B.Sc. DEGREE EXAMINATION, APRIL 2025

Fifth Semester

Computer Science

RELATIONAL DATABASE MANAGEMENT SYSTEMS

(CBCS – 2022 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **all** questions.

1. What is meant by database management system?

2. Draw symbols for representing multivalued attribute and composite attribute in ER diagram.

3. Define normalization.

4. What is a candidate key?

5. Give an advantage of distributed database compared to centralized database.

6. How parallel database works?

7. Define foreign key with suitable example.

8. Define view.

9. Why PL/SQL is called procedural language?

10. How to write an if else block in PL/SQL?

Answer **all** questions choosing either (a) or (b).

11. (a) Discuss about the database users in detail.

Or

(b) Explain the database languages: DDL,DML,DCL.

12. (a) What is Functional Dependency? Discuss on Armstrong's inference rules.

Or

(b) Given R = (A, B, C, G, H, I) and a set of functional dependencies
$F = \{A \rightarrow B A \rightarrow C C G \rightarrow H C G \rightarrow I B \rightarrow H\}$ determine the closure for F.

13. (a) Why might a client choose to subscribe only to the basic infrastructure as a service model rather than to the services offered by other cloud service models?

Or

(b) Discuss on the difference between homogeneous and federated distributed database systems.

14. (a) Create the following tables, add data and display all rows for salary greater than 5,000.

T1 (Empno, Ename, Salary, Designation), T2 (Empno, Deptno.).

Or

(b) Create the following table, add 5 rows and retrieve the marks of the student with roll no 20.

Exam (rollno, subject_code, obtained_marks, paper_code)

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15. (a) Explain database triggers and cursors.

Or

(b) Write a PL/SQL procedure to print all even numbers from 1 to n.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. What does ER model mean? Specify all its Notations with example.

17. Why do we need normalization? Explain INF, 2NF, 3NF, BCNF with example.

18. Discuss in detail about inter query parallelism and intra query parallelism.

19. Discuss on various user privileges and roles in database.

20. Explain stored procedures and stored functions.

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B.Sc. DEGREE EXAMINATION, APRIL 2025

Fifth Semester

Computer Science

PYTHON PROGRAMMING

(CBCS – 2022 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **all** questions.

1. Differentiate between the following operator with the help of examples: / and %.

2. Write Python statements for the following equation

    $$root1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$$

3. Draw the Flow diagram of if statement.

4. Define string slicing.

5. Justify "Tuples are immutable".

6. How to slice a list in Python?

7. Define composition.

8. Compare class and object.

9. What is the use of histogram?

10. What is the role of malplotlib?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Develop Python functions to produce the following output.

```
        *
     *  *  *
  *  *  *  *  *
     *  *  *
        *
```

Or

(b) Consider the following function:

def nMultiple(a 0, num = 1):

return a * num

What will be the output produced when the following calls are made:

1. nMultiple(5)

2. nMultiple(5, 6)

3. nMultiple(num = 7)

4. nMultiple(nurn = 6, a = 5)

5. nMultiple(5, num = 6)

12. (a) With suitable example explain general format of *for* statement

Or

(b) Write a python program to find the given number is odd or even.

2 **S–6973**

13. (a) Describe the following:

    (i) Creating the list

    (ii) Accessing values in the lists.

    Or

    (b) Write a code to illustrate try and except statements in Python.

14. (a) Write a class with following criteria:

    Class name : Flower

    Objects : lilly, rose, hibiscus

    Properties : price, color, smell

    Methods: get( ), display( )

    Or

    (b) What is inheritance? Illustrate types of inheritance with python code.

15. (a) Write a short note on graphical objects.

    Or

    (b) Briefly explain 3D objects.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Write a function area Triangle that takes the lengths of three sides: side1, side2, and side3 of the triangle as the input parameters and returns the area of the triangle as the output. Also, assert that sum of the length of any two sides is greater than the third side. Write a function main that accepts inputs from the user interactively and computes the area of the triangle using the function area Triangle.

3

S–6973

17. Implement Python program to find sum of natural numbers.

18. Describe the built in functions with Tuples.

19. How do we achieve code reusability in python? Write a python code to Explain code reusability.

20. Write a program that shows the notion of a rocket.

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S–6973

S–6974	Sub. Code 22BCE5C3

B.Sc. DEGREE EXAMINATION, APRIL 2025

Fifth Semester

Computer Science

SOFTWARE ENGINEERING

(CBCS – 2022 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **all** questions.

1. What is the prime objective of software engineering?

2. What is Trivial Project?

3. Define Bottom up cost estimate.

4. Define WBS.

5. What are the types of estimation?

6. Define Abstraction.

7. Define Syntactic Model

8. What is the importance of Unit test?

9. What is Corrective maintenance?

10. List intangible cost of S/W maintenance.

Answer **all** questions choosing either (a) or (b).

11. (a) Narrate Product feasibility review.

Or

(b) Enlist the issues which are Concern with Software Engineers.

12. (a) Explain Expert Judgement cost estimation technique.

Or

(b) Write a short note on Software requirement specification.

13. (a) Describe the Structural Partitioning.

Or

(b) Narrate the characteristics of modules.

14. (a) Enlist rules for writing comments.

Or

(b) What are the area of Efficiency should be taken care when a programming language is developed?

15. (a) What are the different project management tools? Explain them.

Or

(b) Write a short note on static analysis tools.

S–6974

Answer any **three** questions.

16. Elaborate on Programming team structure.

17. Briefly discuss Cost estimation models.

18. Describe commonly used design notations.

19. Explain verification and validation techniques.

20. Describe different Analysis and design tools.

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B.Sc. DEGREE EXAMINATION, APRIL 2025.

Fifth Semester

Computer Science

COMPUTER GRAPHICS

(CBCS – 2022 onwards)

Time : 3 Hours   Maximum : 75 Marks

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

Answer **all** questions.

1.   Define aspect ratio.

2.   Differentiate monochrome and color CRT.

3.   What are the applications of line drawing algorithms?

4.   Define DVST.

5.   What is the use of image scanners?

6.   Define output primitives.

7.   Write the 2-D Rotation transformation matrix.

8.   What are the different Colour fill techniques?

9.   What is the need for Homogenous coordinate system?

10. Differentiate line and point clipping.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Write a note on Random scan.

Or

(b) Describe Pixel addressing.

12. (a) Illustrate Bresenhams Line Drawing Algorithm.

Or

(b) Explain Graphics Monitors and Workstations.

13. (a) Explain Midpoint Circle Generating Algorithm.

Or

(b) Describe Output primitives briefly.

14. (a) Describe General Pivot-Point Rotation.

Or

(b) What is Affine Transformation? Explain.

15. (a) Describe Two-Dimensional Viewing Functions.

Or

(b) Write a short note on Window-to-Viewport Coordinate Transformation.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Illustrate the Raster Scan Systems with a neat diagram.

17. Explain Ellipse Generating Algorithm.

S–6975

18. Explain Matrix Representations and Homogeneous Coordinates.

19. Describe General Composite Transformations and Computational Efficiency with examples.

20. Explain Cohen-Sutherland Line Clipping detail.

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S–6975

S–6976	Sub. Code
	22BCE6E1

B.Sc. DEGREE EXAMINATION, APRIL 2025.

Sixth Semester

Computer Science

Elective – COMPUTER NETWORKS

(CBCS – 2022 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **all** questions.

1. What is unicast and multicast in a computer network? Provide one example.

2. How does a switch in Ethernet differ from a hub?

3. Differentiate the Guided and Unguided Transmission Medium.

4. What is soft handoff and hard handoff in CDMA?

5. What is the role of Hamming code in detecting error in data transmission?

6. Define framing?

7. Differentiate Adaptive and Non-adaptive routing.

8. List the Socket primitives for TCP?

9. What is cryptanalysis and cryptology?

10. What is public key cryptography?

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

Answer **all** questions, choosing either (a) or (b).

11. (a) What are the advantages of using a wired LAN over a wireless LAN?

Or

(b) Describe the role of routers in a WAN with diagram?

12. (a) Explain Bandwidth limited signal in the theoretical basis for data communication?

Or

(b) Explain any two types of guided transmission media used in physical layer communication.

13. (a) Explain byte stuffing and bit stuffing with suitable example.

Or

(b) Explain in detail about the four error correcting codes.

14. (a) Explain the services provided to the transport layer?

Or

(b) What is the count to infinity problem in routing, and how does it affect network performance?

15. (a) Explain DNS Name Space and Domain Resource records.

Or

(b) Explain what dynamic web pages are and how they differ from static web pages in terms of functionality and interaction.

S–6976

Part C   (3 × 10 = 30)

Answer any **three** questions.

16. Explain in detail about functions of TCP/IP Network model.

17. Explain Electromagnetic Spectrum and Radio Transmission in wireless transmission.

18. Explain the key assumption of Dynamic Channel Allocation.

19. Discuss the role of Dijkstra's Shortest Path First (SPF) algorithm in Link-State Routing Protocols. Explain how it contributes to route calculation and network efficiency.

20. Explain in detail about function and structure of E-mail protocol including architecture and protocol?

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S–6976

S–6978	Sub. Code
	22BCE6E3

B.Sc. DEGREE EXAMINATION, APRIL 2025.

Sixth Semester

Computer Science

Elective – MOBILE COMPUTING

(CBCS – 2022 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **all** questions.

1.   List the advantages of mobile computing.

2.   What are the different kinds of mobility?

3.   Differentiate DSSS and FHSS.

4.   What are the functions of OSS in GSM?

5.   What is COA? How is it assigned?

6.   Who can be Home Agent'? What is the role played by it?

7.   What is a Datagram?

8.   State any two reasons for routing failures.

9.   What is reverse tunneling?

10.   What is Ingress filtering?

Part B   (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the architecture of a mobile computing environment. Define the functions of the presentation tier, application tier and data tier of mobile computing environment.

Or

(b) What is a hidden terminal? What problem does it create during wireless communications? Explain your answer using a suitable schematic diagram.

12. (a) What is spread spectrum technique? What are the types of it? Explain.

Or

(b) Describe the security services provided by GSM.

13. (a) What are the types of registration in mobile IP? Explain.

Or

(b) What is agent advertisement? Why is it needed? How is it done?

14. (a) Write short notes on IP-in-IP encapsulation.

Or

(b) What is decapsulation? Who does it? Explain this.

15. (a) How is smooth handoff done'? Explain.

Or

(b) Write short notes on broadcast preference extensions.

S–6978

Answer any **three** questions.

16. Explain the different applications of wireless networks and mobile communications with suitable architectures.

17. Explain the system architecture of GSM with a neat sketch.

18. Explain the operation of mobile IP with the help of a suitable schematic diagram and by using suitable examples.

19. How is route optimization done'? Explain with message formats.

20. State any seven features of IPv6 to support mobility.

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S–6978

S–6979	Sub. Code
	22BCE6E4

B.Sc. DEGREE EXAMINATION, APRIL 2025.

Sixth Semester

Computer Science

Elective – DATA MINING AND DATA WAREHOUSING

(CBCS – 2022 onwards)

Time : 3 Hours　　　　　　　　Maximum : 75 Marks

Part A　　　　　　$(10 \times 2 = 20)$

Answer **all** questions.

1.　What is a data warehouse?

2.　Differentiate: Fact and dimension data in a data warehouse.

3.　What is a meta data?

4.　How to identify an ad hoc query in a data warehouse'?

5.　Differentiate: prediction and classification models.

6.　Describe time series analysis using relevant examples.

7.　List the models used for summarization

8.　Define pattern matching.

9.　Define an association rule.

10.　How to find a frequent item set in a data set?

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

Answer **all** questions, choosing either (a) or (b).

11. (a) Why the data to the data warehouse should be cleaned and transformed? Describe the process in detail.

Or

(b) Explain in detail about the query management in a data warehouse.

12. (a) Write about the processes behind user access, query scheduling and query monitoring in a data warehouse.

Or

(b) Using an architecture diagram, specify the role of process managers in a data warehouse.

13. (a) Discuss the sequence of steps to follow for the Knowledge Discovery process.

Or

(b) Describe any two social implications of data mining.

14. (a) Explain fuzzy sets and fuzzy logic.

Or

(b) Represent the usage of decision trees in the process of data analysis.

15. (a) How partitioning improves the efficiency of association rule mining? Justify.

Or

(b) Discuss the working model of incremental association rules.

S–6979

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Explain the process followed by a load manager in a data warehouse.

17. Present the various areas of system management which are crucial to the success of a data warehouse.

18. Discuss the basic descriptive data mining tasks.

19. Illustrate the role of genetic algorithms in the analysis of data.

20. Write about the advanced association rule techniques.

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S–6979

S–6980	Sub. Code
	22BCE6E5

B.Sc. DEGREE EXAMINATION, APRIL 2025.

Sixth Semester

Computer Science

Elective – .NET TECHNOLOGIES

(CBCS – 2022 onwards)

Time : 3 Hours   Maximum : 75 Marks

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

Answer **all** questions.

1.   What is the role of the Common Language Runtime (CLR) in the NET framework?

2.   Define metadata in the context of .NET assemblies.

3.   What is the purpose of an ADO. NET data adapter?

4.   Define the role of the ADO.NET data Reader object.

5.   What is the purpose of the Entity Framework in .NET applications?

6.   Define Object-Relational Mapping (ORM) in the context of Entity Framework.

7.   What is the purpose of the system .Web. UI namespace in ASP.NET?

8. Define data binding in the context of ASP.NET web forms.

9. What does MVC stand for in the context of ASP.NET?

10. Define the role of Razor in ASP.NET MVC.

Part B (5 × 5 = 25)

Answer **all** the questions.

11. (a) Discuss the difference between the Common Language Specification (CLS) and the Common Type System (CTS).

Or

(b) What are the core features of the .NET platform that support language integration?

12. (a) Explain how ADO.NET DataAdapter interacts with a DataSet and how it facilitates data manipulation.

Or

(b) Discuss the different types of ADO.NET command objects and their uses in executing SQL commands.

13. (a) Explain the role of database initializers in Entity Framework and provide examples.

Or

(b) Describe the differences between table splitting and entity splitting in Entity Framework, including their use cases.

14. (a) Compare and contrast ASP.NET Web Forms and Windows Forms in terms of their development approach and interaction with web services.

Or

(b) Explain how data binding and templates are used in ASP.NET to display and manage data on web forms.

S–6980

15. (a) Describe how ASP.NET MVC uses URL routing to direct requests to the appropriate controllers and actions.

Or

(b) Compare and contrast different types of helper methods used in ASP.NET MVC views and their benefits.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Discuss the architecture of the .NET framework, including the role of the Common Language Runtime (CLR), metadata, assemblies, and the Intermediate Language (IL). Explain how these components work together to support a common programming model across different languages.

17. Describe the ADO.NET architecture, focusing on the components such as Connection, Command, DtaAdapter, DataSet, DataTable, and DataReader. Explain how these components work together to facilitate data retrieval, manipulation, and updating in a .NET application. Include examples of how these components are used in a typical data access scenario.

18. Discuss the Entity Framework architecture, focusing on the various approaches to model creation such as Database First, Code First, and Code First with Data Annotations. Explain how these approaches handle database schema creation and updates, and how related entities are loaded and managed. Include examples of how entity splitting and table splitting are implemented and their impact on the data model.

3

19. Discuss the development of ASP.NET web applications and Windows Forms applications, focusing on the roles of System.Web.UI and System. Windows. Forms namespaces. Explain how each framework handles data binding, state management, and scalability. Include examples of how web services are integrated into both ASP.NET and Windows Forms applications, highlighting their respective approaches to interacting with these services.

20. Discuss the architecture of an ASP.NET MVC application, including the roles of controllers, action, views, and models. Explain how Razor is used for view rendering and the significance of URL routing in request processing. Additionally, describe how essential tools and features such as model binding, model validation, and filters contribute to the development of robust MVC application. Include examples to illustrate the integration of these components in a typical ASP.NET MVC application.

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S–6982	Sub. Code
	22BCE6E7

B.Sc. DEGREE EXAMINATION, APRIL 2025.

Sixth Semester

Computer Science

Elective – INTERNET OF THINGS

(CBCS – 2022 onwards)

Time : 3 Hours　　　　　　　　　　Maximum : 75 Marks

Part A　　　　　　$(10 \times 2 = 20)$

Answer **all** questions.

1. Define IoT architecture.

2. What is the role of data management in IoT?

3. Name two competitive technologies in IoT.

4. What are smart objects?

5. What is IP optimization?

6. Label the term constrained networks.

7. Write short note on generic web-based protocols.

8. Define CoAP.

9. Brief network analytics.

10. Explain the term big data.

Answer **all** questions, choosing either (a) or (b).

11. (a)   Outline the IoT functional stack in detail.

Or

(b)   discuss the impact of IoT on various industries.

12. (a)   Describe the MAC layer topology in IoT.

Or

(b)   Summarize he role of standardization and alliances in IoT.

13. (a)   Elaborate the role of profiles and compliance in IoT.

Or

(b)   Describe the process of IP adaptation for IoT.

14. (a)   Discuss the significance of generic web-based protocols in IoT.

Or

(b)   Enumerate the importance of application layer protocols in IoT.

15. (a)   Give the importance of machine learning in IoT applications.

Or

(b)   Explain the concept of edge streaming analytics.

S–6982

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Explain the impact of IoT on different sectors with examples and analyse the challenges in IoT and propose suitable solutions.

17. Examine the IEEE 802.15.4 standard and its significance in IoT.

18. Analyze the key advantages of using IP as the network layer in IoT.

19. Relate the concept of IoT application transport methods and their importance.

20. Evaluate the tools and technologies used for big data analytics in the context of IoT.

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S–6982

S–6983	**Sub. Code**
	22BCE6E8

B.Sc. DEGREE EXAMINATION, APRIL 2025

Sixth Semester

Computer Science

Elective – CLOUD COMPUTING

(CBCS – 2022 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **all** questions.

1.   What is cloud storage?

2.   Define Cloud services.

3.   Discuss advantages of cloud computing.

4.   What is meant by On-demand Computing.

5.   Define Contact List.

6.   Write a note on To-Do list.

7.   Explain the concept of Project Management.

8.   What is the role of Calendars in cloud computing.

9.   Define Blogs.

10.   List out web conference tools.

Answer **all** questions choosing either (a) or (b).

11. (a) Write a note on the history of cloud computing.

Or

(b) Explain the disadvantages of cloud computing.

12. (a) Compare SaaS and PaaS.

Or

(b) Write a short note on Google App Engine.

13. (a) Explain how cloud computing helps in collaborating on group projects.

Or

(b) Discuss the role of cloud computing in event management.

14. (a) Discuss the advantages of online scheduling applications.

Or

(b) Explain how cloud computing is used for task management.

15. (a) Describe the use of web-based communication tools in cloud computing.

Or

(b) Write a short note on collaborating via social networks.

S–6983

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Discuss how cloud works in various companies

17. Explain the role of cloud computing in developing web-based applications.

18. Illustrate how cloud computing facilitates collaboration on Schedules.

19. Describe the process of collaborating on databases and file sharing in cloud computing.

20. Explain the use of web conference tools in cloud-based collaboration.

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S–6983

B.Sc. DEGREE EXAMINATION, APRIL 2025

First Semester

Computer Science

PROGRAMMING IN C

(CBCS – 2022 onwards)

Time : 3 Hours　　　　　　　　　Maximum : 75 Marks

Part A　　　　(10 × 2 = 20)

Answer **all** questions.

1. Define token.

2. What is special operator?

3. Write a note on printf( ).

4. How does jump statement works in loop?

5. Write the syntax of two dimensional arrays.

6. Define Strings.

7. What is function call?

8. How to declare variable in structure?

9. Define Pointer.

10. How to close a file in C?

Answer **all** questions, choosing either (a) or (b).

11. (a) Write short notes on overflow and underflow data.

Or

(b) How to evaluate expressions? Explain.

12. (a) Write short notes on switch statement.

Or

(b) Write a program to generate Fibonacci Series in C.

13. (a) How to declare and initialize arrays? Example.

Or

(b) What are the string functions available in C? Explain.

14. (a) What are the types of arguments in function? Explain.

Or

(b) Write a note on size of structures.

15. (a) How to access variables using pointer? Explain.

Or

(b) What are the IO operations in files? Explain.

S–7320

Answer any **three** questions.

16. Write a detailed note on types of Operators with example.

17. Illustrate conditional statements with suitable example.

18. How to read and write strings in C program? Explain.

19. Write a note on :
    (a) Array of structure
    (b) Arrays within structures.

20. What are the error handling operations available in files? Explain.

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S–7320

S–7321	Sub. Code
	22BCEA1

U.G. DEGREE EXAMINATION, APRIL 2025

Computer Science

Allied – MS OFFICE

(CBCS – 2022 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **all** questions.

1.   Compare files and folders.

2.   What is taskbar?

3.   List the keyboard operations in MS Word.

4.   What is tool bar?

5.   Define Worksheet.

6.   Write a note on column freezing.

7.   How to create slideshow?

8.   List the formatting tools available in power point.

9.   Why do we need Database?

10.   What is query?

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Write the procedure to create new folder in windows.

Or

(b) How to share information between computers? Explain.

12. (a) Write short notes on wizards and template.

Or

(b) How to check spelling and thesaurus in MS Word?

13. (a) What are the various data types available in MS Excel?

Or

(b) How to enter formulae in MS Excel?

14. (a) Write the procedure to add graphics in presentation.

Or

(b) How do you create a presentation in power point? Explain.

15. (a) Write the steps to create table in MS Access.

Or

(b) Discuss the uses of forms in MS Access.

S–7321

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Explain in detail about the system tools in windows.

17. Write in detail about the creation and working of tables in MS Word.

18. Illustrate the working procedure of any two chart types in MS Excel.

19. Explain in detail about handouts in power point.

20. Discuss the steps to create database in MS Access.

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B.Sc. DEGREE EXAMINATION, APRIL 2025

Second Semester

Computer Science

OBJECT ORIENTED PROGRAMMING WITH C++

(CBCS – 2022 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **all** questions.

1.   Define symbolic constant.

2.   What is the use of manipulators?

3.   What is use of destructor in C++?

4.   Write down the syntax to create a class.

5.   What is the need of overloading operators?

6.   Define the Base and Derived classes.

7.   What is meant by pure virtual function?

8.   Define Stream.

9.   What is STL?

10.   What is the use of command line arguments?

Answer **all** the questions, choosing either (a) or (b).

11. (a)   Write down the structure of C++ program.

Or

(b)   Explain OOPS paradigm.

12. (a)   Explain Static class members with example.

Or

(b)   What is the need of constructor? How it is different from the member function?

13. (a)   Enlist the rules for over loading operators.

Or

(b)   How to define derived classes?

14. (a)   Write down the rules for virtual function?

Or

(b)   What are the types of formatted console i/o operations? Explain.

15. (a)   Briefly explain the templates.

Or

(b)   Write a C++ program to write "Welcome to C++" in a file. Then read the data from file and display it on screen.

S–7322

Answer any **three** questions.

16. Elaborate the usage of following with C++ program

    (a)   for

    (b)   while

    (c)   do - while.

17. Write a C++ program to find whether the entered number is even or odd using class.

18. Classify different forms of inheritance and explain them.

19. Write a C++ program demonstrating use of the pure virtual function with the use of base and derived classes.

20. Elaborate on file modes.

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S–7322

U.G. DEGREE EXAMINATION, APRIL 2025

Computer Science

Allied – DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION

(CBCS – 2022 onwards)

Time : 3 Hours   Maximum : 75 Marks

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

Answer **all** questions.

1. What is the binary equivalent for decimal number $(108.75)_{10}$?

2. What is an ASCII code?

3. State the associative property of boolean algebra.

4. Define multiplexer and demultiplexer.

5. Write the four rules of binary addition. Add these 4-bit numbers $(0101)_2$ and $(1001)_2$.

6. Draw the logic diagram for half adder.

7. List the basic computer registers.

8. What is the difference between hardwired control and micro-programmed control?

9. Write the three types of CPU organizations.

10. Draw the structure of memory hierarchy.

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

Answer **all** questions, choosing either (a) or (b).

11. (a) (i) Convert the given hexadecimal number to decimal and binary $(67AC.B4)_{16}$. (3)

    (ii) Convert $(367.254)_{10}$ into Excess-3 code. (2)

    Or

    (b) Implement the Boolean expression using basic gates

    (i) $Y = (A + C)(A + D')(A + B + C')$

    (ii) $Y = AC' + B'D + A'CD$.

12. (a) If $AB' + A'B = C$, Show that $AC' + A'C = B$.

    Or

    (b) Define decoder. Draw the block diagram and truth table for 3 to 8 decoder.

13. (a) Perform the subtraction

    (i) $X - Y$; and

    (ii) $Y - X$ by using 2's complement method for the given numbers $X = 1001101$ $Y = 0110100$.

    Or

    (b) Design a full adder circuits with necessary diagram.

14. (a) Describe the concept of address sequencing in micro-programmed control.

    Or

    (b) List various phases and draw a flowchart for the process of an instruction cycle.

2

15. (a) Write short notes on:

(i) Data transfer instruction

(ii) Data manipulation instruction.

Or

(b) Express in detail about parallel processing.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Show that if all the gate in two level OR – AND gate network are replaced by NOR gate, the output function does not change.

17. (a) Express the Boolean Function as Product of Sum Form $D = (A' + B)(B' + C)$. (5)

(b) Simplify the following boolean expression using K-Map method. (5)

$$F(A, B, C, D) = \sum {}_m (0, 2, 4, 5, 8, 14, 15) + \sum {}_d (7, 10, 13)$$

18. Discuss in detail about micro instruction code format and symbolic micro instructions with suitable example.

19. Analyze the various instruction formats in central processing unit and illustrate with an example.

20. Explain in detail about I/O interface with necessary diagrams.

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S–7323

B.Sc. DEGREE EXAMINATION, APRIL 2025

Third Semester

Computer Science

MICROPROCESSOR AND ITS APPLICATIONS

(CBCS – 2022 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **all** questions.

1. What is stack?

2. What is a subroutine program?

3. What is the use of status register?

4. Narrate the concept of virtual memory.

5. How many interrupt request (IRQ) lines does the 8259 interrupt controller support?

6. What is the function of the 8254 timer chip in the 8086 system?

7. What are some distinguishing features of ARM architecture?

8. Briefly explain the significance of instruction set design in microprocessor architecture.

9. What is the primary function of data transfer instructions in ARM architecture?

10. You are tasked with writing an ARM assembly language program to compute the factorial of a given integer input. Your program should accept an integer input from the user, calculate its factorial, and then output the result.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Compare Procedure and Macro.

Or

(b) How does the 8086 handle interrupts, and what steps are involved in executing an Interrupt Service Routine (ISR)?

12. (a) Draw and explain briefly the pin diagram of 8087 coprocessor.

Or

(b) Briefly explain about closely coupled system using 8086.

13. (a) Describe the process of digital-to-analog (D/A) conversion and its applications.

Or

(b) Compare and contrast parallel and serial communication interfaces in terms of speed, complexity and the number of wires required.

2

14. (a) Discuss the key characteristics of (Advanced RISC Machine) ARM processors, including their RISC-based instruction set, load-store architecture, and scalable design.

Or

(b) Tabulate the difference between 8085 and 8085 microprocessor.

15. (a) Briefly explain about 3-stage pipeline ARM organization with neat diagram.

Or

(b) Write an ARM assembly language program to calculate the sum of numbers from 1 to 10 and stores the result in register 'r3'.

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

Answer any **three** questions.

16. Explain the concepts of linking and relocation in the context of the 8086 microprocessor architecture.

17. Discuss in detail about system design using 8086 with block diagram and bus timing for read and write operation.

18. Examine the roles and functionalities of interrupt controllers and DMA controllers in 8086 microprocessor-based systems with neat diagram.

3   S–7324

19. You have been assigned to expand the instruction set of the MU0 microprocessor to support additional functionalities required for a specific application domain. Outline the process of designing and implementing new instructions for the MU0 architecture, considering factors such as opcode encoding, instruction format, and control logic modification.

20. Write and explain in detail about ARM data processing instructions with format and example.

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S–7325	Sub. Code
	22BCE3C2

B.Sc. DEGREE EXAMINATION, APRIL 2025

Third Semester

Computer Science

DATA STRUCTURES AND COMPUTER ALGORITHMS

(CBCS – 2022 onwards)

Time : 3 Hours　　　　　　　　Maximum : 75 Marks

Part A　　　　　　$(10 \times 2 = 20)$

Answer **all** questions.

1.　Define Axiomatization.

2.　Mention the basic operations that can be performed on a Stack.

3.　Write short notes on Abstract Data type (ADT).

4.　State the properties of a binary tree.

5.　List the Dynamic set Operations.

6.　What are the features of an efficient algorithm?

7.　Compare quick sort and merge sort.

8.　Name the Array based sets.

9.　Specify the general algorithm for greedy method control abstraction.

10.　Delineate principle of Optimality.

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

Answer **all** questions choosing either (a) or (b).

11. (a) Describe the differences between Depth-first search (DFS) and Breadth-first search (BFS).

Or

(b) Given the prefix for an expression. Write its postfix -*-+abc/ef-g/hi.

12. (a) Write an algorithm for push and pop operations on stack using Linked list.

Or

(b) What are threaded binary tree? Write an algorithm for inserting a node in a threaded binary tree.

13. (a) Discuss strategies for debugging and optimizing dictionary-based algorithms.

Or

(b) Illustrate any challenges or limitations associated with sets and disjoint sets in data structures and algorithms.

14. (a) Highlight any key data structures or operations are used within the algorithm and their significance.

Or

(b) Explain briefly an algorithm to implement a selection sort with suitable example.

2

S–7325

15. (a) Elaborate any alternative approaches or optimizations for solving the Knapsack problem, such as greedy algorithms or branch-and-bound techniques.

Or

(b) Enlighten the algorithmic steps involved in computing all pair's shortest paths using dynamic programming.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Explain how to evaluate arithmetic expressions using Stacks.

17. How to insert and delete an element into a binary search tree and write down the code? Discuss.

18. Describe potential optimizations to improve the efficiency of queue implementations.

19. Elucidate the concept of Divide and Conquer Method.

20. Evaluate the performance of traversal and search algorithms in different problem scenarios and data structures.

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3   **S–7325**

S–7326	Sub. Code
	22BCEA3

U.G. DEGREE EXAMINATION, APRIL 2025

Computer Science

Allied - OPERATING SYSTEM

(CBCS – 2022 onwards)

Time : 3 Hours　　　　　　　　　　Maximum : 75 Marks

Part A　　　　　　　　$(10 \times 2 = 20)$

Answer **all** questions.

1. What is spooling?

2. Define multi-threading.

3. What is TLB?

4. Compare physical and virtual address.

5. What is mutual exclusion?

6. Differentiate MS-DOS based window and NT based window.

7. List the features of Linux.

8. What is meant by cat command?

9. Compare grep and fgrep.

10. What is Shell?

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

Answer **all** questions choosing either (a) or (b).

11. (a) Differentiate personal computer and mainframe operating system.

Or

(b) Illustrate the processes states in detail.

12. (a) Discuss about Belady Anomaly in detail.

Or

(b) Write a detailed note on directories and its types.

13. (a) State the four necessary conditions for a deadlock.

Or

(b) What are the utility available in Linux? Explain.

14. (a) Discuss the commands for directories with example.

Or

(b) How to check free space in disk using Linux?

15. (a) Write short notes on

(i) find

(ii) sort commands with example.

Or

(b) What are the various types of shell? Explain.

2

S–7326

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Write a detailed note on Interprocess communication.

17. Explain in detail about the implementation issues of paging system.

18. Describe about Dijkstra's Bankers algorithm to avoid deadlock.

19. Discuss about the basic architecture of Linux system.

20. Write about Mathematical commands available in Linux with example.

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S–7326

B.Sc. DEGREE EXAMINATION, APRIL 2025

Fourth Semester

Computer Science

JAVA PROGRAMMING

(CBCS – 2022 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **all** questions.

1. What is the use of JDK?

2. What is meaning of automatic type conversion?

3. What is the use of continue statement?

4. List out the differences between while and do..while statement.

5. What are static methods?

6. Define abstract class.

7. What is the use of exception?

8. Differentiate exception and error.

9. Enlist the steps involved to execute and run an applet.

10. Write a method in Java applet to display a circle.

Part B   (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Justify "Java is Platform Independent".

Or

(b) Describe the Java program structure.

12. (a) With suitable example explain the mechanism of ternary operator.

Or

(b) Write a Java program to check whether the given number is positive or negative.

13. (a) Difference between method overloading and method overriding in java.

Or

(b) Explain Access Specifiers in java.

14. (a) Write about thread priority.

Or

(b) What are the different states of a thread? Explain.

15. (a) What is an applet? How do applets differ from an application programs?

Or

(b) Explain the paint( ), repaints, drawstring( ) methods.

2   **S–7327**

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

Answer any **three** questions.

16. Explain type casting with example.

17. Elaborate on branching statements.

18. Define Class, Method and Object. Show the syntax to define these in java.

19. Explain the following: try, catch, throw, throws, finally.

20. What are the major steps involved in embedding an Applet into a webpage using HTML? Give example.

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S–7328	Sub. Code
	22BCE4C2

B.Sc. DEGREE EXAMINATION, APRIL 2025

Fourth Semester

Computer Science

OPERATING SYSTEM

(CBCS – 2022 onwards)

Time : 3 Hours　　　　　　　　Maximum : 75 Marks

Part A　　　　　　(10 × 2 = 20)

Answer **all** questions.

1.　List the basic services provided by operating system.

2.　Define system calls.

3.　What does PCB contain?

4.　Define schedulers.

5.　Give the condition necessary for a deadlock situation to arise.

6.　What is a thread?

7.　Define Best fit.

8.　What is virtual memory?

9.　Enlist different types of directory structure.

10.　Write down the working principle of SSTF Scheduling

Part B (5 × 5 = 25)

Answer **all** the questions choosing either (a) or (b).

11. (a) State the operating system structure.

Or

(b) What are the various objectives and functions of Operating systems?

12. (a) Explain process State diagram.

Or

(b) What are the requirements that a solution to the critical section problem must satisfy? Explain.

13. (a) Evaluate FCFS CPU Scheduling algorithm for given Problem.

    Process   P1   P2   P3   P4

    Process Time   24   3   5   6

Or

(b) Write short notes on resource allocation graph.

14. (a) Write short note on Overlays.

Or

(b) What is thrashing? Enlist the problems of thrashing.

15. (a) Compare the various file access methods.

Or

(b) Write a detailed note on free space management.

2

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Part C (3 × 10 = 30)

Answer any **three** questions.

16. Explain briefly different types of System calls.

17. What is Semaphore? Explain producer consumer problem using semaphore.

18. Discuss about deadlock recovery technique.

19. What is Segmentation? Explain with Example.

20. Discuss in detail File operations

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S–7328

S–7329	Sub. Code
	22BCEA4

U.G. DEGREE EXAMINATION, APRIL 2025

Computer Science

Allied – INTERNET AND WEB DESIGN

(CBCS – 2022 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **all** questions.

1. What is the primary purpose of the Internet? Explain its applications

2. Differentiate between E-mail, telnet, and FTP in terms of their functionalities

3. Why is HTML essential for creating web pages?

4. How can you format text using HTML tags?

5. How do you create a simple table in HTML?

6. What is the purpose of merging table cells?

7. What is JavaScript, and how does it enhance web interactivity?

8. Differentiate between Client-side JavaScript and Server-side JavaScript.

9. Define the Document Object Model (DOM)

10. Explain event is in the context of web development.

Part B (5 × 5 = 25)

Answer **all** the questions choosing either (a) or (b).

11. (a) How do Internet Service Providers (ISPs) facilitate connectivity for users?

Or

(b) Describe the evolution of the World Wide Web (WWW) and its impact on information dissemination.

12. (a) Discuss the process of formatting text using HTML tags.

Or

(b) How do style sheets (CSS) format text and paragraphs in HTML?

13. (a) What is the purpose of merging table cells?

Or

(b) How do you create a simple table in HTML? Specify its size and column width.

14. (a) List and explain common JavaScipt operators (e.g. arithmetic, comparison, logical)

Or

(b) Explain the significance of events and event handlers in JavaScript.

15. (a) How do create custom events in JavaScript?

Or

(b) Explain the purpose of the following event handlers: onClick, onKeyDown, onMouseOver, onSubmit.

2

Answer any **three** questions.

16. Explain the terms *routers **gateways **bridges **switches, and **subnets* in networking Explain building significance in building robust networks.

17. Create a sample *hyperlink* and explain its purpose. How can *style sheets (CSS)* be used to format text and paragraphs in HTML?

18. Explain how to embed video files using the <video> tag and specify supported formats.

19. How does JavaScript handle reading values from these types of variables? Provide an example of adding elements using JavaScript.

20. Describe the phases involved in event propagation (i.e., capturing, target and bubbling phases).

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