2,2).
    e. Scan convert a line with end points (10,5) & (15,9) using both DDA and Bresenham algorithm.
    f. Deduce the matrix for rotational transformation in 2D. What is translation vector?
    g. Write in detail about CRT. Show it working with the help of diagram

Section (C)

Attempt **any 3** questions.   (15 x 3 = 45)
Q. 3.   What are display devices? How they can be classified. Elaborate them with example.   How raster scan is different from random scan.
Q. 4.   **a.** Name two line clipping algorithm. Write a procedure to clip a point.
    b. Explain mirror reflection? Write down the matrix of mirror reflection (about x-axis, y-axis).
Q. 5.   **a.** Explain 2D Viewing-Transformation pipeline with the help of diagram.
    b. Write a 2X2 transformation matrix for each of the following rotation about the origin,
        i. Counterclockwise by 120^0 **ii.** Clockwise by 60^0
Q. 6.   **a.** Explain Sutherland-Hodgeman algorithm and using the algorithm clip the following polygon against the rectangle.
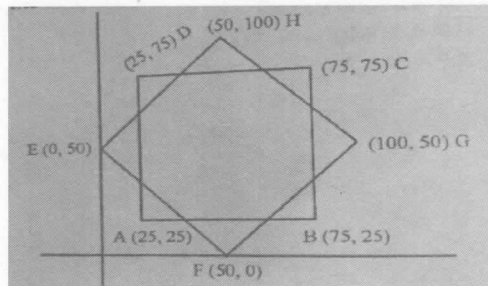
    b. How is 2D transformation different from 3D transformation? Write matrix for Scaling & translation in 3D.
Q. 7.   **a.** What do you mean by Window to Viewport mapping?
    b. Write short notes on :   **i.** Resolution   **ii.** Aspect ratio

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END SEMESTER EXAMINATIONS, JULY-2018
PROGRAM : POLYTECHNIC (CSE)   FIFTH SEMESTER

| COURSE CODE : DCST303 | COURSE TITLE: DATA COMMUNICATION & COMPUTER NETWORK |

[Time allotted: Three hours]   **[Max. Marks: 100]**

Note: Attempt all Sections & Questions.

SECTION A

Q. 1.   Attempt **all** questions.   **(2 x 10 = 20)**

   a.   What are the uses of computer network?

   b.   Explain the concept of sliding window protocol used in the Data link layer.

   c.   Discuss the issues in presentation layer.

   d.   For n devices in a network, what is the number of cable links required for a mesh and ring topology?

   e.   The transport layer creates a communication between the source and destination. What are the three events involved in a connection?

   f.   Define checksum. Explain with the help of example.

   g.   What are the functions of LLC?

   h.   What are the responsibilities of network layer?

   i.   Define masking.

   j.   Define gateway. How many layers of OSI reference model are used in the gateway?

SECTION B

Q. 2.   Attempt **any 5** questions.   **(7 x 5 = 35)**

   a.   Explain in detail, how communication is taking place starting from connection establishment, data transfer and connection termination in :

          i.   Circuit switching

          ii.   Packet switching

   b.   What is Shannon Capacity? Calculate theoretical highest bit rate of a regular telephone line having an extremely noisy channel in which the value of the signal-to-noise is almost zero.

   c.   A signal with 300 milliwatts power passes through 10 devices, each with an average noise of 3 microwatts. What is the SNR? What is the SNRdB?

   d.   What is Hamming distance? What is the Hamming distance for each of the following codewords:

          i.   d (10000 , 01000)

          ii.   d (10101 , 10010)

          iii.   d (1111 , 1111)

          iv.   d (0000 , 0000)

   e.   Explain LAN, MAN & WAN.

   f.   An ISP is granted a block of addresses starting with 190.100.0.0/16(65,536 addresses). The ISP needs to distribute theses addresses to three groups of customers as follows:

          i.   The first group has 64 customers; each need 256 addresses.

          ii.   The second group has 128 customers; each need 128 addresses.

          iii.   The Third group has 128 customers; each need 64 addresses.

       Design the sub-blocks and find out how many addresses are still available after these allocations.

   g.   What is congestion control? Write down the Leaky Bucket algorithm.

Attempt **any 3** questions.   **(15 x 3 = 45)**

Q. 3. **a.** What are the issues of the Data Link Layer? Compare and contrast byte-stuffing and bit-stuffing. **(7.5)**
Which technique is used in byte-oriented protocols? Which technique is used in bit-oriented protocols?

b. Show the forwarding process if a packet arrives at R1 in with the destination address 201.4.22.35 **(7.5)**

Mask	Network Address	Next Hop	Interface
/26	180.70.65.192	-	M2
/25	180.70.65.192	-	M0
/24	201.4.22.0	-	M3
/24	201.4.16.0	-	M1
/0	0.0.0.0	180.70.65.200	M4

Routing Table for Router R1

Q. 4. Design the IPv4 datagram format. Explain each field of the format. **(1**

Q. 5. **a.** Write a short note on classful addressing. What are the private addresses? Explain the role **(7.5)**
of NAT.

b. Explain in details the TCP/IP Reference Model. **(7.5)**

Q. 6. What is Checksum? A sender needs to send the four data items 0x3456, 0xABCC, 0x02BC, and **(15)**
0xEEEE. Answer the following :

a. Find the checksum at the sender site

b. Find the checksum at the receiver site if there is no error

c. Find the checksum at the receiver site if the second data item is changed to 0xABCE.

d. Find the checksum at the receiver site if the second data item is changed to 0xABCE and the third data item
is changed to 0x02BA

Q. 7. Write a short note on the following: **(5 x 3=15)**

a. File Transfer Protocol

b. HTTP

c. WWW

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END SEMESTER EXAMINATION, JUNE-2018
PROGRAM : POLYTECHNIC (CSE)　　SIXTH SEMESTER

| COURSE CODE : DCST306 | COURSE TITLE : NETWORK SECURITY |

[Time allotted: Three hours]　　　　　　　　　　　　　　　**[Max. Marks: 100]**

Note: Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt **all** questions.　　　　　　　　　　　　　　　**(2 x 10 = 20)**

- **a.** Define all kinds of security attacks.
- **b.** What is network security?
- **c.** What is set of residues and congruence?
- **d.** Define Ring.
- **e.** What is the number of elements in $Z_{14}{}^*$?
- **f.** Correlate "Document and Fingerprint" and "Message and Message Digest".
- **g.** Can we use checksum function as a cryptographic hash function?
- **h.** Compare DSS versus RSA.
- **i.** What is symmetric key distribution?
- **j.** Define intrusion.

SECTION B

Q. 2. Attempt **any 5** questions.　　　　　　　　　　　　　　**(7 x 5 = 35)**

- **a.** What is group? Prove that the set of residue integers with the addition operator, $G=<Z_n, +>$, is a commutative group.
- **b.** Explain Message Authentication Code (MAC).
- **c.** What is CRT? Write down the algorithm of CRT and find an integer that has a remainder of 3 when divided by 7 and 13, but is divisible by 12.
- **d.** What is birthday problem? Describe the all four problems of the birthday.
- **e.** Explain triple DES.
- **f.** Write down the first and second version of Fermat's little theorem. Find the result of 3^{12} mod 11.
- **g.** Write down the RSA_Key_Generation Algorithm. Given p=19,q=23, and e=3 .find n, $\varphi(n)$,and d.

SECTION C

Attempt **any 3** questions.　　　　　　　　　　　　　　　　　**(15 x 3 = 45)**

Q. 3.
- **a.** What is field and finite fields? Find the addition, multiplication, additive inverse and multiplicative inverse for GF.　　(7.5)
- **b.** What is digital signature? Differentiate between conventional signatures using digital signatures.　　(7.5)

Q. 4.
- **a.** What are the different kinds of attack on the digital signature? Explain briefly each of them.　　(7.5)
- **b.** Explain DSS. Write down the algorithm of DSS key-generation.　　(7.5)

Q. 5.
- **a.** Define Deffie-Hellman Agreement. Write down the protocols used in this Agreement. Calculate the symmetric key of Alice and Bob. Assume Alice chooses x=3, Bob chooses y=6, g=7 and p=23.　　(7.5)
- **b.** How PGP is helpful to secure the electronic mail?　　(7.5)

Q. 6.
- **a.** Explain two IPSec Security protocols in detail.　　(7.5)
- **b.** What is secure socket layer? What are the different protocols of the SSL? Explain in details.　　(7.5)

Q. 7.
- **a.** Define Intrusion. What are the different methods of intrusion detection systems?　　(7.5)
- **b.** Write the Extended Euclidean Algorithm. Given A=180 and b = 28, find gcd (a,b) and the values of s and t.　　(7.5)

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END SEMESTER EXAMINATIONS, JUNE - 2018
PROGRAM: POLYTECHNIC (CSE)   SIXTH SEMESTER

| COURSE CODE : DCST305 | COURSE TITLE : INTERNET & MULTIMEDIA |

[Time allotted: Three hours]   [Max. Marks: 100]

Note: Attempt all Sections & Questions.

SECTION A

Q. 1.   Attempt **all** questions.   (2 x 10 = 20)
   a. What do you mean by multimedia hardware?
   b. Define Graphics in multimedia.
   c. What do you understand by client server model?
   d. Write the step to convert analog signal to digital signal.
   e. Describe router and gateway.
   f. What do you mean by network topology?
   g. Write difference between Hacker and Cracker.
   h. What do you mean by password protection?
   i. Write difference between Authentication and Authorization.
   j. What is a multimedia file format?

SECTION B

Q. 2.   Attempt **any 5** questions.   (7 x 5 = 35)
   a. Explain the formative and summative evaluation of multimedia in detail.
   b. What do you mean by multimedia storage? Explain with an example.
   c. Describe different type of animation tool in multimedia.
   d. What do you mean by digital audio? Explain the advantage of digital audio over analog audio.
   e. Explain the TCP/IP protocol suite in detail??
   f. What do you mean by Internet? Explain intranet and extranet.
   g. What do you mean by Huffman coding explain with an example.

SECTION C

Attempt **any 3** questions.   (15 x 3 = 45)
Q. 3.   a. Explain the scope of multimedia in business.
        b. What is LZ77? Encode the below character using LZ77. (W=13, LAB=6).
                c a b r a c a d a b r a r r a r r a d

Q. 4.   a. What do you mean by dictionary based compression? Explain LZW with the help of an example.
        b. Define the security in term of confidentiality, integrity and availability.

Q. 5.   a. What do you mean JPEG compression? Explain each component in detail.
        b. What is firewall? Explain different type of firewall.

Q. 6.   a. Define owner, group and other access in unix file by taking a suitable example.
        b. Find the code for given character using shannon fano coding.

Character	X1	X2	X3	X4	X5	X6	X7
Probability	0.4	0.2	0.12	0.08	0.08	0.08	0.04

Q. 7.   Write short notes on-
        i. Authoring tool
        ii. Bridge
        iii. World Wide Web
        iv. Element in Multimedia
        v. Computer Network

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