

GES/SBVC/BVL

Sem End/ EXAM/ April 2023

DATE : 03/04/2023

TIME: 2:30 pm TO 5:00pm

PROGRAM : F.Y.B.Sc. (IT) –SEM II

MARKS : 75

COURSE : Fundamentals of Microprocessor and Microcontrollers

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Note : (1) All questions are compulsory.

(2) Make Suitable assumptions wherever necessary and state the assumptions made.

(3) Answers to the same question must be written together.

(4) Numbers to the right indicate marks.

(5) Draw neat labeled diagrams wherever necessary.

(6) Use of Non-programmable calculators is allowed.

Q.1 Attempt ANY THREE from following

15 Marks

- Draw and explain the block diagram of a computer with a microprocessor as CPU.
- What are computer languages? Explain in detail the types of languages.
- Explain the 8085 pin diagram in detail.
- With a neat labeled diagram explain how the 8085 system bus is divided into three different sets of communication lines.
- Explain 8085 microprocessor architecture along with a diagram.
- What is an encoder? Explain the types of encoder in detail.

Q.2 Attempt ANY THREE from following

15 Marks

- Compare and explain the following instruction :-
  - LDAX and STAX
  - JC and JNC
  - HLT and NOP
- List and explain the various data transfer instructions.
- Discuss in brief the programming model of the 8085 microprocessor.
- Write a short note on I/O mapped I/O techniques.
- Load B and C register with data bytes 65H and 87H. Subtract B from C and store the result in B register.
- What is instruction? Explain one byte instruction with examples.

P.T.O

**Q.3 Attempt ANY THREE from following**

**15 Marks**

- a. Write an assembly language program for addition of two 16 bit numbers stored in memory. After addition stores result in memory.
- b. Write a program to generate a delay using a 16 bit counter.
- c. What is a stack? Explain the effect of the POP and PUSH instruction on the stack pointer.
- d. Discuss various interrupts used by 8085 microprocessors and their priorities.
- e. Explain Conditional call and return instructions for 8085 microprocessor
- f. State differences between counter and time delay.

**Q.4 Attempt ANY THREE from following**

**15 Marks**

- a. Explain any three applications of embedded systems.
- b. Difference between embedded system and general purpose computer system.
- c. Write a short note on CRC.
- d. Explain the functions of 8051 ports.
- e. Explain the classification of embedded systems.
- f. Define and explain ROM and its types.

**Q.5 Attempt ANY THREE from following**

**15 Marks**

- a. What are the factors to be considered in selecting a controller?
- b. Explain the Structure of Embedded Programming.
- c. What is the Process of Embedded Software Development?
- d. What are the various files generated during the compilation of the 8051 processor.
- e. State and Explain phases of EDLC?
- f. Explain the various types of testing performed in a product development.

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Note:

1. All questions are compulsory.
2. Each question carries 20 marks.
3. Draw diagrams whenever necessary.
4. Use of simple calculator is allowed.

**Q.1 Solve any three from the following.****[15 Marks]**

- A) To travel 500 kms if 50 litres of petrol is required. How much petrol is needed to go to a place which is 200 kms away?
- B) Find significant digits in the following numbers.  
i) 0.0459    ii) 4.590    iii) 122.36    iv) 4008    v) 123
- C) Suppose that you have the task of measuring the lengths of a bridge and a rivet and come up with 9999 and 9 cm, respectively. If the true values are 10,000 and 10 cm respectively, compute (a) the true error and (b) percent relative error for each case.
- D) An approximate value of  $\pi$  is given by 3.1428571 and its true value is 3.1415926 . Find the absolute and relative errors.
- E) Find the value of  $e^{0.25}$  using the first five terms of the Maclaurin series.
- F) Find the Maclaurin series of following functions.

$$i) f(x) = e^x \quad ii) f(x) = e^{-x} \quad iii) f(x) = \sin x \quad iv) f(x) = \cos x \quad v) f(x) = \log(1 + x)$$

**Q.2 Solve any three from the following.****[15 Marks]**

- A) Find the smallest positive root of  $f(x) = x^3 - 5x + 1 = 0$  by performing three iterations of the Bisection Method.
- B) By applying Newtons Raphson Method twice, find real root near to 2 of the equation  
 $f(x) = x^4 - 12x + 7 = 0$
- C) By applying Newton's Raphson Method, find  $\sqrt{8}$  [Perform 3 iterations]
- D) Find the unique polynomial P(x) such that P(3) = 1, P(4) = 2 and P(5) = 4 using Lagrange interpolation.
- E) Use Newton's forward difference interpolation formula to estimate the population of a town for the year 1895.

Year	1891	1901	1911	1921	1931
Population (in Thousands)	46	66	81	93	103

F) Define the following terms.

- i) Forward Difference Operator      ii) Backward Difference Operator  
iii) Shift Operator      iv) Mean Operator      v) Central Difference Operator

**Q.3 Solve any three from the following.**

**[15 Marks]**

A) Find the solution of the following set of equation by using Gauss Jordan method.

$$x + 2y + 3z = 7; \quad 2x + 7y + 15z = 26; \quad 3x + 15y + 41z = 26$$

B) Find the solution of the following set of equation by using Gauss Seidel method.

$$10x + y + z = 12; \quad x + 10y + z = 12; \quad x + y + 10z = 12$$

C) From the table find  $\frac{dy}{dx}, \frac{d^2y}{dx^2}$  at  $x = 1$ .

X	1	2	3	4	5	6
y	1	8	27	64	125	216

D) Using Simpson's  $\frac{1}{3}$ rd rules. Evaluate  $\int_{-3}^3 x^4 dx$ , take  $n = 6$ .

E) Evaluate  $\int_0^2 \frac{dx}{x}$ , taking 4 subintervals correct to 5 decimal places using Trapezoidal Rule.

F) Evaluate  $\int_0^1 \frac{1}{1+x^2} dx$ ,  $n = 6$  using Simpson's  $\frac{3}{8}$ th rule.

**Q.4 Solve any three from the following.**

**[15 Marks]**

A) Find order and degree of following differential equations.

i)  $\frac{dy}{dx} = 4x + 5y$       ii)  $\frac{d^2y}{dx^2} + \frac{dy}{dx} = 3$

B) Find the value of  $y$  when  $x = 0.1$ , given that  $y(0) = 1$  and  $\frac{dy}{dx} = x^2 + y$  by using Euler's Method.

C) Given;  $\frac{dy}{dx} = y - x$ , where  $y(0) = 2$ , Use Runge Kutta second order method to find  $y(0.1)$  and  $y(0.2)$ , correct upto 4 decimal places.

D) Find the regression equation  $y = a + bx$  for the following data.

X	16	18	20	23	26	27
y	11	12	14	15	17	16

E) Using method of least square fit a second-degree parabola for the following data:

X	0	1	2	3	4
y	-4	-1	4	11	20

F) Define positive correlation and negative correlation with suitable examples.

**Q.5 Solve any three from the following.**

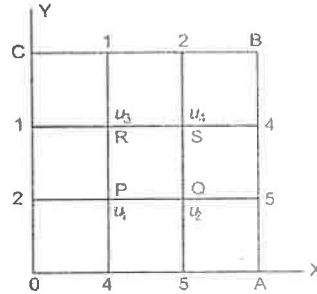
**[15 Marks]**

A) Diet for sick person must contain 400 units of Vitamins, 500 units of Minerals, 300 units of calories. Two foods  $F_1$  and  $F_2$  cost Rs. 2 and Rs. 4 per units respectively. Each unit of contains 10 units of Vitamin, 20 units of Minerals and 20 units of Calories. Formulate LPP to satisfy person requirement at minimum cost.

B) Solve LPP graphically, Maximum  $Z = 10x + 5y$

Subject to,  $x + y \leq 5$ ;  $2x + y \leq 6$ ;  $x \geq 0$ ,  $y \geq 0$

C) Solve Laplace equation  $\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial y^2} = 0$ , for the square region shown in fig. boundary values being indicated.



D) Use the Bender Schmidt formula to solve heat conduction problem  $\frac{\delta u}{\delta t} = \frac{1}{2} \frac{\delta^2 u}{\delta x^2}$

With the condition  $u(x, 0) = 4x - x^2$ , and  $u(0, t) = u(4, t) = 0$

E) Solve the heat equation  $\frac{\delta u}{\delta t} = \frac{1}{2} \frac{\delta^2 u}{\delta x^2}$ , subject to condition,  $u(x, 0) = 0$ , and

$u(0, t) = 0$ ,  $u(1, t) = t$  Using Crank Nicolson scheme find value of  $u(\frac{1}{2}, \frac{1}{8})$  taking successively,  $h = \frac{1}{2}$ ,  $l = \frac{1}{8}$ ,

$u(\frac{1}{2}, \frac{1}{8}) = 0.01878$  Compare the result obtained and find error.

F) Find partial derivatives following functions with respect to variable x and y.

a)  $z = x^3 + xy$

b)  $z = x + x^2y$

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GES/SBVC/BVL

Sem End/EXAM/ April 2023

DATE : 10/04/2023

TIME: 2:30pm TO 5.00pm

PROGRAM : F.Y.B.Sc. (IT) –SEM II

MARKS : 75

COURSE : Green IT

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Note : (1) All questions are compulsory.

(2) Make Suitable assumptions wherever necessary and state the assumptions made.

(3) Answers to the same question must be written together.

(4) Numbers to the right indicate marks.

(5) Draw neat labeled diagrams wherever necessary.

(6) Use of Non-programmable calculators is allowed.

1. Attempt ANY THREE from following

15 Marks

- a) What is Green IT? Explain benefits of Green IT.
- b) What is toxin? How can it spoil the environment?
- c) What are the barriers to green adaptation?
- d) Write a short note on the recycling process.
- e) Write a short note on REACH.
- f) Explain WEEE in detail.

2. Attempt ANY THREE from following

15 Marks

- a) How computer monitor settings save energy.
- b) Differentiate between MAID and RAID.
- c) Explain Polling in detail.
- d) Write a short note on data deduplication.
- e) Explain how the cooling cost can be calculated.
- f) What are the ways of reducing cooling costs??

3. Attempt ANY THREE from following

15 Marks

- a) What is water recycling? Explain the benefits of it.
- b) What are the steps taken to reduce energy consumption?
- c) Explain telecommuting in brief.
- d) Write a short note on intranet.
- e) What are the advantages and obstacles in using EDI in an organization?
- f) Explain reengineering Process.

P.T.O

**4. Attempt ANY THREE from following**

**15 Marks**

- a) Explain different phases of the product life cycle.
- b) Write a short note on refurbishment.
- c) Explain thin clients in brief.
- d) Explain advantages and disadvantages of leasing equipment.
- e) Write a short note on the energy star program for computers.
- f) Explain the features of blade server.

**5. Attempt ANY THREE from following**

**15 Marks**

- a) Write a short note on CRM.
- b) Explain Green procurement in brief.
- c) Write a short note on SMART Goals.
- d) What is the role of a green chief officer?
- e) List and explain different tools for tracking data.
- f) Differentiate between SAAS and ASP.

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GES/SBVC/BVL

Sem End/EXAM/ April 2023

DATE : 08/04/2023

TIME: 2:30 pm TO 5.00pm

PROGRAM : F.Y.B.Sc. (IT) –SEM II

MARKS : 75

COURSE : Object Oriented Programming with C++.

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Note : (1) All questions are compulsory.

(2) Make Suitable assumptions wherever necessary and state the assumptions made.

(3) Answers to the same question must be written together.

(4) Numbers to the right indicate marks.

(5) Draw neat labeled diagrams wherever necessary.

(6) Use of Non-programmable calculators is allowed.

1. Attempt ANY THREE from following

15 Marks

- a. Explain applications of OOP.
- b. What is polymorphism? Explain types of it.
- c. Distinguish between Procedure oriented programming and object oriented programming.
- d. What is the scope resolution operator? Explain it with a program example.
- e. What are the limitations of procedure oriented programming?
- f. Distinguish between call by value and call by reference.

2. Attempt ANY THREE from following

15 Marks

- a. What is class? Explain syntax of defining class.
- b. What is an array of objects? How is it created in C++?
- c. What is a friend function? Explain advantages of it.
- d. Distinguish between constructor and destructor.
- e. Write a short note on Static data in C++.
- f. What is a constructor? Explain characteristics of it.

3. Attempt ANY THREE from following

15 Marks

- a. What is inheritance? Explain types of it.
- b. Explain protected inheritance in brief.
- c. What is a virtual base class? Explain it with a program example.
- d. What are the formatted input and output operations?
- e. Write a short note on Manipulators.
- f. Explain get() and put() with examples.

P.T.O



**4. Attempt ANY THREE from following**

**15 Marks**

- a. Explain file stream in detail.
- b. Explain various file opening modes in detail.
- c. Explain the class template with program examples.
- d. What is an Exception? Explain types of it in detail.
- e. What is a command line argument? Explain it with a program example.
- f. Explain error handling functions in detail.

**5. Write a short note on ANY THREE from following**

**15 Marks**

- a. Container.
- b. Iterator.
- c. Algorithms.
- d. Function object.
- e. Allocators.
- f. STL.

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GES/SBVC/BVL

Sem End/ EXAM/ April 2023

DATE : 05/04/2023

TIME: 2:30 pm TO 5:00pm

PROGRAM : F.Y.B.Sc. (IT) –SEM II

MARKS : 75

COURSE : WEB APPLICATION DEVELOPMENT

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Note : (1) All questions are compulsory.

(2) Make Suitable assumptions wherever necessary and state the assumptions made.

(3) Answers to the same question must be written together.

(4) Numbers to the right indicate marks.

(5) Draw neat labeled diagrams wherever necessary.

(6) Use of Non-programmable calculators is allowed.

**Q.1 Attempt ANY THREE from following**

**15 Marks**

- List and explain important applications of the Internet.
- What is a search engine? Explain its working.
- What is a web browser? Explain the features of all major web browsers.
- List & explain any five formatting style tags with examples.
- What is CSS? Explain different types of CSS.
- How are hyperlinks created in HTML? Explain with the help of an example.

**Q.2 Attempt ANY THREE from following**

**15 Marks**

- How will you create a text based navigation bar? Explain with examples.
- Write a short note on client side image mapping.
- Explain <table> tag and its attributes.
- Explain the semantic elements of HTML5 used for web page layout.
- Develop a web form with a radio button, dropdown list, submit, checkbox and reset button.
- List various tags used to embed audio in a page. Explain with example any two of them.

**Q.3 Attempt ANY THREE from following**

**15 Marks**

- List various features of JavaScript.
- What is an assignment operator? Explain any four assignment operators with examples.
- List and explain the methods of string objects in JavaScript.
- List different methods of document objects. Explain with example any two of them.
- Write a Java Script program to print Fibonacci Series.
- What are event handlers? List and explain any four event handlers.

**P.T.O**

**Q.4 Attempt ANY THREE from following**

**15 Marks**

- a. What is php? Write advantages of PHP for server side scripting.
- b. Write a short note on variables in PHP.
- c. Explain with example break & continue in php.
- d. Write a short note on functions in PHP.
- e. Write PHP code to find the greater of two numbers. Accept the numbers from the user using the form.
- f. Explain superglobals in PHP.

**Q.5 Attempt ANY THREE from following**

**15 Marks**

- a. Explain any five PHP/MYSQL functions with examples.
- b. Write a PHP code to create a database "Company" and to create a table "Employee" (emp\_id, emp\_name, emp\_dept, emp\_salary).
- c. Write a PHP program to create a cookie using PHP and retrieve its value.
- d. Write a short note on the PHP session.
- e. Write a PHP program to demonstrate use of filters.
- f. Write a PHP program to Update rows in a table. (use your own data and table)

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