

**Object Oriented Programming**

**Instructions:**

- 1) All questions are **compulsory**.
  - 2) Mixing of sub questions is not allowed.
  - 3) Write in clear, legible, writing.
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Q1) Attempt any three:

(15)

- A) Write a program in C++ to print tables from 2 to 5 and each table till ten times.
- B) An integer is emirp (prime spelled backward) if, when we reverse the digits, it is also a prime number. Write a function in C++ to print the emirp integers from 1 to 1000. Demonstrate its usage in main().
- C) Write a program in C++ to input an integer containing only 0s and 1s (i.e., a "binary" integer) and print its decimal equivalent. Do not use any conversion functions.
- D) Write a program in C++ that reads in the name and hourly wage of an employee. Then ask how many hours the employee worked in the past week. Be sure to accept fractional hours. Compute the pay. Any overtime work (over 40 hours per week) is paid at 150 percent of the regular wage. Print a paycheck for the employee.
- E) Explain bitwise operators in C++ with examples.

Q2) Attempt any three:

(15)

- A) What is a constructor? How many types of constructors are there in C++? Give examples.
- B) What is a destructor? Explain with an example.
- C) Create a class called MotorVehicle that represents a motor vehicle to store: manufacturer, fuelType, yearOfManufacture, color and engineCapacity. Your class should have a constructor that initializes the data members. Provide a member function called displayCarDetails that displays the five data members in five separate lines in the form "member name: member value". Create an object of it in main and call the member function.
- D) Create a class to represent a complex number. Define appropriate constructor. Overload the operators for adding and multiplying two complex numbers. Create objects in the main and demonstrate the two operations.
- E) Create a class to represent a fraction. Define appropriate constructor. Overload the operators for subtracting and incrementing (pre and post) fractions. Create objects in the main and demonstrate the two operations.

Q3) Attempt any three:

(15)

- A) Explain the various ways in which a class can be inherited and their implications.
- B) Explain five manipulators with examples.
- C) Explain the need of virtual functions with examples.
- D) Explain with examples the order of constructor and destructor calls in inheritance.
- E) What are pure virtual functions, why are they required with examples.

Q4) Attempt any three:

(15)

- A) Explain the various ways in which the file can be opened.
- B) Explain the exception handling mechanism in C++, with examples.
- C) Write a program in C++ which prints itself on the console/monitor.
- D) Create a class Sphere to represent a solid sphere. The constructor should not allow creating objects with negative radius.
- E) Explain how we overload the insertion operator with an example.

Q5) Attempt any three:

(15)

- A) What is the standard template library? Explain it briefly.
- B) Explain five STL algorithms (template functions) with examples.
- C) Write a note on iterators.
- D) Explain five string handling functions with examples.
- E) Explain five functions of 'vector' class.

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Sem-II 10/4/23

- Q1) Attempt any three: (15)
- A) Multiply two 8 bit number stored in memory location 2200H and 2201H by repetitive addition and store the result in memory location 2300H and 2301H.
  - B) Distinguish between hardware interrupt and software interrupt.
  - C) Explain the following instructions: RIM, SIM, and RST.
  - D) Draw and explain pin diagram of 8085 microprocessor.
  - E) Explain the stack and subroutine.
  - F) Explain the following terms: a) Address Bus b) control Bus c) Data Bus.
- Q2) Attempt any three: (15)
- A) Explain the following terms: a) Program counter b) Stack pointer c) Flag
  - B) Explain the time delay.
  - C) Write a note on data types of 8052 C.
  - D) Write a short note on different types of microcontroller.
  - E) Write a program to add two numbers in microprocessor.
  - F) Draw a block diagram of microcontroller and explain its different components.
- Q3) Attempt any three: (15)
- A) Subtract a 16 bit number in Memory 4002 H from the 16 bit in memory 4000 H and 4001 H. The most significant 8 bit of the 2 numbers are in location memory 4001 H and 4003 H. Store the result in memory location 4004 H and 4005 H.
  - B) Write a note on 8085 microprocessor unit.
  - C) What do you mean by interrupt? Explain in brief.
  - D) Distinguish between RISC and CISC.
  - E) Explain the logical AND, OR, NOT, XOR operations.
  - F) What are the different features of microprocessor.
- Q4) Attempt any three: (15)
- A) Why the watchdog timer is used .Explain in brief?
  - B) Explain following terms (a) time driver (b) device driver
  - C) Explain the linker in brief? Write a note on static and dynamic linking.
  - D) Explain the following terms  
(a) cross compiler (b) Debugging (c) preprocessors directives
  - E) Distinguish between microprocessor and microcontroller in brief (Any 4 points).
  - F) List various registers of microprocessors and mention purpose of each registers.
- Q5) Attempt any three: (15)
- A) Explain the Address Bus in brief.
  - B) Explain the following instruction in microcontroller:  
a.MOV b.LXI c.LDA d.CMA
  - C) Distinguish between embedded system and general purpose computer systems?
  - D) Write a note on application of microprocessor and microcontroller in real world .
  - E) What do you mean by DMA(direct memory access)?
  - F) Explain the cache memory in brief.

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Max Time: 2½hrs

WAD

Max Marks: 75

FYIT Sem-II

12/4/23

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- Q I** Attempt any **three** **15**
- A) Explain the role of Internet Service provider.
  - B) What are the applications of Internet?
  - C) Explain E-commerce in detail.
  - D) What is web browser? List and explain any 4.
  - E) Explain how to create hyper link?
  - F) Explain what is style sheet is and what are different types of style sheets?
- Q II** Attempt any **three** **15**
- A) Explain how to create navigational aids in HTML?
  - B) Explain difference between Server side and Client side mapping.
  - C) Explain how to use HTML5 semantic tags with suitable example?
  - D) What is table? Define steps to create table in HTML5.
  - E) Explain cell padding and cell spacing with suitable example.
  - F) Explain how to incorporate audio/video in HTML5?
- Q III** Attempt any **three** **15**
- A) Explain different operators in JavaScript.
  - B) Explain the use of for in statement with the help of example.
  - C) What are the different types of arrays used in JavaScript?
  - D) What are loop statements in JavaScript?
  - E) Write a program to generate table of given number.
  - F) Write a program to check given number is even or odd.
- Q IV** Attempt any **three** **15**
- A) Write a PHP program to do Arithmetic operations.
  - B) Explain different conditional statements in PHP.
  - C) Explain PHP error handling Techniques.

- D) Write a short note on PHP Superglobals.
- E) Write a short note on Array function in PHP.
- F) Write a PHP program to check given number is even or odd.

Q V Attempt any three

15

- A) Write a short note on Session in PHP.
- B) Explain how to create database and table using PHP and MySQL?
- C) Explain mail () function in PHP.
- D) Explain types of regular expression used in PHP.
- E) Explain use of cookies in PHP.
- F) Write a SQL program to display all the selected items from the database.

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17/4/23

Instructions:

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Q1) Attempt any three: (15)

- A. Derive Maclaurin series of  $\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$
- B. solve the following examples by using Regular-Falsi method (3 iterations)  
 $f(x) = x^3 - x - 1$  root lies in the interval [1,2]
- C. Find the value of  $e^{0.25}$  using the first five terms of the Maclaurin series.
- D. solve the following example by using Bisection method (3 iterations)  
 $f(x) = x^2 - 2x - 1$  root lies in the interval [-1,0]
- E. What is True error, Relative True Error, Approximate Error, Relative Approximate Error.
- F. Three approximate values of number  $\frac{1}{3}$  are given as 0.33, 0.33 and 0.34 . which of these are best approximation

Q2) Attempt any three: (15)

- A. Find root of  $x^4 - x - 10 = 0$  by using Newton-Raphson method take  $x_0 = 2$
- B. find the root of  $\cos x + 2\sin x + x^2 = 0$  by secant method. Take  $x_0 = 0, x_1 = -0.1$
- C. Find y at  $x=0.27$  by using Newton forward interpolation formula for the following data

X	0.1	0.2	0.3	0.4
y	1.005	1.020	1.0150	1.081

- D. Find the value of f(3) by using Lagrange's interpolation formula

X	1	2	5	6
F(x)	10	15	22	36

- E. Find y at  $x=1.5$  by using Newton forward interpolation formula for the following data

X	1	2	3	4	5
y	2	4	8	16	32

- F. Prepare a forward difference table for  $f(x) = \sin x + \cos x$  ,  $x = 0(\frac{\pi}{6})^{\pi}/2$

Q3) Attempt any three: (15)

- A. solve the following linear equation by Gauss Jordan method  
 $x + y + z = 2$  ,  $2x - 3y + 2z = -6$  ,  $x + y - 3z = 6$ .
- B. Solve the following system of linear equation using Gauss-Seidel method (3 iterations)  
 $10x + y + z = 12$  ,  $2x + 10y + z = 13$  ,  $x + y + 5z = 7$ .
- C. Find  $f'(0)$  &  $f''(0)$  from the following; table.

X	0	1	2	3	4	5
Y=f(x)	4	8	15	7	6	2

- D. Evaluate  $\int_0^6 \frac{1}{1+x} dx$ , by i) Trapezoidal rule ii) Simpson's  $\frac{1}{3}$ rd rule iii) Simpson's  $\frac{3}{8}$ th rule..  
 (n=6)

E. using the following table find  $\frac{dy}{dx}$  and  $\frac{d^2y}{dx^2}$  at  $x=50$ .

X	50	51	52	53	54	55	56
y	3.6840	3.7084	3.7325	3.7563	3.7798	3.8030	3.8259

F. Use trapezoidal rule to evaluate  $\int_0^6 e^{-x} dx$  with  $h=0.25$ .

Q4) Attempt any three: (15)

A. Use Taylor series method to evaluate  $\frac{dx}{dy} = 3x + y^2$  and  $y(0)=1$ , find value of  $y$  at  $x=0.1$

B. Solve by Euler's method  $\frac{dx}{dy} = 1 - y$ ,  $y(0) = 0$ , find  $y(0.1), y(0.2)$  (take  $h=0.1$ )

C. Use Runge-Kutta method of fourth order to compute  $y(0.1)$

Given that  $\frac{dx}{dy} = y - x^2$ ,  $y(0) = 1$ ,  $h = 0.25$

D. Find the regression equation of yield on fertilizer and the output ( $y$  on  $x$ )

Fertilizer	0	2	4	6	8	10
output	110	113	118	119	120	118

E. Find the most likely price in Mumbai corresponding to the price of 70rs at Lucknow

From the following data:

Average price at Lucknow  $\bar{x} = 65$ , Average price at Mumbai  $\bar{y} = 65$

Standard deviation of Lucknow price  $\sigma_x=2.5$ ,

Standard deviation of Mumbai price  $\sigma_y=2.5$ ,  $r=0.8$

F. Fit an exponential curve of the form  $y = ab^x$  to the following data

X	1	2	3	4	5	6	7	8
Y	1.0	1.2	1.8	2.5	3.6	4.7	6.6	9.1

Q5) Attempt any three:

(15)

A. Write the areas of the application of linear programming.

B. Write the advantages and of L.P.P

C.  $4 \frac{\partial^2 u}{\partial x^2} + 2 \frac{\partial^2 u}{\partial x \partial y} + \frac{\partial^2 u}{\partial y^2} = 0$ , classify the following PDE

D. Solve the following L.P.P graphically

Minimize  $z=8x+5y$

Subject to:  $8x + y \geq 12$

$4x + 2y \geq 8$

$x \geq 0, y \geq 0$

E. A sick person daily requires 10 units of vitamin  $V_1$ , 12 units of vitamin  $V_2$  and 20 units of mineral M daily. He consumes tablet with brand names X and Y to meet his requirements.

Each tablet of brand X has 4 units of vitamin  $V_1$ , 3 units of vitamin  $V_2$  and no M.

Each tablet of brand Y has 1 units of vitamin  $V_1$ , 2 units of vitamin  $V_2$  and 4 unit of M.

How many tablet of each brand should he consume to minimize the daily expenditure on them?

F. Classify the PDE (i)  $4 \frac{\partial^2 u}{\partial x^2} + 2 \frac{\partial^2 u}{\partial x \partial y} + \frac{\partial^2 u}{\partial y^2} = 0$  (ii)  $\frac{\partial^2 f}{\partial x^2} + 2 \frac{\partial^2 f}{\partial x \partial y} + \frac{\partial^2 f}{\partial y^2} = 0$

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<GREEN COMPUTING >

19/4/23

Instructions:

- 1) All questions are compulsory.
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Q1) Attempt any three: (15)

- A) What is e-waste? Explain various toxins generated from e-waste.
- B) What are the benefits of recycling electronics components?
- C) How to reduce power consumption in the organisations ?
- D) Write a short note on solving the E-Waste Problem (StEP).
- E) Write a short note on Basel Action Network.

Q2) Attempt any three: (15)

- A) List and explain the various wireless devices.
- B) Explain the need of Virtualization and storage in reducing power usage?
- C) Explain on-Demand cooling.
- D) What are the ways to cool down devices that generate heat?
- E) What are the ways to reducing cooling costs?

Q3) Attempt any three: (15)

- A) How can an organization reengineer its process to be more environmentally friendly?
- B) What are the steps taken to reduce energy consumption?
- C) What is telecommuting?
- D) What are the benefits of having a paperless office?
- E) Write a note on EDI.

Q4) Attempt any three: (15)

- A) What are the problems related to E-waste?
- B) How do you select a good recycler?
- C) Write a note about Good and Bad about CD.
- D) What are the advantages of having thin clients?
- E) Why is Remote Desktop used ? How did you use it?

Q5) Attempt any three: (15)

- A) Write a not on Power usage effectiveness and data center efficiency
- B) Write a note on CRM components.
- C) Write a note on Green Supply Chain.
- D) What do you understand by SMART goals?
- E) Explain various benefits of certification in green practices.