

**B033313(033)**

**B. Tech. (Third Semester) Examination,  
Nov.-Dec. 2023  
(AICTE Scheme)**

**(Information Technology Branch)**

**OBJECT ORIENTED CONCEPTS &  
PROGRAMMING using JAVA**

*Time Allowed : Three hours*

*Maximum Marks : 100*

*Minimum Pass Marks : 35*

*Note : All questions are compulsory. Attempt any  
two parts from (a), (b) and (c).*

**Unit-I**

1. (a) Write about history of Java. 10

(b) Explain features of Java. 10

**B033313(033)**

**PTO**

[ 2 ]

(c) Explain java data types. 10

**Unit-II**

2. (a) Provide an explanation to constructor overloading with a program. 10
- (b) Explain Wrapper Classes and Inner Classes in Java. 10
- (c) Explain overriding in Java. 10

**Unit-III**

3. (a) Write about string methods and stringBuffer class methods. 10
- (b) Describe String Arithmetic and User Defined Exceptions. 10
- (c) Compare Throw and Throws. Explain Multi-catch statements. 10

**Unit-IV**

4. (a) Describe Thread Life Cycle. 10
- (b) Describe Thread Priority. 10

B033313(033)

[ 3 ]

(c) Define byte and character stream. Write a program for create a file. Write a program to get file information. 10

**Unit-V**

5. (a) Describe applet life cycle. 10
- (b) Describe Event delegation Model, Events, Event Sources, Event Listeners. 10
- (c) Describe JDBC Architectures and JDBC components. 10

470]

B033313(033)

**B033315(033)**

**B. Tech. (Third Semester) Examination,  
Nov.-Dec. 2023**

**(AICTE Scheme)**

**(Information Technology Branch)**

**DIGITAL ELECTRONICS**

*Time Allowed : Three hours*

*Maximum Marks : 100*

*Minimum Pass Marks : 35*

*Note : Attempt all the questions. Part (a) of all questions is compulsory and having 4 marks. Answer any two from (b), (c) and (d) and having 8 marks each question.*

**Unit-I**

1. (a) Reduce the expression

$$f = \sum m(0, 2, 3, 4, 5, 6)$$

using k-map and implement using AoI logic.

4

- (b) Find the minimal expression for

$$f = \pi M(2, 3, 8, 12, 13) \cdot D(10, 14)$$

using Tabular method. 8

- (c) Minimize the following multiple output functions and implement using AoI logic :

$$f_1 = \Sigma m(1, 2, 3, 6, 8, 12, 14, 15)$$

$$f_2 = \pi m(0, 4, 9, 10, 11, 14, 15)$$

- (d) Find the minimized expression of following SoP and PoS term : 8

(i)  $f(x, y, z) = \Sigma m(2, 3, 6, 7)$

(ii)  $f(x, y, z) = \pi m(0, 1, 4, 5)$

(iii)  $F(A, B, C, D) = \pi m(0, 1, 2, 3, 4, 10, 11)$

(iv)  $F(W, X, Y, Z) = \pi m(1, 3, 5, 7, 13, 15)$

### Unit-II

2. (a) Explain 1 Bit comparator with its diagram. 4  
 (b) Design a decimal to BCD encoder with diagram. 8

- (c) Implement the following function with a multiplexer : 8

$$F(A, B, C, D) = \Sigma(0, 1, 3, 4, 8, 9, 15)$$

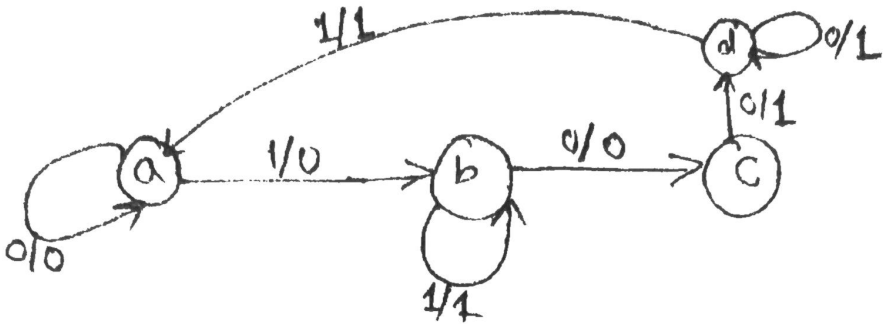
- (d) Explain carry propagation delay in an Adder circuit. How look ahead carry generator solve this problem. 8

### Unit-III

3. (a) Explain need of master-slave J-K flip flop with diagram. 4  
 (b) Design a type T counter that goes through states 0, 3, 5, 6, 0 ..... Is the counter self starting. 8  
 (c) Design a J-K counter that goes through states 3, 4, 6, 7 and 3. Is the counter self starting. 8  
 (d) Design a RING counter of 4 Bit using D flip flop. 8

### Unit-IV

4. (a) Write comparison between Moore and Mealy machine. 4  
 (b) Obtain a reduced state table and reduced state diagram for sequential machine, state diagram is shown below : 8



- (c) Explain the excitation table and state diagram using Mealy Model of J-K flip flop. 8
- (d) Draw the state diagram and the state table for a Moore type sequence detector to detect the sequence 110. 8

**Unit-V**

- 5. (a) Explain PLA with an example. 4
- (b) Draw and explain CMOS NAND Gate. 8
- (c) Explain 2 input ECL OR/NOR Gate. 8
- (d) Explain 2 input TTL NAND Gate. 8

**B033312(033)**

**B. Tech. (Third Semester) Examination,  
Nov.-Dec. 2023**

**(New Scheme)**

**(Information and Technology)**

**COMPUTER ARCHITECTURE, ORGANIZATION  
and MICROPROCESSOR**

*Time Allowed : Three hours*

*Maximum Marks : 100*

*Minimum Pass Marks : 35*

*Note : All questions are compulsory. Part (a) is compulsory from each unit and carry 4 marks. Attempt any two parts from (b), (c) and (d) and carries 8 marks.*

**Unit-I**

**1. (a) Explain the register MBR, MAR, IR.**

- (b) Explain different instruction format. Draw and explain instruction execution cycle.
- (c) What is need of pipelining? How it will speed up execution.
- (d) Show the interconnection structure w.r.t. memory, CPU and I/O units.

### Unit-II

2. (a) Define Overflow and Underflow.
- (b) Explain Booth multiplication algorithm with suitable example.
- (c) Draw and explain flow chart for division.
- (d) Write a short note on floating point representation.

### Unit-III

3. (a) What is the length of Instruction queue of 8086 microprocessor and why?
- (b) Draw and explain the Architecture of Microprocessor 8086.

- (c) Why Microprocessor takes 2 Machine cycle to read data from odd bank first, explain in detail.
- (d) Define Assembler directives. Explain at least five assembler directives with example.

### Unit-IV

4. (a) Define maskable & Non-maskable interrupts.
- (b) Explain Interrupt Structure of 8086 Microprocessor.
- (c) Define stack and explain stack structure of 8086 microprocessor with neat diagram.
- (d) Write a program to generate a delay of 100 ms using an 8086 system that runs on 10 MHz frequency.

### Unit-V

5. (a) What is Paging?
- (b) Interface two 4K X 8 EPROMS and two 4K X 8 RAM chips with 8086. Select suitable maps.
- (c) Define the term Semiconductor Memories. Explain the different types of memory.

(d) Explain Direct Memory access with proper diagram.



Printed Pages -- 6+2=8

Roll No. : 303303322019

**B000311(014)**

**B.Tech. (Third Semester) Examination  
Nov-Dec. 2023**

**(Civil Engg. Branch)**

**MATHEMATICS-III**

***Time Allowed : Three hours***

***Maximum Marks : 100***

***Minimum Pass Marks : 35***

***Note : Attempt all questions. Part (a) is compulsory  
of each question and attempt any two from  
(b), (c) and (d) of each questions.***

**Unit-I**

- 1. (a) Write formula for Laplace transform of a periodic  
function.**

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**B000311(014)**

**PTO**

(b) (i) Find out  $L(t^2 \sin at)$  4

(ii) Apply Laplace Transform to Evaluate : 4

$$\int_0^{\infty} t e^{-2t} \sin 3t dt$$

(c) (i) Evaluate : 4

$$L^{-1} \left\{ \frac{1}{(s^2+1)(s^2+9)} \right\}$$

(ii) Evaluate : 4

$$L^{-1} \left\{ \frac{s+2}{(s^2+4s+5)^2} \right\}$$

(d) Apply Laplace Transform to find solution

$$ty'' + 2y' + ty = \cos t,$$

given that  $y(0) = 1$ . 8

## Unit-II

2. (a) Form a partial differential equation from the given arbitrary function  $f(x^2 + y^2, z - xy) = 0$ . 4

(b) Solve the given equation : 8

$$(x^2 - y^2 - z^2)p + 2xyq - 2xz = 0$$

(c) Solve the following equation 8

$$\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial x \partial y} - 6 \frac{\partial^2 z}{\partial y^2} = y \cos x$$

(d) Apply method of separation of variables to solve

$$4 \frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} = 3u, \text{ given } u(0, y) = 3e^{-y} - e^{-5y}. \quad 8$$

## Unit-III

3. (a) The probability density function of a continuous random variable is given by

$$f(x) = \begin{cases} \frac{k}{x^3} & , 5 \leq x \leq 10 \\ 0 & , \text{ otherwise} \end{cases}$$

Find value of  $k$ . 4

(b) From a bag containing 3 red and 2 white balls, a man is to draw 2 balls at random without replacement, being promised ₹ 20 for each red ball and ₹ 10 for each white one. Find his expectation. 8

(c) Fit a Poisson distribution to the set of observations :

$x$  : 0 1 2 3 4

$f(x)$  : 122 60 15 2 1

Do all the computation for two decimal places. 8

(d) A certain number of articles manufactured in one batch were classified into three categories according to a particular characteristics, being less than 50, between 50 and 60 and greater than 60. If this characteristics is known to be normally distributed, determine the mean and standard deviation for this batch if 60%, 35% and 5% were found in these categories. 8

**Unit-IV**

4. (a) Find the missing terms in the following data : 4

$x$  : 45 50 55 60 65

$f(x)$  : 3 - 2 - -2.4

B000311(014)

(b) Apply Newton's Backward interpolation formula and obtain the cubic polynomial which takes the following values : 8

$x$  : 0 1 2 3

$f(x)$  : 1 2 1 10

(c) Apply Stirling's and Bessel's central interpolation formula respectively to find  $f(29)$  and  $f(32)$  from the following data :

$x$  : 20 25 30 35 40

$f(x)$  : 11.4699 12.7834 1.7648 14.4982 15.0463

Do all the calculations for four decimal places. 8

(d) Apply Newton's Divide Difference formula to obtain  $f(x)$  as a cubic polynomial which represents the following data : 8

$x$  : 1 2 7 8

$f(x)$  : 1 5 5 4

**Unit-V**

5. (a) Write Adams-Bashforth predictor - corrector formula. 4

B000311(014)

- (b) Apply Taylor's series and find out series solution up to four non-zero terms for the given equation

$$\frac{dy}{dx} = xy^4 \text{ and } y(1) = 1$$

Do all the calculation for four decimal places and find numerical solution at  $y(1.2)$ .

8

- (c) Apply Runge Kutta method of fourth order to find out numerical solution of the given differential equation

$$\frac{dy}{dx} + y + xy^2 = 0, \text{ at } y(0.2), \text{ by taking } h = 0.1. \text{ Do}$$

all the calculation for four decimal places.

8

- (d) Apply Milne's predictor corrector method to find numerical solution  $y(0.4)$  for the given equation

$$2 \frac{dy}{dx} = (1 + x^2) y^2, \text{ where } y(0) = 1, \text{ also given}$$

$y(0.1) = 1.06, y(0.2) = 1.12$  and  $y(0.3) = 1.21$ .

Do all the calculation for four decimal places.

8

**B033314(033)**

**B. Tech. (Third Semester) Examination,  
Nov.-Dec. 2023**

**(New Scheme)**

**(IT Branch)**

**COMPUTER NETWORKS**

*Time Allowed : Three hours*

*Maximum Marks : 100*

*Minimum Pass Marks : 35*

*Note : Attempt all questions. Part (a) of each question is compulsory and carries 4 marks. Solve any two parts from part (b), (c) & (d) and carries 8 marks each.*

**Unit-I**

**1. (a) When are different data transmission mode?**

[ 2 ]

- (b) Define computer networks. Discuss various types of networks topologies in computer network. Also discuss various advantages and disadvantages of each topology.
- (c) Explain the significance of switching? What are different switching techniques used in computer networks? Discuss.
- (d) What is significance of layered architecture? Explain the OSI layered architecture with neat sketch.

### Unit-II

2. (a) What are the responsibilities of data link layer?
- (b) Explain the operation of the bit-oriented protocol HDLC with the required frames.
- (c) Compare the access method, addressing scheme, frame formats and data rates for standard Ethernet, fast Ethernet and gigabit Ethernet.
- (d) Data bit represent as polynomial  $x^9 + x^7 + x^6 + x^3 + x^2 + 1$ , and divisor described as

B033314(033)

[ 3 ]

polynomial  $x^1 + x + 1$ . Compute the CRC code and also check send data is accepted or rejected by receiver.

### Unit-III

3. (a) What is pure ALOHA and slotted ALOHA?
- (b) State the major difference between path vector routing and link state routing. Discuss how these routing techniques work.
- (c) What do you mean by computer addressing? Explain different types of addressing also explain different classes of IP addresses along with their ranges.
- (d) Explain the operations and packet format of ARP and RARP in detail.

### Unit-IV

4. (a) The transport layer creates the connection between source and destination. What are the three events involved in the connection.

B033314(033)

PTO

- (b) Explain the ATM reference model along with functions of ATM layers.
- (c) Describe TCP header format and explain their services also.
- (d) What are the X.25 layers? What kind of virtual circuit does X.25 use?

### Unit-V

5. (a) Why is an application such as POP needed for electronic meessaging.
- (b) Discuss the features of HTTP and also discuss how HTTP works.
- (c) How public key cryptography different from private key cryptography.
- (d) Explain the digital signature algorithm. What requirements should a digital signature scheme should satisfy?