

Roll No.

E-3913

B. C. A. (Part III) EXAMINATION, 2021

(New Course)

Paper First

STATISTICAL ANALYSIS

(301)

Time : Three Hours]

[Maximum Marks : 80

Note : Attempt any *two* parts from each Unit. All questions carry equal marks. Only simple calculators are allowed not scientific calculator.

Unit—I

1. (a) If $2^n C_5 = 9 \cdot 9^{n-2} C_5$, then find the value of n .

(b) Find the middle term in the expansion of :

$$\left(x - \frac{1}{x}\right)^{10}.$$

(c) Find the coefficient of x^7 in the expansion of :

$$\left[x^2 + \frac{1}{x}\right]^{11}.$$

P. T. O.

Unit—II

2. (a) Define Histogram and draw a histogram for the following distribution :

Class	Frequency
0—10	2
10—20	4
20—30	10
30—40	4
40—50	8

- (b) Find the mean deviation from the arithmetic mean of the following distribution :

Marks	No. of Students
0—10	5
10—20	8
20—30	15
30—40	16
40—50	6

- (c) Calculate Karl Pearson's coefficient of skewness from the following data :

Age (in years)	No. of Children
0—1	15
1—2	17
2—3	19
3—4	27
4—5	19
5—6	12

Unit—III

3. (a) What is the chance of throwing a total of 11 with two dice if the digit on first dice is 5 ?
- (b) In case of Binomial distribution, write an expression for the probability of at most r successes.
- (c) State and prove additive law of probability.

Unit—IV

4. (a) Find Karl Pearson's coefficient of correlation between the heights of fathers and sons (in inches) :

Height of Father	Height of Son
65	67
66	68
67	65
67	68
68	72
69	72
70	69
72	71

- (b) Fit a straight line to the following data regarding x as the independent variable :

x	y
0	1.0
1	1.8
2	3.3
3	4.5
4	6.3

- (c) Define Chi-square and discuss its uses in testing of hypothesis.

Unit—V

5. (a) What is sampling ? What are the main objects of sampling ?
- (b) A random sample of 400 flower stems has an average length of 10 cm. Can this be regarded as a sample from a large population with mean of 10.2 cm and a standard deviation of 2.25 cm ?
- (c) Prices of shares of a company on the different days in a month were found to be :

66, 65, 69, 70, 69, 71, 70, 63, 64 and 68.

Discuss whether the mean price of shares in the month is 65.

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B. C. A. (Part - III) EXAMINATION : 2021

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Paper Second

Programming in JAVA

(302)

Time : Three Hours]

[Maximum Marks : 80

Note :-All questions are compulsory. Attempt **any two (2)** questions from each unit. All questions carry equal marks.

UNIT-I

- Q.1(a) What is JAVA ? Discuss the genesis of JAVA.
(b) Discuss the overview and features of OOP.
(c) Discuss about the string and string buffer class.

UNIT-II

- Q.2 (a) Write a JAVA program to sort the element of one dimensional Array in descending order.
(b) Describe the control statement using in JAVA.
(c) Write a JAVA program to check that the given string is palindrome or not.

UNIT-III

- Q.3 (a) What is method overloading ? Write a java program to illustrate method overloading.
(b) Discuss the member accessibility modifier.
(c) What is garbage collection ? Write a java program to illustrate garbage collection.

UNIT-IV

- Q.4 (a) What is package ? Write a JAVA program for create a package and one package will import another package.
(b) Write short notes on nested class.
(c) Discuss the exception handling using in JAVA.

UNIT-V

- Q.5 (a) Write a java program for suspending, resuming and stopping threads.
(b) Write a JAVA program to illustrate byte and character stream.
(c) Write short notes on JDBC.

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B. C. A. (Part - III) EXAMINATION : 2021

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Paper Third

Dot Net Technology

(303)

Time : Three Hours]

[Maximum Marks : 80

Note :-Attempt **any two** questions from each unit. All questions carry equal marks.

UNIT -1

1. Describe the architecture of .Net Framework.
2. What is JIT Compiler? Explain the working of JIT Compiler
3. Explain the features of .Net in detail.

UNIT -2

1. What is conditional statement in VB.Net? Explain It's Types also.
2. How to create enumeration in VB.Net? Explain with an example.
3. What is an array? Write a program to demonstrate Dynamic array.

UNIT -3

1. Describe Button Control in VB.Net. Also define it's property.
2. What is windows form? How can we work with form?
3. How can message box be used in VB.Net? Give suitable example.

UNIT -4

1. Discuss the constructor with example?
2. Write a program to demonstrate function overloading in VB.Net.
3. What do you understand by inheritance in VB.net.

UNIT -5

1. Describe the ADO.Net Object Model
2. Write What is DataSet ? Explain the Components of Dataset.
3. How to display data on Data Grid ?

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B. C. A. (Part - III) EXAMINATION : 2021

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Paper Fifth

Data Structure

(305)

Time : Three Hours]

[Maximum Marks : 80

Note :-All questions are compulsory. Attempt **any two (2)** questions from each unit. All questions carry equal marks.

UNIT -1

1. Explain the basic terminologies of Data Structures.
2. Explain the concept of complexity and time-space tradeoff of algorithms.
3. Explain Data Structure operations.

UNIT -2

1. What are records? When we use records explain with example.
2. Explain concept of Multi dimensional arrays.
3. Explain pointers in Data Structures & How and why they are used.

UNIT -3

1. What is linked list? How can we search an element in a linked list explain with an example.
2. What do you understand by a stack? Describe Stack operations.
3. What are Queues? Explain how queues are processed using a simple example.

UNIT -4

1. What are Binary Trees? Explain the terminologies related with Binary Trees.
2. Explain Threading in Trees with examples.
3. What is a Binary Search Tree? Explain with an example.

UNIT -5

1. Describe selection sort.
2. Define Binary Search. Explain how Binary search works with suitable example.
3. Describe the concept of hashing.

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B. C. A. (Part - III) EXAMINATION : 2021

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Paper Sixth

Computer System Architecture

(306)

Time : Three Hours]

[Maximum Marks : 80

Note :-All questions are compulsory. Attempt **any two** questions from each unit. All questions carry equal marks.

UNIT -1

Q.1. Convert following number system as directed- (any four)

1. $(128)_{10} = (?)_8$
2. $(1101)_2 = (?)_{10}$
3. $(22)_8 = (?)_{10}$
4. $(121)_{16} = (?)_2$
5. $(214)_8 = (?)_2$

Q.2. What are error detecting and correcting codes? How can we detect error by parity code.

Q.3. What are basic Binary Arithmetic operations? Explain them briefly.

UNIT -2

Q.1. Write short note on following- (any four)

1. OR Gate
2. NAND Gate
3. XOR Gate
4. NOT Gate
5. AND Gate

Q.2. Briefly describe various laws of Boolean algebra.

Q.3. What is Flip-Flop? Explain J-K Flip-Flop, D Flip-Flop and S-R Flip-Flop with truth table and logic diagram.

UNIT -3

Q.1. Write short note on following- (any four)

1. ALU
2. CPU Organization
3. Registers
4. RAM
5. Cache Memory

UNIT -4

Q.1. Write short note on following- (any four)

1. Peripheral device
2. Interfaces
3. I/O Subsystem
4. I/O Controller
5. Memory Mapped I/O

Q.2. Explain various modes of I/O Data Transfer.

Q.3. What is I/O Processor? Explain with block diagram.

UNIT -5

Q.1. Write short note on following- (any four)

1. Associative Memory
2. Hit Ratio
3. Memory Mapping
4. Replacement Algorithms
5. Page Table

Q.2. Explain memory organization in computer architecture? Draw memory Hierarchy diagram.

Q.3. Explain the concept of Virtual memory.

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B. C. A. (Part - III) EXAMINATION : 2021

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Paper Third

COMPUTER SYSTEM ARCHITECTURE

(301)

Time : Three Hours]

[Maximum Marks : 50

Note :-Attempt **any two** questions from each unit. All questions carry equal marks.

UNIT -1

1. Explain Octal and Hexa decimal Number system with examples.
2. Explain ASCII, BCD and Grey code.
3. Write various Arithmetic operation on Binary numbers.

UNIT -2

1. Explain the concept of Logic Gates. Also explain different logic gates along with truth table.
2. What is K map? Explain sum of product and product of sum.
3. Differentiate between combinational and sequential circuits.

UNIT -3

1. Explain Micro processor architecture along with diagram.
2. Explain motherboard and SMPS in detail.
3. What is system bus? Explain its types with example.

UNIT -4

1. Explain various I/O transfer technique.
2. Differentiate I/O mapped I/O and memory mapped I/O.
3. Explain various data transfer techniques.

UNIT -5

1. What is memory hierarchy? Explain with diagram.
2. Write short note on semiconductor memory and page replacement a

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B.C.A.(Part-III) EXAMINATION, 2021

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Paper Sixth

SOFTWARE ENGINEERING

(304)

Time: Three Hours]

[Maximum Marks:100

[Minimum Pass Marks:40

Note: Attempt any two parts from each Unit. All questions carry equal marks.

Unit-I

1. (a) What is software engineering? Explain the needs and software problem?
- (b) Discuss the connection between waterfall model and iterative model?
- (c) What are software process model? Explain the design principle in software engineering.

Unit-II

2. (a) Briefly describe features of function-oriented metrics with example?
- (b) Discuss the role of Size Oriented Metrics in Software Engineering.
- (c) What is system development life cycle? Explain each phase of SDLC.

Unit-III

3. (a) What is software requirement specification? Why requirement specification is important in software designing?
- (b) What is the role of DFD for software requirement specification? Draw a DFD for a system that pays workers.
- (c) Explain data dictionary. What is the use of data dictionary in software development process?

Unit-IV

4. (a) What is abstraction? Explain different levels of abstraction.
- (b) What are the rules of good programming style? How can we verify code of a system?
- (c) Explain the following two approaches to design hierarchy of component:
 - i. Top down strategy
 - ii. Bottom up strategy

Unit-V

5. (a) What is software testing? Explain various types of testing.
- (b) Differentiate between verification and validation?
- (c) Explain the steps of software maintenance with the help of a diagram.