



Daffodil International University
Department of Software Engineering
Faculty of Science & Information Technology
Final Examination, Spring 2024

Course Code: SE 113; Course Title: Introduction to Software Engineering
Sections: A, B, C, D, E, F, G, H, I, J, and K
Course Teachers: DAKM, MKS, MSA, RHH, and MS

Marks: 40

Time: 2 Hours

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

| | | | | |
|---|----|---|---|-------------|
| 1. | a) | Describe various methods of Black box testing, providing an example for each technique. | 5 | CLO-1 C2 |
| | b) | Estimate the Cyclomatic complexity of the following flow chart. Verify your answer using Graph matrix theory. | 5 | |
| <pre> graph TD 1((1)) -- A --> 2((2)) 1 -- B --> 5((5)) 2 -- H --> 3((3)) 2 -- E --> 4((4)) 3 -- G --> 6((6)) 4 -- E --> 5 4 -- F --> 6 5 -- C --> 4 5 -- D --> 6 </pre> | | | | |
| 2. | a) | Demonstrate characteristics of a good software design with examples. | 5 | CLO-2 C3 |
| | b) | Illustrate the different phases or activities of Software project management. | 5 | |
| | c) | Demonstrate the seven principles of risk management in software engineering briefly and provide real-life examples to illustrate each one. | 5 | |
| 3. | a) | Discuss various techniques of software cost estimation briefly. | 5 | CLO3 C2 |
| | b) | <p>Consider a software project for a hospital management system. The software is designed to manage patient records, appointments, and billing. The major software functions identified are:</p> <ul style="list-style-type: none"> • Patient registration • Appointment scheduling • Billing and invoicing <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div> <p>For patient registration:</p> <p>S_{opt}: 2500</p> <p>S_m: 3500</p> <p>S_{pess}: 5500</p> </div> <div> <p>For appointment scheduling:</p> <p>S_{opt}: 4200</p> <p>S_m: 6300</p> <p>S_{pess}: 8400</p> </div> <div> <p>For billing and invoicing:</p> <p>S_{opt}: 1800</p> <p>S_m: 2400</p> <p>S_{pess}: 4800</p> </div> </div> | 5 | |

Kawsher HRidoy

In this software project, the productivity rate is estimated at 4000 lines of code (LOC) per person-month, and the development cost is \$6000 per person-month. Estimate the following:

- i. Person required per month. — 1.64
- ii. Total cost of the software development. — 9840
- iii. Cost per LOC. — 2.46 \$

- c) Consider the following project schedule with activity labels, durations (in weeks), and their respective precedents: 5

| Activity | Duration (weeks) | Precedents |
|----------|------------------|------------|
| A | 7 | - |
| B | 5 | - |
| C | 3 | A |
| D | 6 | A, B |
| E | 4 | B, C |
| F | 9 | A |
| G | 4 | E, F |
| H | 3 | D, G |

Apply the critical path method to find the critical path and the activities involved. Estimate the earliest start time (ES), earliest finish time (EF), latest start time (LS), latest finish time (LF), and also identify the critical path.

Kawsher HRidoy

