

Total number of printed pages: 2

D/5<sup>th</sup>/DCSE502

2024

**SOFTWARE ENGINEERING**

Full Marks: 100

Time: Three hours

**The figures in the margin indicate full marks for the questions.**

*Answer any five questions.*

1.	a)	Fill in the blanks	5x1=5
	i.	The level 0 DFD is also known as _____.	
	ii.	Decomposition of a bubble is also known as _____.	
	iii.	_____ testing is performed to ensure that the software meets the business requirements and works as expected.	
	iv.	The set of all test cases is called the _____.	
	v.	_____ estimation is carried out first by a project manager during project planning.	
	b)	State True/False	5x1=5
	i.	Data Flow Diagram (DFD) is also known as a bubble chart.	
	ii.	The complete COCOMO model is an example of single variable heuristic cost estimation model.	
	iii.	Operating systems and real-time system programs can be considered as system programs.	
	iv.	Reliability of a software product is observer-independent.	
	v.	System testing can be considered as a white box testing.	
	c)	Explain in detail the Boehm's spiral model for software life cycle and discuss various activities in each phase.	10
2.	a)	What are the essential components of an SRS document? Explain by taking a simple application of your choice.	8
	b)	Discuss the various types of software maintenance.	6
	c)	Briefly explain about software reliability in software projects.	6
3.	a)	What are the characteristics of a good software design?	6

	b)	State the differences between function-oriented design and object-oriented design approaches. Explain with the help of an example.	8
	c)	What is functional independence? Write its advantages.	2+4=6
4.	a)	What do you mean by a data flow diagram (DFD)? Draw the DFD for an RMS calculating software. Start with the context diagram and show decompositions if necessary.	2+7=9
	b)	Construct the data dictionary for the above RMS calculating software.	4
	c)	What does the term “balancing a DFD” mean? Give an example to explain your answer.	5
	d)	Define a structure chart.	2
5.	a)	Differentiate between verification and validation in the context of software testing.	6
	b)	Is the random selection of test cases effective? Justify.	3
	c)	What are the different levels of testing a software? Explain in brief.	6
	d)	Define black-box testing. How is it different from white box testing?	3+2=5
6.	a)	List out the major responsibilities of a software project manager.	4
	b)	What do you mean by software cost estimation? Discuss in brief.	6
	c)	Point out the major shortcomings of Lines of Code (LOC) to be used as a software project size metric.	4
	d)	The size of a semidetached software product has been estimated to be 32,000 lines of source code. Calculate the effort and estimated time required to develop the above software using the basic COCOMO model.	6
7.	a)	Briefly discuss the various quality factors associated with a software product.	8
	b)	State the basic premise of software quality assurance.	2
	c)	Write a brief note on Total Quality Management (TQM).	4
	d)	Draw the process improvement cycle and discuss each component in brief.	6