

FOUR YEAR (HONOURS) B.C.A. (DATA SCIENCE) / DEGREE
EXAMINATION, APRIL/MAY - 2025
CHOICE BASED CREDIT SYSTEM
FOURTH SEMESTER - MAJOR

PART - II

PAPER - 11 : STATISTICAL TECHNIQUES

(Under CBCS New Regulation w.e.f. the academic year 2024-25)

(Statistical tables and Electronic Calculators are allowed)

Time : 3 Hours

Max. Marks : 75

SECTION - A

Answer any Five of the following questions. Each question carries equal marks.

(5×3=15)

1) Calculate QD of 2, 4, 10, 8, 6, 12, 5.

2) Find MD about mean of 2, 5, 8, 11, 14

3) Compute SD of 10, 6, 8, 12, 20

4) Mean = 16.5 and SD = 9, Find CV.

5) Define symmetric and asymmetric distribution.

6) Mean = 32.43, Mode = 31, SD = 11.29, find Karl Pearson's coefficient of skewness.

7) $Q_1 = 32$, $Q_3 = 60$, $Q_2 = 46$, compute Bowley's coefficient of skewness.

8) Define Probable Error.

9) Define Factor Reversal test.

10) Define unweighted index numbers.

SECTION - B

Answer any Five of the following questions. Each question carries equal marks.

(5×12=60)

11) Find QD to the following data

C.I.	0-20	20-40	40-60	60-80	80-100
f	10	25	40	15	10

12) Find MD about median of the following data

C.I.	10-20	20-30	30-40	40-50	50-60
f	5	10	15	10	5

13) Calculate SD

C.I.	0-10	10-20	20-30	30-40	40-50	50-60
f	2	8	16	28	12	4

14) Calculate variance to the following data

C.I.	10-14	14-18	18-22	22-26	26-30	30-34
f	4	9	15	22	7	3

15) Find Karl Pearson's coefficient of skewness.

C.I.	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
F	2	6	11	20	40	75	45	25	18	8

16) Find Bowley's coefficient of skewness.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40
F	15	26	18	13	12	12	4

17) Calculate Karl Pearson's coefficient of correlation coefficient.

X	10	15	12	17	13	16	24	14	22	20
Y	30	42	45	46	33	34	40	35	39	38

- 18) The ranks of 15 students in Mathematics and Statistics are given below. Obtain rank correlation coefficient between them.

Rank of Maths	1	2	6	9	11	15	10	8	4	7	5	14	13	12	3
Ranks of Stats	10	7	8	11	9	13	15	1	6	3	4	12	14	5	2

- 19) Calculate Fisher's Index number.

Commodities	P_0 Price	Q_0 quantity	P_1 Price	Q_1 Quantity
A	20	8	40	6
B	50	10	60	5
C	40	15	50	15
D	20	20	20	25

- 20) Check Fisher index is an ideal index number.

Year	Article - I		Article - II		Article - III		Article - IV	
	Price	Qty	Price	Qty	Price	Qty	Price	Qty
2002	5	5	7.75	6	9.63	4	12.50	9
2005	6.50	7	8.80	10	7.75	6	12.75	9

**FOUR YEAR B.C.A. (HONOURS) (DATA SCIENCE/ARTIFICIAL
INTELLIGENCE/ BIG DATA/CLOUD COMPUTING/GENERAL)**

DEGREE EXAMINATION, APRIL/MAY - 2025

CHOICE BASED CREDIT SYSTEM

FOURTH SEMESTER - MAJOR

PART - II

PAPER - 9 : PYTHON PROGRAMMING

(Under CBCS New Regulation w.e.f. the academic year 2024-25)

Time : 3 Hours

Max. Marks : 75

SECTION - A

Answer any Five of the following questions. Each question carries equal marks.

(5×3=15)

1. Explain the concept of indentation in Python.
2. List and explain different types of operators in Python.
3. Explain the scope of a variable in Python.
4. How does exception handling work in Python?
5. Differentiate between tuples and lists.
6. Explain dictionary traversal with an example.
7. Explain array indexing in detail.
8. How do you import and export data between CSV files and data frames?
9. List the different types of plots supported by Matplotlib.
10. Explain the process of connecting Python with MySQL.

SECTION - B

Answer any Five of the following questions. Each question carries equal marks.

(5×12=60)

- 11. Explain the different data types in Python with examples.
 - 12. Explain string handling functions in Python.
 - 13. Explain built-in functions and user-defined functions in Python with examples.
 - 14. Explain how modules and packages work in Python with examples.
 - 15. Discuss different list methods and built-in functions with examples.
 - 16. Describe dictionaries in Python and their special features.
 - 17. Explain different operations on NumPy arrays with examples.
 - 18. Explain Pandas series and data frames with examples.
 - 19. Discuss different types of charts in Matplotlib with examples.
 - ✕ 20. Compare MySQL with other commercial databases in terms of features and advantages.
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FOUR YEAR HONOURS B.C.A. (Artificial Intelligence) DEGREE**EXAMINATION, APRIL/MAY - 2025****CHOICE BASED CREDIT SYSTEM****FOURTH SEMESTER - MAJOR****PART - II****PAPER - 10 : PROLOG PROGRAMMING***(Under CBCS New Regulation w.e.f. the academic year 2024-25)***Time : 3 Hours****Max. Marks : 75****SECTION - A****Answer any Five of the following questions. Each question carries equal marks.****(5×3=15)**

1. Write a short note on Prolog programming.
2. Differentiate between declarative and procedural meaning.
3. Explain matching in Prolog.
4. Explain the monkey and banana problem in Prolog.
5. How are lists represented in Prolog?
6. Explain the role of operators in Prolog.
7. Explain the purpose of the cut (!) operator.
8. List the common issues with using cut and negation.
9. Explain bagof, setof, and findall.
10. Write a note on control facilities.

SECTION - B

Answer any Five of the following questions. Each question carries equal marks.

(5×12=60)

- 11. Describe the concept of recursion in Prolog with an example program.
 - 12. Explain Prolog's approach to answering questions and how backtracking works.
 - 13. Explain the declarative and procedural meanings of Prolog programs with examples.
 - 14. Discuss the impact of the order of clauses and goals on Prolog program execution.
 - 15. Explain list representation in Prolog and demonstrate some operations on lists.
 - 16. Describe how a non-deterministic automation can be simulated in Prolog.
 - 17. Describe negation as failure in Prolog and explain its limitations.
 - 18. How does Prolog process characters and manipulate atoms? Explain with examples.
 - 19. Discuss different types of equality in Prolog and their significance.
 - 20. How does Prolog support efficient programming, and what are some debugging techniques?
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**FOUR YEAR B.Sc. HONOURS DEGREE EXAMINATION,
APRIL/MAY - 2025
CHOICE BASED CREDIT SYSTEM
FOURTH SEMESTER - MINOR
PART-II : ELECTRONIC
PAPER-11 : MICRO PROCESSOR SYSTEMS
(Under CBCS New Regulation w.e.f. the Academic year 2024-25)**

Time : 3 Hours

Max. Marks : 75

SECTION - A

Answer any Five of the following questions. Each question carries equal marks.

(5×5=25)

1. What are the key differences between the 8085 and 8086 microprocessors?
- 2. Explain the function of the ALU unit in a microprocessor.
3. What are the different types of instructions in the 8085 instruction set?
4. Explain the purpose of branch instructions in microprocessors.
- 5. Write an assembly language program for adding two 8-bit numbers.
6. How do you convert a BCD number to ASCII in assembly language?
7. What are the differences between minimum mode and maximum mode in 8086?
8. Explain the function of a DMA controller in microprocessor-based systems.
9. What are the main differences between ARM-based MCUs and traditional microprocessors?
- 10. Explain the importance of the programming model in ARM processors.

SECTION - B

Answer All questions. Each question carries equal marks.

(5×10=50)

11. a) Explain the architecture of the 8085 microprocessor with a block diagram.
(OR)
b) Discuss the various addressing modes in the 8086 microprocessor with examples.
12. a) Describe the data transfer and arithmetic instruction in the 8085 microprocessor.
(OR)
b) Explain the instruction execution timing in microprocessors with an example.
13. a) Write and explain an assembly language program for finding the largest and smallest numbers in an array.
(OR)
b) Discuss the process of division and multiplication in assembly language programming using 8085.
14. a) Explain the role of serial and parallel communication interfaces in microprocessors.
(OR)
b) Discuss the functions of a keyboard and display interface in microprocessor-based systems.
15. a) Explain the architecture and organization of ARM processors.
(OR)
b) Describe the instruction set of ARM processors and their applications in modern computing.
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FOUR YEAR B.Sc. (HONOURS) DEGREE EXAMINATION, APRIL/MAY-2025**CHOICE BASED CREDIT SYSTEM****FOURTH SEMESTER - MINOR****PART-II : ELECTRONIC****PAPER-10 : MICRO CONTROLLER SYSTEM***(Under CBCS New Regulation w.e.f. the Academic year 2024-25)***Time : 3 Hours****Max. Marks : 75****SECTION - A****Answer any Five of the following questions. Each question carries equal marks.****(5×5=25)**

- 1. Compare microprocessors and microcontrollers.
- 2. What are the development tools used for microcontrollers?
- 3. Explain the architecture of the 8051 microcontroller.
4. What is the function of the PSW register in the 8051 microcontroller?
- 5. List and explain different addressing modes of the 8051 microcontroller.
6. What is the purpose of the Timer/counter in the 8051 microcontroller?
- 7. Write an assembly language program to add two 8-bit numbers.
8. How do you arrange a given set of numbers in ascending order using assembly language?
9. Explain the working of the PPI 8255 interfacing with a microcontroller.
- 10. How is a stepper motor controlled using a microcontroller?

SECTION - B

Answer All questions. Each question carries equal marks.

(5×10=50)

11. a) Explain the evolution of microcontrollers from 4-bit to 32-bit systems.
(OR)
b) Describe the process of assembling, compiling, and debugging in microcontroller programming.
12. a) Explain the memory organization and register banks of the 8051 microcontroller.
(OR)
b) Draw and explain the pin diagram of the 8051 microcontroller.
13. a) Describe the instruction set of the 8051 microcontroller with examples.
(OR)
b) Explain the concept of time delay generation and its applications in the 8051 microcontroller.
14. a) Write an assembly language program for multiplication and explain its execution.
(OR)
b) Explain the procedure for arranging a set of numbers in descending order using assembly language.
15. a) Discuss the interfacing of seven-segment displays with a microcontroller.
(OR)
b) Explain the temperature measurement process using an LM35 sensor with a microcontroller.

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CIRC  
MOV A, #04H  
MOVB, #06H  
MUL A,B  
MOV DPTR, A  
MOVX DPTR, A  
INC A  
Loop: SJMP, A  
MOVX DPTR, A  
END
```

FOUR YEAR B.A./B.Com./B.Sc./B.C.A./B.B.A./B.Music/B.Dance/B.A.(O.L)/B.H.M/

B.VOCATIONAL IN DAIRYING AND ANIMAL HUSBANDRY/

B.VOCATIONAL IN HORTICULTURE (ALL GROUPS) DEGREE

EXAMINATION, APRIL/MAY - 2025

CHOICE BASED CREDIT SYSTEM

FOURTH SEMESTER

PART - I(D) : MULTIDISCIPLINARY COURSE

PAPER - IV : INTRODUCTION TO NANOTECHNOLOGY

(Under CBCS New Regulation w.e.f. the academic year 2024-25)

Time : 1½ Hours

Max. Marks : 50

Answer any Five questions. Each question carries equal marks.

(5×10=50)

1. Define Nanotechnology and write about its scope.
2. Describe the historical development of nanotechnology with reference to key milestones.
3. Explain how the surface-to-volume ratio affects the behavior of nanomaterials.
4. What are nanomaterials? Discuss the different types such as nanoparticles, nanotubes and nanocomposites with suitable examples.
5. What is top-down fabrication? Explain how lithography technique is used in creating nanostructures.
6. Define bottom-up fabrication. Describe how self-assembly is used to build nanoscale structures.
7. Discuss how spectroscopy is used to study the properties of nanomaterials.
8. Discuss the potential environmental risks posed by the release of nanoparticles into the environment.
9. Discuss the major ethical issues in the development and use of nanotechnology.
10. Discuss the future challenges in the field of nanotechnology, especially in area like nanomedicine.