C–1072

Sub. Code
96413

B.Sc. DEGREE EXAMINATION, NOVEMBER 2019

First Semester

Computer Science

PROGRAMMING IN C

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Write any two keywords in C language.

2. Write the use of the following operators: ? and &

3. Define the term Array.

4. Write declaration statement to store 9 integers in 3 rows and 3 columns.

5. What is the use of '\O' in string representation?

6. How many arguments are there in the following function declaration and identify their types: int add(int x, float y, double z);

7. What is the use of the keyword struct in C language?

8. List any two operator symbols used with pointers.

9. What is the meaning of the following statement? #define A 5

10. Write the different modes of opening a file.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Define the terms identifier and constant. Write the rules governing them and give examples.

Or

(b) Write the precedence of arithmetic operators. Find the answer for the following expression:

5 – 3 * (4+2)/(1+1)

12. (a) Write and explain the working principle of different forms of IF statement.

Or

(b) Giving program code, illustrate the use of break and continue statements in loops.

13. (a) Write an user defined function to find the area of a rectangle whose length and breadth are passed as real numbers. Formula for area : length * breadth.

Or

(b) Write any five string functions and explain their use.

14. (a) Define a structure to store student data such as REGNO, NAME, AGE, SEX, DOB. Write code to access the members.

Or

(b) Write program to code to declare an integer variable. Write code to read value from keyboard and store it using pointer. Display the value using pointer.

15. (a) Write short notes on any three header files and their purpose.

Or

(b) What is macro definition. Illustrate with an example definition.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain all the data types, their storage requirement and range of values that can be stored in them.

Or

(b) Giving general syntax, illustrate the mechanism of different type of looping statements in C.

17. (a) Explain mathematical library functions in C through examples.

Or

(b) Write a program to create an array of structure to store and display data in them.

18. (a) Write a program to create employee file with the following data: EMPNO, NAME, DESIGNATION, SALARY.

Or

(b) Explain in detail about dynamic memory allocation functions in C.

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C–1073

Sub. Code
96415

B.Sc. DEGREE EXAMINATION, NOVEMBER 2019

First Semester

Computer Science

ALGEBRA AND CALCULUS

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer all questions.

1. What is meant by Descartes rule of signs.

2. Define transformation of equations.

3. What is meant by singular matrix?

4. State any one property of eigen value.

5. Define definite integral.

6. What are the methods of integration?

7. When a function f(x, y) is said to be maximum?

8. Define partial derivatives of f(x, y).

9. Define variables separable.

10. Solve $\frac{d^2x}{dt^2} + 6\frac{dx}{dt} + 9x = 0$.

Part B $(5 \times 5 = 25)$

Answer **all** questions.

11. (a) Solve the equation $x^4 - 5x^3 + 4x + 8x - 8 = 0$. Given that one of the roots is $1 - \sqrt{5}$.

Or

(b) Determine completely the nature of the roots of the equation $x^5 - 6x^2 - 4x + 5 = 0$.

12. (a) Find the sum of the squares of the eigen values of $A = \begin{bmatrix} 3 & 1 & 4 \\ 0 & 2 & 6 \\ 0 & 0 & 5 \end{bmatrix}$.

Or

(b) Solve the following system of equations if consistent.

$x + y + z = 3; x + y + -z = 1; 3x + 3y - 5z = 1$.

13. (a) If $u = \sin^{-1} \dfrac{x^2 + y^2}{x + y}$ prove that $x \dfrac{\partial u}{\partial x} + y \dfrac{\partial u}{\partial y} = \tan u.$

Or

(b) If $u = x \log xy$ where $x^{3+} y^3 + 3xy = 1$ find $\dfrac{du}{dx}$.

14. (a) Integrate $\int \dfrac{2x + 3}{x^2 + x + 1} dx$.

Or

(b) Evaluate $\int_o^{\pi} \dfrac{dx}{5 + 4 \cos x}$.

15. (a) Solve $(D^2 - 5D + 6)y = e^{4x}$.

Or

(b) Solve $(D^2 - 3d + 2)y = \sin 3x$.

Part C $(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Increase by 7 the roots of the equation

$3x^4 + 7x^3 + 15x^2 + x - 2 = 0.$

Or

(b) Solve the equation $6x^5 - x^4 - 43x^3 + 43x^2 + x - 6 = 0$.

17. (a) Determine the rank of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 2 \\ 2 & 6 & 5 \end{bmatrix}$.

Or

(b) Verify Cayley-Hamilton theorem for the matrix $A = \begin{bmatrix} 7 & 2 & -2 \\ -6 & -1 & 2 \\ 6 & 2 & -1 \end{bmatrix}$ and hence find A^{-1}.

18. (a) Find the first and second partial derivatives of $z = x^3 + y^3 - 3axy$.

Or

(b) Evaluate $\int \frac{6x + 5}{\sqrt{6 + x - 2x^2}} dx$.

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C–1074

Sub. Code
96423

B.Sc. DEGREE EXAMINATION, NOVEMBER 2019

Second Semester

Computer Science

PROGRAMMING IN C++

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. List the features of C++.
2. What are tokens?
3. What is the purpose of inline function?
4. What is copy constructor?
5. Define abstract class.
6. What are manipulators?
7. What are file pointers?
8. State the features of random access files.
9. What is generic programming?
10. List any four exceptions in C++.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Write a note on operators used in C++.

Or

(b) Discuss about For loop.

12. (a) With suitable example explain how to create a class and object in C++.

Or

(b) Write a note on parameterized constructors.

13. (a) Explain about single inheritance.

Or

(b) What is the use of this pointer? Describe.

14. (a) Create a text file in C++.

Or

(b) Write a program using command line arguments.

15. (a) Discuss about function templates.

Or

(b) How to handle uncaught exceptions in C++.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain in detail about the basic principles of Object Oriented Programming.

Or

(b) Discuss about static data members and member functions.

17. (a) Discuss in detail about multi level and multiple inheritance.

Or

(b) Describe about unformatted and formatted I/O operations.

18. (a) With suitable example explain about error handling during file operations.

Or

(b) How to create user defined templates? Explain with example.

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C–1075

Sub. Code
96425

B.Sc. DEGREE EXAMINATION, NOVEMBER 2019

Second Semester

Computer Science

NUMERICAL ANALYSIS AND STATISTICS

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Give Newton-Raphson iterative formula.

2. When Newton's backward interpolation formula is used?

3. Gauss-Seidal method is better than Gauss-Jacobi method – Why?

4. When does Simpson's rule give exact result?

5. Write Milne's predictor – corrector formula.

6. Where the Taylor series method of solving differential equation is powerful?

7. What is meant by Median?

8. Write the equation of the regression line of y on x.

9. Define Binomial Distribution.

10. What is meant by Normal Distribution.

Part B $(5 \times 5 = 25)$

Answer **all** questions.

11. (a) By Newton Raphson method find a non-zero root of $x^2 + 4\sin x = 0$.

Or

(b) Find a root of $x^3 - 6x - 13 = 0$ by bisection method.

12. (a) Evaluate $\int_0^1 e^{-x^2}\,dx$ by dividing the range of integration into 4 equal parts using trapezoidal rule.

Or

(b) Evaluate $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$ rule with $h = 0.25$.

13. (a) Given $\frac{dy}{dx} = x^2y - 1$ and $y(0) = 1$. Find the value of $y(0.1)$ using Taylor series method.

Or

(b) Using Euler's method solve $y' = x + y + xy$, $y(0) = 1$ compute y at $x = 0.1$, by taking $h = 0.05$.

14. (a) Obtain the lines of regression and find the coefficient of correlation from the following :

x :	1	2	3	4	5	6	7
y :	9	8	10	12	11	13	14

Or

(b) Calculate the median and the mean deviation from the median as origin for the following frequency distribution :

Weight in kg :	91-100	101-110	111-120	121-130
Frequency :	13	52	79	133
Weight in kg :	131-140	141-150	151-160	161-170
Frequency :	121	64	27	11

15. (a) Ten unbiased coins are tossed simultaneously. What will be the probability of happening exactly 6 heads?

Or

(b) Write down the properties of Normal distribution.

Part C $(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Find the polynomial $f(x)$ by using Lagrange's formula and hence find $f(3)$ for :

x :	1	3	5	7
y :	24	120	336	720

Or

(b) Using the Gauss-Jordan method solve the following equations :

$$10x + y + z = 12$$
$$2x + 10y + z = 13$$
$$x + y + 5z = 7.$$

17. (a) Solve the system of equations :

$$x + y + 54z = 110$$
$$27x + 6y - z = 85$$
$$6x + 15y + 2z = 72$$

Using Gauss-Seidal iteration method.

Or

(b) Using Adam's method find $y(0.4)$ given $y' = \frac{xy}{2}$.

$y(0) = 1, y(0.1) = 1.01; y(0.2) = 1.022, y(0.3) = 1.023$.

18. (a) The following table shows the respective heights (in inches) x and y of a sample of 12 fathers and their eldest sons. Find the correlation coefficient.

x : 65 63 67 64 68 62 70 66 68 67 69 71

y : 68 66 68 65 69 66 68 65 71 67 68 70

Or

(b) The following table gives the frequencies of occurrence of a variate x between certain limits.

x :	Less than 40	40-50	5 and above
y :	30	33	37

If the distribution is exactly normal find the distribution and obtain the frequency between 50 and 60.

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C–1076

Sub. Code
96432

B.Sc. DEGREE EXAMINATION, NOVEMBER 2019

Third Semester

Computer Science

DIGITAL COMPUTER FUNDAMENTALS

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What do you mean by Number Systems?

2. Find the 1's Complement of $(10110110)_2$.

3. State the De Morgan's Law.

4. Convert $AB'C + A'BC + AC'$ to Product of sums.

5. What are combinational circuits?

6. What is the purpose of binary counters?

7. State the importance of ALU.

8. Draw the logic diagram of half subtractor.

9. What is the need for complement data representation?

10. List any four binary codes.

Part B $(5 \times 5 = 25)$

Answer **all** questions.

11. (a) Convert the following :

(i) $(1101110)_2 = (\ ?\ )_8$

(ii) $(234980)_{10} = (\ ?\ )_{16}$.

Or

(b) Write a note on numeric and character codes.

12. (a) With the help of truth table prove the commutative law.

Or

(b) Implement $X = ABD + ACD + BCD$ using two level combinational circuits.

13. (a) Explain the working of Decoders.

Or

(b) Write a note on BCD counters.

14. (a) What is ALU? Explain about the construction of ALU.

Or

(b) Describe the working of half adder.

15. (a) Discuss about the need for data representation in Digital Computers.

Or

(b) Write a note on error detection codes.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Describe the steps involved in converting octal to hexa decimal number system. Also elucidate the conversion using $(23417)_8 = (\ ?\ )_{16}$ and $(631050)_8 = (\ ?\ )_{16}$.

Or

(b) Simplify using Karnaugh's map.

$F(A, B, C, D) = \Sigma m(0, 1, 2, 4, 5, 7, 8, 10, 11, 13, 14)$.

17. (a) Explain the working of Master slave flip flop.

Or

(b) Describe the circuit of multiplexer and demultiplexer.

18. (a) Explain the working of 4-bit parallel binary adder.

Or

(b) With suitable examples discuss in detail about fixed point and floating point representations.

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C–1077

Sub. Code
96433

B.Sc. DEGREE EXAMINATION, NOVEMBER 2019

Third Semester

Computer Science

JAVA PROGRAMMING

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What are the benefits of OOP?

2. What is the purpose of JVM?

3. List the precedence of Arithmetic operators.

4. Which statement is called as decision making statement?

5. Define a class.

6. What are wrapper classes?

7. How will you hide a class?

8. What are interfaces?

9. State the difference between web page and web site.

10. Write down the syntax of Applet tag.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Describe the evolution of JAVA

Or

(b) Write a simple program in JAVA and explain its structure.

12. (a) Write a note on type conversion used in JAVA.

Or

(b) With suitable example explain the working of Switch statement.

13. (a) What are constructors? Explain with examples.

Or

(b) Describe about the creation and data storing of two dimensional arrays.

14. (a) What are threads? Explain how to create threads in JAVA.

Or

(b) Describe the syntax of Try.. Catch statement.

15. (a) How applets differ from traditional applications? Explain.

Or

(b) Write a program to draw a polygon in JAVA.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Describe the basic concepts of Object oriented programming.

Or

(b) Explain the working of FOR loop with example.

17. (a) Discuss in detail about string handling in JAVA.

Or

(b) How will you implement multiple inheritance in JAVA? Explain.

18. (a) Discuss about packages with examples.

Or

(b) With suitable examples discuss in detail about Applets.

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C–1078

Sub. Code
96434

B.Sc. DEGREE EXAMINATION, NOVEMBER 2019

Third Semester

Computer Science

DATA STRUCTURES AND ALGORITHMS

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. State the advantages of using Data structures.
2. What do you mean by traversal?
3. Convert (A+B) * (C+D) to postfix notation.
4. What is difference between top and front pointers?
5. List the non linear data structures.
6. What do you mean by hashing?
7. What is divide and conquer principle?
8. What is the need for partition element?
9. Describe the Omega notation
10. What is the purpose of theta notation.

Part B $(5 \times 5 = 25)$

Answer **all** questions.

11. (a) Write a note on linear data structures

Or

(b) Explain the procedure to sort a list.

12. (a) Describe the operations performed in a stack.

Or

(b) How will your represent queue? Explain.

13. (a) What is the difference between trees and binary trees? Explain.

Or

(b) Write a note on binary search trees.

14. (a) Describe the algorithms to sort given set of animals using Tree sort.

Or

(b) Explain the procedure for searching an element using liner search? Explain.

15. (a) Explain about pseudo codes.

Or

(b) Write a note on Big oh notation.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Describe the procedure to merge lists..

Or

(b) Explain in detail about linked lists.

17. (a) Discuss in detail about traversing a binary tree.

Or

(b) Describe the Dijkstra's algorithm.

18. (a) Explain the working of Selection sort.

Or

(b) Explain in detail about the complexity of algorithms.

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C–1079

Sub. Code
96437

B.Sc. DEGREE EXAMINATION, NOVEMBER 2019

Third Semester

Computer Science

Allied - APPLIED PHYSICS – I

(2016 Onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define equipotential surface.

2. Give the types of capacitor with examples.

3. Define magnetic flux density.

4. Explain susceptibility.

5. Sate Laplace' law

6. State Flemings left hand rule.

7. Define mutual inductance.

8. What is mean by induced emf.

9. What are double components.

10. Draw the circuit for choke parallel resonance.

Part B (5 × 5 = 25)

Answer **all** questions

11. (a) State Gauss theorem and give its applications.

Or

(b) Differentiate capacitance in series and parallel.

12. (a) Define magnetization and Intensity of magnetization.

Or

(b) Give the relation between potential and intensity.

13. (a) Discuss shortly about Carey Foster's bridge with a neat diagram.

Or

(b) Write the theory of moving coil galvanometer.

14. (a) Discuss about the determination of self inductance.

Or

(b) Write a short note on coefficient of coupling.

15. (a) Discuss the power in A/C circuits.

Or

(b) Derive the power factor derivation.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Define capacitor and its principle. Write a short note on spherical and cylindrical capacitors.

Or

(b) Finding coerivity, retentivity and energy loss from hysteresis loop (PH curve) – Explain.

17. (a) Discuss in detail

(i) Fleming's left hand rule

(ii) Flemings right hand rule

Or

(b) What is eddy current? Give the detailed note on theory of Transformer.

18. (a) Explain about short note on:

(i) Selectively and sharpness of Resonance

(ii) Oscillatory discharge of a condenser

Or

(b) Define capacitance of a capacitor and explain the capacitors in series and parallel circuits.

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