2CSc.254-2069 ✡

Tribhuvan University
Institute of Science and Technology
2069

✡

Bachelor Level / Second Year/ Forth Semester/ Science — Full Marks: 60
Computer Science and Information Technology (CSc.254) — Pass Marks: 24
(Computer Graphics) — Time: 3 hours.

Candidates are required to give their answers in their own words as for as practicable.
All questions carry equal marks.

Attempt all the questions.

1. Explain the random scan display system with its advantages and disadvantages.

2. Why homogeneous coordinates are used for transformation computations in computer graphics? Explain.

3. Differentiate between window port and view port. How are lines grouped into visible, invisible and partially visible categories in 2D clipping? Explain.

4. Define polygon. What are the different types of polygons? Explain with example.

5. Differentiate between periodic B-spline curves with non-periodic B-spline curves.

6. Explain the z-buffer algorithm for removing hidden faces?

7. Differentiate between incremental algorithm over DDA with example.

8. Define the following terms (**any two**):
   a) Video controller
   b) 3D viewing
   c) Raster graphics
   d) list priority

9. Explain the simple illumination model with example.

OR

Explain the Gourand shading model with example.

10. Explain the virtual reality and its applications in the computer graphics.

Tribhuvan University
Institute of Science and Technology
2069
✡

Bachelor Level / Second Year/ Forth Semester/ Science
Computer Science and Information Technology (CSc.253)
(Database Management System)

Full Marks: 60
Pass Marks: 24
Time: 3 hours.

Candidates are required to give their answers in their own words as for as practicable.
The figures in the margin indicate full marks.

Attempt all the questions. (5x2=10)

1. Answer the following questions in short:

   (a) Differentiate between two-tier and three-tier client/server architecture.

   (b) The null value attribute and its uses.

   (c) Difference between logical data independence and physical data independence.

   (d) When is the concept of a weak entity used in data modeling?

   (e) The difference among a relationship instance, a relationship type, and a relationship set.

2. (a) Draw an ER diagram for a database showing Hospital system. The Hospital maintains data about Affiliated Hospitals, type of Treatments facilities given at each hospital, and Patients. (6)

   (b) In what sense does relational calculus differ from relational algebra, and in what sense are they similar? (4)

3. (a) Assume a database about **Company**.
   EMPLOYEE(ss#, name)
   COMPANY (cname, address)
   WORKS (ss#, cname)
   SUPERVISES(supervisor_ss#,employee_ss#)

   Write relational algebra and SQL queries for each of the following cases.

   (i) Find the names of all the supervisors that work in companies whose address equals 'Biratnagar'.

   (ii) Find the names of all the companies who have more than 10 employees.

   (iii) Find the name of the supervisor who has the minimum number of employees. (5)

   (b) What is constraint? How does SQL allow implementation of general integrity constraints? (1+4)

4. (a) Define first, second, and third normal forms with suitable example. (1+4)

   (b) What is functional dependency? Describe full and partial functional dependency with suitable example. (1+4)

5. (a) Draw a state diagram, and discuss the typical state that a transaction goes through during transaction. (5)

(b) Describe serial and serializable schedule? Why serializable schedule is considered correct? (5)

6. (a) How does the granularity of data items affect the performance of concurrency control? What factors affect selection of granularity size for data items? (5)

(b) Describe write-ahead logging protocol. (5)

2CSc.255-2069 ✡

Tribhuvan University
Institute of Science and Technology
2069

✡

Bachelor Level / Second Year/ Forth Semester/ Science
Computer Science and Information Technology (CSc.255)
(Introduction to Cognitive Science)

Full Marks: 60
Pass Marks: 24
Time: 3 hours.

Candidates are required to give their answers in their own words as for as practicable.
All questions carry equal marks.

Attempt all the questions.

1. Explain the cognitive science and its applications.

2. Explain the artificial intelligence task domains with example.

3. Explain the steps involved in building a system to solve an artificial intelligence problem.

4. What do you mean by AO* algorithm? Explain with example.

OR

Differentiate between procedural and declarative knowledge.

5. Explain with block diagram of the components of a typical expert system.

6. Differentiate between depth-first search and breadth first search with example.

7. Explain the tuning machine with suitable example.

8. Mention the tuypes of all Chomsky hierarchies and explain two of them with practical example.

9. Define the terms:
   a) Gelernter
   b) Pinter

10. Explain the parameters of natural language processing with its syntax and suitable example.

OR

Mention the steps of natural language processing and explain them in briefly.

2CSc.252-2069 ✡

Tribhuvan University
Institute of Science and Technology
2069
✡

Bachelor Level / Second Year/ Forth Semester/ Science
Computer Science and Information Technology (CSc.252)
(System analysis and Design)

Full Marks: 60
Pass Marks: 24
Time: 3 hours.

Candidates are required to give their answers in their own words as far as practicable.
The figures in the margin indicate full marks.

Group A

Long Answer Questions:

Attempt any two: (2x10=20)

1. Explain the types of information with example and compare each of them.
2. Draw a DFD diagram of student information system up to level 2.
3. Explain the process of maintaining the information system with example.

Group B

Short Answer Questions:

Attempt any eight: (8x5=40)

4. Differentiate between decision support system (DSS) and Management Information System (MIS).
5. What do you mean by Joint application Design? Explain.
6. Explain the steps of E-R diagram design.
7. What do you mean by case tools? Explain the case tools in data modeling.
8. Explain the steps in Feasibility analysis.
9. What do you mean by normalization? Explain with example.
10. What are the two important things to remember about testing systems?
11. Differentiate between system documentation and V ser documentation.
12. What are the different types of main tenance?
13. Explain the Unified Modeling Language with example.

Tribhuvan University
Institute of Science and Technology
2069
✡

Bachelor Level / Second Year/ Forth Semester/ Science
Computer Science and Information Technology (ENG.256)
(Technical Writing)

Full Marks: 80
Pass Marks: 32
Time: 3 hours.

Candidates are required to give their answers in their own words as for as practicable.
The figures in the margin indicate full marks.

Attempt all the questions.

1. Prepare a newspaper article in about 250 words making a comparison (and contrast) between writing with and without a computer. [10]

2. Write a job application on the basis of the given advertisement . Give your recent resume along with the application. [15]

IMMEDIATELY WANTER
Aakriti International has a vacancy for a Computer Engineer to work on contract for five years
Interested candidates with qualification and experience are Requested to apply within a week to
The Executive Manager
Aakriti International Lazimpat
Kathmandu
E-mail: aakritinepal@gmail.com

3. Write two paragraphs on advantages and disadvantages of wireless communication (devices such as Bluetooth, Wi-Fi) using these expressions: *in short, in other words, namely, that is, for instance, however, finally, such as, otherwise, whereas.* [15]

4. What is graphic presentation technique? What are the advantages of the use of graphs, charts, pictures, and tables in technical communication? [15]

5. Imagine you are the Head of the Department of Computer Science and Information Technology and also imagine that you have conducted a Departmental meeting of all teaching staff. Now prepare a formal minute of the meeting with agenda and resolutions. [15]

6. Write a technical description of your new laptop with its special features. [10]

2069 ✡

Tribhuvan University
Institute of Science and Technology
2069

✡

Bachelor Level / Second Year/ Forth Semester/ Science
Computer Science and Information Technology (CSc.251)
(Theory of Computation)

Full Marks: 80
Pass Marks: 32
Time: 3 hours

Candidates are required to give their answers in their own words as for as practicable
The figures in the margin indicate full marks.

Attempt all the questions.

Group A

(8x4=32)

1. What do you mean by finite automata? Explain deterministic finite automata with example.
2. Explain the finite automata with Epsilon Transition.
3. Explain the closure properties of context free languages with example.
4. Differentiate between deterministic and non deterministic PDA.
5. Explain the non-deterministic tuning machines with practical example.
6. Define the tuning machine. What are the roles of tuning machines?
7. What is universal tuning machines?
8. Differentiate between class P and class NP.

Group B

(6x8=48)

9. Design a constructive method to prove that the complement of the language accepted by an NFA is accepted by a DFA.
10. What do you mean by regular expressions? Explain with example of pumping lemma for regular languages.
11. Define the non deterministic finite automata (NFA) and write down recursive definition of δ^* for NFA and A.
12. Draw tuning machine to accept palindromes over {a, b}.
13. Give a detailed description of ambiguity in context free grammar.
14. Explain the following:
    a) Minimization of finite state machine.
    b) Push down automata (PDA).
    c) Halting problems.
    d) computational complexity.