

Begum Rokeya University, Rangpur

Department of Computer Science and Engineering

B.Sc. (Engg.) 3rd year 2nd Semester Final Examination, 2016. (Session: 2013-14)

Course Code: CSE 3203

Course Title: Computer Graphics

Time: 3.00 hours

Total Marks: 50

[NB: Answer any five (5) questions and figures in the right margin indicate full marks]

[All parts of each question must be answered sequentially]

1. a) What do you mean by computer Graphics? 2
b) Define resolution. Is there having any overlap among points in resolution? 2
c) Note some advantage and disadvantage of lower persistence and higher persistence phosphor in CRT monitor. 3
d) How beam penetration method is differ from shadow mask method. 3

2. a) What is rigid body translation? Why it is important? 2
b) Briefly discuss the midpoint circle drawing algorithm when a circle function around the origin is given by $f_{circle}(x,y) = x^2 + y^2 - r^2$. What happens when $f_{circle}(x,y) < 0$, $f_{circle}(x,y) = 0$ and $f_{circle}(x,y) > 0$? 5
c) What is shear? Briefly discuss shear transformation. 3

3. a) Write down the differences between geometric transformations and coordinate transformation. 2
b) For scaling an object, is it necessary to have a fixed point? 2
c) Explain how to convert standard 3D coordinates, (x; y; z), to homogeneous coordinates, and how to convert homogeneous coordinates to standard 3D coordinates. 3
d) What do you understand by blobby objects? Explain any one model that represents blobby objects. 3

4. a) Classify the visible surface detection algorithms. 2
b) Discuss depth buffer method to detect visible surface with proper diagram 5
c) Define BSP tree. What is it's application? 2
d) Why CMY model is used in printer rather than RGB model. 1

5. a) How viewing-coordinate reference frame can be established? 2
b) What is projection? Draw a diagram for parallel projection of an object to the view plane. 3
c) What is vanishing point in perspective projection? 2
d) Illustrate the effect on shape of the oblique-projection view volume by moving the window position. 3

6. a) What do you mean perspective and parallel projection in 3-D viewing? 4
b) What is the role of shading in illuminating a model? Describe various shading models. 6

7. a) Describe run length encoding for image compression 4
b) What is the role of Pulse code modulation and Quantization in digitizing an audio file? 2
c) What are the compression techniques carried out in coding real time video? 2
d) Differentiate between *bitmap* image and *vector* image. 2

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Department of Computer Science & Engineering

Begum Rokeya University, Rangpur

Semester Final Examination-2016 3rd year 2nd Semester Year Session: 2013-2014
Course Title: Microprocessor & Assemble Language Course Code: CSE 3205
Time: 3.0Hours Full Marks: 50

[N.B. *Answer any Five (5) Questions, Number of each question is indicated to the right*]

1. (a) Write down the difference between microprocessor and microcontroller. 3
(b) Explain in brief about the era of microprocessor 3
(c) Draw the block diagram of the organization of Intel 8086 processor and then discuss the functions of its internal units. 4
2. (a) Indicate the different registers available in 8086 and explain their operations. 5
(b) Briefly explain the advantages of the instruction queue in 8086. 2
(c) What is meant by segment override prefix? Explain with example. 3
3. (a) What is physical memory? A memory location has physical address 80FD2h. In what segment does it have offset BFD2h? 1+3=4
(b) Discuss how an array can be declared in 8086 processor with DUP instruction. Give example. 4
(c) How can we use PTR to override a type. 2
4. (a) Explain the bus cycle of 8086 with proper diagram. 5
(b) Explain briefly the different interrupts in 8086. 5
5. (a) Explain the different addressing modes in 8086 with examples. 5
(b) Indicate the addressing modes of the destination operand and calculate its real mode address for the following instructions: (i) ADD [DI], AL; (ii) SUB BLOCK, AX; (iii) AND [BX+DI], CL; (iv) ADDC [BP+100H], AX; MOV AL, [1234H]. Assume CS=1000H; DS=2000H; SS=4000H; BX=3FFFH; DI=5A00H; SP=64A0H; IP=A000H; BP=69B0H; BLOCK=4000H. 5
6. (a) Define the assembly language. What are the difference between Machine language and Assembly language? 1+3=4
(b) Explain in briefly the different types of instructions supported by 8086. 6
7. (a) What are the differences between status flag and control flags? 2
(b) Explain the instructions DIV and IDIV. 2
(c) Discuss how rotate instructions can be used to count the number of 1 bit in a register without changing the content of that register. 4
(d) What is the use the LOCK bar signal of 8086 microprocessor? 2

Begum Rokeya University, Rangpur
Department of Computer Science and Engineering
3rd Year 2nd Semester Final Examination, 2016 (Session: 2013-14)

Course Code: CSE 3207

Time: 3 Hrs

Course Title: Computer Networks

Total Marks: 50

Answer any five of the following questions

- | | | |
|----|--|---|
| 1. | a) Mention fundamental types of wireless network topology. Compare peer-to-peer and multi-hop ad hoc topologies. | 4 |
| b) | In terms of scalability, flexibility, controllability, and reliability you compare Ad Hoc and Infrastructure Network Topology. | 4 |
| c) | Define interference. How many types interference are important in cellular architecture. | 2 |
| 2. | a) Define cluster. Write the major technical issues which you need to address for planning a cellular network. | 3 |
| b) | In cellular communication why we consider a hierarchical cellular infrastructure supporting cell of different sizes. | 2 |
| c) | Why is hexagonal cell shape preferred over other cell shapes to represent the cellular architecture? | 2 |
| d) | Draw cellular architecture with a cluster size of N=7, and also find the co-channel cell using the value of <i>i and j</i> . | 3 |
| 3. | a) Prove that Signal to interference ratio, $S_r = 1.76 + 20\log N$. | 3 |
| b) | Explain with an example the cellular architecture of AMPS. | 4 |
| c) | Define frequency reuse factor. Prove that minimum value of N will provide maximum channel. | 3 |
| 4. | a) How many basic methods are used to expand capacity of a cellular network? Briefly describe each method. | 3 |
| b) | Define smart antenna. Explain how does it expand the capacity in GSM system? | 2 |
| c) | Describe channel borrowing and cell dazing techniques. | 2 |
| d) | Write the comparison between FCA and DCA. | 3 |
| 5. | a) Describe OSI security architecture. | 2 |
| b) | Write the difference between active attack and passive attack. | 2 |
| c) | Describe a simplified network security model. | 3 |
| d) | Mention all ingredients of a symmetric encryption. | 3 |
| 6. | a) Define cryptanalysis and Brute-Force Attack. | 2 |
| b) | Explain the working principle of playfair cipher. | 4 |
| c) | Generate cypher text using Hill Ciphering approach. | 4 |
| 7. | a) What is Ethernet? Briefly describe technical specification of 10Base T, 100Base T and Gigabit Ethernet standard. | 3 |
| b) | Describe the concept of VLAN in brief. What are the advantages of VLAN over LAN. | 3 |
| c) | Discuss Dijkstra's routing algorithm with an example. | 4 |

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Begum Rokeya University, Rangpur.

3rd Year 2nd Semester Final Examination'2016

Course Code: CSE 3201 (Session:2013-14); CSE 3203(Session: 2012-2013)

Course Title: Software Engineering

Time: 3.00 Hours

Full Marks: 50

Answer Any Five from the Given Questions

(Note: Numbers in the right margin indicate marks for each question.)

1. (a) What is software engineering? What are the objectives of software engineering? 3
(b) Describe briefly the measurement qualities of good software. 4
(c) What is the most important difference between generic software product development and custom software development? What might this mean in practice for users of generic software products? 3
2. (a) Suggest why it is important to make a distinction between developing the user requirements and developing system requirements in the requirements engineering process. 3
(b) Explain why test-first development helps the programmer to develop a better understanding of the system requirements. What are the potential difficulties with test-first development? 3
(c) Compare and contrast the Scrum approach to project management with conventional plan-based approaches. The comparisons should be based on the effectiveness of each approach for planning the allocation of people to projects, estimating the cost of projects, maintaining team cohesion, and managing changes in project team membership. 4
3. (a) Identify and briefly describe four types of requirement that may be defined for a computer based system. 3
(b) Using your knowledge of how an ATM is used, develop a set of use cases that could serve as a basis for understanding the requirements for an ATM system. 4
(c) You have taken a job with a software user who has contracted your previous employer to develop a system for them. You discover that your company's interpretation of the requirements is different from the interpretation taken by your previous employer. Discuss what you should do in such a situation. You know that the costs to your current employer will increase if the ambiguities are not resolved. However, you have also a responsibility of confidentiality to your previous employer. 3
4. (a) You have been asked to develop a system that will help with planning large-scale events and parties such as weddings, graduation celebrations, birthday parties, etc. Using an activity diagram, model the process context for such a system that shows the activities involved in planning a party (booking a venue, organizing invitations, etc.) and the system elements that may be used at each stage. 5
(b) Develop a sequence diagram showing the interactions involved when a student registers for a course in a university. Courses may have limited enrollment, so the registration process must include checks that places are available. Assume that the student accesses an electronic course catalog to find out about available courses. 5
5. (a) What are the objectives of software testing? 2
(b) How software project differs from other projects? Today's reality is "software Prefects' get into all sort of trouble due to lack of communication and coordination among team members": You have been appointed as a Project Manager, how would you handle the coordination and communication issues in project and in what manner? 4
(c) Briefly describe about black box testing model. 4
6. (a) What is the impact of reusability in software development process? 3
(b) Explain the CMMI model to assess the organization level. 7
7. (a) Discuss in detail COCOMO II model for software cost estimation 5
(b) Model a data flow diagram for a 'Library Management System'. State the functional requirements 5

A

Begum Rokeya University, Rangpur
 Department of Computer Science and Engineering
 B. Sc. Engineering 3rd Year 2nd Semester Final Examination- 2016
 Course: CSE 3208 (Theory of Computation and Automata)

Time: 3 hours

Full Marks: 50

N.B.

- a) There are **SEVEN** questions in this course. Answer any **FIVE** questions.
 b) The figures in the margin indicate full marks.

- | |
|---|
| <ol style="list-style-type: none"> 1. a) Write the difference between the + closure and * closure. 2
 b) Define alphabet, string, powers of an alphabet and concatenation of strings. 3
 c) Design an FSM for a divisibility-by-3 tester for decimal numbers. 5
 2. a) Define finite automata. Why should you study automata? 3
 b) If L is accepted by an NFA with ϵ-transition then show that L is accepted by an NFA without ϵ-transition. 4
 c) Prove that every FA can be represented using a transition graph (TG), but not every TG satisfies the definition of an FA. 3
 3. a) When NFA and DFA are equivalent? 2
 b) Determine a deterministic Finite State Automaton from the given NFA $M = [\{p, q\}, \{a, b\}, \delta, p, \{q\}]$ where the state transition function δ is as shown in the following table 5 |
|---|
- | δ | a | b |
|----------|-----|--------|
| p | {p} | {p, q} |
| q | {r} | {r} |
| r | {Ø} | {Ø} |
- c) Draw the NFA to accept the following languages. 3
 Set of Strings over alphabet {0, 1, 9} such that the final digit has appeared before.
4. a) Show that Halting problem is undecidable. 5
 b) Let G be the grammar: $S \rightarrow 0A|1A, A \rightarrow 0|0S|1AA, B \rightarrow 1|1S|0BB$. 5
 For the string 00110101, find i) Leftmost derivation
 ii) Rightmost derivation
 iii) Parse tree
5. a) What are the closure properties of CFL? State the proof for any two properties. 3
 b) Construct a CFG representing the set of palindromes over $(0+1)^*$ 3
 c) What is a unit production and how will you eliminate it. Explain with example. 4
6. a) Reduce the following grammar to Chomsky normal form. 5
 $S \rightarrow 0A|1A, A \rightarrow 0|0S|1AA, B \rightarrow 1|1S|0BB$
 b) Define Greibach Normal form with suitable example. 3
 c) Differentiate between Mealy and Moore Machine 2
7. a) Write short note on Linear Bounded Automata. 3
 b) What is Russel's Paradox? Write down fundamental properties of formal systems. 3
 c) Design a Turing machine to recognize all strings consisting of odd number of 1's. Test whether this TM accepts 11111 or not. 4

A

Begum Rokeya University, Rangpur

Department of Computer Science and Engineering

3rd Year 2nd Semester Examination-2016 (Improvement)

Course Title: Algorithm Design and Analysis

Course Code: CSE3206

Full Marks: 50

Time: 3 Hours

*Note: i) Answer any FIVE questions from the following questions
ii) Numbers in the right margin indicate marks for each question.*

- | | | |
|----|---|----|
| 1. | (a) Illustrate the steps involved in analyzing algorithm using an example. | 2 |
| | (b) Write the asymptotic notations used for best case, average case, and worst case analysis of algorithms and write an algorithm for finding maximum element of an array perform best, worst and average case complexity with appropriate order notations. | 6 |
| | (c) How will you measure input size of algorithms. | 2 |
| 2. | (a) Many algorithms typically follow divide-and-conquer approach. Explain. Describe an algorithm that follows divide-and-conquer paradigm. | 5 |
| | (b) What is a heap? Discuss the Heap-sort algorithm. | 5 |
| 3. | (a) What is dynamic programming (DP)? Explain a classic DP algorithm with necessary illustration. | 5 |
| | (b) Briefly explain dynamic programming. What kind of problems can be solved using dynamic programming? Discuss. | 5 |
| 4. | (a) Discuss different algorithmic complexities of an algorithm. | 5 |
| | (b) Explain a string-matching algorithm. | 5 |
| 5. | (a) What is a Minimum Spanning Tree(MST)? Discuss Kruskal's algorithm to find the MST of a given graph. | 5 |
| | (b) Discuss an algorithm to find all pair shortest path of a given weighted graph. | 5 |
| 6. | Write short notes on any two of the followings: | 10 |
| | i) Floyd-Warshall Algorithm ii) bellman-ford algorithm iii) bubble-sort algorithm | |
| 7. | (a) Briefly discuss the Breadth-first-search and Depth-first search algorithm. | 5 |
| | (b) How data structure can play an important role in designing an algorithm? Select a data structure that you have seen previously, and discuss its strengths and limitations. | 5 |