KARIMGANJ COLLEGE, SRIBHUMI
FYUG EVEN SEMESTER UNIT TEST, 2026
(ASSIGNMENT)

FYUG 2nd Semester
Subject: Biotechnology
Paper: BTC DSC 151 (Biochemistry)

Write Assignment on the following topics (Any two) **10x2= 20**

1. Carbohydrates including their structure, properties and biological roles.
2. Protein extraction and fractionation technique.
3. Gluconeogenesis and glycogenolysis.

NB: Students are directed to write the assignments in A4 paper and to write on one side only by keeping margins on top and left-hand corner of each page. Students are to write their name, class, roll number and registration number on the top of the cover page.

KARIMGANJ COLLEGE, SRIBHUMI
FYUG EVEN SEMESTER UNIT TEST, 2026
(ASSIGNMENT)

FYUG 2nd Semester
Subject: Biotechnology
Paper: BTC SEC 151 (Immunology)

Write Assignment on the following topics (Any two) **7x2= 14**

1. Cell mediated & Humoral Immune response mechanism
2. Passive & Active immunization
3. Details account on HIV.

NB: Students are directed to write the assignments in A4 paper and to write on one side only by keeping margins on top and left-hand corner of each page. Students are to write their name, class, roll number and registration number on the top of the cover page.

KARIMGANJ COLLEGE, SRIBHUMI
FYUG EVEN SEMESTER UNIT TEST, 2026
(ASSIGNMENT)

FYUG 4th Semester
Subject: Biotechnology
Paper: BTC DSC 251 (Bio-analytical tool)

Write Assignment on the following topics (Any two) **10x2= 20**

1. Detailed description on Chromatography (mention types and their uses).
2. Detailed description on centrifugation (mention types and their uses).
3. Detailed description on electrophoresis.

NB: Students are directed to write the assignments in A4 paper and to write on one side only by keeping margins on top and left-hand corner of each page. Students are to write their name, class, roll number and registration number on the top of the cover page.

KARIMGANJ COLLEGE, SRIBHUMI
FYUG EVEN SEMESTER UNIT TEST, 2026
(ASSIGNMENT)

FYUG 4th Semester
Subject: Biotechnology
Paper: BTC DSC 252 (Bioprocess technology)

Write Assignment on the following topics (Any two) **10x2= 20**

1. Detailed note growth kinetics.
2. Detailed note microbial culture
3. Sterilization techniques.

NB: Students are directed to write the assignments in A4 paper and to write on one side only by keeping margins on top and left-hand corner of each page. Students are to write their name, class, roll number and registration number on the top of the cover page.

KARIMGANJ COLLEGE, SRIBHUMI
FYUG EVEN SEMESTER UNIT TEST, 2026
(ASSIGNMENT)

FYUG 6th Semester
Subject: Biotechnology
Paper: BTC DSC 351 (Recombinant DNA Technology)

Write Assignment on the following topics (Any two) **10x2= 20**

1. Enzymes used in Genetic Engineering
2. Methods of gene transfer
3. Polymerase Chain Reaction.

NB: Students are directed to write the assignments in A4 paper and to write on one side only by keeping margins on top and left-hand corner of each page. Students are to write their name, class, roll number and registration number on the top of the cover page.

KARIMGANJ COLLEGE, SRIBHUMI
FYUG EVEN SEMESTER UNIT TEST, 2026
(ASSIGNMENT)

FYUG 6th Semester
Subject: Biotechnology
Paper: BTC DSC 352 (Genomics and Proteomics)

Write Assignment on the following topics (Any two) **10x2= 20**

1. Human Geneome project
2. Physical interactions determining the properties of protein.
3. SDS-PAGE & native PAGE.

NB: Students are directed to write the assignments in A4 paper and to write on one side only by keeping margins on top and left-hand corner of each page. Students are to write their name, class, roll number and registration number on the top of the cover page.

KARIMGANJ COLLEGE, SRIBHUMI
FYUG EVEN SEMESTER UNIT TEST, 2026
(ASSIGNMENT)

FYUG 6th Semester
Subject: Biotechnology
Paper: BTC DSC 353 (Bioinformatics)

Write Assignment on the following topics (Any two) **10x2= 20**

1. BLAST and its types (also mention the necessary step s associated with performing the same.)
2. Sequence alignment.
3. Nucleotide database.

NB: Students are directed to write the assignments in A4 paper and to write on one side only by keeping margins on top and left-hand corner of each page. Students are to write their name, class, roll number and registration number on the top of the cover page.

KARIMGANJ COLLEGE, KARIMGANJ
FYUG EVEN SEMESTER UNIT TEST, 2026
(ASSIGNMENT)

FYUG 2nd Semester
SUBJECT: BOTANY

BOT DSC-151
Cell Biology
Total Marks: 20

Write detailed notes on any two topics from the following: **10 X 2= 20**

1. Differentiate between prokaryotic and eukaryotic cell. Describe the structure of eukaryotic cell with diagram. 3+7=10
2. Describe the structure of DNA with suitable diagram. Differentiate between nucleoside and nucleotide. Write about different types of RNA. 6+2+2=10
3. Write the structure and function of:
    a. Ribosome
    b. Mitochondria
4. What do you mean by cell cycle and cell cycle checkpoints. Describe in detail different events of cell cycle with diagram. 2+8=10

NB: Students are directed to write the assignments in A4 paper and to write on one side only by keeping proper margin. Students need to write their name, class, roll number and registration number on the top of the cover page.

KARIMGANJ COLLEGE, SRIBHUMI
FYUG EVEN SEMESTER UNIT TEST, 2026
(ASSIGNMENT)

FYUG 2nd Semester
SUBJECT: BOTANY

BOT DSM-151
Angiosperm Morphology and Taxonomy
Total Marks: 20

Write detailed notes on any two topics from the following: **10 X 2= 20**

1. Explain – 'flower as a modified shoot'.
2. Herbarium and its preparation.
3. Binomial nomenclature. Principles and rules of ICN.
4. Bentham and Hooker system of classification.

NB: Students are directed to write the assignments in A4 paper and to write on one side only by keeping margins on top and left-hand corner of each page. Students are to write their name, class, roll number and registration number on the top of the cover page.

KARIMGANJ COLLEGE, KARIMGANJ
FYUG EVEN SEMESTER UNIT TEST, 2026
(ASSIGNMENT)

FYUG 2nd Semester
SUBJECT: BOTANY
BOT IDC 151
Biodiversity Conservation
Total Marks: 20

Write detailed notes on any two topics from the following: **10 X 2= 20**

1. IUCN Red data book and Red list categories.
2. Conservation of Biodiversity.
3. Protected areas: National Parks, Wildlife Sanctuaries and Biosphere reserves.
4. Floristic regions of India.

NB: Students are directed to write the assignments in A4 paper and to write on one side only by keeping proper margin. Students need to write their name, class, roll number and registration number on the top of the cover page.

KARIMGANJ COLLEGE, KARIMGANJ
FYUG EVEN SEMESTER UNIT TEST, 2026
(ASSIGNMENT)

FYUG 2nd Semester
SUBJECT: BOTANY

BOT SEC-151
Mushroom Cultivation
Total Marks: 14

Write detailed notes on any two topics from the following: **7X 2= 14**

5. Nutritional and medicinal value of edible mushrooms (*Pleurotus citrinopileatus* and *Agaricus bisporus*).
6. Mushroom bed preparation- Paddy straw. Factors affecting the mushroom bed preparation.
7. Food Preparation: Types of food prepared from mushroom.
8. Storage and nutrition of mushrooms.

NB: Students are directed to write the assignments in A4 paper and to write on one side only by keeping proper margin. Students need to write their name, class, roll number and registration number on the top of the cover page.

KARIMGANJ COLLEGE, KARIMGANJ
FYUG EVEN SEMESTER UNIT TEST, 2026
(ASSIGNMENT)

FYUG 4th Semester
SUBJECT: BOTANY

BOT DSC-251
Economic Botany
Total Marks: 20

Write detailed notes on any two topics from the following: **10 X 2= 20**

1. Centre of origin and their importance with special reference to Vavilop's works.
2. Origin, Morphology, Cultivation practices, processing and Uses of Rice.
3. Morphology, extraction, uses and health implications of coconut oil.
4. Trapping, processing and uses of Rubber.

NB: Students are directed to write the assignments in A4 paper and to write on one side only by keeping proper margin. Students need to write their name, class, roll number and registration number on the top of the cover page.

KARIMGANJ COLLEGE, KARIMGANJ
FYUG EVEN SEMESTER UNIT TEST, 2026
(ASSIGNMENT)

FYUG 4th Semester
SUBJECT: BOTANY

BOT DSC-252
Plant systematics
Total Marks: 20

Write detailed notes on any two topics from the following: **10 X 2= 20**

1. Write the principles of ICN. Write a note on typification. 5+5=10
2. What is herbarium and botanical garden. Write about taxonomic significance of herbarium.

   Name two important botanical gardens of India. 2+6+2=10
3. Write about any two from the following: 5+5=10
   a. Convergence and divergence
   b. Homology and analogy
   c. Cladogram and phylogenetic tree

NB: Students are directed to write the assignments in A4 paper and to write on one side only by keeping proper margin. Students need to write their name, class, roll number and registration number on the top of the cover page.

KARIMGANJ COLLEGE, SRIBHUMI
FYUG EVEN SEMESTER UNIT TEST, 2026
(ASSIGNMENT)

FYUG 4th Semester
SUBJECT: BOTANY

BOT DSM-252
Plant Physiology
Total Marks: 20

Write detailed notes on any two topics from the following: **10 X 2= 20**

1. With neat label sketches briefly describe the photosystem I and photosystem II in photosynthesis.
2. Briefly describe the electron transport system and mechanism of ATP synthesis.
3. Describe the process of phloem loading and unloading.
4. Write a detailed note on discovery, chemical nature and physiological role of Auxin.

NB: Students are directed to write the assignments in A4 paper and to write on one side only by keeping margins on top and left-hand corner of each page. Students are to write their name, class, roll number and registration number on the top of the cover

KARIMGANJ COLLEGE, KARIMGANJ
FYUG EVEN SEMESTER UNIT TEST, 2026
(ASSIGNMENT)

FYUG 6th Semester
SUBJECT: BOTANY

BOT DSC 351
Ecology and Phytogeography
Total Marks: 20

Write detailed notes on any two topics from the following: **10 X 2= 20**

1. Food chain and Food web..
2. Formation and Composition of Soil.
3. Structure and Functioning of an Ecosystem.
4. Vegetation types of NE India with special reference to Assam.

NB: Students are directed to write the assignments in A4 paper and to write on one side only by keeping proper margin. Students need to write their name, class, roll number and registration number on the top of the cover page.

KARIMGANJ COLLEGE, KARIMGANJ
FYUG EVEN SEMESTER UNIT TEST, 2026
(ASSIGNMENT)

FYUG 6th Semester
SUBJECT: BOTANY

BOT DSC-352
Plant Biochemistry and Metabolism
Total Marks: 20

Write detailed notes on any two topics from the following: **10 X 2= 20**

1. Write short note on: (5+5=10)
    a. a). Crassulacean acid metabolism and their regulation.
    b. b). Red Drop and Emerson Enhancement effect.
2. Describe the mechanism of ATP synthesis with sketch diagram. Add a note on Pentose phosphate pathway.
3. Briefly discuss the nomenclature and classification of enzyme.
4. Discuss the concept of free energy and add a note on laws of thermodynamics.

NB: Students are directed to write the assignments in A4 paper and to write on one side only by keeping proper margin. Students need to write their name, class, roll number and registration number on the top of the cover page.

KARIMGANJ COLLEGE, KARIMGANJ
FYUG EVEN SEMESTER UNIT TEST, 2026
(ASSIGNMENT)

FYUG 6th Semester
SUBJECT: BOTANY

BOT DSC- 353
Plant Biotechnology
Total Marks: 20

Write detailed notes on any two topics from the following: **10 X 2= 20**

1. Protoplast isolation, culture and fusion.
2. Restriction Endonucleases (Type I-IV), biological roles and applications.
3. PCR mediated gene cloning.
4. Transgenic crops with improved quality traits (Golden rice).

NB: Students are directed to write the assignments in A4 paper and to write on one side only by keeping proper margin. Students need to write their name, class, roll number and registration number on the top of the cover page.

CHEMISTRY

Unit Test/ Assignment-I

FYUG 6TH SEMESTER

Course no –CHMDSC -351

Advance Materials

Full Marks-20

(In the cover page clearly write your name, Roll No and University Registration no)

1	Define nanomaterial. Discuss some unique properties of nanomaterials. Classify nanomaterials based on their dimension.	1+2+2
2	Give a brief account of the emergence and challenges of nanotechnology.	5
3	Explain the characteristic and molecular arrangement of (i) Nematic Phase (ii) Smectic C phase and (iii) Cholesteric Phase with proper diagram.	10

CHEMISTRY

Unit Test/ Assignment-I

FYUG 6^{TH} SEMESTER

Course no –CHMDSC -352

Spectroscopy

Full Marks-20

(In the cover page clearly write your name, Roll No and University Registration no)

1	a) Obtain an expression for energy of rotational diatomic molecule and explain the intensity of the transition spectra.	7
	b) Explain the difference between the rotational transition spectra of $^{12}C\,^{16}O$ and $^{13}C\,^{16}O$	3
2.	Write briefly the Woodward –Fieser rules for calculating max wavelength of absorption for conjugated carbonyl compounds. Also calculate $\tilde{\lambda}_{max}$ for a suitable conjugated carbonyl compounds having two double bond extending conjugation.	7+3

CHEMISTRY

Unit Test/ Assignment-I

FYUG 6TH SEMESTER

Course no –CHMDSC -353

(Chemical Kinetics)

Full Marks-20

(In the cover page clearly write your name, Roll No and University Registration no)

1	Obtain an expression for rate constant and half-life of second order reaction (i) when both the reactant are same (ii) when reactants are different.	10
2	a) What is transport number? Determine transport number by using the following two methods- i. Hittorf's methods ii) Moving boundary method	2+4+4

CHEMISTRY

Unit Test/ Assignment-I

FYUG 4TH SEMESTER

Course no –CHMDSC -251

((Physical Chemistry-II))

Full Marks-20

(In the cover page clearly write your name, Roll No and University Registration no)

1	Explain the phase diagram of water and carbon dioxide.	10
2	Write the differences between the following a) State function and path function b) Extensive and intensive properties	2+2
3	a) Prove that dq is not a perfect differential but dq/T is a perfect differential b) Derive an mathematical expression for 2nd law of thermodynamics	2+4

CHEMISTRY

Unit Test/ Assignment-I

FYUG 4^{TH} SEMESTER

Course no –CHMDSC -252

(Inorganic and Analytical Chemistry-III)

Full Marks-20

(In the cover page clearly write your name, Roll No and University Registration no)

1	a)What are organometallic compounds? Give examples of two naturally occurring organometallic compounds.	1+1
	b) Discuss the classification of organometallic compounds based on their bond type.	3
2	a) Define hapticity. Discuss the classification of organic ligands based on hapticity.	1+2
	b) Hapticity of a polyhapto ligand is not fixed. Justify taking a suitable example.	2
3	Give a brief account on buffer solution.	4
4	What are interfering acid radicals? Explain the detection and removal techniques of interfering acid radicals PO_4^{3-} and BO_3^{3-}	6

CHEMISTRY

Unit Test/ Assignment-I

FYUG 4^{TH} SEMESTER

Course no –CHMDSM -252

(Fundamental of Chemistry-II)

Full Marks-20

1	Explain phase, components and degree of freedom with a proper example and derive Gibbs phase rule.	10
2	Briefly narrate the VSEPR theory	4
3	Define bonding and non bonding molecular orbital. Draw the MO diagram of O_2 and CO	3+3

CHEMISTRY

Unit Test/ Assignment-I

FYUG 2nd Semester

Course No. : CHMDSC-151

(Organic Chemistry-1)

Full Marks-20

1	What are polynuclear hydrocarbons? What are the classes of polynuclear hydrocarbon? How will you establish the structural formula of naphthalene?	1+2+7
2	Explain stereochemistry in organic molecules. Discuss chirality, optical isomerism, geometrical isomerism and stereochemical configuration with suitable examples	10

CHEMISTRY

Unit Test/ Assignment-I

FYUG 2nd Semester

Course No. : CHMIDC-151

(Indian Chemistry through the Ages)

Full Marks-20

1	Explain the causes and consequences of (a) Acid rain (b) Global Warming	5+5
2	Who was Acharya Prafulla Chandra Ray? Discuss his contributions- (a) In Chemical Research and (b) In development of Indian Chemical Industry	1+5+4

CHEMISTRY

Unit Test/ Assignment-I

FYUG 2nd Semester

Course No. : CHMSEC-151

(Basic Analytical Chemistry)

Full Marks-14

1	Define cosmetics. What are different types of cosmetics? What are the major and minor components of cosmetics	6
2	What is soil? Discuss the composition of soil.	4
3	Define pH. Discuss a method of measuring pH of a solution.	4

CHEMISTRY

Unit Test/ Assignment-I

FYUG 2nd Semester

Course No. : CHMDSM-151

(Fundamental of Chemistry-I)

Full Marks-20

1	Discuss the postulates of Bohr's theory. Write its limitations.	3+2=5
2	State and explain Heisenberg's Uncertainty Principle.	5
3	Write the postulates of kinetic theory of gases and derived kinetic gas equation.	10

KARIMGANJ COLLEGE
Department of Computer Science and Application
FYUG – 2nd Semester 2026
Computer Science
CSCDSC-151
Data Structure
Unit Test 1(Assignment)

Answer any 4 question each carries 5 marks each: Total marks: 20

1. Write an algorithm to insert an element in a Linear Array.
2. Explain Bubble sort with an example.
3. Write an algorithm to insert an element at the beginning of a singly linked list.
4. What is a stack? Write an algorithm to delete an element from a stack using array.
5. What is a queue? Write an algorithm to insert an element in a queue.

KARIMGANJ COLLEGE
Department of Computer Science and Application
FYUG – 2nd Semester_2026
Computer Science
CSCDSC-152
Lab on Data Structure
Unit Test 1(Assignment)

Answer any 4 question each carries 5 marks each: Total marks: 20

1. Write a program in C to search an element in a linked list using linear search.
2. Write a program in C to search an element in a linked list using binary search.
3. Write a program in C to sort element using Bubble sort.
4. Write a program in C to sort element using Insertion sort.
5. Write a program in C to sort element using Selection sort.
6. Write a program in C to insert an element in a linked list.
7. Write a program in C to delete an element in a linked list.

Karimganj College
Department of Computer Science and Application
FYUG 2nd Semester
Computer Science
CSCSEC151: Python Programming
Unit Test (Assignment)
Marks: 14

1. Write a program that reads an integer value and prints "leap year" or "not a leap year". 2
2. Write a program that takes a positive integer n and then produces n lines of output shown as follows: 3

   *
   **
   ***
   ****
   *****
3. Write a function that takes an integer 'n' as input and calculates the value of $1 + 1/1! + 1/2! + 1/3! + \ldots + 1/n$ 3
4. Write a function that takes an integer input and calculates the factorial of that number. 3
5. Write a function that takes a string input and checks if it's a palindrome or not. 3

Karimganj College
Department of Computer Science and Application
FYUG 2nd Semester
Computer Science
CSCDSM151: Programming with C
Unit Test
Marks: 20
Assignment

Q: Write the following C programs: **5 x 4 = 20**

1. Write a program to find the factorial of a number.
2. Write a program to find the greatest among three numbers.
3. Write a program to print the numbers from 10 to 20 using while loop.
4. Write a program implement the concept of Structure.
5. Write a program using function to swap two numbers.

Department of Computer Science and Application
Unit Test—Assignment
FYUG 2nd Sem. Computer Science
Programming Fundamentals with C: CSCIDC-151
Total Marks—20

Answer the following questions:

1. Explain the concept of three types of programming language. 7
2. Differentiate between Interpreter and Compiler 5
3. Write short notes on: 2x4=8
    a) Source code
    b) Algorithm
    c) Debugging
    d) Target code

Karimganj College

Department of Computer Science and Application
FYUG 4th Semester
Computer Science
CSCDSC251: Object Oriented Programming with Java
Unit Test
Marks: 20
Assignment

Q: Write a Java program: 5 x 4 = 20

1. To find the sum of any number of integers entered as command line arguments .
2. To find the factorial of a given number.
3. To learn use of single dimensional array by defining the array dynamically.
4. To learn use of length in case of a two dimensional array
5. To convert a decimal to binary number

KARIMGANJ COLLEGE
Department of Computer Science and Application
FYUG – 4th Semester_2026
Computer Science
CSCDSC-252
DBMS
Unit Test 1(Assignment)

Answer any 4 question each carries 5 marks each: Total Marks: 20

1. List out four significant differences between file-processing system and a DBMS.
2. Explain the different types of data models in DBMS.
3. What are the different levels of data abstraction explain in detail.
4. What is an entity-relationship model? Draw an ER-diagram of Hospital.
5. Explain the fundamental Relational-Algebra Operations in DBMS.

KARIMGANJ COLLEGE
Department of Computer Science and Application
FYUG – 4th Semester_2026
CSCDSC-253
Lab on Java & DBMS
Computer Science
Unit Test 1(Assignment)

Total marks: 20

Java

1. Write a java program to find the factorial of a given number. 2
2. Write a program to convert a decimal to binary number. 2
3. Write a program to create a distance class with methods where distance is computed in terms of feet and inches, how to create objects of a class and to see the use of this pointer. 3
4. Write a program to show the difference between public and private access specifiers. The Program should also show that primitive data types are passed by value and objects are passed by reference and to learn use of final keywords. 4

DBMS

1. Write a query to create a table named Employees with columns for EmployeeID, FirstName, LastName, and HireDate. Make EmployeeID the primary key. 3
2. Write a SQL query to add a column named Email of type VARCHAR (255) to the Employee table. 3
3. Write a SQL query to remove the email column from the Employee table. 3

KARIMGANJ COLLEGE
Department of Computer Science and Application
FYUG– 4th Semester_2026
Computer Science
CSDSM-251
Lab on C & DBMS
Unit Test 1(Assignment)

Total marks: 20

C

1. Write a program in C to print the Fibonacci series. 3
2. Write a program in C to find the factorial of a given number. 2
3. Write a program on C to add two 3X3 matrices 4
4. Write a program to copy one file to other, use command line arguments. 3

DBMS

4. Write a SQL query to remove the country column from the Customers table. 2
5. Write a SQL query to change the data type of the birth_date column in the employees table to DATE. 2
6. Write a SQL query to rename the column customer_id to q_id in the Customers table. 2
7. How can you copy only specific rows from one table to another 2

KARIMGANJ COLLEGE
Department of Computer Science and Application
FYUG – 4th Semester_2026
Computer Science
CSDSM-252
Database Management System
Unit Test 1(Assignment)

Total marks: 20

1. What is DBMS? Explain some advantages of DBMS. 4
2. Explain Database system architecture briefly 5
3. What is ER Model? What are the different types of attributes in ER model? 4
4. What are the different types of SQL commands? Explain. 4
5. Write a SQL query to remove the country column from the Customers table. 3

KARIMGANJ COLLEGE

Department of Computer Science and Application

Unit Test—Assignment, 2026

FYUG 6th Sem. Computer Science

Computer Network and Internet Technology: CSCDSC-351

Total Marks—20

Answer the following questions:

1. Define Computer Network. Explain network classification briefly. 3+7=10
2. Illustrate network topologies with diagram. 7
3. Write short notes on Network Protocol. 3

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KARIMGANJ COLLEGE

Department of Computer Science and Application

FYUG – 6th Semester, 2026

CSDSC-352

Computer Science

Theory of Computation

Unit Test 1(Assignment)

Total marks: 20

Answer any 4 question each carries 5 marks each:

1. Explain the importance of Theory of Computation in computer science
2. Explain the concepts of alphabet, string, and language with suitable example.
3. Explain Deterministic Finite Automata (DFA) with formal definition, transition diagram and example.
4. Explain PDA with example.
5. Write the difference between FA and DFA.

KARIMGANJ COLLEGE

Department of Computer Science and Application

FYUG – 6th Semester_2026

Computer Science

CSCDSC-353

Microprocessor and System Programming

Unit Test 1(Assignment)

Answer any 4 question each carries 5 marks each: Total marks: 20

1. What is a microprocessor? What are the features of an 8086 microprocessor?
2. Explain Bus interface unit and Execution unit in detail of an 8086 microprocessor.
3. Write the different addressing modes available in 8086 microprocessor.
4. Explain the different types of instruction set of 8086 microprocessor.
5. Explain the different types of General Purpose Registers in 8086 microprocessor.

Department of Computer Science and Application
Unit Test—Assignment
FYUG 6th Sem. Computer Science
Lab on C & DBMS: CSCDSM-351
Total Marks—20

Answer the following questions ***(Any four):*** 4X5=20

1. Write a C program to add two numbers and display its result.
2. Write a C program to check whether a number is Even or Odd.
3. Write a C program to check whether a number is Prime or not
4. Write a C program to find the average of three numbers and the condition that numbers should be entered at the time of running the program.
5. Write a C program to find the factorial of a given number.

***

Ecology and Environmental Science

Assignment for 2nd Semester
Discipline Specific Minor
(DSM-151)
BASIC CONCEPTS OF ECOLOGY
Marks: 20

1. Write short notes on the following (Any 2):
   Abiotic components of the ecosystem, biotic components of the ecosystem, ecosystem, food chain **5×2=10**
2. Give a detailed account of the carbon cycle or the nitrogen cycle. **10**

Interdisciplinary Course
(IDC-151)
NATURAL RESOURCES, BIODIVERSITY CONSERVATION AND ENVIRONMENTAL POLLUTION
Marks: 20

1. Define pollution. Give a detailed account of the causes, effects, and control measures of air pollution. **2+6+6+6=20**

or

2. Write short notes on the following (Any 4): **5×4=20**
   Chornobyl disaster, Kalpakkam disaster, Fukushima nuclear accidents, Minamata disaster, Bhopal gas tragedy.

Assignment for 4th Semester
Discipline Specific Minor
(DSM-251)
CONCEPT OF ATMOSPHERE AND CLIMATE CHANGE
Marks: 20

1. Give a detailed account of the evolution and development of Earth's atmosphere. **10**
2. Write short notes on the following (Any 2) **5×2=10**

El Nino and La Nina, greenhouse gases, the process of springtime ozone depletion over Antarctica, climate change, and global warming.

Guidelines for submission of assignment:

1. Assignments should be handwritten. Handwriting should be legible.

2. All pages should be numbered consecutively except the cover page.

3. Students should submit their assignment along with the information mentioned below on the cover page of the assignment.

Department:----------
Semester: _____
Session:----------
Subject: _____
Name of the paper: _____
Course code
Name of the student: _____
University Roll No: _____
Registration No:_____
Contact No:_____

HOME ASSIGNMENT
MATHEMATICS (EVEN SEMESTER)
2025-26

ASSIGNMENT (FYUG)
(2^{ND} Semester)
Session: 2025-26
Subject: Mathematics
Paper: MATDSC-151T (Analytical Geometry)
Marks: 20

Answer the following questions (5 x 4 = 20)

1. The gradient of one of the straight lines of $ax^2 + 2hxy + by^2 = 0$ is twice that of the other. Show that $\mathbf{8h^2 = 9ab}$.
2. Show that the angle between the straight lines drawn through the origin to the points of intersection of the curve $(x + 1)^2 + 2xy + (y + 1)^2 = 7$ and the line $3x - y + 1 = 0$ is $\mathbf{\tan^{-1}\left(\frac{2\sqrt{6}}{13}\right)}$.
3. Find the radical axis of the circles $x^2 + y^2 + 2x + 3y - 7 = 0$ and $x^2 + y^2 - 2x - y + 1 = 0$. Also find the length of their common chord.
4. Find the equation of the circle through the points of intersection of the circles $x^2 + y^2 = 4$ and $x^2 + y^2 = 2x + 4y - 4$ and touching the straight line $x + 2y = 0$.

ASSIGNMENT (FYUG)
(2ND Semester)
Session:2025-26
Subject: Mathematics
Paper: MATSEC-151T (Mathematical Programming in C)
Marks: 14

Problem 1

a. What do curly braces denote in C? Why does it make sense to use curly braces to surroundthe body of a function?

b. Describethedifferencebetweentheliteralvalues7,"7",and'7'.

c. Considerthestatement

```
doubleans= 10.0+2.0/3.0−2.0∗2.0;
```

Rewritethisstatement,insertingparenthesestoensurethatans = 11.0uponevaluation of this statement.

Problem 2

For each of the following statements, explain why it is not correct, and fix it.

a. #include <stdio.h>;

b. int function(void arg1)

{

return arg1-1;

}

c. #define MESSAGE = "Happy new year!"

puts(MESSAGE);

ASSIGNMENT (FYUG)
(2ND Semester)
Session:2025-26
Subject: Mathematics
Paper: MATDSC-151T (Integral Calculus & Vectors)
Marks: 20

Answer all the following given questions

1. Integrate the following: 2x3=6

(a) $\int \frac{x^4}{(x^2+a^2)(x^2+b^2)}\,dx$ (b) $\int \frac{e^x}{e^x-3e^{-x}+2}\,dx$

2. Define integration as the limit of sum. Using summation, evaluate $\int_0^a \sin(nx)dx$ 1+3=4

3. Evaluate (a) $\int_0^{\pi} \frac{x}{(a^2cos^2x+b^2sin^2x)^2}\,dx$ (b) $\int_0^{\frac{\pi}{4}} \frac{x}{1+cos2x+sin2x}\,dx$ 2x4=8

4. Show that the vectors $\vec{a} \times (\vec{b} \times \vec{c})$, $\vec{b} \times (\vec{c} \times \vec{a})$ and $\vec{c} \times (\vec{a} \times \vec{b})$ are coplanar 2

ASSIGNMENT (FYUG)
(2^{ND} Semester)
Session: 2025-26
Subject: Mathematics
Paper: MATDSM-151T (Calculus)
Marks: 20

1. Discuss the concept of partial derivatives of a function of n variables, where$n \in \mathbb{N}$, $1 < n < \infty$. Give some examples of functions with several variables and find their partial derivatives up to second order.
2. State Euler's theorem on partial derivatives of a function of two variables and prove it. Also verify this theorem considering a function.

Assignment: 2025-26
Subject: Mathematics
FYUG (2nd semester)
Name of paper: Geometry
Paper code: MATIDC-151T
Marks:20

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1. Find the distance between the points $P(x_1, y_1)$ and Q(x_2, y_2) in the cartesian plane. Show that the points $(7,9), (3,-7), (-3,3)$ are the vertices of a right angled isosceles triangle. (4+2=6)
2. Find the distance between $P(x_1, y_1)$ and $Q(x_2, y_2)$ when (1+1=2)
   a) PQ parallel to the y-axis
   b) PQ parallel to the x-axis
3. If two vertices of an equilateral triangle are $(3,4)$ and $(-2,3)$, find the coordinates of third vertex. (4)
4. A line through the point $P(3,-2)$ meets the x-axis at A and y-axis at B such that PA : PB = 2 : 3. Find the coordinates of A and B. (4)
5. Find the coordinates of the vertices of the triangle given the midpoints of the sides $(4,-1), (7,9), (4,11)$. (4)

Assignment: 2025-26
Subject: Mathematics
FYUG 4th SEMESTER (Honours)
Name of Paper: Abstract Algebra
Paper Code: MATDSC-251T
Marks:20

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1. Define a group. Show that identity element in a group is unique. (4)
2. Let G be a group. Show that G is abelian if $(ab)^2 = a^2b^2$ for all $a, b \in G$. (4)
3. Let G be an abelian group with identity e. Let $H = \{x \in G : x^2 = e\}$. Show that H is a subgroup of G. (4)
4. Define center of a group. Show that center of a group is a subgroup of the group. (4)
5. Show that $(Z_n, +_n)$ is an abelian group. (4)

Assignment: 2025-26
Subject: Mathematics
FYUG 4th SEMESTER (Honours)
Name of Paper: Mechanics
Paper Code: MATDSC-252T
Marks:20

Answer all the following given questions

1. If a point moves in a straight line in such manner that its retardation is proportional to its speed, prove that the space described in any time is proportional to the speed destroyed in that time. 2

2. Prove that if a point moves with a velocity varying any power (not less than unity) of its distance from a fixed point which it is approaching, it will never reach that point. 3

3. A particle moves along a circle $r = 2acos\theta$ in such a way that its acceleration towards the origin is always zero. Show that the transversal acceleration varies as the fifth power of $cosec\theta$. 3

4. Obtain Tangential and Normal component of velocity and acceleration of a particle moving along a plane curve. 5

5. A curve is described by a particle having a constant acceleration in a direction inclined at constant angle to the tangent. Show that the curve is an equiangular spiral. 4

6. The coordinates of a moving point at time t are given by $= a(2t + sin2t)$; $y = a(1 - cos2t)$, prove that its acceleration is constant and find the direction motion at time t. 3

Assignment (FYUG)
Session: 2025-26
4th Semester (even)
Subject : Mathematics
Paper: MATDSC 253T: Linear Algebra
Marks:20

1. In $\mathbb{R}$, consider the addition $x \oplus y = x + y - 1$ and the scalar multiplication $\alpha \cdot x = \alpha(x-1)+1$. Prove that $\mathbb{R}$ is a vector space over $\mathbb{R}$ with respect to theseoperations. What is the additive identity (the 0 vector in the definition) inthis case?
2. Show that $W = \{(x_1, x_2, x_3, x_4): x_4 - x_3 = x_2 - x_1\}$ is a subspace of $\mathbb{R}^4$.
3. Describe all the subspaces of $\mathbb{R}^3$.
4. Find the condition on real numbers a, b, c, d so that the set {(x, y, z): ax +by + cz = d} is a subspace of $\mathbb{R}^3$.
5. Discuss the linear dependence/independence of following set of vectors:

a. {(1, 0, 0), (1, 1, 0), (1, 1, 1)} in $\mathbb{R}^3$ as a vector space over $\mathbb{R}$.
b. {(1, 0, 0, 0), (1, 1, 0, 0), (1, 1, 1, 0), (3, 2, 1, 0)} in $\mathbb{R}^4$ as a vector space over$\mathbb{R}$.

Assignment (FYUG)
Session: 2025-26
4th Semester (even)
Subject : Mathematics
Paper: MATDSM-251/252T(Differential Equations)
Marks:20

Answer the following questions 4x5=20

1. Show that the differential equation of the family of circles of fixed radius ***r*** with centre on y – axis is $\left(\boldsymbol{x^2 - r^2}\right)\left(\frac{dy}{dx}\right)^2 + \boldsymbol{x^2} = \boldsymbol{0}$.
2. Write down the order and degree of $x^2\left(\frac{d^2y}{dx^2}\right)^3 + y\left(\frac{dy}{dx}\right)^4 + y^4 = 0$. How many constants does the general solution of the differential equation must contain.
3. Form the differential equations for the equation $xy = ae^x + be^{-x}$; $a, b \; are \; constant.$
4. Form the differential equations for the equation $y = A\cos nt + B\sin nt$; $A, B \; are \; constant.$
5. Obtain a differential equation satisfied by the family of concentric circles.

Assignment (FYUG)
(6th Semester)
Session:2025-26
Subject: Mathematics
Paper: MATDSC-351T (Complex Analysis)
Marks: 20

1. Find the polar form of the complex number $(-\sqrt{3} - i\sqrt{3})$. Also find argument of the complex number. 2
2. Give the geometrical interpretation of $\left(\frac{z}{z-2}\right)$. 2
3. If z_1, z_2 and z_3 are nonzero complex numbers are affixes of vertices of a triangle ABC . Prove that $\frac{z_3-z_1}{z_2-z_1} = \frac{AC}{AB}e^{i\theta}$, where $-\pi < \theta < \pi$. 3
4. If the product of two complex numbers z_1 and z_2 is a non zero real number, prove that there exists a real c such that $z_1 = c^2\bar{z_2}$. 2
5. Show that the origin and the points representing the roots of the equation $z^2 + pz + q = 0$ form an equilateral triangle if $p^2 = 3q$. 3
6. If ${z_1}^2 + {z_2}^2 \pm 2z_1z_2cos\theta = 0$, prove that points represented by z_1, z_2 and the origin form an isosceles triangle, θ being real 4
7. If z_1, z_2, z_3, , z_4 be the vertices of rhombus ABCD in argand plane and $Angle\ CBA = \frac{\pi}{3}$, then prove that
   $2z_2 = z_1(1 + i\sqrt{3}) + z_3(1 - i\sqrt{3})$ and $2z_4 = z_1(1 - i\sqrt{3}) + z_3(1 + i\sqrt{3})$ 4

Assignment (FYUG)
(6th Semester)
Session:2025-26
Subject: Mathematics
Paper: MATDSC-352T (Hydrodynamics)
Marks: 20

Answer the following questions

1.	Write short notes on fluid.	6
2.	Describe the methods of fluid motion.	6
3.	Differentiate between real fluid and perfect fluid. And also write its applications in real life problems.	8

Assignment (FYUG)
FYUG 6th SEMESTER (Honours)
Subject: Mathematics
Session: 2025-26
Name of Paper: Multivariate Calculus
Paper Code: MATDSC-353T
Marks:20

1. Discussthe continuity of the functions (5×3=15)

I. $f(x,y) = \begin{cases} \frac{2xy^2}{x^3+y^3}, & (x,y) \neq (0,0) \\ 0, & (x,y) = (0,0) \end{cases}$.

II. $f(x,y) = \begin{cases} \frac{xy}{\sqrt{x^2+y^2}}, & (x,y) \neq (0,0) \\ 0, & (x,y) = (0,0) \end{cases}$.

III. $f(x,y,z) = \begin{cases} \frac{xyz}{x^2+y^4+z^4}, & (x,y,z) \neq (0,0,0) \\ 0, & (x,y,z) = (0,0,0) \end{cases}$

2. Show that the limit exists at the origin but the repeated limits do not, where

$$f(x,y) = \begin{cases} x\sin\left(\frac{1}{y}\right) + y\sin\left(\frac{1}{x}\right), & xy \neq 0 \\ 0, & xy = 0 \end{cases}$$ (5)

Assignment(FYUG)
Subject: Mathematics
6th Semester (even)
Session:2025-26
MATDSC 354T: Linear Programming
Full Marks: 20

1. Discuss the origin and development of operations research problems with special reference to linear programming problems. Consider any three practical linear programming problems with at least three decision variables in each and formulate them wherein at least one problem contains at least one constraint of $\geq$ type.
2. Solve the three problems of Question No. 1.

Assignment: 2025-26
Subject: Mathematics
FYUG 6th SEMESTER
Name of Paper: Classical Algebra and Trigonometry
Paper Code: MATDSM-351T
Marks:20

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1. State and prove **De Moivre's Theorem**. (5)
2. Express $\boldsymbol{Z = \frac{-1}{2} + i\frac{1}{\sqrt{3}}}$ into polar form. (2)
3. Find the expansion of $\boldsymbol{\cos n\theta}$ *and* $\boldsymbol{\sin n\theta}$ when **n** is a positive integer and $\boldsymbol{\theta}$ is real. (4)
4. If n is a positive integer then prove that (5)
   $\left(\frac{1 + \sin\theta + i\cos\theta}{1 + \sin\theta - i\cos\theta}\right)^n = \cos\left(\frac{n\pi}{2} - n\theta\right) + i\sin\left(\frac{n\pi}{2} - n\theta\right) = (\sin\theta + i\cos\theta)^n$
5. Solve $x^7 = 1$. (4)

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP EVEN SEMESTER EXAMINATION, 2026
PHYSICS
ASSIGNMENT – I
SEMESTER – II
PHYDSC – 151T
(Electricity and Magnetism)
Full Marks: 20

Answer the following questions
(Each question carries 10 marks.)

1. (a) State and prove Gauss's law in electrostatics.

   Two concentric spherical surfaces enclose a point charge **q**. The radius of the outer sphere is twice that of the inner one. Compare the electric fluxes crossing the two surfaces. 1+3+2=6

   (b) Define an electric dipole. Obtain an expression of potential at a point due to an electric dipole. 1+3=4

2. (a) By applying Biot-savart's law, find the magnetic field at the centre of a circular loop carrying current. 2

(b) Describe how Helmholtz coil is used in tangent galvanometer. 3

(c) Find an expression of Torque on a current carrying loop in a uniform magnetic field.3

(d) What is Toroid and solenoid? 2

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP EVEN SEMESTER EXAMINATION, 2026
PHYSICS
ASSIGNMENT – I
SEMESTER – II
PHYSEC – 151T
(Electrical circuits and safety)
Full Marks: 14

Answer the following questions
(Each question carries 7 marks.)

1. (a) Explain the term KCL and KVL. 2

   (b) Write the difference between AC current and DC current. 2

   (c) Define inductance, Capacitance and Impedance. 3

2. (a) What are single phase and three phase AC motors? 2

   (b)Explain the working of diodes as half wave and full wave rectifiers. 3

   (c) What are fuses and circuit breakers? 2

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP EVEN SEMESTER EXAMINATION, 2026
PHYSICS
ASSIGNMENT – I
SEMESTER – II
PHYDSM – 151T
(Mechanics, Relativity and Mathematical Physics)
Full Marks: 20

Answer the following questions
(Each question carries 10 marks.)

1. (a) Describe the conservation of momentum and conservation of energy. 4

   (b) Define scalar triple product and vector triple product. 3

   (c) Find the unit normal to the surface: 3

   $x^2 + y^2 = z$ at a point (1,2,5)

2. (a) State Hooke's law. 2

   (b) Find an expression for work done in stretching a wire. 3

   (c) Describe theory of Torsional Pendulum. 5

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FYUGP EVEN SEMESTER EXAMINATION, 2026

PHYSICS

ASSIGNMENT – I

SEMESTER – II

PHYIDC – 151T

(Understanding the Climate)

Full Marks: 20

Answer the following questions

(Each question carries 10 marks.)

1. Describe the elementary concept of atmosphere and its composition. Also explain atmospheric dynamics. 5+5=10

2. Write a short note on application of radars to study the atmospheric phenomenon. 10

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP EVEN SEMESTER EXAMINATION, 2026
PHYSICS
ASSIGNMENT – I
SEMESTER – IV
PHYDSC – 251T
(Mathematical Physics-II)
Full Marks: 20

Answer the following questions
(Each question carries 10 marks.)

1. (a) To show that $P_n(x)$ is the coefficient of Z^n in the expansion of $(1-2xz+z^2)^{-1/2}$ in ascending powers of z. 5

   (b) Using the recurrence formula for $P_n(x)$ show that

   $(1-x^2)\,P_n^{/} = n\,(P_{n-1} - xP_n)$ 5

2. (a) Obtain the Laplace transform of {cos at – cos bt}/t 5

   (b) Find the inverse Laplace transform of following function : 5

$$\frac{(14s+10)}{(49s^2+28s+13)}$$

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP EVEN SEMESTER EXAMINATION, 2026
PHYSICS
ASSIGNMENT – I
SEMESTER – IV
PHYDSC – 252T
(Electronics)
Full Marks: 20

Answer the following questions
(Each question carries 10 marks.)

1. (a) Convert $(68.125)_{10}$ into binary. 3

   (b) How can you realize two -input OR and two-input AND gates using diodes? 4

   (c) How can you obtain basic logic gates using NAND gate? 3

2. (a) What do you mean by transistor biasing and stability? 4

   (b) What are the different ways of biasing a transistor? 2

   (c) Explain Voltage Divider Bias. 4

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP EVEN SEMESTER EXAMINATION, 2026
PHYSICS
ASSIGNMENT – I
SEMESTER – IV
PHYDSM – 252T
(Electricity, Magnetism and Electronics)
Full Marks: 20

Answer the following questions
(Each question carries 10 marks.)

1. (a) What do you mean by P and N-type semiconductors? Explain. 5

   (b) With necessary circuit diagram, explain the working of a full-wave rectifier. 5

2. (a) State and explain Biot Savart's Law. 4

   (b) Find the magnetic field due to a long straight conductor carrying current. 3

   (c) A solenoid of length and diameter has turns per cm. If a current of 5A flows through it, calculate the magnetic induction at the axis inside the solenoid. 3

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP EVEN SEMESTER EXAMINATION, 2026
PHYSICS
ASSIGNMENT – I
SEMESTER – VI
PHYDSC – 351T
(Nuclear and Particle Physics)
Full Marks: 20

Answer the following questions
(Each question carries 10 marks.)

1. Describe the construction and action of ionization chamber. Alpha particles of energy 5 MeV pass through an ionization chamber at the rate of 10 per second. Assuming all the energy is used in producing ion pairs, calculate the current produced. (35eV is required for producing an ion pair & $e = 1.6 \times 10^{-19}$ C) 3+4+3=10
2. (a) Discuss the structure of the nucleus and give its properties. 5

   (b) Explain the liquid drop model of the nucleus. 5

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP EVEN SEMESTER EXAMINATION, 2026
PHYSICS
ASSIGNMENT – I
SEMESTER – VI
PHYDSC – 352T
(Statistical Mechanics and Plasma Physics)
Full Marks: 20

Answer any two from the following questions
(Each question carries 10 marks.)

1. (a) What do you mean by black body radiation? Mention the characteristics of black body radiation. 1+2=3

   (b) Derive Planck's law of black body radiation. Obtain Rayleigh-Jeans law from Planck's law. 4+1=5

   (c) Explain ultraviolet catastrophe. 2

2. (a) What is plasma? Describe the characteristics of plasma. 1 + 2=3

   (b) Write the difference between Ordinary gas and plasma. 2

   (c) Write short notes on solar corona. 5

3. (a) What do you mean by microstates and macrostates? 4

   (b) Define phase space and ensembles. 2

   (c) Explain the terms micro-canonical, canonical and grand canonical ensembles. 4

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP EVEN SEMESTER EXAMINATION, 2026
PHYSICS
ASSIGNMENT – I
SEMESTER – VI
PHYDSC – 353T
(Solid State Physics)
Full Marks: 20

Answer the following questions
(Each question carries 10 marks.)

1. (a) State the difference between amorphous and crystalline materials. 2

(b) show that lattice + basic = crystal 3

(c) What are Miler indices? Describe Bragg's law. 1 + 4

2. (a) State Dulong and Petit's law. 1

(b) Describe Einstein theory of specific heat of solids. 4

(c) Derive Debye's $\mathbf{T^3}$ law. 5

Assignment - I DSC 151 (2nd Sem) Full Marks : 20

(STATISTICS)

Q. (1) (i) Define probability density function.

A continuous random variable 'X' has the p.d.f $f(x) = 3x^2$, $0 \le x \le 1$. Find 'r' and 's' such that

(a) $P[X \le r] = P[X > r]$ (b) $P[X > s] = 0.05$

1+2+2 = 5

(ii) Let 'X' be a continuous random variable having p.d.f

$$f(x) = \begin{cases} ax, & 0 \le x \le 1 \\ a, & 1 \le x \le 2 \\ -ax + 3a, & 2 \le x \le 3 \\ 0, & \text{elsewhere} \end{cases}$$

(iii) Determine the value of 'a' and compute $P(X \le 1.5)$

5

Q. (2) (i) Define mathematical expectation of a random variable. Let 'n' dice are thrown. Find the mathematical expectation of the sum and product of the points on them.

2+3 = 5

(ii) Suppose the lives in hours of a bulb is a continuous random variable 'X' with pdf given by

$$f(x) = \begin{cases} \frac{100}{x^2}, & x \ge 100 \\ 0, & \text{elsewhere} \end{cases}$$

$2\frac{1}{2} + 2\frac{1}{2} = 5$

(a) What is the probability that a bulb will have to be replaced during the first 150 hours ?

(b) What is the probability that the bulb will not be replaced ?

Assignment 1

STASEC 151 (STATISTICS)

Marks : 14

(1) How to handle missing data in R? (3)

(2) Write the steps involved in installing R-studio.

(3) Write a note on Data types. (3)

(4) How to import different files in R? Explain with examples. (5)

Assignment-1 DSM 151 (STATISTICS) Marks : 20

1. Q. (i) Define the term Statistics. Write some functions of Statistics. (1+4=5)

(ii) Define census and sampling. Write down the advantanges of sampling over census. (2+3=5)

Q. (2) (i) Explain the methods of collection of primary data. (5)

(ii) Write the requisites of a good ~~questionnaire~~ questionnaire. (5)

Assignment-1 IDC 151 (STATISTICS) Marks : 20

Q.(1) (i) What is Index numbers? Write the uses of Index numbers. (1+3=4)

(ii) Mention the different types of Index numbers. Briefly explain the problems arise during the construction of index numbers. (2+4=6)

Q.(2) (i) What is meant by time series? What is scatter diagram of a time series? Explain its significance. (2+2+2=6)

(ii) Briefly discuss the components of a time series. (4)

Assignment - I

Statistics - Semester - IV

STADSC - 251

Full Marks : 20

1. (a) Define estimation. (2)

(b) What are the criteria of a good estimator? (8)

2. (a) State Cramer - Rao Inequality. (2)

(b) What are the assumptions of Cramer - Rao Inequality. (5)

(c) If T_1 is an MVU estimator of $\gamma(\theta)$, $\theta \in (H)$ and T_2 is any other unbiased estimator of $\gamma(\theta)$ with efficiency $e = e_0$, then the correlation between T_1 and T_2 is given by $\rho = \sqrt{e}$ i.e, $\rho_\theta = \sqrt{e_0}$ $\forall$ $\theta \in (H)$ (3)

Assignment-1
STADSC 252 Marks : 20
(STATISTICS)

Q.(1) (i) Explain the concept of Infimum and Supremum. (2)

(ii) Prove that the interior of a set is an open set. (3)

Q.(2) State and prove the Bolzano-Weierstrass theorem. (5)

Q.(3) State and prove the fundamental theorem of finite differences. (5)

Q.(4) (i) If Δ and ∇ be the first descending difference operator and first ascending difference operator respectively of a function $f(x)$, show that $(\Delta - \nabla) \equiv \Delta\nabla$ (3)

(ii) ~~Evaluate~~ Show that $\Delta \log f(x) = \log\left[1 + \frac{\Delta f(x)}{f(x)}\right]$ (2)

Assignment-1 DSM-252 (STATISTICS) Marks : 20

Q.(1) What is a random variable ? Define the different types of it. (1+3=4)

Q.(2) A random variable 'X' has the following probability function :

$X=x$	0	1	2	3	4	5	6	7
$P(X=x)$	0	k	$2k$	$2k$	$3k$	k^2	$2k^2$	$7k^2+k$

(i) Find the value of k

(ii) Determine the distribution function of 'X'.

(iii) Evaluate $P(X<6)$, $P(X\geq 6)$, $P(0<X<5)$. (6)

Q.(3) A continuous random variable has the function $f(x) = 6x(1-x)$, $0\leq x\leq 1$

(i) Check that $f(x)$ is a p.d.f.

(ii) Determine the number 'b' such that $P(X<b) = P(X>b)$. (4)

Q.(4) If 'X' is a random variable with p.d.f $f(x) = c(1-x)$, $0\leq x\leq 1$, then find

(i) ~~find 'c'~~ the value of 'c'

(ii) mean

(iii) Median

(iv) Mode

(v) Variance

(vi) $P\left(\frac{1}{2}<X<\frac{3}{4}\right)$ (6)

Assignment - I
Statistics : Semester VI
STADSC - 351 Marks : 20

Q.(1) Define the following : (1×4 = 4)

(i) Parameter and Statistic

(ii) Estimator and Estimate

(iii) Standard Error

(iv) Sampling units.

Q.(2) Explain the basic principles of sample survey. (6)

Q.(3) Differentiate between Sampling and Complete enumeration. (5)

Q.(4) Explain the different types of sampling. (5)

Assignment - I

Statistics : Semester VI

STA DSC - 352

Marks : 20

1.(a) Write a note on Markov chain. (6)

(b) Define transition probability matrix and order of a Markov chain. (2+2=4)

2. Let $\{X_n, n \geq 0\}$ be a Markov chain with three states 0, 1, 2 and with transition matrix

$$\begin{pmatrix} 3/4 & 1/4 & 0 \\ 1/4 & 1/2 & 1/4 \\ 0 & 3/4 & 1/4 \end{pmatrix}$$

and the initial distribution $Pr\{X_0 = i\} = \frac{1}{3}, i = 0, 1, 2$

Obtain the following :

(i) $Pr\{X_2 = 2, X_1 = 1 / X_0 = 2\}$

(ii) $Pr\{X_2 = 2, X_1 = 1, X_0 = 2\}$

(iii) $Pr\{X_3 = 1, X_2 = 2, X_1 = 1, X_0 = 2\}$ (6)

3. A particle performs a random walk with absorbing barriers, say, at 0 and 4. Whenever it is at any position r $(0 < r < 4)$, it moves to $(r+1)$ with probability p or to $(r-1)$ with probability q, $p + q = 1$. But as soon as it reaches 0 or 4 it ~~moves~~ remains there itself. Write down the transition probability matrix. (4)

(STATISTICS) Assignment-1 Marks : 20

DSC-353

1. (a) Obtain the moment generating function of Bivariate Normal Distribution. (5)

(b) (X, Y) possesses a bivariate Normal distribution if and only if every linear combination of X and Y viz. $aX + bY$, $a \neq 0$, $b \neq 0$ is a normal variate. (5)

2. Derive the following

(a) Marginal distribution of Bivariate Normal Distribution of X and Y. (5)

(b) Conditional distribution of Bivariate Normal Distribution of X on Y and Y on X. (5)

KARIMGANJ COLLEGE

FYUG ZOOLOGY 2nd semester DSC 1st Unit Test 2026

Course No.: ZOODSC 151

(Cell Biology)

Full Marks: 20

Write an assignment on any one of the following topics.

1. Mitochondria
2. Golgi apparatus
3. Cell cycle regulation
4. Transport across membrane.

KARIMGANJ COLLEGE

FYUG ZOOLOGY 2nd semester DSM 1st Unit Test 2026

Course No.: ZOODSM 151

(Cell biology & histology)

Full Marks: 20

Write an assignment on any one of the following topics.

1. Transport across membranes.
2. Mitochondria.
3. Cell cycle and its regulation.
4. Connective tissue.

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FYUG ZOOLOGY 2nd semester SEC 1st Unit Test 2026

Course No.: ZOOSEC 151

(Medical diagnostics)

Full Marks: 14

Write an assignment on any one of the following topics.

1. Blood and its composition
2. Cancer
3. Hepatitis
4. MRI – basic principle, types and applications

KARIMGANJ COLLEGE

FYUG ZOOLOGY 2nd semester IDC 1st Unit Test 2026

Course No.: ZOOIDC 151

(Economic Zoology)

Full Marks: 20

Write an assignment on any one of the following topics.

1. Communicable and non-communicable diseases
2. Composite fish culture
3. Lac culture
4. Poultry farming

KARIMGANJ COLLEGE
FYUG ZOOLOGY 4th semester DSC 1st Unit Test 2026
Course No.: ZOODSC 251
(Histology)

Full Marks: 20

Write an assignment on any one of the following topics.

1. Connective tissue.
2. Muscle Contraction.
3. Nerve fiber - classification, properties and glands.
4. Gastrointestinal tract and associated glands.

KARIMGANJ COLLEGE
FYUG ZOOLOGY 4th semester DSC 1st Unit Test 2026
Course No.: ZOODSC 252
(Fundamentals of Biochemistry)

Full Marks: 20

Write an assignment on any one of the following topics.

1. Structure and biological importance of carbohydrates.
2. Vitamins – classification, properties and function.
3. Amino acids.
4. Nucleic acids.

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FYUG ZOOLOGY 4th semester DSM 1st Unit Test 2026
Course No.: ZOODSM 252
(Genetics and Molecular Biology)

Full Marks: 20

Write an assignment on any one of the following topics.

1. Crossing over – types, mechanism and significance.
2. Mutation - gene and chromosomal.
3. Sex determination – cytoplasmic, hormonal and environmental basis.
4. Extra chromosomal inheritance.

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FYUG ZOOLOGY 6th semester DSC 1st Unit Test 2026

Course No.: ZOODSC 351

(Molecular Biology)

Full Marks: 20

Write an assignment on any one of the following topics.

1. DNA replication in prokaryotes.
2. Genetic Code.
3. Protein synthesis in prokaryotes.
4. Types and mechanism of gene mutation.

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FYUG ZOOLOGY 6th semester DSC 1st Unit Test 2026

Course No.: ZOODSC 352

(Evolutionary Biology)

Full Marks: 20

Write an assignment on any one of the following topics.

1. Origin and evolution of life of on earth.
2. Isolation mechanism.
3. Origin and evolution of human.
4. Continental drifting.

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FYUG ZOOLOGY 6th semester DSC 1st Unit Test 2026

Course No.: ZOODSC 353

(Reproductive and Developmental Biology)

Full Marks: 20

Write an assignment on any one of the following topics.

1. Development and differentiation of gonads.
2. Mechanism of hormone action.
3. Cleavage planes & pattern.
4. Metamorphosis in amphibians.

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C.B.C.S. 6th SEMESTER ZOOLOGY
UNIT TEST (assignment mode) 2026

Course: ZOOHCC 601 (Developmental Biology)

Full Marks: 14

1. Answer any one : 1x14=14
   a) What is gametogenesis? Discuss the various steps of fertilization of gametes in human.
   b) Discuss the various types of placenta. What are the functions of placenta?

Course: ZOOHCC 602 (Evolutionary Biology)

Full Marks: 14

1. Answer any one : 1x14=14
   a) Discuss in details the various aspects of chemogeny in the light of Oparin and Haldane's experiment.
   b) Write notes on:
      i. Natural selection
      ii. Isolating mechanisms