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Reg. No. :

Code No. : 30771 E Sub. Code : EMCS 31

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2024.

Third Semester

Computer Science — Core

PROGRAMMING IN C++

(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. Who invented C++?
(a) Dennis Ritchie (b) Ken Thompson
(c) Brian Kernighan (d) Bjarne Stroustrup
2. Which of the following is a correct identifier in C++?
(a) VAR_1234 (b) \$var_name
(c) 7VARNAME (d) 7var_name

3. What does a class in C++ holds?
(a) data
(b) functions
(c) both data and functions
(d) arrays
4. Which is used to define the member of a class externally?
(a) : (b) ::
(c) # (d) !!\$
5. What is inheritance in C++?
(a) Wrapping of data into a single class
(b) Deriving new classes from existing classes
(c) Overloading of classes
(d) Classes with same names
6. How many specifies are used to derive a class?
(a) 1 (b) 2
(c) 3 (d) 4
7. Which among the following is the language which supports classes but not polymorphism?
(a) SmallTalk (b) Java
(c) C++ (d) Ada

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8. Which among the following best describes polymorphism?

- (a) It is the ability for a message/data to be processed in more than one form
- (b) It is the ability for a message/data to be processed in only 1 form
- (c) It is the ability for many messages/data to be processed in one way
- (d) It is the ability for undefined message/data to be processed in at least one way

9. Which of the following is used to create an output stream?

- (a) ofstream (b) ifstream
- (c) ostream (d)fstream

10. Which of the following is used to create a stream that performs both input and output operations?

- (a) ofstream (b) ifstream
- (c) ostream (d)fstream

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Recall in detail about Object Oriented Programming Paradigm.

Or

(b) Relate in brief about various standard manipulators used in C++ syntax with example.

12. (a) Explain in detail classes and objects in C++ syntax with example.

Or

(b) Outline in brief about static member variables and functions in C++ syntax with example.

13. (a) Enumerate in detail about single inheritance in C++ syntax with example.

Or

(b) Summarize in detail about multilevel inheritance in C++ syntax with example.

14. (a) Illustrate in detail about array of classes in C++ syntax with example.

Or

(b) Illuminate in brief about new and delete operators in C++ syntax with example.



15. (a) Analyze the general form of function template with illustration.

Or

- (b) Examine in brief about try with multiple catch statements with example.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 600 words.

16. (a) Elucidate in brief about else-if-ladder in C++ syntax with example.

Or

- (b) Write a program using switch statement to do the 4 basic arithmetic operators between 2 numbers.

17. (a) Examine in brief about friend functions in C++ syntax with example.

Or

- (b) Summarize in brief about multiple and copy constructor with example.

18. (a) Illuminate in detail about Hierarchical inheritance in C++ syntax with example.

Or

- (b) Infer in detail about multiple inheritance in C++ syntax with example.

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19. (a) Clear up in brief about virtual function in C++ syntax with example.

Or

- (b) Examine in detail about file streams available in opening, closing and processing files.

20. (a) Analyze in brief about class templates syntax with example.

Or

- (b) Write a C++ program to perform the concatenation of given two strings.

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Reg. No. :

Code No. : 30774 E Sub. Code : EECS 31

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2024.

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. Which of the following is NOT a characteristic of IoT?
 - (a) Connectivity
 - (b) Intelligence
 - (c) Scalability
 - (d) Standalone operation

2. Which protocol is commonly used at the link layer in IoT?
 - (a) HTTP
 - (b) Bluetooth low energy
 - (c) TCP
 - (d) MQTT
3. What is the primary benefit of smart appliances in IoT home automation?
 - (a) Reduced energy consumption
 - (b) Increased internet speed
 - (c) Improved sound quality
 - (d) Enhanced video resolution
4. In a smart city, what is the purpose of smart roads?
 - (a) To provide high-speed internet to vehicles
 - (b) To monitor and manage traffic conditions using IoT sensors
 - (c) To charge electric vehicles
 - (d) To offer navigation services
5. What does M2M stand for?
 - (a) Machine to machine
 - (b) Mobile to mobile
 - (c) Media to media
 - (d) Message to message



6. Which of the following is more focused on using internet protocols for communication?
- (a) IoT
 - (b) M2M
 - (c) Both IoT and M2M equally
 - (d) Neither IoT nor M2M
7. Which of the following is an immutable data type in Python?
- (a) List
 - (b) Tuple
 - (c) Dictionary
 - (d) Set
8. How can you convert a list to a tuple in Python?
- (a) tuple(list_name)
 - (b) list(tuple_name)
 - (c) convert(list_name, tuple)
 - (d) to_tuple(list_name)
9. Which of the following is NOT a basic building block of an IoT device?
- (a) Sensors
 - (b) Actuators
 - (c) Video cards
 - (d) Microcontroller or microprocessor

10. Which of the following operating systems is commonly used of Raspberry Pi?
- (a) Linux (Raspbian)
 - (b) Windows XP
 - (c) MacOS
 - (d) Android

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) Define Internet of Things (IoT) and explain its three key characteristics that differentiate IoT from traditional internet-based systems.

Or

- (b) Discuss the role of wireless sensor networks in IoT and its features that support IoT applications.

12. (a) Explain the concept and benefits of smart lighting in home automation.

Or

- (b) Illustrate the smart parking solutions and discuss how IoT technology can improve parking efficiency and user convenience in urban areas.



13. (a) Write a short note on Machine-to-machine (M2M) communication and explain how it differ from IoT.

Or

- (b) Discuss the importance and challenges of systems management in IoT environments.

14. (a) Explain the differences between lists and tuples in Python.

Or

- (b) Discuss how type conversions are handled in Python.

15. (a) Demonstrate the IoT device and its key characteristics that distinguish IoT devices from traditional computing devices?

Or

- (b) Explain the significance of the Raspberry Pi as an exemplary IoT device. What are its key features and how does it support various IoT applications?

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 600 words.

16. (a) Discuss and compare the roles and functions of link layer and network/internet layer in IoT protocols.

Or

- (b) Analyze the role, techniques, benefits and challenges of Big data analytics in the context of IoT.

17. (a) Illustrate the use and benefits of IoT in environmental monitoring, including weather forecasting and pollution tracking with example.

Or

- (b) Explain the role of wearable electronics in health and fitness monitoring and provide examples of popular wearable's and their features.

18. (a) Describe the need for effective systems management in IoT environments and explain its primary challenges and solutions associated with managing IoT systems.

Or

- (b) Explain the role, functions, limitations and impact of Simple Network Management Protocol (SNMP) in network management for IoT systems.



19. (a) Write the short note on structure and usage of dictionaries in Python with examples.

Or

- (b) Explain how python packages such as JSON and XML are used to handle data from IoT devices and discuss its best practices to ensure accuracy and efficiency.

20. (a) Demonstrate the role of Linux operating system on the Raspberry Pi board with examples.

Or

- (b) Describe how Amazon EC2 (Elastic Compute Cloud) is utilized in IoT applications and discuss its features and benefits.
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