PURBANCHAL UNIVERSITY
2018

B. E. (Computer/E. & C./Electrical)/Second Semester/*Final*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BEG176CO: Object-Oriented Programming *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer EIGHT questions. **8×10=80**

1(a) What is object oriented programming? Discuss the need of object oriented programming. 2+3

(b) Write a program to find sum of first and last element of an array demonstrating use of new and delete operator. 5

2(a) When will you make a function inline and why? Write a suitable program in c++ showing inline function. 2+3

(b) How function overloading is achieved? Write a program to compare two integer numbers and two single characters using function overloading. 2+3

3(a) Is it mandatory to use constructor in a class? Explain the need for having more than one constructors in a class. 1+3

(b) Write a program to copy content of one object into another object of a class named "BOX" and length, breadth and height as its data members. 6

4(a) Mention rules for overloading an operator. 3

(b) Write a program to overload = = operator to compare two strings. 7

5(a) Define inheritance Explain different forms of inheritance with their sintax. 5

(b) What is function over ridding. Explain with example. 1+4

6(a) Describe different methods of opening a file. 3

(b) Write a program to write the name, roll and marks of 10 students in the file and read the name of student securing highest mark from the file. 7

Contd. ...

PURBANCHAL UNIVERSITY
2017

(Computer)/Fourth Semester/*Final*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

SEG274CO: Discrete Structure *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer EIGHT questions. **8×10=80**

1(a) Use Warshall's Algorithm to find the transitive closure of the relation R on a set $A = \{1,2,3,4\}$ where R = (1, 1), (1, 3), (2,3), (2,4), (3,2), (3,3), (4,1)). 5

(b) Suppose that the relation R on a set is represented by the matrix $M_R = \begin{bmatrix} 1 & 1 & 0 \\ 1 & 1 & 1 \\ 0 & 1 & 1 \end{bmatrix}$. Is R reflexive, symmetric, and/or antisymmetric? 5

2. State the contra-positive and converse statement of the following statement: "If the triangle is equilateral then it is equiangular". Show that the statement $((p \rightarrow q) \wedge (q \leftrightarrow r)) \rightarrow (p \rightarrow r)$ is tautology and obtain the principle disjunctive normal form of $(\sim p \rightarrow r) \wedge (q \leftrightarrow p)$. 2+4+4

3(a) Determine whether the given graph has Hamilton circuit. If it does, find such a circuit. 2+4

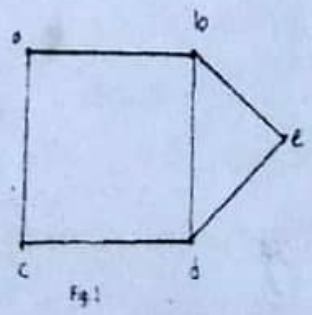

Fig 1

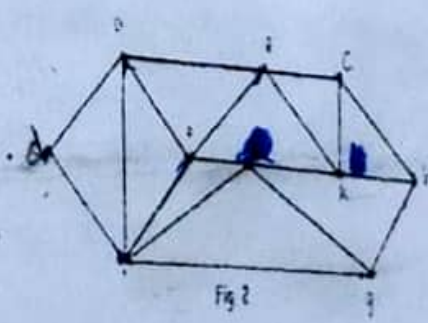
Fig 2

(b) Define the following graph with example (any TWO): 2+2

(i) Regular graph (ii) Compete graph (iii) Bipartite graph

Contd. ...

4(a) Define generating functions. List out their areas of application. 2+2

(b) Solve the recurrence relation: 6

$F_n = 5F_{n-1} - 6F_{n-2}$ where

$F_0 = 1$ and $F_1 = 4$.

5(a) State multiplication principle of counting. In how many ways can 7 women be seated in a row if 7 men & 7 women 2+5

(i) any person may sit next to any other?

(ii) men and women must occupy alternate seat?.

(b) Define composition of relation with an example. 3

6(a) If R be a relation on a set of integers Z defined by $R = \{(x, y) : x, y \in Z, (x, y)$ is divisible by 6$\}$. Then prove that R is an equivalence relation. 5

(b) Let $R = \{(1,1),(2,1),(3,2),(4,3)\}$ be a relation on a set $A = \{1,2,3,4\}$. Find the powers R^n, $n \geq 1$. 5

7(a) Define mathematical induction. Prove that the statement given below is true using mathematical induction: 1+4

$$1^3+2^3+3^3+ \text{-----} +n^3 = \frac{n^2(n+1)^2}{4}$$

(b) Define walk, path and cycle with examples. 5

8(a) Give the formal definition of regular expression and grammar. 4

(b) Describe finite state automata with an example. 6

9(a) Describe the Euler circuit and path with example. 5

(b) Write short notes on: 2.5+2.5

(i) Fibonacci member (ii) Logical equivalent

10. Prove the validity of the following argument If I get the job and work hard, then I will get promoted. If I get promoted then I will be happy. I will not be happy. Therefore, either I will not get the job or I will not work hard'. 10

$p \; q \quad (p \vee q) \equiv$

2016

B. E. (Computer/E. & C./Electrical)/Second Semester/Final

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BEG176CO: Object-Oriented Programming *(New Course)*

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Answer EIGHT questions. **8×10=80**

1(a) What is Object Oriented Programming (OOP)? Describe the basic characteristics of object-oriented programming. Mention any three drawbacks of procedure oriented languages. 2+2+2

(b) Discuss importance and limitation of inline function. 4

2(a) Define type casting with an example. Discuss constant pointer and pointer to a constant with example. 2+3

(b) Construct an overloaded function equivalent to the pow (x, n) where x can be either integer or float and *n* is an integer. 5

3(a) What are friend functions? Is it possible for a function to be friend of two different classes? If yes, then how it is implemented in C++. Explain with a suitable example. 1+6

(b) What do you mean by function overriding? Explain. 3

4(a) Explain copy constructor in C++. Why is destructor function required in class? 2+2

(b) What do you mean by static variable and static function? Explain with an example. 2+2

5(a) Define a class ACCOUNT that includes 10 following members:

Data Members: Name of Depositor, Account no., Type of A/c, Balance Amount.

Member functions: To assign initial values, deposit amount, withdraw after checking balance to display name and balance. 7

Contd. ...

(b) Differentiate between early and late binding.

6(a) What do you mean by operator overloading? Write a program to overload the unary minus operator using friend function. 2+6

(b) List out the operators that can't be overloaded in C++. 2

7(a) Define multiple inheritance with its syntax. Write a program to demonstrate the use of constructor in derived class. 2+6

(b) What is the difference between a virtual function and a pure virtual function? 2

8(a) What do you mean by exception Handling? Explain briefly. 4

(b) Write a program which asks for a file name from the keyboard, opens a file with that name for output, reads a line from the keyboard character by character and writes the line onto the file. 6

9(a) What is stream? Describe the Input/ Output class hierarchy in brief. 2+3

(b) Write a temple function to find the maximum number from a template array of size N. 5

PURBANCHAL UNIVERSITY
2021

B. E. (Computer/E. & C./Electrical)/Second Semester/*Final*

Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BEG176CO: Object-Oriented Programming *(New Course)*

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All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer EIGHT questions. **8×10=80**

1(a) Explain the features OOP. Write a program that illustrates the OOP concept. 4+3

(b) Write a program to swap two numbers using pass by reference concept. 3

2(a) Describe why default arguments are used with functions. How can a function with default arguments are implemented? Give appropriate example. 1+5

(b) Write programs for defining member function inside the class definition and outside the class definition. 4

3(a) Describe friend function with appropriate example. 4

(b) Create a class called Student with data members (rollno, name, marks in English, math, science and total), a constructor that initializes the data members to the values passed to it as parameters, a member function called calctotal() that calculates the total of the marks obtained in the three subjects, and a member function called display() that display the details of the student. Create two objects of the class Student and for each objects call the calctotal() and display() functions. 6

4(a) What do you mean by constructor? Why is it necessary? List the properties of constructor. 1+1+3

(b) Define overloading. Write a program to add two complex numbes using operator overloading. 1+4

5(a) Can we overload all operators? List out the operator that cannot be overloaded. 1+2

Contd. ...

(b) Create a class called information with member data to store name, age, and address of a person. Create another class called academic_info with member data to represent highest academic degree gained. From these two classes, derive a class called employee which in addition to above attributes contains other attributes professional status. Use member functions to read and print all the attributes of an employee.

6(a) Define inheritance. Explain base class and derived class with syntax. 1+3

(b) Write a program to enter the name, age, and salary of 10 employees and store them in file. Read and display the name of those employees whose salary amount is more than 50000. 6

7(a) What is function overloading and why is it used? 3

(b) What is pure virtual function and abstract class? With suitable example, explain run time polyniorpbism 2+5

8(a) What is template? List out the advantages of template. 1+3

(b) Write a program to enter five numbers in array and find the smallest and largest number using template function. 6

9. Write short notes on any TWO: 2×5=10

(a) Exception Handling

(b) Namespace

(c) Manipulators

PURBANCHAL UNIVERSITY

2017

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Answer EIGHT questions. **8×10=80**

1(a) Write down Characteristics and applications of OOP. 5

(b) Explain new and delete operator with an example. 5

2(a) What do you mean by inline function? Write advantages and disadvantages of inline function. 2+3

(b) Discuss static data member and static member function with a suitable program. 5

3(a) Define default argument with an example. 3

(b) Write a program to find the volume of cube and sphere by using function overloading. 7

4(a) Mention characteristics of friend function. 3

(b) Write a program to add two complex numbers belonging to two different classes using friend function. 7

5(a) What are constructor and destructor? Explain types of constructor. 5

(b) Write a program to demonstrate passing object as argument and returning object from the function. 5

6(a) What is inheritance? Write benefits of inheritance. 1+2

(b) Write a program to accept name, address, contact number of person, write it to person .txt file and display the information. 7

7(a) Define operator overloading. Write a program to overload unary minus using friend function. 1+5

Contd. ...

(b) What do you mean by virtual function, pure virtual function and abstract classes? 4

8(a) How can we convert basic type to class type and vice versa. 4

(b) Write a program using function template to find sum of first and last elements of an array of type int and float. 6

9 Write short notes on any TWO: 2×5=10

(a) This pointer

(b) Input/output class hierarchy

(c) Multiple inheritance

(d) Exception handling

Constructor
Constructor
Constructor
Constructor

501

PURBANCHAL UNIVERSITY
2017

B. E. (Computer/E. & C./Electrical)/Second Semester/Final
Time: 03:00 hrs. Full Marks: 80 /Pass Marks: 32

BEG171CO: Digital Logic *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

5×16=80

Answer FIVE questions.

1(a) What do you mean by number system? Convert $(11010.11)_{10}$ into octal ad decimal equivalent. 1+4

(b) What is radix of Number system? Subtract $(1001)_2$ from $(11110)_2$ and $(10011)_2$ from $(100010)_2$ using 2's complement method and check the answer by straight subtraction. 1+4

(c) Simplify: 6

(i) $A\bar{B}C + B + B\bar{D} + ABD + AC$ (ii) $AB\bar{C}(\overline{A+B+C})$

2(a) Simplify: F(X,Y,Z) = Π(0,1,4,5) using K-Map and also draw their simplified logic circuit using NOR gates only. 6

(b) Design a full-Subtractor with two half-Subtractor and OR gate. 6

(c) What is Master-Slave flip-flop? Explain. 4

3(a) Design 4-bit Binary to Gray code converter. 8

(b) State and prove Demorgan's first and second law. 6

(c) Why NAND and NOR gate are called universal gate? 2

4(a) Design 4-bit Magnitude Comparator Circuit. 8

(b) What do you mean by Multiplexer? Implement F(A,B,C,D) = Σ(0,1,3,4,8,9,15) using Multiplexer. 2+6

5(a) Design a counter using T flip flop which will count sequence 0,1,2,3,4,7. 8

(b) Define shift register? List out its type. Explain about parallel in parallel out shift register. 8

Contd. —

4×4=16

6. Write short notes on any FOUR:

(a) Digital logic family

(b) PLA

(c) ROM

(d) Ring counter

(e) ALU

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