

KARIMGANJ COLLEGE
Department of Computer Science and Application
2nd UNIT TEST (Assignment)—2024
FYUG 1st Semester (Computer Application)

CADSC-101T: Fundamentals of Information Technology

Marks:: 20

- | | |
|---|-------|
| 1. Explain in brief the different components of a computer system. | 4 |
| 2. Differentiate between RAM and ROM. | 3 |
| 3. Differentiate between Application software and System software. | 4 |
| 4. Explain the different types of Input and Output devices. | 5 |
| 5. Write in brief about Arithmetic Logic Unit. | 2 |
| 6. Explain utility software and Open source software with examples. | 1+1=2 |

CADSC-102T: Discrete Structure

Marks: 20

Answer the following questions:

- | | |
|---|---|
| 1. What are the properties of tree? | 2 |
| 2. What is rooted tree? Define descendants, siblings, leaf and level with diagram. | 3 |
| 3. Explain BFS algorithm with suitable example. | 5 |
| 4. What do you mean by compound proposition? Define different connectives to make compound proposition. | 4 |
| 5. Define tautologies and contradiction with example. | 3 |
| 6. Test the validity: $P, p \rightarrow Q$ logically implies Q | 3 |

CADSM-101T: Programming with C

Marks: 20

- | | |
|--|---|
| 1. What is keyword in C? Give an example. | 4 |
| 2. Write down the rules for writing identifiers in C | 5 |
| 3. Write a program to find the area of circle. | 3 |
| 4. Write a program to find the maximum of two numbers. | 3 |
| 5. What is data type? What are the basic datatypes in C. | 5 |

CAIDC101-Fundamentals of Information Technology

Marks::20

- | | |
|--|-------|
| 1. Define Compute. What are the different IT Tools and their Applications? | 2+5=7 |
| 2. Explain briefly the different types of Computer. | 7 |
| 3. Write short notes(Any Two) | 2x3=6 |
| a. Write Three characteristics of Computers | |
| b. Hardware and Software | |
| c. Central Processing Unit | |

CACSEC-101: Programming with C

Marks :: 14

- | | |
|--|-----|
| 1. Explain C tokens with example. | [5] |
| 2. What do you mean by variable? How variables are declared and initialized? Give example. | [3] |
| 3. What are different data-types used in C? | [2] |
| 4. Write a C program to calculate Simple Interest. | [4] |

KARIMGANJ COLLEGE
Department of Computer Science and Application
2nd UNIT TEST (Assignment)—2024
FYUG 3rd Semester (Computer Application)

CADSC-201: Computer Organization and Architecture
Marks: 20

Answer the following questions:

1. Explain Programmed I/O and Interrupt-initiated I/O modes of transfer. 3
2. What is a DMA? Explain DMA controller in detail. 2+5=7
3. Discuss in details the tasks that must be performed by the assembler during the translation process. 10

CADSC-202: Operating Systems
Marks: 20

Answer the following questions:

1. What is an Operating System? 1
2. Explain the various functions of an Operating System. 6
3. Why Operating System is also known as resource manager? 3
4. What is a Process? Define various Process States with a neat diagram. 1+5=6
5. What is process scheduling? Describe different levels of scheduler. 1+3=4

CAIDC201-Introduction to Web Designing & Cyber Security
Marks::20

Answer the following questions:

1. What do you mean by Internet? Explain some basic applications of Internet. 7
2. What is cyber law? Explain its advantages. 7
3. Write Short notes on (Any Two) 2x3=6
 - a. World Wide Web
 - b. Website
 - c. Web Browser

CASEC-201: Web Programming
Marks :: 14

Answer the following questions:

1. Write the difference between HTTP and HTTPS? 2
2. Write short notes on: 1x3=3
 - a) Web Browser
 - b) URL
 - c) Proxy server
3. What are HTML tags and attributes? Give example 2
4. What do you mean by scripting language? Write down the difference between client side scripting language and server-side scripting language. 1+2=3
5. Write a JavaScript program to display "Hello World" using text box, submit button and alert function. 4

KARIMGANJ COLLEGE
Department of Computer Science and Application
2nd UNIT TEST (Assignment)—2024
TDC (CBCS) 5th Semester (BCA)

CACCC501T: Programming with Java
Marks: 14

Answer the following questions:

1. Explain different features of Java. [5]
2. What is JVM? Write down the difference between JDK and JRE. [2+2=4]
3. What are different primitive data types used in Java. [3]
4. How arrays are declared and initialised in Java? [2]

CACCC502: Management Information System (MIS)
Marks: 14

Answer the following questions:

1. Describe managerial overview of Computer Hardware. 4
2. What is ethical hacking? Give an example. 3
3. What do you mean by digital signature? 3
4. Illustrate the concept of Balanced MIS. 4

CACDSE-501: Numerical and Statistical Methods
Marks :: 14

Answer the following questions:

1. Discuss Bisection method to solve transcendental equation. 7
2. State and prove Newton Forward interpolation formula. 7

CACDSE502T: Internet Technology
Marks :: 14

Answer the following questions:

1. Write down the difference between internet and intranet. [3]
2. Write short notes on – i) WWW ii) Internet Protocol iii) TCP/IP [6]
3. Explain client-server architecture with diagram. [5]

FYUG ODD SEMESTER
2ND UNIT TEST-2024 (ASSIGNMENT)
Subject: BIOTECHNOLOGY
1st Semester
Paper code: **BTC-DSC-101T**
(Cell Biology)

Total Marks: **20**

Answer any **four** of the following assignments: (5x4=20)

1. Microfilaments & microtubules.
2. Golgi complex.
3. Cell cycle checkpoint.
4. Lysosomes.
5. Mitosis.
6. Ultra structure of Eukaryotic cell.

FYUG ODD SEMESTER
2ND UNIT TEST-2024 (ASSIGNMENT)
Subject: BIOTECHNOLOGY
1st Semester
Paper code: **BTC-DSC-102T**
(Environmental Biotechnology)

Total Marks: **20**

Answer any **four** of the following assignments: (5x4=20)

1. Conventional fuels & their environmental impacts.
2. Microbial hydrogen production.
3. Biogas production.
4. Remote sensing & GIS for environmental analysis.
5. Microbial enrichment of ores.
6. Biostimulation & Bioaugmentation.

FYUG ODD SEMESTER
2ND UNIT TEST-2024 (ASSIGNMENT)
Subject: BIOTECHNOLOGY
1st Semester
Paper code: **BTC-SEC-101**
(Microbiology)

Total Marks: **14**

Answer any **two** of the following assignments: (7x2=14)

1. Physical and chemical methods of sterilization.
2. Cell structure of bacteria and bacterial conjugation.
3. Bacterial transformation and transduction.
4. Preservation of various types of food.

FYUG ODD SEMESTER
2ND UNIT TEST-2024 (ASSIGNMENT)
Subject: BIOTECHNOLOGY
3rd Semester
Paper code: **BTC-DSC-201T**
(Genetics)

Total Marks: **20**

Answer any **four** of the following assignments: (5x4=20)

1. Polytene chromosome and lampbrush chromosome
2. Multiple allele.
3. Hardy-Weinberg principle of equilibrium.
4. Variations in chromosome structure (chromosomal aberrations).
5. Barr bodies & Genetic balance theory.
6. Sex linked inheritance.

FYUG ODD SEMESTER
2ND UNIT TEST-2024 (ASSIGNMENT)
Subject: BIOTECHNOLOGY
3rd Semester
Paper code: **BTC-DSC-202T**
(Animal Cell Culture)

Total Marks: **20**

Answer any **four** of the following assignments: (5x4=20)

1. HAT selection
2. Selectable marker
3. Insulin production.
4. Growth kinetics.
5. Isolation of cells and tissues.
6. Organ culture techniques.

FYUG ODD SEMESTER
2ND UNIT TEST-2024 (ASSIGNMENT)
Subject: BIOTECHNOLOGY
3rd Semester
Paper code: **BTC-SEC-201T**
(Molecular Biology)

Total Marks: **14**

Answer any **two** of the following assignments: (7x2=14)

1. DNA polymerases and rolling circle model.
2. Deamination, depurination and photoreactivation.
3. Mechanism of rRNA & tRNA splicing.
4. Post translational modification of proteins.

**TDC (CBCS) ODD SEMESTER
2ND UNIT TEST-2024 (ASSIGNMENT)
Subject: BIOTECHNOLOGY
5th Semester
Paper code: BTCH-CC-501T
(Bioprocess Technology)**

Total Marks: **14**

Answer any **two** of the following assignments: (7x2=14)

1. Industrial production of Lactic acid
2. Downstream processing.
3. Chemical methods of sterilization.
4. Bioprocess measurement and control system with respect to computer aided process control.

**TDC (CBCS) ODD SEMESTER
2ND UNIT TEST-2024 (ASSIGNMENT)
Subject: BIOTECHNOLOGY
5th Semester
Paper code: BTCH-CC-502T
(Recombinant DNA Technology)**

Total Marks: **14**

Answer any **two** of the following assignments: (7x2=14)

1. Production of chimeric protein.
2. Microinjection.
3. Principle and application of PCR.
4. Principle and application of RT-PCR.

**TDC (CBCS) ODD SEMESTER
2ND UNIT TEST-2024 (ASSIGNMENT)
Subject: BIOTECHNOLOGY
5th Semester
Paper code: BTC-DSE-I (501T)
(Plant Diversity)**

Total Marks: **14**

Answer any **two** of the following assignments: (7x2=14)

1. *Polysiphonia*
2. Application of Algae.
3. *Volvox*
4. Economic importance of Lichen.

**TDC (CBCS) ODD SEMESTER
2ND UNIT TEST-2024 (ASSIGNMENT)
Subject: BIOTECHNOLOGY
5th Semester
Paper code: BTC-DSE-II (502T)
(Animal Biotechnology)**

Total Marks: **14**

Answer any **two** of the following assignments: (7x2=14)

1. Embryonic stem cell mediated gene transfer.
2. Vectors in Gene therapy.
3. Transgenic sheep.
4. Retrovirus and gene transfer.



KARIMGANJ COLLEGE, KARIMGANJ
FYUGODD SEMESTER 2ND UNIT TEST, 2024
(ASSIGNMENT)

FYUG 3rd Semester
SUBJECT: BOTANY

BOT DSC-201 T
ARCHEGONIATAE
Total Marks: 20

Prepare assignments on any four topics from the following: 5 X 4= 20

1. Characteristic features of Bryophytes.
2. Apogamy & Apospory.
3. Alternation of Generation in Bryophytes and Amphibiannature of Bryophytes.
4. Evolution of Stelar Structure in Pteridophytes.
5. Affinities and Economic Importance of bryophytes
6. Salient features of Pteridophytes and Telome Theory.

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. Department may arrange group presentation or viva voce on the assignment topic.



KARIMGANJ COLLEGE, KARIMGANJ
FYUG ODD SEMESTER 2ND UNIT TEST, 2024
(ASSIGNMENT)

FYUG 1st Semester
SUBJECT: BOTANY

BOT DSM-101T
Plant Anatomy and Embryology
Total Marks: 20

Prepare assignments on any four topics from the following: 5 X 4= 20

1. Virus: Characteristic features and Economic Importance.
2. Range of Thallus Organisation in Algae.
3. Puccinia.
4. Lysogenic and Lytic Cycle.
5. Fritsch Classification of Algae.
6. Volvox.

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. Department may arrange group presentation or viva voce on the assignment topic.



KARIMGANJ COLLEGE, KARIMGANJ
CBCS ODD SEMESTER 2ND UNIT TEST, 2024
(ASSIGNMENT)

CBCS5thSemester
SUBJECT: BOTANY

BOT CC 501 T
Reproductive Biology of Angiosperms.
Total Marks: 14.

Prepare assignments on any TWI topics from the following: $7 \times 2 = 14$.

1. Contributions of B.M. Johri and P.Maheshwari.
2. Pollination: Types, Contrivances for Cross Pollination and features of Entomophilly.
3. Parasexual Hybridisation and in vitro fertilisation.
4. Structure and Functions of Flower.
5. Mixed Pollination and Stub Pollination

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. Department may arrange group presentation or viva voce on the assignment topic.



KARIMGANJ COLLEGE, KARIMGANJ
FYUGODD SEMESTER 2ND UNIT TEST, 2024
(ASSIGNMENT)

FYUG 3rd Semester
SUBJECT: BOTANY

BOT DSC-202 T
Genetics, Molecular Biology and Plant Breeding
Total Marks: 20

Prepare assignments on any four topics from the following: 5 X 4= 20

1. Pedigree analysis
2. Mutation.
3. Griffith's experiment.
4. Genetic code dictionary.
5. Protein synthesis.
6. Hybridization.

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. Department may arrange group presentation or viva voce on the assignment topic.



KARIMGANJ COLLEGE, KARIMGANJ
FYUG ODD SEMESTER 2ND UNIT TEST, 2024
(ASSIGNMENT)

FYUG 3rd Semester
SUBJECT: BOTANY

BOT DSM-201 T
Plant Anatomy and Embryology
Total Marks: 20

Prepare assignments on any four topics from the following: 5 X 4= 20

1. Types of tissues.
2. Secondary growth in stem.
3. Structure of flower.
4. Pollination.
5. Double fertilization.
6. Endosperm types.

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. Department may arrange group presentation or viva voce on the assignment topic.



KARIMGANJ COLLEGE, KARIMGANJ
FYUG ODD SEMESTER 2ND UNIT TEST, 2024
(ASSIGNMENT)

FYUG 1st Semester
SUBJECT: BOTANY

BOT IDC-101 T
Gardening and Nursery Management
Total Marks: 20

Prepare assignments on any four topics from the following: 5 X 4= 20

1. History of gardening in India.
2. Types of gardening.
3. Green house- Technology.
4. Plant growth regulators.
5. Hanging Baskets.
6. Bonsai.

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. Department may arrange group presentation or viva voce on the assignment topic.



KARIMGANJ COLLEGE, KARIMGANJ
FYUG ODD SEMESTER 2ND UNIT TEST, 2024
(ASSIGNMENT)

FYUG 1st Semester
SUBJECT: BOTANY

BOT DSC-101 T
Microbiology
Total Marks: 20

Prepare assignments on *any four* topics from the following: 5 X 4= 20

1. Microbial growth curve and generation time.
2. Physical methods of sterilization
3. Role of microorganisms in sulfur cycle.
4. Industrial production of lactic acid.
5. Biogas production.
6. Bioremediation of contaminated soil.

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. Department may arrange group presentation or viva voce on the assignment topic.



KARIMGANJ COLLEGE, KARIMGANJ
TDC CBCS ODD SEMESTER 2ND UNIT TEST, 2024
(ASSIGNMENT)

TDC CBCS 5th Semester
SUBJECT: BOTANY

BOTDSE-502T
Plant Breeding
Total Marks: 14

Prepare assignments on *any two* topics from the following: 7 X 2= 14

1. Important achievements of plant breeding and undesirable consequences.
2. Plant genetic resources and domestication of crop plants.
3. Centers of origin of crop plants.
4. Modes of reproduction in crop plants.

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. Department may arrange group presentation or viva voce on the assignment topic.



KARIMGANJ COLLEGE, KARIMGANJ
FYUG ODD SEMESTER 2ND UNIT TEST, 2024
(ASSIGNMENT)

FYUG 3rd Semester
SUBJECT: BIOTECHNOLOGY

BTC DSC-202 T
Animal Cell Culture
Total Marks: 20

Prepare assignments on *any four* topics from the following: 5 X 4= 20

1. HAT selection.
2. Selectable marker.
3. Insulin production.
4. Growth kinetics of cells in culture.
5. Isolation of cells and tissues.
6. Organ culture 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. Department may arrange group presentation or viva voce on the assignment topic.

**FYUG ODD SEMESTER
ASSIGNMENT (2ND UNIT TEST)-2024**

Subject: BOTANY

1st Semester

Paper code: **BOT-DSC-102T**
(Phycology & Mycology)

Full Marks: **20**

Answer any **four** of the following assignments: (5x4=20)

1. Range of thallus organisation in Algae.
2. Evolutionary significance of *Prochloron*.
3. *Volvox*
4. *Alternaria*
5. *Penicillium*
6. *Synchytrium*

**TDC (CBCS) ODD SEMESTER
ASSIGNMENT (2ND UNIT TEST)-2024
Subject: BOTANY
5th Semester
Paper code: BOT-DSE-I (501T)
(Analytical techniques in Plant Sciences)**

Full Marks: **14**

Answer any **two** of the following assignments: (7x2=14)

1. TEM & SEM.
2. Column chromatography & TLC.
3. Measures of dispersion (Range, Mean deviation, Variation & Standard deviation).
4. Representation of data (Tabular & Graphical)

**FYUG ODD SEMESTER
ASSIGNMENT (2ND UNIT TEST)-2024**

Subject: BOTANY

3rd Semester

Paper code: **BOT-SEC-201T**
(Horticulture)

Full Marks: **14**

Answer any **two** of the following assignments: (7x2=14)

1. Detailed account of grafting.
2. Medicinal and aromatic plants.
3. Annual and biennials
4. Propagation by root, leaf and stem cuttings.



**KARIMGANJ COLLEGE, KARIMGANJ
SECOND UNIT TEST EXAMINATION 2024-25**

ON

ASSIGNMENT MODE

SUBJECT: BOTANY

TDC 5th Semester (Science)

PLANT PHYSIOLOGY

COURSE NO.: BOTHCC-502T

Total Marks: 14

Prepare an assignment on *any two* topics from the following:

2X7=14

1. Aquaporins and its importance in water transport in plants.
2. Ascent of sap with special reference to cohesion-tension theory.
3. Mechanism of stomatal movement and antitranspirants.
4. Mechanism of Active and passive transport in plants.
5. Florigen concept and vernalization.

NB: Students are directed to write the assignment 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. Department may arrange group presentation or viva voce on the assignment topic.



**KARIMGANJ COLLEGE
SECOND UNIT TEST EXAMINATION, 2024-25**

ON

ASSIGNMENT MODE

SUBJECT: BOTANY

FYUG 3rd Semester (Science)

Plants and Traditional Knowledge

COURSE NO.: BOT-IDC-201T

Total Marks: 20

Prepare an assignment on *any four* topics from the following:

4X5=20

1. Sarpagandha
2. Vasaka
3. Ginger
4. Arjuna
5. Ethnobotany: concept and significance.
6. Methods of ethnobotanical investigation
7. IPR

NB: Students are directed to write the assignment 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. Department may arrange group presentation or viva voce on the assignment topic.



KARIMGANJ COLLEGE
SECOND UNIT TEST EXAMINATION, 2024-25
ON
ASSIGNMENT MODE
SUBJECT: BOTANY
FYUG 1st Semester (Science)
Medicinal Plants & Herbal Technology
COURSE NO.: BOT-SEC-101T
Total Marks: 14

Prepare an assignment on *any two* topics from the following:

2X7=14

1. Endangered and endemic medicinal plants of India.
2. Drug adulteration and methods of drug evaluation.
3. Brief history of indigenous medicine in India.
4. Pharmacognosy and medicinal importance of Fenugreek.
5. IPR
6. Herbs as health food.

NB: Students are directed to write the assignment 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. Department may arrange group presentation or viva voce on the assignment topic.

Unit Test-II (Assignment)
2024
Chemistry
FYUG 1st Semester
Course No. : CHM-DSC-101T
(Inorganic Chemistry-I)

Full Marks-20

(Answer all the questions)

1. Describe briefly the line spectrum of H-atom. Explain why there are innumerable lines in the spectrum of H-atom although it has only one electron. 3+2=5
2. Derive expression for the energy of an electron in the nth orbit of H-atom. 3
3. Write a short note on electromagnetic spectrum. 2
4. Define effective nuclear charge. Explain the variation of effective nuclear charge in the periodic table. 1+3=4
5. Define ionization energy. Explain the different factors which affect the ionization energy. Write the applications of ionization energy. 1+3+2=6

Unit Test-II (Assignment)
2024
Chemistry
FYUG 1st Semester
Course No. : CHM-DSC-102T
(Physical Chemistry-I)

Full Marks-20

(Answer all the questions)

1. Define the following: 10
 - a) Co-efficient of viscosity (b) Mean free path
 - c) Root mean square velocity (d) Most probable velocity (e) Equipartition of energy
2. Discuss the criteria of seven crystal systems with proper diagram and give example of each. 5
3. Define the term liquid crystal and explain the phase texture of smectic A, C and nematic phase. 2+3=5

Unit Test-II (Assignment)
2024
Chemistry
B.Sc. 1st Semester
Course No. : CHM-DSM-101T
(Fundamentals of Chemistry-I)

Full Marks-20

(Answer all the questions)

1. Define the following 2x3=6
 - (a) Collision number
 - (b) Root mean square velocity
 - (c) Mean free path
2. Explain the method of determination of Coefficient of viscosity of a liquid by Oswald Viscometer. What is the unit of Coefficient of viscosity? 6+1=7
3. (a) Write the expression for the energy of an electron in the nth orbit of H-atom and explain the terms involved. 3
 - (b) Write the limitations of Bohr's model of H- atom. 2

Unit Test-II (Assignment)
2024
Chemistry
FYUG 1st Semester
Course No. : CHM-IDC-101T
(Fundamentals of Chemistry-I)

Full Marks-20

(Answer all the questions)

1. (a) What are Vitamins? How vitamins are classified? 1+2=3
(b) What is the importance of Vitamin A? What are the sources of Vitamin A? 2+2=4
2. Why preservation of food is necessary? Narrate briefly the different physical methods of food preservation. 7
3. Discuss different generation of Biofuels. What are the limitations of 1st and 2nd generation Biofuels? 4+2 =6

Unit Test-II (Assignment)
2024
Chemistry
FYUG 1st Semester
Course No. : CHMSEC-101T
(Separation Techniques)

Full Marks-14
(Answer all the questions)

1. What is solvent extraction? Explain the different techniques of solvent extraction. 1+7=8
2. Write the mechanism of solvent extraction of the following- 3+3=6
 - (a) Extraction by solvation
 - (b) Extraction by chelation

Unit Test-II (Assignment)
2024
Chemistry
FYUG 3rd Semester
Course No. : CHM-DSC-201T
(Inorganic Chemistry-II)

Full Marks-20

(Answer all the questions)

1. Explain reasons for the anomalous behavior of the first member of each group in the periodic table. 3
2. Write a short note on crown ethers. 3
3. What is catenation? Give some examples of elements exhibiting catenation. 1+1=2
4. Why does N show less catenation property than P? 2
5. What is SHAB principle? Briefly describe one application of SHAB principle. 1+2=3
6. What is silicone? Briefly explain the structural aspects and applications of silicone. 1+6=7

Unit Test-II (Assignment)
2024
Chemistry
FYUG 3rd Semester
Course No. : CHM-DSC-202T
(Organic Chemistry-II)

Full Marks-20

(Answer all the questions)

1. (a) Discuss the mechanism and stereochemistry of bimolecular nucleophilic substitution reaction 6
(b) Discuss the effect of the nature of the nucleophilic reagent, polarity of the solvent and the concentration of the nucleophilic reagent on SN¹ reactions 4
2. Define Knoevengel condensation reaction. Write its mechanism 5+5=10 and application

Unit Test-II (Assignment)
2024
Chemistry
FYUG 3rd Semester
Course No. : CHMSEC-201T
(Forensic Chemistry)

Full Marks-14

(Answer all the questions)

- | | | |
|--------|---|-------|
| 1. (a) | What are narcotic substances? Give examples. | 1+1=2 |
| | (b) Discuss briefly the therapeutic uses of narcotics. | 3 |
| | (c) What are hallucinogens? Give examples. | 2 |
| 2. | What are drugs? Classify drugs on the basis of (a) effects on body (b) legal status | 1+6=7 |

Unit Test-II (Assignment)
2024
Chemistry
B.Sc. 3rd Semester
Course No. : CHM-DSM-201T
(Fundamentals of Chemistry-II)

Full Marks-20

(Answer all the questions)

1. Define the following terms- 2x3=6
(a) Bond energy (b) Standard enthalpies of formation (c)
Enthalpies of combustion
2. Discuss the vapour pressure-composition and temperature-
composition curve of an ideal solution. 7
3. Briefly describe the anomalous properties of the first elements
of the groups 15 and 16. 7

Unit Test-II (Assignment)
2024
Chemistry
FYUG 3rd Semester
Course No. : CHM-IDC-201T
(Heritage of Indian Metallurgy)

Full Marks-20

(Answer all the questions)

1. (a) Write a short note on Indian wootz steel. Discuss its applications. 2+3=5
- (b) What is wrought iron? Discuss its properties and applications. 1+4=5
2. (a) Briefly explain the early evidence of metal in the Indian subcontinent. 5
- (b) What is alloy? Discuss the applications of two important alloys. 1+4=5

Unit Test-II (Assignment)
2024
Chemistry
B.Sc. 5th Semester
Course No. : CHMHCC-501T
(Organic Chemistry)

Full Marks-14

(Answer all the questions)

- | | | |
|---|--|---|
| 1 | (a) Write the name and the structure of DNA bases | 2 |
| | (b) Explain the Watson and Crick model of DNA | 3 |
| | (c) Write the structure of ADP and UTP | 2 |
| 2 | What are antipyretics and analgesics? Describe briefly the mode of action of antipyretics and analgesics | 7 |

Unit Test-II (Assignment) 2024
Chemistry
B.Sc. 5th Semester
Course No. : CHMHCC- 502T
(Physical Chemistry)

Full Marks-14

(Answer all the questions)

1. Derive Schrodinger Time independent equation for particle in a box and rigid rotator. Also derive the value of zero point energy for both the problems. 7
2. Explain the difference between Rayleigh Scattering and Raman Scattering. 3
3. Define Stoke and anti Stoke line. Explain why intensity of stoke line is higher than anti stoke line. 2+2=4

Unit Test-II (Assignment)
2024
Chemistry
B.Sc. 5th Semester
Course No. : CHMDSE- 503T
(Green Chemistry)

Full Marks-14

(Answer all the questions)

1. What is Green Chemistry? Describe briefly the goal of Green Chemistry 7
2. Briefly explain the concept of selectivity by taking suitable examples 7

Unit Test-I
2024
Chemistry
B.Sc. 5th Semester
Course No. : CHMDSE- 501T
(Analytical Method in Chemistry)

Full Marks: 14

(Answer all the questions)

1. Write short note on the different kind of (i) sources (ii) 7
Monochromator (iii) Detector use in IR spectroscopy.
2. Briefly describe the principle of conductometric and P^H-metric 4+3=7
titration. Write the graphical techniques used for the determination of
equivalence points for both the titration.

KARIMGANJ COLLEGE
Department of Computer Science and Application
2nd UNIT TEST (Assignment)—2024
FYUG 1st Semester (Computer Science)

CSCDSC-101T: Digital Computer Fundamentals
Marks: 20

Answer the following questions:

1. What are the characteristics of computer? 3
2. What is memory? Differentiate between RAM and ROM 3
3. Discuss the evolution of computer 4
4. What is sequential circuit? Write down the difference between sequential circuit and combinational circuit. 2+5=7
5. What is flip flop? Mention different types of flip flop. 3

CSCDSC-102T: Discrete Structure
Marks: 20

Answer the following questions:

1. What are the properties of tree? 2
2. What is rooted tree? Define descendants, siblings, leaf and level with diagram. 3
3. Explain BFS algorithm with suitable example. 5
4. What do you mean by compound proposition? Define different connectives to make compound proposition. 4
5. Define tautologies and contradiction with example. 3
6. Test the validity: $P, p \rightarrow Q$ logically implies Q 3

CSCDSM-101T: Programming with C
Marks: 20

1. What is keyword in C? Give an example. 4
2. Write down the rules for writing identifiers in C 5
3. Write a program to find the area of circle. 3
4. Write a program to find the maximum of two numbers. 3
5. What is data type? What are the basic datatypes in C. 5

CSCIDC101- Computer Fundamentals & Applications
Marks::20

1. Explain briefly the characteristics of Computers. 7
2. Describe the Evolution of Computers in your words 7
3. Write short notes(Any Two) 2x3=6
 - a. Hardware and Software
 - b. Central Processing Unit
 - c. Digital Computer

CSCSEC-101: Programming with C
Marks :: 14

1. Explain C tokens with example. [5]
2. What do you mean by variable? How variables are declared and initialized? Give example. [3]
3. What are different data-types used in C? [2]
4. Write a C program to calculate Simple Interest. [4]

KARIMGANJ COLLEGE
Department of Computer Science and Application
2nd UNIT TEST (Assignment)—2024
FYUG 3rd Semester (Computer Science)

CSCDSC-201: Computer Organization and Architecture
Marks: 20

Answer the following questions:

1. Explain Programmed I/O and Interrupt-initiated I/O modes of transfer. 3
2. What is a DMA? Explain DMA controller in detail. 2+5=7
3. Discuss in details the tasks that must be performed by the assembler during the translation process. 10

CSCDSC-202: Operating Systems
Marks: 20

Answer the following questions:

4. What is an Operating System? 1
5. Explain the various functions of an Operating System. 6
6. Why Operating System is also known as resource manager? 3
7. What is a Process? Define various Process States with a neat diagram. 1+5=6
8. What is process scheduling? Describe different levels of scheduler. 1+3=4

CSCDSM-201: Database Management System
Marks: 20

1. Describe the three levels of data abstraction. 3
2. Define Database schema and Instances of a schema. 1+1=2
3. Define DDL and DML with an example. 2+2=4
4. Explain the different Data models. 6
5. Explain the fundamental operations in a relational algebra. 5

CSCIDC201-Introduction to Web Designing & Cyber Security
Marks::20

1. What do you mean by Internet? Explain some basic applications of Internet. 7
2. What is cyber law? Explain its advantages. 7
3. Write Short notes on (Any Two) 2x3=6
 - a. World Wide Web
 - b. Website
 - c. Web Browser

CSCSEC-201: Programming with C
Marks :: 14

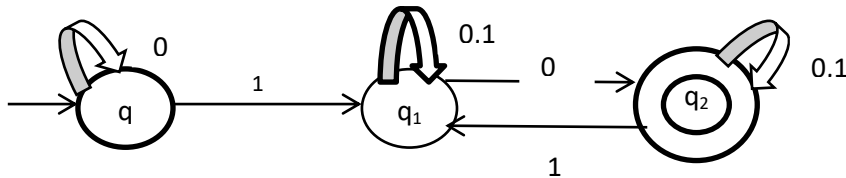
1. Explain different features of object oriented programming. 7
2. Explain the difference between POP and OOP. 3
3. Write a C++ program to calculate area of a circle using OOPS. 4

KARIMGANJ COLLEGE
Department of Computer Science and Application
2nd UNIT TEST (Assignment)—2024
TDC (CBCS) 5th Semester (BCS)

CSCHCC501T: Theory of Computation
Marks: 20

Answer the following questions:

- | | |
|---|---|
| 1. What are finite automata? | 2 |
| 2. Draw a DFA for the language accepting string starts with "101" over input alphabet $\Sigma = \{0, 1\}$. | 3 |
| 3. What is regular language and how is it defined in formal language theory? | 3 |
| 4. Differentiate between deterministic and non-deterministic finite automata. | 4 |
| 5. Convert NFA to DFA. | 4 |



- | | |
|----------------------|-------|
| 6. Write short notes | 1×4=4 |
| a) Alphabet | |
| b) Symbol | |
| c) Concatenation | |
| d) Kleene Star | |

CSCHCC502: INTERNET TECHNOLOGY
Marks: 14

Answer the following questions:

- | | |
|---|---------|
| 1. What is javascript? Explain the features of Javascript? | 5 |
| 2. Explain the basic datatypes in Javascript. | 4 |
| 3. What is the function in Javascript? How do you declare a function in javascript?
Give an Example. | 2+2+1=5 |

CSCDSE-501: Numerical Methods
Marks :: 14

Answer the following questions:

- | | |
|---|---|
| 1. Discuss Bisection method to solve transcendental equation. | 7 |
| 2. State and prove Newton Forward interpolation formula. | 7 |

CSCDSE502T: Network Programming
Marks :: 14

Answer the following questions:

- | | |
|--|---|
| 1. Explain the working of TCP. | 5 |
| 2. Differentiate between TCP and UDP. | 3 |
| 3. Explain in detail how TELnet works. | 4 |
| 4. Define SMTP. | 2 |

CSCDSE501: INTERNET TECHNOLOGY (Pass)
Marks: 14

Answer the following questions:

- | | |
|---|---------|
| 1. What is javascript? Explain the features of Javascript? | 5 |
| 2. Explain the basic datatypes in Javascript. | 4 |
| 3. What is the function in Javascript? How do you declare a function in javascript?
Give an Example. | 2+2+1=5 |

Assignment

Session 2024-25

Subject: Ecology and Environmental Science

Assignment topics for FYUG 1st Semester

Name of the paper: Fundamentals of Ecology

Course Code: DSM 101

Give a detailed account on any one of the following 1×20=20

1. Biogeochemical Cycles
2. Ecological Succession
3. Types of Ecosystem

Name of the paper: Basic Concepts of Ecology and Environmental Science

Course Code: IDC 101

Give a detailed account on any one of the following 1×20=20

1. Ecosystem and its components
2. Atmosphere
3. Hydrosphere

Assignment topics for FYUG 3rd Semester

Name of the paper: Atmosphere and Climate change

Course Code: DSM 201

Give a detailed account on any one of the following 1×20=20

1. Global Warming and climate change
2. Ozone layer depletion
3. Climate change initiatives in India

Name of the paper: Environmental Pollution and Management

Course Code: IDC 201

Give a detailed account on any one of the following 1×20=20

1. Air pollution
2. Water pollution
3. Soil pollution

Assignment topic for TDC CBCS 5thSemester

Name of the paper:Energy & Environment

Course Code: DSE 501

Give a detailed account on any one of the following $1 \times 14 = 14$

1. Impacts of over consumption of energy on the environment and economy
2. Green energy.
3. Action strategies for sustainable energy mix and management from a future perspective.

Guidelines for submission of assignment:

1. Assignment should be written on one side of A4 size white paper leaving wide margins on both sides. Handwriting should be legible. Over writing and use of correction pen etc. are not allowed.
2. All pages should be numbered consecutively except cover page. Tables and figures should also be numbered serially.
3. At the end of the assignments reference list should be given.
4. Students should submit the assignment along with the below mentioned information on the cover page of the assignment.

Assignment Topic-----

Session-----

Department-----

Semester: _____

Subject: _____

Name of the paper: _____

Name of the student: _____

Roll No: _____

Registration No: _____

Contact No: _____

Email ID: _____

Second Unit Test

2024

GEOLOGY

Corse No. : GELDSC - 501T

5th Semester

Time: 1 hour

Marks: 14

The figures in the margin indicate full marks for the questions

1. Define core logging and core drilling. 1 + 1 = 2
2. Write about the different types of drilling in mineral exploration. 4
3. What are the different methods used in mineral exploration? 6
4. Write note on the planning of bore holes. 2



(Assignment)

B.Sc.1st semester (FYUG)

Paper-Higher Algebra and Trigonometry

PAPER CODE: MATDSC-101T

Session: 2024-25

Marks: 20

- 1) What are matrix elementary transformations? (2)
- 2) Define rank of a matrix. (2)
- 3) Reduce the following matrix into normal form (3)

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

- 4) Reduce the following matrix into echelon form (3)

$$A = \begin{pmatrix} -1 & 2 & 3 & 0 \\ 1 & 5 & 2 & 3 \\ 7 & 1 & 2 & 0 \\ -1 & 2 & 1 & 1 \end{pmatrix}$$

- 5) Express $Z = \frac{-1}{2} + i\frac{1}{\sqrt{3}}$ into polar form. (2)
- 6) Find the expansion of $\cos n\theta$ and $\sin n\theta$ when n is a positive integer and θ is real. (3)
- 7) State and prove **De Moivre's Theorem**. (5)

Unit test-2/ Home Assignment(FYUG)
Session: 2024-25
1ST Semester
Subject : Mathematics
Paper: MATDSC-102T(CALCULUS)
Marks:20

(Answer the following questions)

1. Find the asymptotes of the curve $\frac{a^2}{x^2} - \frac{b^2}{y^2} = 1$, parallel to coordinate axes. (3)

2. $f(x) = \begin{cases} x \sin\left(\frac{1}{x}\right) & \text{if } x \neq 0 \\ 0 & \text{if } x = 0 \end{cases}$ (3)
Is continuous at $x=0$

3. Show that $\lim_{x \rightarrow 0} \frac{e^{\frac{1}{x}} - 1}{1 + e^{\frac{1}{x}}}$ does not exist (4)

4. If $u = \log(x^3 + y^3 + z^3 - 3xyz)$, show that

a) $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = \frac{3}{x+y+z}$ (6)

b) $\left(\frac{\partial}{\partial x} + \frac{\partial}{\partial y} + \frac{\partial}{\partial z}\right)^2 u = -\frac{9}{(x+y+z)^2}$

5. Evaluate $\lim_{x \rightarrow 0} (\cos x)^{\frac{1}{x^2}}$ (4)

2nd UNIT TEST/ASSIGNMENT
FYUG 1st Semester
Session: 2024- 2025
Subject: Mathematics
Paper: MAT-SEC-101T
(Mathematical Skill Development with Software)
Marks: 14

(Answer the following questions)

1. Let $A=\mathbb{R}-\{3\}$ and $B=\mathbb{R}-\{1\}$. If $f : A \rightarrow B: f(x) = \frac{x-2}{x-3}$, show that f is bijective . (2)
2. Prove that the product of any function with the identity function is the function itself. (3)
3. Solve: (a) $\frac{dy}{dx} + x^2 = x^2 e^{3y}$ (b) $(x^2y - 2y^2x)dx = (x^3 - 3x^2y)dy$. (3x2=6)
4. Solve $(1 + x)\frac{dy}{dx} - xy = 1 - x$ (3)

Karimganj College, Karimganj
2nd Unit Test/Assignment, Examination: 2024-25
Subject: Mathematics
FYUG 1st SEMESTER (Science)/Pass
Name of paper: Calculus
Paper code: MATDSM-101T
Marks: 20

(Answer the following questions)

1. If $u = \log(x^3 + y^3 + z^3 - 3xyz)$, show that
 - a) $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = \frac{3}{x+y+z}$ 6
 - b) $\left(\frac{\partial}{\partial x} + \frac{\partial}{\partial y} + \frac{\partial}{\partial z}\right)^2 u = -\frac{9}{(x+y+z)^2}$

2. Examine if $\lim_{x \rightarrow 2} \frac{|x-2|}{x-2}$ exists 4

3. If $z = f(x + ay) + g(x - ay)$, prove that $\frac{\partial^2 z}{\partial y^2} = a^2 \frac{\partial^2 z}{\partial x^2}$ 5

4. Find the area bounded by the ellipse $\frac{x^2}{9} + \frac{y^2}{4} = 1$ in the first quadrant. 5
Hence find whole area of the ellipse.

Home Assignment(FYUG)
Session: 2024-25
1ST Semester
Subject : Mathematics
Paper: MATIDC-101T(Foundation Course in Mathematics)
Marks:20

(Answer the following questions)

1. If $\frac{1}{6!} + \frac{1}{7!} = \frac{x}{8!}$, find x. (2)
2. Find n, if $n - 1_{P_3} : n_{P_4} = 1:9$ (3)
3. A market research group conducted a survey of 800 consumers and reported that 620 consumers like product A and 350 consumers like product B, what is the least number that must have liked both products? (3)
4. If $U = \{1,2,3,4,5,6,7,8,9\}$, $A = \{1,2,3,4\}$, $B = \{2,4,6,8\}$ and $C = \{3,4,5,6\}$. Find $(A \cup C)'$ and $(B - C)'$. (3)
5. Define quadratic equation and solve the equation $x^2 - 5x + 6 = 0$ (1+2=3)
6. Find the number of arrangements of the letters of the word INDEPENDENCE. In how many of these arrangements
 - a. do the words start with P
 - b. do all the vowels always occur together
 - c. do the vowels never occur together
 - d. do the words begin with I and end in P? (4)
7. Find the number of 4-digit numbers can be formed using the digits 1,2,3,4,5 if no digit is repeated. How many of these will be even? (2)

(Assignment)

B.Sc. 3rd semester (FYUG)

Paper- Real Analysis (MATDSC-201T)

Session: 2024-25

Marks: 20

1. Define cluster point of a set $A \subseteq \mathbb{R}$. (1)
2. Define limit of a function $f : A \rightarrow \mathbb{R}$, $A \subseteq \mathbb{R}$. at a cluster point $a \in \mathbb{R}$ (2)
3. Prove that if limit of a function $f : A \rightarrow \mathbb{R}$ at a cluster point a of A exists, then it is unique. (3)

4. Let $f : A \rightarrow \mathbb{R}$ and let c be a cluster point of A , then prove that the following statements are equivalent : (2+2)
 - (a) $\lim_{x \rightarrow c} f(x) = L$.
 - (b) Given any ϵ -neighbourhood $V_\epsilon(L)$ of L , there exist a δ -neighbourhood $V_\delta(c)$ of c such that if $x \neq c$ is any point in $V_\delta(c) \cap A$, then $f(x)$ belongs to $V_\epsilon(L)$.
5. Show that there does not exist a rational number r such that $r^3 = 3$. (3)
6. If $a, b \in \mathbb{R}$, then show that (2+2)
 - a. $||a| - |b|| \leq |a - b|$
 - b. $|a - b| \leq |a| + |b|$.
7. Prove that
 - a. If $a \in \mathbb{R}$ and $a \neq 0$, then $a^2 > 0$. (3)
 - b. $1 > 0$.
 - c. If $n \in \mathbb{N}$ then $n > 0$.

2nd Unit Test/HOMEASSIGNMENT
FYUG 3rd Semester
Session: 2024- 2025
Subject: Mathematics
Paper: MATDSC-202T
Name of Paper: (Ordinary Differential equation)
Marks: 20

(Answer the following questions)

1. Solve the following: 3x2=6
 - (a) $(xysin(xy) + \cos(xy))ydx + (xysin(xy) - \cos(xy))xdy = 0$
 - (b) $(xy^2 - x^2)dx + (3x^2y^2 + x^2y - 2x^3 + y^2)dy = 0$
2. Solve $(D^4 - m^4)y = \cos mx + \cosh mx$ where $D = \frac{d}{dx}$ 4
3. Using the method of variation parameter solve the following equation: 5
 $y'' + 2y' + y = e^{-x} \log x$
4. Solve $(x^4D^3 + 2x^3D^2 - x^2D + x)y = 1$ where $D = \frac{d}{dx}$ 5

Unit test-1/ Home Assignment(FYUG)
Session: 2024-25
3rd Semester
Subject : Mathematics
Paper: MATDSM-201T(Higher Algebra & Trigonometry)
Marks:20

(Answer the following questions)

1. Find the adjoint of a square matrix $A = \begin{pmatrix} 1 & 2 \\ -1 & 1 \end{pmatrix}$ (1)
2. Find the adjoint of $A = \begin{pmatrix} 1 & 2 & 3 \\ 3 & -2 & 1 \\ 4 & 2 & 1 \end{pmatrix}$ and verify that $A(\text{adj}A) = |A|I_3 = (\text{adj}A)A$ (5)
3. Prove that $(a + ib)^{\frac{m}{n}} + (a - ib)^{\frac{m}{n}} = 2(a^2 + b^2)^{\frac{m}{n}} \cos\left(\frac{m}{n} \tan^{-1} \frac{b}{a}\right)$ (3)
4. If n be a positive integer, then prove that
 $(1 + i)^n + (1 - i)^n = 2^{\frac{n}{2}+1} \cos \frac{n\pi}{4}$ (3)
5. Solve the equation $2x^3 - x^2 - 22x - 24 = 0$, two of the roots being in the ratio 3:4 (4)
6. If α, β, γ are the roots of the equation $x^3 + px^2 + qx + r = 0$, the find the value of $\sum \alpha^3$ and $\sum \alpha^3 \beta$ (4)

2nd UNIT TEST/Home Assignment (2024-25)
3RD SEMESTER (FYUG)
SUBJECT: MATHEMATICS
PAPER: MATDSEC-201T
(Numerical Methods)
Marks:14

Answer the following questions

1. Find a root of the equation $x^3 - x - 1 = 0$, using the bisection method correct to three decimal places. (5)
2. Evaluate $\Delta^5 e^x$ (2)
3. Prove that $e^x = \left(\frac{\Delta^2}{E}\right) e^x \cdot \frac{E e^x}{\Delta^2 e^x}$, the interval being h (2)
4. Write down the polynomial of lowest degree which satisfies the following set of numbers 0,7,26,63,124,215,342,511 corresponding to the arguments 0,1,2,3,4,5,6,7. (5)

Unit test-2/ Home Assignment (FYUG)
Session: 2024-25
3rd Semester
Subject : Mathematics
Paper: MATIDC-201T (Basic Calculus)

Marks:20

(Answer the following questions)

1. Give $\varepsilon - \delta$ definition of a function $f(x)$ at a point $x=c$. (1)
2. Define continuous function, with example (1)
3. Show that $f(x) = |x|$ is continuous at $x=0$. (4)
4. Evaluate (i) $\frac{d}{dx}\left(x^2 + \frac{1}{\sqrt{x}}\right)$ (ii) $\frac{d}{dx}(e^{2x^2+5x+1})$ (iii) $\frac{d}{dx}(\tan(x^2 + 5))$ (6)
5. Evaluate (a) $\lim_{x \rightarrow 2} \frac{x^3 - 2x^2}{x^2 - 5x + 6}$ (b) $\lim_{x \rightarrow 0} \frac{\sqrt{1+x} - 1}{x}$ (c) $\lim_{x \rightarrow 0} \frac{\sin ax}{bx}$ (3+3+2=8)

2ND UNIT TEST/HOME ASSIGNMENT

SESSION:2024-25

SUBJECT: MATHEMATICS

5TH SEMESTER (CBCS)

PAPER: TOPOLOGY

PAPER CODE :MTMHCC-501T

MARKS: 20

Answer the following questions;

1. Define a topological space. Define open and closed sets with examples. 5
2. Define co-countable topology on the real line R and show that it is actually a topology On R . 5
3. Prove that (R,τ) is metrizable, where τ is the usual topology on R . 5
4. Prove that (R,τ_1) is weaker than (R,τ_2) , where τ_1 and τ_2 are respectively the usual and lower limit topologies on R . (5)

Karimganj College, Karimganj
2nd Unit Test Examination: 2024-25
(Assignment)
Subject: Mathematics
5th SEMESTER(CBCS)
Name of Paper: Multivariate Calculus
Paper Code: MTMHCC-502T
Marks:20

Answer the following questions:

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

$$f(x, y) = \begin{cases} x \sin\left(\frac{1}{y}\right) + y \sin\left(\frac{1}{x}\right), & xy \neq 0 \\ 0 & xy = 0 \end{cases} \quad (3)$$

2. Find maxima and minima of the function (3)

$$f(x, y) = x^3 + y^3 - 3x - 12y + 20 \quad (3)$$

3. Find absolute maxima and minima of the function on the given domains (5)

$$f(x, y) = x^2 - xy + y^2 + 1 \text{ on the closed triangular plate in the first quadrant bounded by the lines } x = 0, y = 4, y = x.$$

4. Find the directional derivative of $f(x, y, z) = x^2yz + 4xz^2$ at the point $(1, -2, -1)$ in the direction of the vector $2i - j - 2k$. (2)

5. Find the equations of the tangent plane and normal to the surface $x^2 - 4y^2 + 3z^2 + 4 = 0$ at the point $(3, 2, 1)$. (4)

6. Discuss continuity of the function at origin

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

2ND UNIT TEST/HOME ASSIGNMENT,
SESSION: 2024-2025
SUBJECT: MATHEMATICS
5TH SEMESTER (CBCS)
PAPER: NUMBER THEORY
PAPER CODE: MTMHDSE-501T(I)
MARKS: 20

Answer the following questions:

1. Determine all solutions in the integers of the Diophantine equation $56x+72y=40$. 5
2. Prove that there are an infinite number of primes of the form $4n+3$. 5
3. State and prove Chinese Remainder Theorem. 5
4. Solve the system of linear congruences: $x \equiv 2 \pmod{3}$, $x \equiv 3 \pmod{5}$, $x \equiv 2 \pmod{7}$. 5

2nd UNIT TEST/ASSIGNMENT
5th Semester (CBCS)
Session: 2024- 2025
Subject: Mathematics
Paper: DSE-501T (I)
Name of Paper: (Mechanics)
Marks: 20

(Answer the following questions)

1. Answer the following questions: 1x3=3
 - (a) A particle of mass m is projected vertically under gravity, the resistance of air being mk times the velocity. Write down equation of motion.
 - (b) Define resisting force.
 - (c) Define terminal velocity.

2. A particle of mass m moves on a straight line under a force mn^2x towards a point O on the line, where x is the distance from O . Show that if $x = a$ and $\frac{dx}{dt} = u$, when $x = 0$, then at time t , $x = a \cos nt + \frac{u}{n} \sin nt$. 4

3. A particle moves in a straight line, its acceleration directed towards fixed point O in the line and is always equal to $\mu \left(\frac{a^5}{x^2}\right)^{\frac{1}{3}}$ when it is at a distance x from O . If it starts from rest at a distance a from O , show that it will arrive at O with velocity $a\sqrt{6\mu}$ after time $\frac{8}{15}\sqrt{6\mu}$. 5

4. A particle of mass m is falling under the influence of gravity through a medium whose resistance equals μ times the velocity. If the particle were released from rest, find the distance fallen through in time t . 4

5. A particle of mass m is projected vertically upward under gravity the resistance of the air being mk times the velocity. Show that the greatest height attained by the particle is $\frac{V^2}{g}[\mu - \log(1 + \mu)]$, where V the terminal velocity of the particle and μV is the initial velocity. 4

2nd Unit Test/Home Assignment, Examination: 2024-25

Subject: Mathematics

CBCS 5TH SEMESTER (Science)/Honours

Name of paper: Analytical Geometry

Paper code: MTMHDSE-502T

Marks: 20

Answer the following questions

(5 x 4 = 20)

1. Find the equation of a system of co-axial circles of which the points $(\pm 2, 0)$ are the limiting points.
2. Prove that the equation $4x^2 + 12xy + 9y^2 + 8x + 12y = 0$ represents a pair of parallel straight lines and find the distance between them.
3. Find the equation of the cone formed by rotating the line $2x + 3y = 6, z = 0$ about y-axis.
4. Find the equation of the cylinder whose generators are parallel to the line $x = \frac{y}{2} = \frac{z}{2}$ and whose guiding curve is the ellipse $x^2 + 2y^2 = 1, z = 0$

Karimanj College, Karimanj
2nd Unit Test Examination: 2024-25
(Assignment)
Subject: Mathematics
CBCS 5th SEMESTER (Pass)
Name of Paper: Linear Algebra
Paper Code: MTMDSE-501T
Marks:20

Answer the following questions:

1. Define vector space. Show that $(R^3(R), +, \cdot)$ is a vector space over the field of real numbers. (3)

2. Let V be a vector space over the field F . (3+3)
 - (a) Show that the intersection of any collection of subspace of V is a subspace of V .
 - (b) Is the union of two subspace is a subspace? Justify .

3. Show that a set of vectors which contains zero vector is linearly dependent. If α_1 and α_2 are vectors of a vector space $V(F)$ and $a, b \in F$. Show that the set $\{ \alpha_1, \alpha_2, a\alpha_1 + b\alpha_2 \}$ is linearly dependent. (2+2)

4. Let $T : R^3(R) \rightarrow R^3(R)$ by $T(x, y, z) = (x, y, 0)$. Show that T is a linear transformation. (3)

5. Let V and W be vector spaces over the field F and $T: V \rightarrow W$ be linear. Then show that null space of T i.e. $N(T)$ and range of T i.e. $R(T)$ are subspaces of V and W respectively. (4)

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP ODD SEMESTER EXAMINATION, 2024
PHYSICS
UNIT TEST – II (ASSIGNMENT)
SEMESTER – I

PHYDSC – 101T
(Mathematical Physics-I)

Full Marks: 20

All questions are compulsory.
(Each question carries 10 marks.)

- 1.
- (a) Define scalar triple product & vector triple product. Show that
- $$\vec{A} \times (\vec{B} \times \vec{C}) = \vec{B}(\vec{A} \cdot \vec{C}) - \vec{C}(\vec{A} \cdot \vec{B}) \quad 2+5=7$$
- (b) A particle moves along a curve whose parametric equations are $x = e^{-t}$,
 $y = 2\cos 3t$, $z = 2\sin 3t$, where t is the time. Find the magnitudes of the velocity and
acceleration at $t = 0$. 3
2. Using the fundamental integral expression for beta function obtain other two integral
expressions of beta function. Express beta function in terms of gamma functions and hence
show that beta function is a symmetric function in terms of variables. 10

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP ODD SEMESTER EXAMINATION, 2024

PHYSICS

UNIT TEST – II (ASSIGNMENT)

SEMESTER – I

PHYDSC – 102T
(Mechanics and Relativity)

Full Marks: 20

All questions are compulsory.
(Each question carries 10 marks.)

- 1.
- (a) Explain conservative and non-conservative forces with examples. 4
- (b) Estimate whether the following forces are conservative:
- (i) $\mathbf{F} = \left(\frac{\alpha}{r^4}x, \frac{\alpha}{r^4}y, \frac{\alpha}{r^4}z \right)$,
- (ii) $\mathbf{F} = (3z + 5y)\mathbf{i} + (5x + 2z)\mathbf{j} + (2y + 3x + 4z)\mathbf{k}$. 3+3
2. Find the time average values of potential and kinetic energy for a body executing SHM. Describe the condition of resonance. 5+5=10

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP ODD SEMESTER EXAMINATION, 2024
PHYSICS

UNIT TEST – II (ASSIGNMENT)

SEMESTER – I

PHYSEC – 101T
(Workshop Skill)

Full Marks: 14

All questions are compulsory.
(Each question carries 7 marks.)

1. What is a sextant? Discuss the principle of measuring the height of a building using sextant. 2+5=7
2. Write in details the function of a gear, gear design along with its different types and their uses. 7

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP ODD SEMESTER EXAMINATION, 2024
PHYSICS
UNIT TEST – II (ASSIGNMENT)

SEMESTER – I

PHYDSM – 101T
(Mechanics, Relativity and Mathematical Physics)

Full Marks: 20

All questions are compulsory.
(Each question carries 10 marks.)

1.
 - (a) Define scalar triple product. Give the geometrical interpretation of scalar triple product. Determine λ such that $\vec{a} = i+j+k$, $\vec{b} = 2i-4k$, $\vec{c} = i+\lambda j+3k$ are coplanar.
 - (b) If $\vec{a} = i+j-k$, $\vec{b} = i-j+k$, $\vec{c} = i-j-k$, Find the vector $\vec{a} \times (\vec{b} \times \vec{c})$. 2+3+3+2=10

2.
 - (a) Define four elastic constants and state the relations between them. 4+2
 - (b) Deduce the expression for strain energy of a stretched wire. Hence find the strain energy per unit volume. 3+1

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP ODD SEMESTER EXAMINATION, 2024

PHYSICS

UNIT TEST – II (ASSIGNMENT)

SEMESTER – I

PHSIDC – 101
(Physics in Daily Life)

Full Marks: 20

All questions are compulsory.
(Each question carries 10 marks.)

- (a) What do you mean by error? Describe different types of errors. 1+5=6

(b) Describe the rules for significant figures with examples. 4
- Give the origin of friction. Illustrate the statement that friction is a necessary evil.
Mention some measures of reducing friction. 3+4+3=10

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP ODD SEMESTER EXAMINATION, 2024
PHYSICS
UNIT TEST – II (ASSIGNMENT)

SEMESTER – III

PHYDSC – 201T
(Waves and Optics)

Full Marks: 20

All questions are compulsory.
(Each question carries 10 marks.)

1. Describe the construction and working principle of Fresnel Bi-prism experiment.
How can you determine wavelength of light by Lloyd's single mirror experiment?
3+4+3=10
2. Describe linearity and superposition principle. Find the resultant of two colinear oscillations having (1) equal frequency and (2) different frequencies. 5+5=10

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP ODD SEMESTER EXAMINATION, 2024
PHYSICS
UNIT TEST – II (ASSIGNMENT)

SEMESTER – III

PHYDSC – 202T
(Thermal Physics)

Full Marks: 20

All questions are compulsory.
(Each question carries 10 marks.)

1. Write the definitions, properties and application of the following terms
Internal energy, Enthalpy, Helmholtz free energy, Gibbs free energy 10
2. Following Maxwell-Boltzmann law for distribution of speeds of an ideal gas, deduce expressions for mean, rms and most probable speeds of an ideal gas. Hence find their ratio. 10

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP ODD SEMESTER EXAMINATION, 2024
PHYSICS
UNIT TEST – II (ASSIGNMENT)

SEMESTER – III

PHYSEC – 201T
(Renewable energy and energy harvesting)

Full Marks: 14

All questions are compulsory.
(Each question carries 7 marks.)

1. (a) Write the advantage and disadvantage of the following
Fossil fuel, and nuclear energy 3
- (b) Describe briefly the Construction and working of nuclear reactor 4
2. Discuss the need and characteristics of photovoltaic systems. 7

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP ODD SEMESTER EXAMINATION, 2024
PHYSICS
UNIT TEST – II (ASSIGNMENT)

SEMESTER – III

PHYDSM – 201T
(Electricity, Magnetism and Electronics)

Full Marks: 20

All questions are compulsory.
(Each question carries 10 marks.)

1. State Biot-Savart law. Applying Biot-Savart law find the expressions for field intensity at a point due to a straight conductor and circular coil. 2+4+4=10
2. What is a rectifier? Explain with suitable circuit diagram the working of a half-wave rectifier. Obtain an expression of rectification efficiency of a half-wave rectifier. 1+5+4=10

KARIMGANJ COLLEGE, KARIMGANJ
FYUGP ODD SEMESTER EXAMINATION, 2024
PHYSICS
UNIT TEST – II (ASSIGNMENT)

SEMESTER – III

PHSIDC – 201T
(Renewable energy and energy harvesting)

Full Marks: 20

All questions are compulsory.
(Each question carries 10 marks.)

1. (a) Write the advantage and disadvantage of the following
Fossil fuel, and nuclear energy 4
- (b) Describe briefly the production and extraction of nuclear energy? 6

2. Write short notes on the following - 5+5=10
 - (a) Tidal energy.
 - (b) Geothermal energy.

KARIMGANJ COLLEGE, KARIMGANJ
TDC (CBCS) ODD SEMESTER EXAMINATION, 2025
PHYSICS
UNIT TEST – II (ASSIGNMENT)

SEMESTER – V

PHSHCC – 501T
(Quantum Mechanics and Applications)

Full Marks: 14

All questions are compulsory.

(Each question carries 7 marks.)

1. What do you mean by normalisation of wave function? How is it mathematically expressed? Show that the momentum operator commutes with the free particle Hamiltonian operator, i.e, $[\hat{H}, \hat{p}] = 0$.

2+1+4=7
2. Obtain the energies of the five lowest energy levels of a particle in a cubical box. Comment on the degeneracy of the said energy levels.

5+2=7

KARIMGANJ COLLEGE, KARIMGANJ
TDC (CBCS) ODD SEMESTER EXAMINATION, 2024
PHYSICS

UNIT TEST – II (ASSIGNMENT)

SEMESTER – V

PHSHCC – 502T
(Solid State Physics)

Full Marks: 14

All questions are compulsory.

(Each question carries 7 marks.)

1. State Dulong-Petit law. Describe Einstein's theory of specific heat. 2+5=7
2. What is superconductivity? Describe Meissner effect. Give a brief qualitative account of BCS theory of superconductivity. 2+2+3=7

KARIMGANJ COLLEGE, KARIMGANJ
TDC (CBCS) ODD SEMESTER EXAMINATION, 2024
PHYSICS
UNIT TEST – II (ASSIGNMENT)

SEMESTER – V

PHSDSE 501T-A
(Classical Dynamics)

Full Marks: 20

All questions are compulsory.
(Each question carries 10 marks.)

1.

- (a) Explain stable and unstable equilibrium with examples.
(b) Expand potential energy around a point of stable equilibrium.
(c) The potential energy of a particle is given by $V(x) = x^4 - 4x^3 - 8x^2 + 48x$.
Find the points of stable and unstable equilibrium. 4+2+4=10

2.

- (a) What will be the Hamiltonian corresponding to the Lagrangian

$$L = a\dot{x}^2 + b\dot{y}^2 - kxy \quad 2$$

- (b) The Lagrangian of a particle of mass m moving in 1D is given by

$$L = \frac{1}{2}m\dot{x}^2 - bx, \text{ where } b \text{ is a constant. Find the coordinate of the particle } x(t) \text{ at time } t. \quad 3$$

- (c) Consider the motion of a particle in 2D is given by

$$L = \frac{1}{2}m(\dot{x}^2 + \dot{y}^2) - \frac{k}{4}(x + y)^2$$

Where $k > 0$. The initial conditions are given as $y(0)=0, x(0)=42 \text{ m}, \dot{x}(0)=\dot{y}(0) = 0$

What is the value of $x(t)-y(t)$ at $t= 25$ seconds in meters? 5

KARIMGANJ COLLEGE, KARIMGANJ
TDC (CBCS) ODD SEMESTER EXAMINATION, 2024

PHYSICS

UNIT TEST – II (ASSIGNMENT)

SEMESTER – V

PHSDSE 502T-A
(Nuclear & Particle Physics)

Full Marks: 20

All questions are compulsory.
(Each question carries 10 marks.)

1. Write in details about nuclear shell model. 10
2. Describe construction and working principle of ionisation chamber. What are the difference between G.M. Counter & proportional counter region? 7+3=10

TDC (CBCS) ODD SEMESTER EXAMINATION, 2024

KARIMGANJ COLLEGE, KARIMGANJ

UNIT TEST – II (Assignment)

SEMESTER – I

PHSDSC/GE – 101T

(Mechanics)

Full Marks: 14

All questions are compulsory.

(Each question carries 7 marks.)

1. State Kepler's laws of planetary motion. Obtain the expressions for total energy and orbital velocity of an artificial satellite revolving around earth remaining at a height above the surface of the earth. 2+5=7
2. Find the expression for strain energy of a stretched wire. Hence find the strain energy per unit volume. What is the twisting couple of a cylinder? 4+2+1=7

KARIMGANJ COLLEGE, KARIMGANJ
TDC (CBCS) ODD SEMESTER EXAMINATION, 2024
PHYSICS
UNIT TEST – II (Assignment)
SEMESTER – III

PHSDSC/GE – 301T
(Thermal Physics and Statistical Mechanics)

Full Marks: 14

All questions are compulsory.
(Each question carries 7 marks.)

1. Why gases have two specific heats? Define C_p and C_v . Show that for one mole of an ideal gas $C_p - C_v = R$. (Terms have their usual meaning). 2+2+3=7
2. What is meant by the mean free path of the molecules of a gas? Obtain an expression for it and show that it is inversely proportional to the pressure and directly proportional to the absolute temperature of the gas. 1+3+1 $\frac{1}{2}$ +1 $\frac{1}{2}$ =7

18

DSC 101

Q1. What do you mean by primary data and secondary data? Explain the methods of collection of primary data and secondary data. (10)

Q2. What do you mean by tabular presentation of data? Explain the parts of a table. Also write the requisites of a good table. (10)

DSC 102

Q1. Define Karl Pearson Coefficient of correlation. Prove that correlation coefficient is independent of change of origin and scale. (10)

Q2. Explain scatter diagram. Also show that correlation coefficient lies between -1 to $+1$. (10)

20
DSM 101.

Q1. Explain the graphical representation of frequency distribution and its types. Also write its ~~two~~ advantages. (10)

Q2. Explain ~~the~~ (i) classical definition of Probability
(ii) Axiomatic definition of Probability
~~What is the scope of probability~~
Also write its limitations. (10)

10C 101

Q1. State and Prove Multiplicative Theorem of Probability.

Q2. Explain (i) Classical Definition of Probability -
(ii) Axiomatic Definition of Probability -
Also write its limitations.

~~Answers~~

1st Unit test 2024

3rd semester

FYUG

Statistics (SEC-201)

Time- 1hr

Total marks-14

1. Write some basic data types and their sizes. 4
2. What are derived data types. Write any two with examples. 5
3. Write a program to find the summation of all the elements of an array. 5

1st Unit test 2024

1st semester

FYUG

Statistics (SEC-101)

Time- 1hr

Total marks-14

Answer any four questions:-

1. What is Microsoft Excel? What are the features of Microsoft Excel?
2. What is a cell? How can we enter data and formula into cell?
3. Write a note on data validation. What is the difference between.
a Workbook and a worksheet?

2+3=5

1+4=5

2+2=4

DSC 202

Q1. Define chi-square statistic. Obtain the sampling distribution of chi-square variate. (10)

Q2. What do you mean by contingency table? For 2×2 contingency table, prove that

$$\chi^2 = \frac{(ad - bc)^2 N}{(a+b)(c+d)(a+c)(b+d)} \quad (10)$$

—x—

DSC 201

Q1. Define idempotent of matrix.

Show that, $A = \begin{bmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & -3 \end{bmatrix}$ is idempotent. (10)

Q2. What is singular matrix?

Find the inverse if the given 3×3 matrix

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 1 & 4 \\ 5 & 6 & 0 \end{bmatrix} \quad (10)$$

BSM 201

Q1. Define Binomial Distribution.
Derive the mean and variance of Binomial Distribution. (10)

Q2. Define Poisson Distribution.
Show that Poisson Distribution is a limiting case of Binomial Distribution. (10)

—*—

IDC 201

Q1. Define sample survey and census. (10)
Explain the advantages of sample survey over complete enumeration.

Q2. Define variance and covariance of a random variable.
Prove that (i) $v(ax) = a^2 v(x)$,
(ii) $v(ax+b) = a^2 v(x)$. (10)

Q1. Explain the measures of ~~births~~ fertility with merits and demerits. (10)

Q2. Explain the measures of mortality with merits and demerits. (10)

— X —

FYUG 2nd Unit Test 2024

B.Sc 1st Semester,Sub: Zoology

Paper- Zoo: DSC-101, **Diversity of Non-Chordates**

Q. Write an assignment on any two of the following topic: 10+10= 20

1. Reproduction in Protozoa.
2. Polymorphism in siphonophora.
3. Respiration in Pila

FYUG 2nd Unit Test 2024

B.Sc 1st Semester,Sub: Zoology

Paper- Zoo: DSC-102, **Diversity of Chordates**

Q. Write an assignment on any two of the following topic. 10+10=20

1. Binomial Nomenclature.
2. Classification of Chordata.
3. Parental care in Fishes.

FYUG 2nd Unit Test 2024

B.Sc Ist Semester,Sub: Zoology

Paper- Zoo: DSM-101, **Animal Diversity**

Q. Write an assignment on any two of the following topic. 10+10=20

1. Locomotion in Protozoa.
2. Life history of *Taenia solium*.
3. General features of Protochordata, Agnatha and Cyclostomes.

FYUG 2nd Unit Test 2024

B.Sc Ist Semester,Sub: Zoology

Paper- Zoo: IDC-101, **Understanding Life processes**

Q. Write an assignment on any two of the following topic. 10+10=20

1. Characteristics of Living Beings.
2. Human digestive system
3. Disorders of Circulatory system.

FYUG 2nd Unit Test 2024

B.Sc. 3rd Semester, Sub: Zoology

Paper- Zoo: DSC-201, **Principle of Genetics**

Q. Write an assignment on any two of the following topic: 10+10=
20

1. Incomplete dominance and co-dominance
2. Chromosomal mechanism of sex-determinatio
3. Mechanism of Crossing over.

FYUG 2nd Unit Test 2024

B.Sc. 3rd Semester, Sub: Zoology

Paper- Zoo: DSC-202, **Principle of Ecology**

Q. Write an assignment on any two of the following topic: 10+10=
20

1. Affect of biotic factors on living organisms.
2. Ecological pyramid.
3. Wild life conservation.

FYUG 2nd Unit Test 2024

B.Sc. 3rd Semester, Sub: Zoology

Paper- Zoo: DSM-201, **Physiology and Biochemistry**

Q. Write an assignment on any two of the following topic: 10+10=
20

1. Transport of respiratory gases.
2. Mechanism of Urine formation.
3. Nomenclature and Mechanism of enzyme action.

FYUG 2nd Unit Test 2024

B.Sc 3rd Semester, Sub: Zoology

Paper- Zoo: DSM-201, **Public health and Hygine**

Q. Write an assignment on any two of the following topic: 10+10=
20

1. Importance of Carbohydrates and Protein.
2. Air pollution
3. Communicable diseases.

CBCS 2nd Unit Test 2024
B.Sc. 5th Semester, Subject –Zoology
Paper-HCC-501, Molecular Biology.

- Q . Write assignment on any two of the following topic: 10+10=20
1. Structure and function of DNA.
 2. Write notes on Split gene, intron and exon.
 3. Genetic code.

CBCS 2nd Unit Test 2024
B.Sc. 5th Semester, Subject –Zoology
Paper-HCC-502, Molecular Biology

- Q . Write assignment on any two of the following topic: 10+10=20
1. Incomplete dominance and co-dominance.
 2. Mechanism of Crossing over.
 3. Gene Mutation

CBCS 2nd Unit Test 2024
B.Sc. 5th Semester, Subject –Zoology
Paper-DSE-501, Immunology

- Q . Write assignment on any two of the following topic: 10+10=20
1. Primary Lymphoid organs
 2. Antigen and its properties
 3. AIDS-causes and prevention

CBCS 2nd Unit Test 2024
B.Sc. 5th Semester, Subject –Zoology
Paper-DSE-502, Fish and Fisheries

- Q . Write assignment on any two of the following topic: 10+10=20
1. Scales of fishes.
 2. Bacterial and viral diseases of fishes.
 3. Parental care in Fishes