F.Y.B.S.C

I.T.

A.T.K.T

Exam. oct 2024-25

SEM-II

V.B.S. College, Chiplun
F.Y.I.T II nd semester Exam. Oct. 2024
Subject:- Object oriented Programming with C++
Date:- 03/10/2024

FYBSc I.T
3/10/24

Duration: 2.30 Hrs. **Full Marks: 75**

Instructions: (1) All questions are compulsory.
(2) Numbers to the right indicate marks.
(3)Assume necessary data required.

Q.1 **Attempt the following (any three)** (15)

A) State the important features of object oriented programming.
B) What is Polymorphism? Explain it with an example.
C) Differentiate between user defined data types and derived data types.
D) What is a loop? Explain While loop with an example.
E) Write a C++ program that displays prime numbers between 100 to 500.
F) List a few domain application of OOP technology.

Q.2 **Attempt the following (any three)** (15)

A) Explain use of friend function with the help of suitable example.
B) State the use of scope resolution operator and its use in C++.
C) Write a C++ program to calculate root of quadratic equations by initializing the object using default constructor.
D) Explain the method of passing simple data types to functions by reference.
E) Using the concept of function overloading write a C++ program to find the maximum of three numbers.
F) Write the different types of constructors in C++.

Q.3 **Attempt the following (any three)** (15)

A) What is virtual function? Explain method of calling a virtual function through a base class reference.
B) Explain abstract class and its uses.
C) What is inheritance? What are its advantages?
D) With a diagram explain multiple and multilevel inheritance.
E) Discuss the use of public, private and protected access specifiers and their visibility in the class.
F) Write a program to calculate area of circle using Inline function.

Q.4 **Attempt the following (any three)** (15)

A) Explain the concept of a template with the help of an example.
B) Explain passing arrays to functions and arrays as objects.
C) Write a C++ program that throws an arithmetic exception whenever the input numbers is less than zero.
D) What is stream? Explain any two file stream classes needed for the file manipulation.
E) Write a program in a C++ to write and read a string from / to a file.
F) List and explain use of any four file mode parameters in C++.

Q.5 **Attempt the following (any three)** (15)

A) List and explain the components of Standard Template Library(STL).
B) Write a program to copy contents of XY.txt to AB.txt
C) Write a function template for finding the maximum value contained in an array.
D) Write a C++ program to swap two numbers by using function template.
E) How string is used in C++? How can we create string object?
F) Write a C++ program using function template to find the average of two integer or floating point type of data.

Duration: 2.30 Hrs. Full Marks: 75

Instructions: (1) All questions are compulsory.
(2) Numbers to the right indicate marks.

FYIT 4/10/2024 ATKT

Q.1) **Attempt any three of the following:** 15
A) Draw a neat diagram of memory classification.
B) Write a program of 8085 microprocessor to find largest number from any two 8-bit numbers.
C) Define an operating system. Write any four applications of it.
D) Draw a neat pin out diagram of 8085 microprocessor.
E) Write a note on machine languages.
F) Draw neat block diagram of 8085 microprocessor.

Q.2) **Attempt any three of the following:** 15
A) With a neat diagram explain seven segment LED display.
B) Explain 8085 programming model in detail.
C) Write a program of 8085 microprocessor subtraction of any two 8-bit numbers.
D) What is static and dynamic memory? Explain its classification.
E) Write a program of 8085 microprocessor which will transfer data from one register to another.
F) With an example explain arithmetic operations in microprocessor.

Q.3) **Attempt any three of the following:** 15
A) Write a note on continuous loop.
B) Write a note on interrupt.
C) With diagram explain counter design with time delay.
D) Explain subroutine with CALL.
E) Explain compare operation with an example.
F) Difference between restart and software instructions.

Q.4) **Attempt any three of the following:** 15
A) With the help of diagram explain pin diagram of 8051.
B) Write and explain any five data types in 8051 programming in C.
C) Write difference between general purpose system and embedded system.
D) List and explain any five applications of embedded system.
E) Write a note on history of embedded system.
F) Write a note on classification of embedded system.

Q.5) **Attempt any three of the following:** 15
A) Explain structure of embedded system.
B) List and Explain all types of files generation on cross-compilation.
C) What is EDLC? Explain in detail.
D) Write all trends in embedded industry.
E) Draw a neat diagram of 8051 architecture.
F) Explain the concept of infinite loop.

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F4 I.T
7/10/24

D. B. J. College, Chiplun
F.Y.I.T. Sem-II ATKT Exam. oct 2024
Subject:- Numerial Methods
Date:- 07/10/2024

Time : 2.30 Hrs. **Full Marks: 75**

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Instructions:

(1) All questions are compulsory.

(2) Numbers to the right indicate full marks.

(3) Use of scientific calculator is allowed.

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Q.1) Attempt <u>any three</u> of the following: 15

1. The derivative of a function $f(x)$ at a particular value of x can be approximately calculated by

$$f'(x) \approx \frac{f(x + h) - f(x)}{h}$$

of $f'(2)$ For $f(x) = 7e^{0.5x}$ and $h = 0.3$, find

a) the approximate value of $f'(2)$

b) the true value of $f'(2)$

c) the true error for part (a)

2. The derivative of a function $f(x)$ at a particular value of x can be approximately calculated by

$$f'(x) \approx \frac{f(x + h) - f(x)}{h}$$

of $f'(2)$ For $f(x) = 7e^{0.5x}$ and $h = 0.3$, find

a) relative true error

b) absolute relative true error

3. Derive the Maclaurin series of $sin\,(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \ldots..$

4. Find the sum of $\sqrt{2} + \sqrt{5} + \sqrt{7}$ upto four significant digits and find its absolute and relative errors.

5. Round off 0.987250 correct four significant figures and find out absolute , relative and percentage error.

6. Explain data uncertainty with an example.

Q.2) Attempt <u>any three</u> of the following: 15

1. By using Newton-Raphson method find appropriate root of the equation $x^3 - x - 1 = 0$ up to two approximations by taking initial root 1.

2. Obtain the root of $f(x) = x^3 - x - 4$ using Regula-falsi method.

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

X	1	2	5	6
f(x)	10	15	22	35

4. Find y at x= 1.5 by using Newton's forward interpolation formula for the following data

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

5. Find f(7.5) from the following data by using Newton's backward interpolation formula

x	1	2	3	4	5	6	7	8
y	1	8	27	64	125	216	343	512

6. Find the root $x^4 - x - 10 = 0$ up to two iterations by taking initial roots 1 and 2 using secant method.

Q.3) Attempt any three of the following: 15

1. Explain the trapezoidal rule.
2. Solve the following linear equations using Gauss Jordan method

$$4x + y - 2z = 4, y = 4, 3x + 4y + 5z = 2$$

3. Solve the following linear equations using Gauss Seidel method

$10x + y + z = 12,\ 2x + 10y + z = 13,\ x + y + 5z = 7$

4. Evaluate $\int_0^6 \frac{1}{1+x}\, dx$ by Trapezoidal rule.

5. Evaluate $\int_0^1 \frac{1}{1+x}\, dx$, h= 0.125 by Simpson's 1/3 rd rule

6. Evaluate $\int_1^4 (4x - 1)\, dx$ by Simpson's 3/8 th rule

Q.4) Attempt any three of the following: 15

1. For the data given below

X	2	3	4
Y	3	5	7

Find

(I)The arithmetic means $\bar{x}, \bar{y}$

(II) v(x), v(y)

(III) cov(x,y)

2. Find the coefficients of regression

X	2	6	8	10
Y	4	3	5	6

Find y, when x =1.5, and x when y = 3.5

3. Using Runge kutta method of second order to find y(0.2), given $\frac{dy}{dx} = -y, y(0) = 1, h = 0.2.$

4. Use Taylor series method to obtain the solution of $\frac{dy}{dx} = x - y^2$. Given y(0)=1. Find y(0.2).

5. For a given data

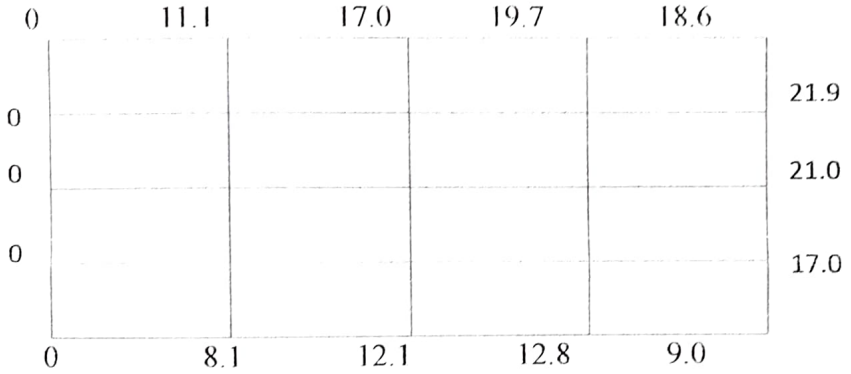
	X	Y
Mean	3	5
Variance	2.5	0.5

And the covariance is 0.25, find
(I)the equations of the lines of regression
(II)find y, when x=4 and x when y = 3

6. Consider two regression lines
y on x : $5x - 2y = 7$
x on y: $3x - y = 5$
find, $\bar{x}, \bar{y}, b_{xy}, b_{yx}$

Q.5) Attempt <u>any three</u> of the following: **15**

1. Find by Liebmann's method, the value at the interior lattices points of a square region of the harmonic function whose bounding values are shown in the figure



2. Find the value of the function u(x,t) satisfying the equation $\frac{\partial u}{\partial t} = 4\frac{\partial^2 u}{\partial x^2}$ and the boundary functions $u(0,t) = 0, u(8,t) = 0, u(x,0) = \frac{1}{2}x(8-x)$ at the points $x = i, i = 0,1,2,3,4$ *and* $t = \frac{1}{8}j, j = 0,1,2,3,4,5.$

3. Given that $\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}$, $u(0,t) = 0, u(4,t) = 0$ and $u(x,0) = \frac{x}{3}(16 - x^2)$. Find $u(i,j), i = 1,2,3, j = 1,2,3$ by Crank Nikolson's method

4. Solve graphically the following LPP
Maximize $z = 6x + 7y$
Subject to :
$2x+3y \leq 12$
$2x+y \leq 8$
$x \geq 0, y \geq 0$

5. Classify $\frac{\partial^2 u}{\partial x^2} + \frac{4\partial^2 u}{\partial x \partial y} + \frac{4\partial^2 u}{\partial y^2} - \frac{\partial u}{\partial x} + 3\frac{\partial u}{\partial y} = 0$

6. Explain graphical method for solving LP problem

D.B.J. College, Chiplun
F.Y.I.T. Sem-II MKT Exam Oct 2024
Subject: Green IT
Date: - 08/10/24

F.Y.I.T
8/10/24

Duration: 2.30 Hrs. **Full Marks: 75**

Instructions: (1) All questions are compulsory.
(2) Numbers to the right indicate marks.

Q.1) Attempt any three of the following: 15
A) Explain the work of StEP.
B) What are the steps taken by JAPAN in managing their own e-waste problem?
C) Write a short note on Basel Action Network function.
D) Explain 3 R's of Green Computing.
E) How to reduce power consumption in the organization?
F) Write a short note on toxins.

Q.2) Attempt any three of the following: 15
A) What is net metering? Which things are needed to sell the power?
B) How to reduce power usage?
C) Write a short note on wireless devices.
D) List and explain the various low-cost solutions for checking power on workstation and standalone devices.
E) How do computer monitor settings save energy?
F) Write a note on power problem.

Q.3) Attempt any three of the following: 15
A) What are the options of data storage in data center design?
B) Which things are needed to go paperless in an organization?
C) What are the steps to be taken for recycling non-IT components?
D) Explain Process Reengineering with Green in mind.
E) Write a note on Telecommuting
F) What are the processor power states?

Q.4) Attempt any three of the following: 15
A) Write a short note on Good and Bad things about CDs/ DVDs Disposal.
B) Write short note on refurbishing.
C) Explain system's life cycle with diagram.
D) What is the commercial and non-commercial refurbishing?
E) List and explain the advantages of Thin Client?
F) What is blade server? Give its benefits.

Q.5) Attempt any three of the following: 15
A) List and explain the tools used for measuring and tracking data.
B) Write a short note on Customer Interaction.
C) Write the steps to create virtual server in VMware.
D) Explain the following terms
a) Datacenter density b) CPU Utilization c) Storage Utilization
E) How CRM segregates the people of an organization in groups?
F) Explain the procedure of billing and online forms.

XOX

F.Y. B.Sc. Sem II ATKT Examination Oct 2024
Subject : Chemistry - II
Date :- 08-10-2024

FYBSc
8/10/24

Time: 3 Hrs Marks: 75

N.B.1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Use of non-programmable calculator is allowed.

Q.1 A **Select the correct option and complete the following sentences. (Any Nine)** 09

i pH of 0.01M HNO_3 is .....
a) 1 b) 2 c) 3

ii For dibasic acids, dissociation constant, Ka= .....
a) $K_1 + K_2$ b) $K_1 \times K_2$ c) $K_1 - K_2$

iii Larger the amount of strong acid or base that should be added to change pH of buffer by one unit, ... is buffer capacity.
a) greater b) lesser c) zero

iv Greenish cold glow produced by the fire flies is an example of .....
a) fluorescence b) phosphorescence c) chemiluminescence

v Which of the following is high energy radiation?
a) Radio waves b) Gamma rays c) Micro waves

vi Strongest reducing agent in electrochemical series is.....
a) Li b) F c) H_2

vii Indicator used in titration involving the use of iodine solution is.....
a) starch b) methyl orange c) phenolphthalein

viii Atoms undergo bonding in order to.....
a) attain stability b) move freely c) increase energy

ix The steric number of water molecule is.....
a) 2 b) 4 c) 6

x Transannular strain in cyclohexane is absent in.....form.
a) chair b) boat c) twist boat

xi The number of π-electrons in anthracene is.....
a) 10 b) 12 c) 14

xii Pyridine is.....membered heterocyclic compound.
a) four b) six c) eight

xiii Halogenation of benzene is.....reaction.
a) addition b) nucleophilic substitution
c) electrophilic substitution

B **State whether following statements are True or False (Any Three)** 03

i Chlorophyll acts as photosensitizer in plants.
ii $KMnO_4$ is strong reducing agent.
iii Increase in oxidation state is called oxidation.
iv Cyclobutadiene is 4π- electron system.
v The nitro group is electron withdrawing group.

C **Match the following. (Any Three)** 03

	A		B
i)	Scattering of radiation	a)	Pyridine
ii)	CH_4	b)	Cyclopropene
iii)	$BeCl_2$	c)	Carboxylic group
iv)	Non-aromatic compound	d)	Nephelometry
v)	Deactivating group	e)	Linear
		f)	Spectrophotometry
		g)	Tetrahedral

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Q.2 **Attempt any four of the following.**

A Derive Henderson equation for pOH of basic buffer.

B Explain strong and weak electrolytes with examples.

C A buffer solution contains 0.05 mol sodium lactate and 0.01 mol lactic acid per dm^3. Calculate pH of buffer solution ($K_a = 1.6 \times 10^{-4}$)

D Explain primary and secondary processes in photochemical reactions with example.

E State and Explain Beer-Lambert's law.

F i) Calculate the energy of photon corresponding to a light radiation of wavelength 480 nm (Given: $h = 6.625 \times 10^{-34}$ Js, $c = 3 \times 10^8$ ms^{-1})

ii) Calculate wavelength associated with radiation of wave number 1.6×10^5 m^{-1}.

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Q.3 **Attempt any four of the following.**

A Define ionic bonding and explain its characteristics.

B Explain the Sidgwick Powell theory and give the structure of BF_3 on the basis of Sidgwick Powell theory.

C Mention the factors which favour covalent character of an ionic bond. Explain any two of them.

D Explain applications of VSEPR theory for predicting the shape and F-Cl-F bond angle in ClF_3.

E Balance the following equation with stepwise explanation.

$Cr_2O_7^{2-} + C_2O_4^{2-} \longrightarrow Cr^{3+} + CO_2 + H_2O$ (Acidic Medium)

F Explain the role of iodine as redox agent with suitable example.

Q.4 **Attempt any four of the following.** 20

A i) Draw the resonating structures of phenanthrene.

ii) Explain aromaticity of anthracene.

B Explain the terms : i) Transannular strain ii) Pitzer strain

C What is conformational analysis? Draw chair and boat conformation of cyclohexane. Discuss their relative stability.

D What are activated and deactivated aromatic rings? Explain with following examples using resonance structures.

i) Benzoic acid ii) Phenol

E What is halogenation reaction? Give the mechanism of chlorination of benzene.

F Classify the following compounds as aromatic, non-aromatic or anti-aromatic. Justify your answer.

i) Cyclopropenyl cation ii) Cyclopentadiene