Bangladesh Army University of Science and Technology

Department of Computer Science and Engineering

Final Examination, Winter 2023

Course Code: CSE 3101 **Level-3 Term- I**

Time: 03 (Three) hours **Full Marks: 180**

Course Title: Software Engineering

N.B.
- The questions are of equal value.
- Figures in the margin indicate full marks allotted to each question.
- Symbols and abbreviations bear their standard meaning.
- Use separate answer script for each PART.
- The corresponding course learning outcomes (CLOs) are given in the right most column.

PART- A (Marks: 90)

(Answer any three questions including Q. No. 1)

			Marks	CLOs
1.	a)	Define Systems Analysis and Design Life Cycle (SDLC). Write the steps of SDLC in details.	15	CLO1
	b)	Suppose, you are assigned as an analyst in a software company called "ABC Informatics". Describe your roles for the company.	10	CLO1
	d)	Briefly explain the components of information system.	5	CLO1
2.	a)	Write short notes on below topics: i) Diagram model ii) Relationships iii) Association iv) Generalization v) Aggregation	10	
	b)	A popular online shopping app called "Easy Shop". The app involves many customers, seller, admin etc. Moreover, the system performs many actions. Draw a use case diagram of shopping app.	15	
	c)	Briefly describe the elements of use case diagram.	5	
3.	a)	Define design pattern with proper example. Write the types of design pattern.	10	
	b)	Suppose, you are a project manager of "X Technical Solutions", a software development company. Your client is expecting a design of software which can deal with different interfaces for similar behavior. Now answer the questions. i) Determine the best suited design pattern in this situation. ii) Explain the reason behind your choice. iii) Give an example of the pattern with necessary diagram.	15	
	c)	Describe Model View Controller (MVC) with diagram.	5	
4.	a)	Word Statement: "Our company receives many items from several vendors each accompanied by a delivery note. A receiving office receives the item and checks the delivery note with corresponding order. Any discrepancy is reported to purchase office. The items received along with items received note (with details of items) is sent to the inspection office." Prepare document flow diagram from this system requirements specification (SRS).	10	
	b)	Derive the equation of software reliability theory.	15	
	c)	Differentiate between coupling and cohesion with example.	5	

PART- B (Marks: 90)

(Answer any three questions including Q. No. 5)

			Marks	
5.	a)	Differentiate between White Box Testing and Black Box Testing.	10	CL
	b)	Find Cyclomatic Complexity, V(G) of the following program code.	20	CLO3

```
i)    void finding_large()
ii)   {
iii)  int x=8;
iv)   int y=10;
v)    int j;
vi)   Label:
vii)  if(x>y)
viii)  j=6;
ix)   else
x)     goto Label;
xi)   return 0;
xii)  }
```

6.	a)	Write down the principles of agile methods that lead to the accelerated development and deployment of software.	12	
	b)	Write short notes on the following key terms: i) Sprint Cycle ii) Extreme Programming	10	
	c)	Differentiate between the user requirements and system requirements with example.	08	
7.	a)	A software system is to be developed to manage the records of patients who entre a clinic for treatment. The records include records of all regular patient monitoring (temperature, blood, pressures, etc.), treatment given, patient reactions and so on. After treatment, the records of their stay are sent to the patient's doctor who maintains their complete medical record. The record is visible by the all registered doctors of that clinic from anywhere at any time and also by the patients and their representative (max one for each patient) through their access credential. Write four non-functional requirements for this patient record system. Give justification for each stated (non-functional) requirements with respect to this system description.	15	
	b)	State the drawbacks of Test-First Development in Extreme Programming.	06	
	c)	Define Software Prototyping. State four benefits of software prototyping.	09	
8.	a)	Differentiate between the *incremental model and the waterfall model* of software development.	10	
	b)	Extreme programming expresses user requirements as stories with each story written on a card. Discuss the advantages and disadvantages of this approach to requirements description.	12	
	c)	Briefly state the essential attributes of a good software.	08	