Roll No. .....

86971

M. Sc. (Computer Science) 4th Semester Under NEP-2020 (w.e.f. 2025-26) Examination – May - 2026

CLOUD COMPUTING

Paper : 25CSC204DS01

Time : Three hours] *[Maximum Marks : 50*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Unit. Question No. **1** is ***compulsory***. All questions carry equal marks.

1. (a) What are the key characteristics of cloud computing ? $2 \times 5 = 10$

(b) What is virtualization ?

(c) What are the major security challenges in cloud environments ?

(d) What is Serverless computing ?

(e) How do public and private clouds differ ?

UNIT – I

2. (a) What are the different cloud service models ? How do IaaS, PaaS, and SaaS differ in functionality ? Explain. 5

(b) How do architectural principles like elasticity and scalability improve cloud performance ? Illustrate. 5

3. (a) What is the evolution of cloud computing ? How has it transformed IT services ? Explain. 5

(b) How do leading cloud providers influence market trends in cloud computing ? Illustrate. 5

UNIT – II

4. (a) What are hypervisors ? How do Type-1 and Type-2 hypervisors differ ? Explain. 5

(b) How do containers such as Docker and orchestration tools like Kubernetes support cloud deployment ? Illustrate. 5

5. (a) What is Software-Defined Networking (SDN) ? How does it enhance cloud networking ? Explain. 5

(b) How do distributed storage and object storage systems work in cloud environments ? Illustrate. 5

UNIT – III

6. (a) What are common threats in cloud environments ? How does encryption help mitigate them ? Explain. 5

   (b) How does Identity and Access Management (IAM) ensure secure cloud operations ? Illustrate. 5

7. (a) What are major legal and regulatory frameworks in cloud computing ? How do they affect deployments? Explain. 5

   (b) How do governance and compliance practices help in managing cloud environments effectively ? Illustrate. 5

UNIT – IV

8. (a) What are the benefits of Big Data analytics in cloud platforms ? How are they implemented ? Explain. 5

   (b) How do edge computing and IoT integrate with cloud systems to improve performance ? Illustrate. 5

9. (a) What are cloud-native architectures ? How do they support modern application development ? Explain. 5

   (b) How do hybrid and multi-cloud strategies help organizations optimize performance and cost ? Illustrate. 5

Roll No. .....

86972

M. Sc. (Computer Science) 4th Semester Under NEP-2020 (w.e.f. 2025-26) Examination – May - 2026

Mobile Application Development Using Android

Paper : 25CSC204DS02

Time : Three hours] *[Maximum Marks : 50*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Unit. Question No. 1 is ***compulsory***. All questions carry equal marks.

1. (a) What is Android ? List any f two versions of Android with their API levels. 2

(b) Differentiate between Implicit Intent and Explicit Intent in Android. 2

(c) What is the purpose of AndroidManifest.xml ? Name any two key elements declared in it. 2

(d) What is Recycler View ? How does it differ from List View ? 2

(e) What is Retrofit ? State its main use in Android development. 2

UNIT – I

2. What is Android Architecture and explain in detail with a neat diagram ? Describe each layer and its significance. 10

3. What is the Lifecycle of Activity in Android ? Describe all states and callback methods with a lifecycle diagram. 10

UNIT – II

4. Explain the following XML-based layouts with styles and themes are applied in Android with suitable examples : 3 + 3 + 4

(i) Constraint Layout

(ii) Linear Layout

(iii) Relative Layout.

5. What are Fragments in Android ? How are dynamic Uls created using Fragments ? Explain the Fragment Lifecycle with example. 10

UNIT – III

6. What are the various data storage options available in Android ? Explain Shared Preferences. Internal Storage, External Storage. 10

7. What are REST APIs and JSON ? Explain how HTTP requests are made in Android using Retrofit. Discuss Authentication and Authorization mechanisms. 10

UNIT – IV

8. (a) What is the complete process of publishing an Android application on the Google Play Store ? Explain. 5

   (b) What are steps for preparing the app for release and how to find the current location using Google Maps API ? Explain. 5

9. What is Multimedia and Sensors in Android ? Explain in reference to :

   (i) Playing Audio and Video 10

   (ii) Capturing Images and Videos using the Camera API

   (iii) Implementing Notifications and Alerts

Roll No. .....

86973

M. Sc. (Computer Science) 4th Semester
Under NEP-2020 (w.e.f. 2025-26)
Examination – May, 2026

INTERNET OF THINGS

Paper : 25CSC204DS03

Time : Three hours] *[Maximum Marks : 50*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each unit. Question No **1** is ***compulsory***. All questions carry equal marks.

1. (a) What is the role of the middleware layer in IoT architecture ? $2 \times 5 = 10$

(b) How does serial communication (UART) work in embedded systems ?

(c) How does 6LoWPAN support IPv6 in IoT networks ?

P. T. O.

(d) What is the importance of edge-to-cloud synchronization in IoT systems ?

(e) How do GDPR and CCPA influence privacy compliance in IoT applications ?

UNIT – I

2. (a) What are the key layers of IoT architecture ? Illustrate their functions with a suitable diagram. 5

(b) How do analog and digital signals differ in sensor applications ? Illustrate with examples of ADC/DAC conversion. 5

3. (a) What are the basic components of embedded systems ? Illustrate with examples of microcontrollers like Arduino and ESP32. 5

(b) How does GPIO interfacing enable interaction between sensors and microcontrollers? Illustrate with one practical example. 5

UNIT – II

4. (a) What are the major short-range IoT communication technologies ? Illustrate their applications in smart homes or wearables. 5

(b) How do long-range technologies like LoRaWAN and NB-IoT differ from short-range options ? Illustrate their suitability for agricuiture or industrial use. 5

5. (a) What are the key IoT application-layer protocols? Illustrate the working of CoAP and HTTP. 5

(b) How do transport-layer protocols (TCP and UDP) affect IoT performance ? Illustrate with real-time use cases. 5

UNIT – III

6. (a) What is the process of sensor data collection in IoT ? Illustrate with time-series data from temperature or motion sensors. 5

(b) How does data preprocessing improve IoT data quality ? Illustrate noise filtering, calibration, and normalization techniques. 5

7. (a) What is edge computing in IoT ? Illustrate local data processing on microcontrollers versus Raspberry Pi. 5

(b) How do on-device storage options like SD cards and EEPROM support IoT applications ? Illustrate edge-to-cloud synchronization strategies. 5

UNIT – IV

8. (a) What are the major security threats in IoT systems ? Illustrate with the Mirai botnet attack case study. 5

(b) How do device authentication mechanisms secure IoT devices ? Illustrate X.509 certificates and OAuth2. 5

9. (a) What are the key security measures for IoT communication ? Illustrate data encryption using TLS/SSL for MQTT and HTTP. 5

(b) How do secure firmware updates protect IoT devices ? Illustrate OTA updates with cryptographic signatures. 5

Roll No. .....

86974

M. Sc. (Computer Sc.) 4th Semester
Under NEP-2020 w.e.f. 2025-26
Examination – May, 2026

DATA VISUALIZATION AND INTERPRETATION

Paper : 25CSC204DS04

Time : Three Hours] *[Maximum Marks : 50*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Unit. Question No. 1 is ***compulsory***. All questions carry equal marks.

1. Attempt the following : $2 \times 5 = 10$

(a) Write the steps of creating a data visualization.

(b) Write name of one data types where a pie chart fails because the data type is not suitable.

(c) Which is more important in a visualization : clarity or simplicity ? Justify.

(d) What type of misinterpretation does a bar chart without a zero baseline can mislead ?

(e) Why is a pie chart not suitable when values differ by only 2-3% ?

UNIT – I

2. Define Data Visualization. Explain its importance in modern decision making and analytics with two real-world examples of your choice. 10

3. (a) Explain Gestalt principles of visual perception. Describe *any four* Gestalt principles and explain how these help in designing effective visualizations. 5

(b) Differentiate between categorical. ordinal, and quantitative data. Also, suggest the most suitable chart type for each data type with justification. 5

UNIT – II

4. (a) Explain Edward Tufte's design philosophy. Discuss the concept of *chart junk* and how it affects data understanding. 5

(b) What is misinterpretation ? How is it avoided ? 5

5. (a) Compare bar charts and line charts and mention at least two suitable applications of each type. 5

(b) Define Exploratory Data Analysis (EDA). Explain the role of descriptive statistics in EDA. 5

UNIT – III

6. (a) What is multidimensional data visualization ? Explain how pair plots help in understanding relationships among multiple variables. 5

(b) Explain how titles, legends, and annotations improve the interpretability of complex visualizations. 5

7. (a) Explain hierarchical data visualization. Compare tree maps and dendrograms in terms of structure and usability. 5

(b) Write best practices for data labeling and annotations. 5

UNIT – IV

8. (a) Explain the Power BI workspace with special emphasis on report view, data view and model view. 5

(b) What is spurious correlation ? Explain how feature biases or overfitting are related to machine learning models ? 5

9. Explain data cleaning operations in Power Query. Discuss handling null values and removing duplicates with examples. 10

Roll No. .....

86975

M. Sc. (Computer Science) 4th Semester
Under NEP-2020 w.e.f. 2025-26
Examination – May, 2026

COMPILER DESIGN

Paper : 25CSC204DS05

Time : Three hours] *[Maximum Marks : 70*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Unit. Question No. **1** is ***compulsory***. All questions carry equal marks.

1. Answer the following : $7 \times 2 = 14$

(i) What is procedure inlining ?

(ii) Distinguish between Semantic and Syntax Analysis.

(iii) Illustrate the purpose of Assembler.

(iv) What is Bootstrapping ?

(v) Illustrate the various operations used in Symbol Table.

(vii) Explain LL(1) grammar with example.

(viii) What do you mean by type & declaration in Intermediate Code ?

UNIT – I

2. What is Compiler ? Explain the structure of compiler along with suitable diagram. Write down the output of each phase for the expression $x := z * 13 + y$. 14

3. Differentiate between following : $2 \times 7 = 14$

(a) Compiler and Interpreter

(b) Recursive decent parsing and Predictive parsing

UNIT – II

4. (a) What is Ambiguity in Grammar ? How can ambiguous grammars be handled in bottom-up parsing ? 7

(b) Explain operator precedence parsing with suitable example. Also write advantages & disadvantages. 7

5. (a) Define the term Error. Explain different error recovery techniques used in parsing. Discuss the

importance of error handling in parsers and how it improves compilation ? 9

(b) Write the various applications of SDT. 5

UNIT – III

6. (a) Explain the term Intermediate Code. Explain syntax tree and postfix notation in detail and draw syntax tree and postfix notation of given example :

$$a := b * - c + b * - c$$ 10

(b) Explain heap management technique for storage organization. 4

7. What is storage allocation ? Explain various storage allocation strategies. Explain how memory is allocated at run time when a procedure is called and value is returned from procedure. 14

UNIT – IV

8. Explain the following in detail : $2 \times 7 = 14$

(a) Data flow analysis

(b) Loops in flow graph

9. (a) Define basic blocks and flow graphs. Explain how optimization of basic blocks improves code efficiency with suitable examples ? 9

(b) Explain static vs. dynamic register allocation strategies. Discuss their advantages and limitations. 5
