C–0517	Sub. Code
	96432

B.Sc. DEGREE EXAMINATION, NOVEMBER 2023

Third Semester

Computer Science

DIGITAL COMPUTER FUNDAMENTALS

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** the questions.

1. Why number system is important in digital computer?

2. What is the use of complements in computer systems?

3. What is meant by combinational circuit?

4. What are the most commonly used Boolean operators?

5. What is the purpose of a decoder in digital system?

6. Why do we need multiplexer?

7. What is the full form of ALU?

8. How many inputs are there in half adder?

9. How characters are represented in a computer?

10. What is data type in computer system?

Part B (5 × 5 = 25)

Answer **all** the questions.

11. (a) How do you convert from decimal to binary number system? Explain with examples.

Or

(b) What is hexadecimal number system? Discuss with examples.

12. (a) Bring out the applications of Boolean algebra.

Or

(b) How do you simplify product of sum? Discuss with examples.

13. (a) What is JK Flip flop in digital electronics? Explain how it solves the undefined state of SR flip-flop.

Or

(b) Write a brief note on binary counter with a neat structure.

14. (a) What is half subtractor? Explain briefly with examples.

Or

(b) What is parallel Binary adder? Discuss about the working of a 4-bit parallel binary adder.

15. (a) How many types of complements are there in digital electronics? Explain.

Or

(b) Write short notes on floating point representation with examples.

Part C (3 × 10 = 30)

Answer **all** the questions.

16. (a) What are character codes? Explain in detail about its types with examples.

Or

(b) What is DeMorgan's theorem and how it is used to simplify various Boolean algebra expressions? Explain in detail with examples.

17. (a) How do you simplify Boolean expression using Karnaugh map? Discuss in detail with examples.

Or

(b) What are sequential circuits? Explain in detail about its operations with a neat structure.

18. (a) How do you construct a full adder? Elaborate on its working procedure and its applications.

Or

(b) What are error detection codes? Discuss in detail about its types with examples.

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C–0518	Sub. Code
	96433

B.Sc. DEGREE EXAMINATION, NOVEMBER 2023

Third Semester

Computer Science

JAVA PROGRAMMING

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define the term World Wide Web.

2. Write down the structure of a java program.

3. What is conditional operator?

4. Draw the flowchart for else if statement.

5. Differentiate between final class and final variable.

6. What is the use of access specifiers?

7. Write a note on finally keyword.

8. How to implement runnable interface?

9. Write code to draw a line.

10. How an applet differs from application?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Write a Java program to display the square value of a number using command line arguments.

Or

(b) Explain briefly about Java statements.

12. (a) Write a Java program to display factorial of a number using for loop.

Or

(b) Discuss in detail about switch statement, its syntax and usage.

13. (a) Narrate the use of Wrapper class with an example.

Or

(b) Define the following string handling functions: (i) equals (ii) lastindexOf (iii) toLowerCase (iv) substring(m, n) (v) length

14. (a) How a class can be accessed from different packages? Explain.

Or

(b) Illustrate about synchronization of a thread.

15. (a) Write the procedure that passes parameters to the applet.

Or

(b) Write an applet program to draw a traffic signal light with three colors.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Discuss in detail about data types in Java.

Or

(b) Differentiate between break and continue statements with suitable example.

17. (a) Illustrate method overloading with an example program.

Or

(b) Write a Java program to add two matrices.

18. (a) How user can create a new package and use it? Explain.

Or

(b) Elaborate on drawing, handling arc and polygon graphics components.

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C–0519	Sub. Code
	96434

B.Sc. DEGREE EXAMINATION, NOVEMBER 2023.

Third Semester

Computer Science

DATA STRUCTURES AND ALGORITHMS

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Define linear data structure and give two examples.

2. Why do we need data structures?

3. Convert the following infix expression $(A+B)\ \hat{}\ C\ \hat{}\ D^{*}E-F/G$ into postfix expression.

4. What are the applications of a linked list?

5. Define the term strictly binary tree.

6. What are the characteristics of a good hash function?

7. Differentiate between merge sort and quick sort.

8. Write worst case and best case complexity of linear search.

9. Differentiate between algorithm and Pseudo code.

10. Derive the Big O notation for $f(n)=n^2+2n+5$.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Explain the implementation of a list.

Or

(b) How to perform insertion and deletion operations on list? Explain with suitable example.

12. (a) What is stack? Explain the implementation of a stack.

Or

(b) Explain about Circular Queues through example.

13. (a) Explain various representations of Binary Tree.

Or

(b) Create a Binary Search Tree for the following data and write the in-order, Preorder and post-order tree traversal representations.

50,60,25,40,30,70,35,10,55,65,5

14. (a) Write the steps to find the element "35" in the following array: {10,13,21,32,35,44,55} using (i) linear search (ii) binary search.

Or

(b) Explain general method for divide an conquer technique.

15. (a) Define the term Pseudo code. How to write Pseudo code? What are the advantages of Pseudo code?

Or

(b) Discuss about the time and space complexities of an algorithm.

Part C (3 × 10 = 30)

Answer all questions.

16. (a) Explain in detail about different types of Data Structure.

Or

(b) What is Doubly Linked List? Write an algorithm to insert and delete a node in Doubly Linked List.

17. (a) Discuss on queue and its operations.

Or

(b) Explain the following Tree terminologies:

(i) Root node (ii) Children (iii) Siblings (iv) Level (v) Ancestor (vi) Leaf Node (vii) Height of Binary tree.

18. (a) Illustrate the insertion sort and bubble sort algorithms on input 30,20,10,60,70,40.

Or

(b) Describe the different notations used to describe the asymptotic running time of an algorithm.

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C–0520	Sub. Code
	96437

B.Sc. DEGREE EXAMINATION, NOVEMBER 2023

Third Semester

Computer Science

APPLIED PHYSICS – I (Allied)

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Define electric flux. State its equation related with electric intensity.

2. State Gaurs' law of electrostatics.

3. Define magnetic permeability and susceptibility.

4. Which physical quantity has the unit wb/m^2? Is it a scalar or vector quantity.

5. State Ohm's law.

6. Explain Fleming's left hand rule.

7. The induced emf is also called back e.m.f. why?

8. Define self inductance.

9. An alternating voltage of 10 volts at 100 Hz is applied to a choke of inductance 5 henry and of resistance 200 ohms. Find the power factor of the coil.

10. Define resonant frequency.

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

Answer **all** questions.

11. (a) Apply Gauss' law to calculate the electric field intensity due to a charged sphere.

Or

(b) Write short notes on types of capacitors.

12. (a) Explain the theory behind the loss of energy due to Hysteres is and mention its uses.

Or

(b) List down the properties of dia, para and ferromagnetic materials.

13. (a) Explain the conversion of galvanometer into ammeter and voltmeter.

Or

(b) Derive an expression for force of attraction or repulsion between two parallel conductors.

14. (a) Explain in detail the theory of transformer.

Or

(b) Describe a method of determining the mutual inductance between two coils of wire.

15. (a) An electric lamp which runs at 100 volts DC and 10 ampere current is connected to 220 volts 50 Hz A.C mains calculate the inductance of the choke in the circuit.

Or

(b) Discuss about sharpness of resonance of a series LCR circuit using resonance curves.

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

Answer **all** questions.

16. (a) Derive an expression for the combined capacitance of three capacitors connected in series and parallel.

Or

(b) What is a magnetic shell? Find an expression for the potential at any point due to a this magnetic shell.

17. (a) Describe the construction of a moving coil Ballistic galvanometer.

Or

(b) Using Kirchoff's law, derive an expression for the sensitivity of Wheat stone's bridge. How do the positions of cell and galvanometer affect the sensitivity.

18. (a) (i) Obtain the relation between induced emf and mutual inductance. (7)

(ii) What is meant by coefficient of coupling? (3)

Or

(b) Explain and compare the functions of series resonant circuit and parallel resonant circuit.

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C–0521	Sub. Code
	96451

B.Sc. DEGREE EXAMINATION, NOVEMBER 2023

Fifth Semester

Computer Science

WEB TECHNOLOGY

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Expand the term HTML and write its purpose.

2. How do you give a line break between text on a web page? Write the tag to do so.

3. Write JavaScript code to add two input numbers.

4. What is the use of apply () method?

5. What is the difference between selection and repetition structure?

6. Write the syntax of JavaScript function.

7. What is JavaScript identifier? How to declare it?

8. Write the use of toString() method.

9. List any four VB script functions.

10. What are the main properties of an input box?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Explain table tag in HTML with illustrations.

Or

(b) Explain the concept of Frames in HTML.

12. (a) Elaborate on memory management in JavaScript.

Or

(b) How will you pass arrays to a function? Explain with code.

13. (a) Discuss about the selection structures in JavaScript.

Or

(b) Explain logical operators in JavaScript.

14. (a) Discuss in detail about recursive function in JavaScript.

Or

(b) Explain about Boolean Object through an example program.

15. (a) Bring out the precedence of operators in VBScript.

Or

(b) Explain Code flow control in VB script.

Part C

$(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Illustrate different types of list in HTML.

Or

(b) Explain decision making statements in JavaScript.

17. (a) Explain in detail about user defined functions in JavaScript.

Or

(b) Detail on the following:

(i) Math object

(ii) String object.

18. (a) Explain the use of all the operators in VBScript.

Or

(b) Write VBScript code to complete Simple Interest using P, N, R values in Text Boxes. Display the result in 4th Text Box.

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C–0522	Sub. Code
	96452

B.Sc. DEGREE EXAMINATION, NOVEMBER 2023

Fifth Semester

Computer Science

OPERATING SYSTEMS

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is operating system and give example?

2. What is hardware in OS?

3. What is processor management?

4. Define deadlock.

5. Why is concurrent processing needed?

6. What is pipelining?

7. What are the activities of file management in OS?

8. How does OS interacts with file systems?

9. What is Unix operating system?

10. What language does Unix use?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) What is fixed partitioning in operating system? Explain with a neat structure.

Or

(b) What is best fit in OS? Discuss in brief along with its advantages.

12. (a) What is process scheduling in OS? Explain with a neat structure.

Or

(b) Write a brief note on cache memory.

13. (a) What is the use of cooperating processes in OS? Discuss.

Or

(b) How do you manage I/O request in OS? Give a brief note about different categories.

14. (a) Discuss in brief about the types of file manager.

Or

(b) What is distributed operating system? Discuss about its types with a neat structure.

15. (a) Bring out the features of Unix operating system.

Or

(b) What is processor management in Linux? Discuss.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Define allocation and deallocation in memory. Discuss in detail about First – Fit allocation with a neat structure.

Or

(b) Elaborate in detail about paged memory allocation with a neat structure.

17. (a) What is job scheduling and give its types? Explain any one with a neat structure.

Or

(b) What is multiprocessing? Discuss in detail about its types with a neat structure.

18. (a) What is data compression in OS? Elaborate in detail about loss less data compression.

Or

(b) Discuss in detail with neat structure about the components of Unix with a neat structure.

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C–0523	Sub. Code 96453

B.Sc. DEGREE EXAMINATION, NOVEMBER 2023.

Fifth Semester

Computer Science

SOFTWARE ENGINEERING

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Define the term: Software Engineering.

2. Write any four factors that influences the quality and productivity.

3. What is project estimation?

4. What is meant by structural analysis?

5. Differentiate real time and distributed design.

6. What do you mean by Inspection?

7. What is the purpose of Integration testing?

8. What is called black box testing?

9. State the major issues for code inspection and reviews.

10. At what stage, Formal technical review is carried out?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Bring out the quality factors in software project.

Or

(b) Explain the important activities of Project Planning.

12. (a) Explain the Expert judgment method of cost estimation.

Or

(b) Explain the format of software requirement specification.

13. (a) Compare data flow diagram with structured charts.

Or

(b) Discuss on standards and guidelines for coding.

14. (a) Explain the process of Unit testing.

Or

(b) Write about software maintenance tools and techniques.

15. (a) Briefly explain the software quality concepts.

Or

(b) Outline the SQA plan.

Part C

$(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Explain the Phased model of the software life cycle.

Or

(b) How will you plan the development process? Explain.

17. (a) Explain any two software cost estimation techniques.

Or

(b) Explain the software design notations and design techniques.

18. (a) Explain the following testing strategies:

(i) White box testing

(ii) Validation testing.

Or

(b) Explain about software reviews.

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C–0524	Sub. Code
	96454A

B.Sc. DEGREE EXAMINATION, NOVEMBER 2023.

Fifth Semester

Computer Science

MULTIMEDIA AND ITS APPLICATIONS

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** the questions.

1. What is multimedia data?

2. What is the difference between synchronous and asynchronous mode of transfer?

3. What are the types of sound?

4. What are the components of MIDI in multimedia?

5. Why do we use animation?

6. What is video signal representation?

7. What is compression ratio in multimedia?

8. What is JPEG compression quality?

9. What are multimedia resources?

10. What for graphics editors are used?

Part B (5 × 5 = 25)

Answer **all** the questions.

11. (a) Bring out the characteristics of multimedia systems.

Or

(b) Brief on information unit in multimedia.

12. (a) What is speech synthesizer? How it works?

Or

(b) What are the different ways of image representation? Explain.

13. (a) Write short notes on conventional television system with its features.

Or

(b) What are the steps to animate an object in multimedia? Explain

14. (a) Bring out the differences between lossless and lossy compression.

Or

(b) What is hierarchical mode? Explain with a neat structure.

15. (a) What is the job of sound editor? Discuss about different types of audio editing software.

Or

(b) What is hypermedia in multimedia system? List out its various application fields.

Part C

$(3 \times 10 = 30)$

Answer **all** the questions.

16. (a) What are multimedia authoring tools? Discuss in detail about its types with an example.

Or

(b) What are the four functions of image analysis? Explain in detail with a neat structure.

17. (a) What is computer animation? Discuss in detail about various animation techniques with illustrations.

Or

(b) Explain in detail about various animation languages in multimedia.

18. (a) What do you mean by video encoding? Discuss in detail with a neat architecture.

Or

(b) What is virtual reality? Elaborate in detail about its applications in various fields.

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C–0525	Sub. Code 96454B

B.Sc. DEGREE EXAMINATION, NOVEMBER 2023.

Fifth Semester

Computer Science

TRENDS IN COMPUTING

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. What are the applications of Grid Computing?

2. What are Data Grids?

3. Define Web 2.0.

4. What do you mean by SaaS?

5. Define Web Services.

6. List the types of Threats for Cloud data.

7. Define Artificial Neural Network.

8. What are Fuzzy membership functions?

9. Define Tournament Selection in Evloutionary Algorithm.

10. What are the operators in Genetic Algorithm?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Describe in brief about the application areas of Cloud computing.

Or

(b) Elucidate the Distributed computing method with suitable illustration.

12. (a) Write short notes on Components of Cloud computing.

Or

(b) Write about the steps involved in the implementation of Infrastructure as a Service.

13. (a) List down the advantages and disadvantages of Cloud Data Storage.

Or

(b) Describe in detail about the Service Oriented Architecture.

14. (a) Write short notes on Neural Networks.

Or

(b) Describe Fuzzy Set Functions with suitable illustration.

15. (a) Distinguish between the Traditional Vs Genetic Algorithm.

Or

(b) Write short notes on Mutation Operation in Genetic Algorithm Life Cycle.

Part C

$(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Explain in detail about the Architecture of Distributed Computing models with neat Sketch.

Or

(b) What are the various Cloud Deployment Tools available? Explain in detail.

17. (a) Explain in detail with proper illustration, Disaster Recovery using Cloud Data Storage.

Or

(b) Describe in detail with proper illustration, the working of Fuzzy membership functions.

18. (a) Elucidate with proper example, Supervised Neural Network.

Or

(b) Describe with neat sketch Genetic Algorithm process.

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