(6 pages) Reg. No. : .....

Code No. : 20745 E Sub. Code : FCAD 11

B.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2025.

First Semester

Artificial Intelligence and Data Science – Core

PROGRAMMING WITH C++

(For those who joined in July 2024 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. C++ begins its execution with _____

(a) header file (b) main

(c) class (d) declaration

2. The instructions, which are used in programming, are called _____

(a) Data type (b) Keywords

(c) Objects (d) Identifiers

3. A _____ for an object is a request for execution of a procedure.

(a) object (b) functions

(c) dynamic binding (d) message

4. _____ are the smallest or the atomic elements of a language.

(a) Identifiers (b) Literals

(c) Keywords (d) Tokens

5. Identify the unary operator

(a) ? , : (b) ++

(c) + (d) %

6. Constructor is executed when _____

(a) an object is created

(b) an object is used

(c) a class is declared

(d) an object goes out of scope

7. In OOP which concept provides the idea of reusability?

(a) inheritance (b) encapsulation

(c) data hiding (d) polymorphism

8. How can we make a class abstract?

(a) By making all member functions constant

(b) By making at least one member function as pure virtual function

(c) By declaring it abstract using the static keyword

(d) By declaring it abstract using the virtual keyword

9. Public, private, protected are _____

(a) identifiers

(b) data members

(c) access specifies

(d) type of class

10. What is the benefit of C++ input and output over c input and output?

(a) Both Type safety and Exception

(b) Sequence container

(c) Exception

(d) Type safety

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) What are the applications of OOP? Explain.

Or

(b) Elaborate the benefits of OOP.

12. (a) Describe the need of inline function with syntax.

Or

(b) Highlight the purpose of function prototyping.

13. (a) Explain the creating and using a copy constructor.

Or

(b) Relate the syntax and example of overloading binary operators.

14. (a) Point out the multilevel inheritance with neat diagram.

Or

(b) Determine the pointer to objects in C++.

15. (a) Write a C++ program to calculate the sum of digits of a given number.

Or

(b) Summarize the overloading of template functions.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Examine the basic concepts of object oriented programming.

Or

(b) Outline the UML as a design tool beginning with C++.

17. (a) Compare and construct the Call by reference and Return by reference.

Or

(b) Illustrate the function overloading with simple example.

18. (a) Assess the syntax and example of multiple constructors.

Or

(b) Elaborate the constructors with default arguments.

19. (a) Discuss the concept of hybrid inheritance with example.

Or

(b) Assume the implementation of virtual base classes.

20. (a) Demonstrate the exception handling mechanism used in C++ program.

Or

(b) Explain the class templates with multiple parameters.

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(6 pages) Reg. No. : .....

Code No. : 20399 E **Sub. Code : EECS 31/ FECS 31**

B.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2025.

Third Semester

Computer Science

Elective – IoT AND ITS APPLICATIONS

(For those who joined in July 2023 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer.

1. A dynamic global network infrastructure with self configuring capabilities is termed as

(a) design (b) IoT

(c) WWW (d) internet

2. Protocol that determines how the data is physically sent over the network's physical layer is

(a) network layer

(b) transport layer

(c) link layer

(d) application layer

3. Open source automation platform for homes and buildings is

(a) Open Remote (b) Open Air

(c) Open Window (d) All of these

4. Weather and air quality monitoring kit is

(a) AirWS (b) AirPi

(c) WSAir (d) AIRWEA

5. Unique identifiers for the things in IOT are

(a) IP addresses (b) HTTP

(c) link (d) internet

6. NMS stands for

(a) Network Monitoring Station

(b) Network Measurement Station

(c) Network Management Station

(d) National Monitoring System

7. Python 2.0 was released in the year

(a) 2004 (b) 2000

(c) 2006 (d) 2005

8. A string which has zero characters is called an

(a) empty string (b) void string

(c) null string (d) zero string

9. Single board mini computer is

(a) Tab (b) Raspberry Pi

(c) PC (d) JSON

10. IaaS stands for

(a) Information-as-a Service

(b) Infrastructure-as-a-Service

(c) Info-as-a-Service

(d) Internet-as-a-Service

PART B — (5 × 5 = 25 marks)

Answer ALL questions by choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Define IoT and write its characteristics.

Or

(b) Explain transport layer.

12. (a) Explain home automation.

Or

(b) Explain air and noise pollution monitoring.

13. (a) Explain the need for IoT systems management.

Or

(b) Explain the purpose and requirement specification for IoT design methodology.

14. (a) Explain Lists in Python.

Or

(b) Explain SMTPLib.

15. (a) Explain the basic building blocks of an IoT device.

Or

(b) Explain Amazon RDS.

PART C — (5 × 8 = 40 marks)

Answer ALL questions by choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain any two IoT protocols in detail.

Or

(b) Briefly explain wireless sensor networks and cloud computing.

17. (a) Explain IoT applications in cities.

Or

(b) Explain the applications of IoT in health and lifestyle.

18. (a) Explain SNMP in detail.

Or

(b) Explain any two IoT design methodologies in detail.

19. (a) Explain tuples and dictionaries in Python.

Or

(b) Explain date and time operations in Python.

20. (a) Explain exemplary device.

Or

(b) Explain DynamoDB and Amazon Kinesis.

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