CSc. 319-2076 ✡

Tribhuvan University
Institute of Science and Technology
2076

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Bachelor Level / Third Year /Fifth Semester/Science
Computer Science and Information Technology (CSc.319)
(Multimedia Computing)

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.

Group A

Long answer questions
Attempt **any two** questions [2×10 = 20]

1. Explain the global structure of multimedia with block diaram and explain each block in detail.
2. List and explain the various colour models used in image and videos.
3. Why do we need Huffman coding ? Explain it with suitable example.

Group B

Short answer questions
Attempt **any eight** questions [8 × 5 = 40]

4. Explain the speech generation method.
5. How can you generate animation using computer?
6. Differentiate between JPEG and MPEG.
7. Discuss in brief about user interface design process in multimedia.
8. Explain the abstraction levels of the programming of object-oriented approach.
9. Discuss the colour dithering technique with example.
10. Calculate the file size in bytes for a 30 second recording at 44.1 khz, 8 bits resolution stereo sound.
11. Differentiate between lossless and lossy compression.
12. Explain the applications of multimedia in telemedicine.

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Bachelor Level / Third Year /Fifth Semester/Science
Computer Science and Information Technology (CSc.317)
(Simulation and Modelling)

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.

Section A

Attempt any two questions. **(2×10 = 20)**

1. Define queuing system. Explain different queuing disciplines. Also explain different performance measures for evaluation of queuing system.

2. Differentiate between chi-square test and KS test for uniformity. Use KS test to check for the uniformity for the input set of random numbers given below. 0.54, 0.73, 0.98, 0.11, 0.68, 0.45. Assume level of significance to be $D\alpha=0.05 \Rightarrow 0.565$.

3. What do you understand by static mathematical model? Explain with example. Differentiate between stochastic and deterministic activities.

Section B

Attempt any eight questions. **(8×5 = 40)**

4. Discuss the merits and demerits of system simulation.
5. Explain markov's chain with a suitable example.
6. Define arrival pattern. Explain non-stationary Poisson process.
7. Differentiate between validation and calibration. How can we perform validation of a model?
8. Use Mixed congruential method to generate a sequence of random numbers with $X_0= 27$, $a= 17$, $m=100$ and $c=43$.
9. What do you understand by replication of runs. Why is it necessary?
10. Explain generation of non uniform random number generation using inverse method.
11. Parts are being made at the rate of one every 10 minutes. They are of two types, A and B. And are mixed randomly with about 10% being type B. A separate inspector is assigned to examine each part. Inspection of part A takes 6 ± 2 minutes while B takes 10 ± 2 minutes. Both inspector rejects 10% of parts they inspect. Draw GPSS block diagram to simulate the above problem for 100 parts.

12. Write short notes on **(any two)**: **(2×2.5 = 5)**
    a. System and its environment
    b. Simulation run statistics

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Bachelor Level / Third Year /Fifth Semester/Science
Computer Science and Information Technology (CSc.318)
(Web Technology)

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.

Section A

Long Answer Questions
Attempt Any Two questions. [2x10=20]

1. Create web form for book search catalog. The form should contain a dropdown defining search type, a text box for search keyword, a radio button for download type true or false, now write PHP script to store data from the form into database table and also retrive the results from stored table in a new page. [10]

2. How can you create objects in JavaScript? Create a HTML page containing a division with image and its description in paragraph. Write a JavaScript function to change the value of description in the paragraph during onmouseover and onmouseout event on the image. [4+6]

3. How positioning of HTML elements can be done using CSS? Create a HTML page with a div with some content and two paragraph tags with some contents having id p1 and p2. Write external CSS for the div tag having fixed position with border style solid and width 2px. The p1 should have relative position. The font type of p1 should be Arial and color should be red. The p2 have absolute position with top 0px and left200px. [2+8]

Section B

Short Answer Questions
Attempt Any Eight questions. [8x5=40]

4. What is HTTP protocol? Define HTTP Request and Response. [2+3]

5. Create a HTML page with tags header, article and footer. Insert a link containing mail to info@iost.edu.np in the footer tag. Set the keywords "iost", "csit" using Meta tag in the page. [5]

6. How jQuery animate can be used to create custom animation? Write syntax with sample script. [2+3]

7. What is the use of JSON? How can you parse a JSON, illustrate with an example. [1+4]

8. What is XML? Create an XML file containing records of employee having elements of simple and complex types. [1+4]

9. How XSD of a XML file is created? Illustrate with an example. [2+3]

10. How can you define variables in PHP? Define any two variables of string types and display their results after concatenation. [1+4]

11. How web pages can be made resposive using media queries? Illustrate with an example. [2+3]

12. Why Inline frames are used? Create a HTML page containing iframe with in a paragraph. The iframe have source to http://www.tuiost.edu.np and its height and width are 200px and 400px respectively. [1+4]

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Bachelor Level / Third Year /Fifth Semester/Science
Computer Science and Information Technology (CSc.316)
(Cryptography)

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.

Section A

Attempt Any Two questions **[2×10= 20]**

1. Among monoalphabetic and polyalphabetic cipher, which one is more vulnerable? Justify your statement. Which types of keys are considered as weak keys in DES? Explain the round operation in IDEA. [2 + 2 + 6]

2. State the Fermat's theorem with example. Given the prime number p=29 and its primitive root g=8, private key of sender with X=9 and random integer K=11, encrypt the message m=13 using Elgamal cryptosystem. [5 + 5]

3. Compare the SHA parameters between SHA-1 and SHA-2 family. Decrypt the cipher text DRJJ with key $\begin{bmatrix} 7 & 8 \\ 11 & 11 \end{bmatrix}$ using Hill Cipher. [3+7]

Section B

Attempt Any Eight questions **[8×5 = 40]**

4. Define discrete logarithm. Explain the procedure of sharing the secret key in Diffie Hellman. [2 + 3]

5. Distinguish between stream cipher and block cipher. Encrypt the message WE ARE IN SAME RACE UNTILL OUR LIVE END using Rail fence cipher using 4 as number of rails. [2 + 3]

6. Define digital signature. Describe the approaches of DSS. [2 + 3]

7. What is the task of firewall? List the elements of X.509. [2 + 3]

8. How does the nature of worms differ with virus? Define PKI with its architecture model. [1 + 4]

9. Explain the procedure of mix column transformation in AES with an example. [5]

10. What is the role of prime number in Euler totient function? Find the GCD of 12 and 16 using Euclidean algorithm. [2.5 + 2.5]

11. Write down any two limitations of MAC? What does policy and mechanism mean in cryptography?Describe with a scenario. [2 + 3]

12. Write short notes on (AnyTwo) [2.5 + 2.5]
    a. Classes of Intruder
    b. SSL
    c. DoS Attack

CSc. 315-2076 ✡

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Bachelor Level / Third Year /Fifth Semester/Science
Computer Science and Information Technology (CSc.315)
(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 for as practicable.
The figures in the margin indicate full marks.

Section A

Attempt any two questions. **(2 × 10 = 20)**

1. What is waterfall model? Explain prototyping model for developing information systems along with merits and demerits. (2 + 8)

2. Define feasibility. Explain different categories of feasibility. How do you measure economic feasibility? (2 + 8)

3. Assuming a retail clothing store in a mall, draw a context diagram and a level-0 diagram that represent the selling system at the store. (4 + 6)

Section B

Attempt any eight questions. **(8 × 5 = 40)**

4. Explain modern approaches to system analysis and design. (5)

5. What is rapid application development? Explain. (5)

6. What is project initiation? Explain different activities you will perform during project initiation phase. (1 + 4)

7. Explain the process of identifying and selecting information system development project in brief. (5)

8. What is group interview? What are the benefits and drawbacks of group interview? (2 + 3)

9. How do you format forms and reports? Explain general guidelines for formatting forms and reports? (2 + 3)

10. List major activities of maintenance. Explain different types of maintenance activities. (1 + 4)

11. What is object oriented development? How is it different from structured development? (2 + 3)

12. Write short notes on: **(2 × 2.5 = 5)**
    a. Spiral model
    b. Decision table

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Bachelor Level / Third Year/ Fifth Semester/ Science
Computer Science and Information Technology (CSc.314)
(Design and Analysis of Algorithms)

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 questions are of equal marks.

Section A

Long Answer Questions
Attempt any two questions **(2x10=20)**

1. What do you mean by complexity of an algorithm? Explain about the asymptotic notations used to describe the time/space complexity of any algorithm with their geometrical interpretation and example. (1+9)

2. Explain about the divide and conquer paradigm for algorithm design with suitable example. Write the Quick sort algorithm using randomized approch and explain its time complexity. (4+6)

3. Explain in brief about the Backtracking approach for algorithm design. How it differs with recursion? Explain the N-Queen Problem and its algorithm using backtracking and analyze its time complexity. (2+2+6)

Section B

Short Answer Questions
Attempt any eight questions **(8x5=40)**

4. Write the algorithm for Selection Sort and explain its time and space complexity. (5)

5. Solve the following recurrence relations using master method. (2.5+2.5)
   a. $T(n) = 7T(n/2) + n^2$
   b. $T(n) = 4T(n/4) + kn$

6. Explain the greedy algorithm for fractional knapsack problem with its time complexity. (5)

7. Trace the heap-sort algorithm for the following data: {12, 45, 62, 50, 85, 15, 28}. (5)

8. What do you mean by Dynamic Programming Strategy? Explain the elements of DP. (2+3)

9. Explain the approximation algorithm for solving vertex cover with suitable example. (5)

10. Explain the Prim's algorithm for MST problem and analyze its time complexity. (5)

11. Explain in brief about the classes P, NP and NP Complete with example. (5)

12. Write short notes on (2x2.5)
    a. Backtracking Strategy
    b. Tractable and Intractable problems

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