21CSCC101

CHOICE BASED CREDIT SYSTEM SEMESTER SCHEME
B.Sc. FIRST SEMESTER DEGREE EXAMINATION | OCTOBER 2025
COMPUTER SCIENCE

Computer Fundamentals and Programming in C

Duration:2 Hours   **Max Marks:60**

PART A

Answer any FIVE questions: **(5×2= 10)**

1) List the different types of number system.

2) Write any four relational operators in C.

3) What is the significance of break statement in C? Give an example.

4) Write the syntax of structure declaration.

5) Write the basic structure of C programming language.

6) Write the syntax of do-while loop.

PART B

Answer any FIVE questions :   **(5×6= 30)**

7) Explain any six symbols of flowchart.

8) What are constants? Explain any two types.

9) Explain with syntax and example   a) if statement   b) if-else statement

10) Explain the concept of union with example .

11. Explain application software with any two examples.

12. What are trigraph character constants? Write any five with its meaning.

PART C

Answer any TWO questions :   **(2×10= 20)**

13. a) Explain any five applications of a computer.

     b) Explain the components of a computer system with a neat diagram.

14. Explain with syntax and example a) getchar() and putchar()   b) scanf() and printf()

15. a) How do you read elements in two dimensional array? Explain with an example.

    b) Explain one dimensional array with an example.

****

21BOTC101   Reg No   :   ....

CHOICE BASED CREDIT SYSTEM SEMESTER SCHEME
B.Sc. FIRST SEMESTER DEGREE EXAMINATION OCTOBER 2025
BOTANY
Botany Theory - I

Duration:2 Hours   **Max Marks:60**

SECTION - A

Answer the following strictly observing the internal choice provided: **4×5=20**

UNIT 1

1) Write a note on contributions of M. J. Thirumalachar and B. B. Mundkur.

OR

2) Explain Whittaker's five Kingdom system.

UNIT 2

3) Briefly explain growth in microbes.

OR

4) Define i) Storage media   ii) Basal media

UNIT 3

5) Explain embryonated egg method of culturing viruses.

OR

6) Explain streak plate method.

UNIT 4

7) Describe the process of root nodule formation by *Rhizobium*.

OR

8) Explain the thallus structure in *Rhizopus*.

SECTION - B

Answer the following strictly observing the internal choice provided: **4×10=40**

UNIT 1

9) Explain the principle, procedure and precations of Schaeffer-Fulton staining method for endospore.

OR

10) Explain the working principle and applications of Phase contrast microscope.

UNIT 2

11) Briefly explain the mode of nutrition in microbes.

OR

12) Write a note on   i) Antiseptic   ii) Tyndallisation   iii) Pasteurization

UNIT 3

13) Describe the structure and replication of SARS-COV-2.

OR

14) Explain the economic importance of viruses.

UNIT 4

15) Explain parasexulaity in Fungi.

OR

16) Write the beneficial and harmful effect of Fungi.

****

22NHEC101

Reg No : ....

CHOICE BASED CREDIT SYSTEM SEMESTER SCHEME
B.A. and B.Sc., FIRST SEMESTER DEGREE EXAMINATION OCTOBER 2025
NUTRITION AND HEALTH EDUCATION
Fundamentals of food and nutrition science

Duration:2 Hours   Max Marks:60

SECTION - A

Answer the following strictly observing the internal choice provided: 4×5=20

UNIT 1

1) What are the psychological effects of food?

OR

2) Elaborate on scope of nutrition.

UNIT 2

3) Give the functions of Niacin.

OR

4) What are the functions of proteins?

UNIT 3

5) Write the changes that occur during cooking of egg.

OR

6) Explain the nutritional importance of fruits and vegetables.

UNIT 4

7) Write a note on parboiling.

OR

8) Briefly explain microwave method of cooking.

SECTION - B

Answer the following strictly observing the internal choice provided: 4×10=40

UNIT 1

9) Explain the various functions of food.

OR

10) How are food, nutrition and health inter-related? Explain.

UNIT 2

11) Explain in detail the various functions and deficiency of fat soluble vitamin D.

OR

12) Explain the sources, functions and deficiency of iodine.

UNIT 3

13) Explain the nutritional contribution of i) fats and oils ii) sugar and jaggery.

OR

14) Elaborate on changes during cooking of
   a) cereals and millets
   b) pulses and legumes

UNIT 4

15) Explain various methods of cooking using dry heat with advantages.

OR

16) Explain the pre cooking methods of pulses.

****

24BOTC101

CHOICE BASED CREDIT SYSTEM

B.Sc. FIRST SEMESTER DEGREE EXAMINATION OCTOBER 2025

BOTANY

Microbes and Algae

Duration:3 Hours   Max Marks:80

I. Answer any FIVE of the following :   (5×2= 10 Marks)

1. Write any two symptoms of vein clearing disease.

2. Write two distinct structural features of Mycoplasma.

3. What are transgenic plants? Give examples.

4. Name the caustative organism of Leaf blight of paddy and Bacterial canker of tomato.

5. What are the uses of diatoms?

6. Name the pigments and reserve food material in *Polysiphonia*.

II. Answer any FIVE of the following :   (5×6= 30 Marks)

7. Give the characteristic features of kingdom Mycota with examples.

8. Write an account of discovery and classification of viruses.

9. Explain the cell structure of cyanobacteria with a neat labeled diagram.

10. Write a note role of bacteria in industries.

11. Explain the structure and morphology of Zoospores in *Vaucheria*.

12. Explain conjugation in *Spirogyra*.

III. Answer any FOUR of the following :   (4×10= 40 Marks)

13. Give an account of Phase Contrast Microscopes.

14. Explain in detail about genetic recomination in bacteria.

15. Explain reproduction in *Volvox* with a neat labeled diagram.

16. Briefly explain autotrophic nutrition in bacteria.

17. With a neat labeled diagram explain the thallus structure and reproduction in Oscillatoria.

****

CHOICE BASED CREDIT SYSTEM SEMESTER SCHEME

B.Sc FIRST SEMESTER DEGREE EXAMINATION OCTOBER 2025

PHYSICS

Mathematical Physics, Properties of Materials and Relativity

Duration:3 Hours   Max Marks:80

Part A

Answer any seven questions: (7×10= 70)

1. a) Define line integral and surface integral of a vector.
    b) Obtain expressions for radial and transverse velocity & accelerations of a particle.
    (3 + 7)

2. a) Explain briefly the calculation of rigidity modulus using static torsion method.
    b) Derive an expression for torsional couple per unit twist. Arrive at the expression for the rigidity modulus of the wire   (3 + 7)

3. a) Find the energy equivalent of 1 kg of matter in MeV.
    b) What is the meaning of mass-energy equivalence? Establish mathematically Einstein's mass-energy relationship. (3+7)

4. a) Define unit vector, equal vector and null vector.
    b) Explain with examples dot product and cross product of vectors. (3 + 7)

5. a) Define strain. Explain longitudinal strain and volume with the expressions.
    b) State and explain Hooke's law with the necessary graph.   (3 + 7)

6. a) If $\vec{r}$ is a position vector of a particle, show that, $\frac{d\vec{r}}{dt}$ is its velocity and $\frac{d^2\vec{r}}{dt^2}$ is its acceleration.
    b) Deduce the expression for derivative of i) $\vec{A} - \vec{B}$ ii) $\vec{A} + \vec{B}$ iii) $\vec{A} \times \vec{B}$ iv) $\vec{A} \cdot \vec{B}$.
    (3 + 7)

7. a) Define Neutral surface, Neutral axis and Bending moment.
    b) What is a cantilever? Obtain an expression for the depression at the loaded end of a cantilever.   (3 + 7)

8. a) Why does the 'Twin Paradox' exist as a physical phenomenon?
    b) Write Lorentz transformation equations and obtain an expression for time dilation. (3+7)

9. a) Explain trigonometric and exponential form of complex number.
    b) Explain in detail the Fundamental operations with complex numbers. (3 + 7)

336

Part B (Numerical)

Answer any two questions: (2×5= 10)

10. A spherical drop of mercury of radius 4mm falls through a certain height on the floor. It is divided into one million equal drops all of which being at rest. Calculate the height from which it has fallen. Given density of mercury= 13600 kg/m^3, Surface tension of mercury = 0.54 N/m

11. Find the unit vector paralle to the resultant of vectors.
$$r_1 = 3\hat{i} + 6\hat{j} + 8\hat{k}, \ r_2 = 2\hat{i} + 2\hat{j} + 3\hat{k}.$$

12. (i) A rocket was found to be of length 100 m when measured on the earth. If it leaves and moves at a constant velocity of 2 x 10^8 m s^{-1}. What will be its length?
(ii) What is the length of a metre stick moving parallel to its length when its mass is 3/2 of its rest mass?

****

337

CHOICE BASED CREDIT SYSTEM SEMESTER SCHEME

B.A/B.Sc. FIRST SEMESTER DEGREE EXAMINATION OCTOBER 2025

NUTRITION AND HEALTH EDUCATION

Fundamentals of Nutrition and Food Science

Duration:3 Hours   Max Marks:80

Section A

I. Answer any Five of the following: (5×2= 10)

1. Define food.

2. Write any two functions of calcium.

3. What are vegetarian eggs?

4. Give any two disadvantages of soaking.

5. Give any two advantages of parboiling.

6. How does nutrition improve well being?

Section B

II. Answer any Five of the following: (5×5= 25)

7. What are the psychological effects of food?

8. Explain the functions of riboflavin.

9. Give the effect of cooking on pulses.

10. Write the difference between boiling and pressure cooking.

11. Explain the deficiency diseases of Vitamin D.

12. Give the effect of cooking on milk and milk products.

Section C

III. Answer any Three of the following: (3×15= 45)

13. a) Classify food based on their functions with examples (5)

    b) Write a note on MyPlate (5)

    c) RDA (5)

14. Explain protein under following heads:

   a) Functions (5)

   b) Sources (5)

   c) Classification (5)

15. Explain about the methods for minimizing nutrient losses during cooking.

16. a) Write a note on the nutritional contribution of Fats and oils.(5)

   b) What are the changes during cooking of fats? (5)

   c) Write a note on carmalization (5)

****

CHOICE BASED CREDIT SYSTEM SEMESTER SCHEME

B.A./B.Sc FIRST SEMESTER DEGREE EXAMINATION OCTOBER 2025

NUTRITION AND HEALTH EDUCATION

Fundamentals of Nutrition and Food Science

Duration:3 Hours   Max Marks:80

Section A

I. Answer any Five of the following: (5×2= 10)

1. Write any four functions of food.

2. What is goitre?

3. What is retrogradation?

4. Give any two disadvantages of soaking.

5. List out few methods to prevent nutrient loss during cooking.

6. Write any four scope of nutrition.

Section B

II.Answer any Five of the following: (5×5= 25)

7. Classify nutrients in detail.

8. Explain the deficiency diseases of folic acid.

9. Briefly explain the selection of fruits and vegetables.

10. Write about methods of preventing nutrient loss during cooking.

11. Classify fats with examples.

12. Explain the nutritional importance of fats and oils and sugars.

Section C

III. Answer any Three of the following: (3×15= 45)

13. a) Classify food based on their functions with examples. (5)
    b) Write a note on MyPlate. (5)
    c) RDA (5)

14. Explain Vitamin K under following heads:

   a) Functions (6)

   b) Deficiency (6)

   c) Sources (3)

15. Write a detailed note on different dry heating methods with their advantages, disadvantages and examples.

16. a) Write on the selection process for egg. (8)

   b) Give the nutritional contribution of meat. (7)

****

24ANMC101   Reg No   :   ....

Duration:3 Hours   Max Marks:80

I. Answer any FIVE of the following :   (5×2= 10 Marks)

1. Define circular or cyclical time.

2. Define non-coplanar points.

3. How secondary colors are formed?

4. Name the types of balance.

5. What do you mean by golden ratio?

6. What is flowing rhythm?

II. Answer any FIVE of the following :   (5×6= 30 Marks)

7. Write a note on usage of texture.

8. Explain some of the size cues which helps to percieve depth.

9. Write a note on unity in art.

10. Write a note on light and shade.

11. Differentiate between emphasis and contrast.

12. Write a note on contrast in art.

III. Answer any FOUR of the following :   (4×10= 40 Marks)

13. Discuss the use of repeated figures and multiple images to convey motion.

14. Discuss the various techniques used to create the illusion of depth on a two-dimensional surface.

15. Write a note on color interaction.

16. Explain Harmony and Variety in Art.

17. Write a note on movement in art.

****

CHOICE BASED CREDIT SYSTEM
B.Sc FIRST SEMESTER DEGREE EXAMINATION OCTOBER 2025
CHEMISTRY
General Chemistry-1

Duration:3 Hours   **Max Marks:80**

PART - A

I. Answer any Five of the following: (2×5= 10 Marks)

1 Write Mulliken's electronegativity scale.

2 Define atomic radius.

3 How is the Celsius scale related to Kelvin scale of temperature?

4 State the first law of thermodynamics.

5 What are annulenes? Give two examples.

6 Which is the most stable conformation of cyclohexane? Why?

PART - B

II:Answer any <u>seven</u> of the following choosing at least TWO from each Unit: (10×7= 70 Marks)

UNIT I

7 a) Explain the variation of Ionisation energy in the periodic table.
   b) With suitable examples explain the classification of chemicals based on sources.
   c) How are chemicals classified based on nature of compounds? (4+3+3)

8 a) Explain briefly the trends in the metallic/non metallic character of elements across the periodic table.
   b) With suitable examples explain the classification of chemicals based on sources.
   c) Explain the variation of electron affinity down the group and across the period in the periodic table. (4+3+3)

9 a) Compare the radius of an anion and cation with respect to its neutral atom.
   b) Explain the variation of electronegativity with hybridisation.
   c) What are Isoelectronic ions? Give examples. (4+3+3)

251

UNIT II

10 a) Derive an expression for the entropy change of an ideal gas with the change in temperature and pressure.

b) Define heat capacity at constant pressure Cp. How is it related to Cv?

c) Write Gibbs- Helmholtz equation and explain its significance. (4+3+3)

11 a) Derive an expression for Gibbs free energy with pressure for an ideal gas.

b) Derive an expression for work done during an adiabatic process.

c) 8 moles of an ideal gas expands isothermally and reversibly from a volume of 5 dm^3 to 9 dm^3 at 280K. Calculate the work done by the gas. (4+3+3)

12 a) Derive Joule Thomson coefficient for an ideal gas.

b) Discuss the relationship between free energy and spontaneity.

c) Calculate the entropy change during vaporisation of water at 100°C. Latent heat of vaporisation of water is 2260J/g (4+3+3)

UNIT III

13 a) Explain the mechanism of Reimer Tiemann reaction.

b) Explain the polymerization of Dienes with a suitable example.

c) Explain the reaction of cyclopropane and cyclobutane with bromine (4+3+3)

14 a) Explain Dieckmann method for the preparation of cycloalkanes.

b) Explain the addition of i) bromine   ii) HBr to 1,3 butadiene.

c) Explain the classification of carbocations and their order of stability.(4+3+3)

15 a) Explain Homolytic and Heterolytic fission with examples.

b) How do you prepare 1,3 - butadiene by

(i) dehydration of diols   (ii) dehydrogenation of alkanes

c) Explain substitution reaction with an example. (4+3+3)

****

CHOICE BASED CREDIT SYSTEM

B.Sc. FIRST SEMESTER DEGREE EXAMINATION OCTOBER 2025

COMPUTER SCIENCE

Computer Fundamentals and Programming in C

Duration:3 Hours   Max Marks:80

I. Answer any FIVE of the following :   (5×2= 10 Marks)

1. What are keywords? List any two keywords in C.

2. What is the significance of continue statement in C? Give an example.

3. How do you read a floating point number in C? Give an example.

4. What are actual parameters? Give an example.

5. Define structure. Write its syntax.

6. What is a variable? Write a C statement to declare an integer variable.

II. Answer any FIVE of the following :   (5×6= 30 Marks)

7. Explain the components of a computer system with a neat diagram.

8. Explain do-while loop with syntax and example.

9. Write a note on   a) Assignment operators   b) Logical operators

10. What is a pointer variable? Explain how the pointer variable is declared and initialized.

11. What is ASCII code? Mention its applications.

12. Explain application software with any two examples.

III. Answer any FOUR of the following :   (4×10= 40 Marks)

13. a) Explain switch statement with syntax and example.
    b) Explain conditional operator with syntax and example.

14. Explain any five string functions in C. Give an example for each.

15. a) How do you read elements in one dimensional array? Explain with an example.
    b) Explain two dimensional arrays with an example.

16. Explain the basic structure of C programming language with an example program.

17. a) Explain any five symbols of flowchart.
    b) Explain any three benefits and limitations of flowchart.

****

24MICC101

CHOICE BASED CREDIT SYSTEM

B.Sc FIRST SEMESTER DEGREE EXAMINATION OCTOBER 2025

MICROBIOLOGY

General Microbiology

Duration:3 Hours   Max Marks:80

I. Answer any FIVE of the following :   **(5×2= 10 Marks)**

1. Write any two characteristic features of Kingdom Fungi.

2. Write any two advantages of Binomial Nomenclature.

3. Expand SEM.

4. Name the two types of Differential Staining.

5. Define a mixed culture and a Pure culture.

6. What is an ampoule and what is it used for?

II. Answer any FIVE of the following :   **(5×6= 30 Marks)**

7. Write a short note on Koch's Postulates.

8. Write a short note on Twort De'Herelle phenomenon.

9. Explain the procedure of endospore staining by Schaeffer - Fulton method.

10. Write a note on Fluorescence microscope.

11. Write a note on anaerobic jar.

12. Write a note on nutrient agar.

III. Answer any FOUR of the following :   **(4×10= 40 Marks)**

13. Describe the Bergey's manual of Bacteriology.

14. Describe the scope and significance of Microbiology as a modern science.

15. Explain the parts and principle of Bright field microscope.

16. Describe sterilisation by moist heat.

17. Explain in detail pour plate and spread plate method with diagram.

****

CHOICE BASED CREDIT SYSTEM

B.Sc. FIRST SEMESTER DEGREE EXAMINATION OCTOBER 2025

MATHEMATICS

Calculus and Analytical Geometry

Duration:3 Hours   **Max Marks:80**

I. Answer any EIGHT of the following :   **(8×3= 24 Marks)**

a. Define point of inflection. Does the graph of the function $y = x^8$ have a point of inflection. Justify your answer.

b. Show that the equation $x^3 + 3x + 1 = 0$ has exactly one real solution.

c. Using L'Hopital's rule find $\lim_{x \to 0} \frac{3x - \sin x}{x}$.

d. Find the value of c that satisfies Mean Value Theorem for the function
$f(x) = 1 - x^2$ on $[0, 2]$.

e. Write the formula for integration by parts and hence find $\int x^3 \ln x \, dx$.

f. Find the average value of $f(x) = 3x^2 - 3$ on $[0, 2]$. Also find where f assumes its average value in $[0, 2]$.

g. Evaluate $\sum_{i=1}^{n} (i^2 - i)$.

h. Find the semi major axis, semi minor axis, center-to-focus distance and foci of the ellipse $\frac{x^2}{16} + \frac{y^2}{9} = 1$.

i. Use the discriminant to check whether the equation
$2x^2 - 8xy + 8y^2 + 2x + 2y = 0$ represents a parabola, ellipse, or hyperbola.

j. Find the focus and the directrix of the parabola $y = 4x^2$. Sketch the parabola and include its focus and directrix.

II. Answer any EIGHT of the following :   **(8×7= 56 Marks)**

a. Suppose that $y = f(x)$ is continuous at every point of the closed interval $[a, b]$ and is differentiable at every point of (a, b). If $f(a) = f(b)$ then prove that there exists atleast one number c in (a, b) such that $f'(c) = 0$.

b. For the curve $y = x^2 - 4x + 3$ on $(-\infty, \infty)$, find the critical points, intervals of increase and decrease, concavity, local extrema, point of inflection, asymptotes and sketch the graph.

c. Determine the concavity and point of infelction of $f(x) = x^4$.

d. Derive the reduction formula for $\int cosec^n x \, dx$ and hence evaluate $\int cosec^3 x \, dx$.

e. State and prove the Fundamental theorem of calculus(Part 2).

f. Find the area of the trapezoid that is the region bounded by the lines $x = 1$ and $x = 3$, the x-axis and and the line $2x + y = 3$ by taking the inscribed rectangles.

g. Rotate the coordinate axes to change the equation $x^2 - 2xy + y^2 = 2$ into an equation that has no cross product term. Also, identify the curve.

h. The hyperbola $\frac{x^2}{16} - \frac{y^2}{9} = 1$ is shifted two units to the right to generate the new hyperbola $\frac{(x-2)^2}{16} - \frac{y^2}{9} = 1$. Find the new centre, foci, vertices and asymptotes of the new hyperbola. Sketch the new hyperbola then include the new centre, foci, vertices and asymptotes.

i. Find the centre, vertices, centre to focus distance, foci, eccentricity and directrices of the ellipse $2x^2 + 3y^2 = 6$. Sketch the ellipse and include the foci and vertices of the ellipse.

j. Express the hyperbola $x^2 - y^2 = 1$ in the standard form. Find the centre to focus distance, foci, eccentricity, directrices and asymptote of the given hyperbola. Sketch the hyperbola, and include the foci and asymptotes.

****

CHOICE BASED CREDIT SYSTEM

B.Sc Data Science FIRST SEMESTER DEGREE EXAMINATION OCTOBER 2025

STATISTICS

Programming in Python

Duration:3 Hours   **Max Marks:80**

I. Answer any FIVE of the following :   **(5×2= 10 Marks)**

1. Why is Python considered easy to read?

2. What is a local variable in Python?

3. How do you concatenate two lists?

4. What does resubn return?

5. What is the purpose of the math module in Python?

6. What is the output of min((5, 3, 9))?

II. Answer any FIVE of the following :   **(5×6= 30 Marks)**

7. Compare Python with other programming languages.
   (a) Write any three differences between Python and Java.
   (b) Write any three differences between Python and C.

8. Explain the use of break, continue and pass statements with syntax and example.

9. Explain the concept of return and return multiple values in Python functions with an example.

10. Explain the concept of multiple and multilevel inheritance.

11. Explain the concept of variable length arguments with an example.

12. Differentiate date, time and datetime classes.

III. Answer any FOUR of the following :   **(4×10= 40 Marks)**

13. Explain type conversion in Python between int, float and string variables with an example.

14. Explain comparison operators in Python with an example.

15. Describe Python comments and docstrings with an example.

16. Write a Python program using try and except to handle multiple exceptions.

17. What are constructors in Python? Explain the types of constructors with examples showing their usage.

****

CHOICE BASED CREDIT SYSTEM

B.Sc. FIRST SEMESTER DEGREE EXAMINATION OCTOBER 2025

DATA SCIENCE

Discrete Mathematics and Descriptive Statistics

| Duration:3 Hours | Max Marks:80 |

I. Answer any FIVE of the following :   (5×2= 10 Marks)

1. If $A = \{a, b\}$ and $B = \{1, 2, 3\}$, find $A \times B, B \times A$.

2. Given $A = \begin{bmatrix} 2 & 0 & 4 \\ 6 & 2 & 8 \\ 2 & 4 & 6 \end{bmatrix}$, $B = \begin{bmatrix} 8 & 4 & -2 \\ 0 & -2 & 0 \\ 2 & 2 & 6 \end{bmatrix}$ and

   $C = \begin{bmatrix} 8 & 2 & 0 \\ 0 & 2 & -1 \\ -8 & 4 & -12 \end{bmatrix}$.

   Find $(A - B) + 2C$.

3. Define quantitative characteristic with an example.

4. Define income inequality.

5. If $p(x) = \frac{1}{K}$; x=1, 2 ...K, find E(X).

6. Distinguish between p.m.f and p.d.f.

II. Answer any FIVE of the following :   (5×6= 30 Marks)

7. If $U = \{a, b, c, d, e, f\}, A = \{a, b, c\}, B = \{c, d\}$ then   verify
   $(A \cup B)' = A' \cap B'$ and $(A \cap B)' = A' \cup B'$.

8. State and prove any two properties of regression coefficients.

9. a) Find $\begin{vmatrix} 1 & 0 & 2 \\ 1 & 2 & 5 \\ 6 & 8 & 0 \end{vmatrix}$.

   b) Find the adjoint of the matrix $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & -3 \\ 2 & -1 & 3 \end{bmatrix}$.

10. Reduce the matrix $A = \begin{bmatrix} -3 & 4 & 6 \\ 5 & -5 & 7 \\ 3 & 1 & -4 \end{bmatrix}$ to it's normal form and find the rank .

11. A continous random variable has its p.d.f $f(x) = 6x(1-x)$ $0 \le x \le 1$, find mean and standard devaition of the variable.

12. Describe Partial and Crossed Elasticity's of Deamand.

III. Answer any FOUR of the following :　　　　　　　　　　(4×10= 40 Marks)

13. Find the first six terms of the sequence defined by the recurrence relation $a_n = a_{n-1} - a_{n-2}$ and initial condition $a_0 = 2, a_1 = -1$.

14. Solve the system of equations by using Matrix method and Cramers rule:
$$x + y + z = 9$$
$$2x + 5y + 7z = 52$$
$$2x + y - z = 0$$

15. 1) Prove that correlation coefficient is independent of change of origin and scale.(5)
    2) Prove that Karl Pearson's coefficient of correlation lies between -1 and 1.　　(5)

16. a) With usual notations prove that $0 \le P(A \cap B) \le P(A) \le P(A \cup B) \le P(A) + P(B)$. (5)
    b) Given P(A)=a, P(B)=b, P(A∩B)=C, find the probability that　(i) A alone occurs
    (ii) A alone occurs or B alone occurs. (5)

17. a) Suppose $A_1, A_2, \ldots A_n$ are the n independent events with proabilities $p_1, p_2, \ldots, p_n$ then prove that $P(A_1 \cup A_2 \cup \ldots \cup A_n) = 1 - (1-P_1)(1-P_2) \ldots (1-P_n)$. (5)
    b) If the events A and B are independent then prove that i) A^C and B^C are independent ii) A and B^C are independent . (5)

****

288

CHOICE BASED CREDIT SYSTEM

B.Sc. FIRST SEMESTER DEGREE EXAMINATION OCTOBER 2025

DATA SCIENCE

Computer Fundamentals and Programming in C

Duration:3 Hours   Max Marks:80

I. Answer any FIVE of the following :   (5×2= 10 Marks)

1. Differentiate system software and application software.

2. Differentiate break and continue statements in C.

3. What is a two dimensional array? Write its syntax.

4. What is a function prototype?

5. Write the syntax for pointer initialization.

6. What is link section? Give an example.

II. Answer any FIVE of the following :   (5×6= 30 Marks)

7. Convert the following binary numbers to decimal:
   a) $(1111.10)_2$ b) $(10001.110)_2$ c) $(10101.01101)_2$

8. Elaborate on the getchar() and putchar() functions with syntax and examples.

9. Write a note on a) Arithmetic operators   b) Relational operators

10. Explain the difference between structures and union.

11. Briefly explain the characteristics of first and second generation of computers.

12. Explain character set with examples.

III. Answer any FOUR of the following :   (4×10= 40 Marks)

13. a) Explain switch statement with syntax and example.
    b) Explain conditional operator with syntax and example.

14. Explain any four string functions in C with an example each.

15. Explain with syntax and example   a) while loop   b) for loop

16. What are constants? Explain any four types with examples.

17. a) Explain any five symbols of flowchart.
    b) Explain any three benefits and limitations of flowchart.

****

289