

# CBCS SCHEME

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22MCA425

## Fourth Semester MCA Degree Examination, June/July 2024 Software Metrics and Quality Assurance

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	Why are software attributes important while evaluating the quality of a software application? What does “CUPRIMDA” stand for? Show the possible relationship between certain quality attributes write an example.	10	L1	CO1
	b.	List down the key elements of Total Quality Management and tell how they contribute towards software quality with a neat diagram.	10	L1	CO1
<b>OR</b>					
Q.2	a.	What is the role of Abstraction hierarchy in software measurement? List the levels of measurement used while looking for quality with suitable examples for each level of measurement.	10	L1	CO1
	b.	Lets say, we have two variables and we are interested to find the relationship between them. What do you think can be “any five types of relationships” between two variables? Show the relationship between the variable with heat diagram and your thoughts on that.	10	L1	CO1
<b>Module – 2</b>					
Q.3	a.	How does the “PTF” checklist contribute towards the fix quality improvement approach? Explain the different sample items that can be present in a “PTF” check list with a neat sketch of any sample.	10	L2	CO2
	b.	Illustrate how histograms help in defect distribution and customer satisfaction. Can we improve the overall quality of software project with this tool? Give an example scenario and draw the associated histogram for the same.	10	L2	CO2
<b>OR</b>					
Q.4	a.	Explain how the Rayleigh model can be used while empirically studying the defect patterns in a software project. With your own example, illustrate how the Rayleigh model works with a neat sketch.	10	L2	CO2
	b.	Differentiate between reliability and predictive validity. Why are these two considered as the two most important issues while measuring the quality of an application.	10	L2	CO2
<b>Module – 3</b>					
Q.5	a.	In a software code, let's say the number of distinct operator's is 5 and the number of distinct operands is 10. Total number of operators is 5 and total number operands. Use Halstead's software science metrics and calculate the vocabulary, length of the code and program volume.	10	L3	CO3

	<b>b.</b>	For the given code below, draw the control flow graph and calculate the cyclomatic complexity of the code. Code : A = 10 If B > C then A = B Else A = C Endif Print A Print B Print C	10	L3	CO3
<b>OR</b>					
<b>Q.6</b>	<b>a.</b>	In the Lorenz metrics suite, which metrics indicate the following? i) A statement of good programming practices ii) A quality indicator iii) Validating the OO development process Identify the rules of Thumb as specified by Lorenz for all the classes metric in detail :	10	L3	CO3
	<b>b.</b>	Does OO Testing Defect derival follow the pattern of a software reliability growth model? If yes, take your own example and build the graph for the same by clearly giving your thoughts.	10	L3	CO3
<b>Module – 4</b>					
<b>Q.7</b>	<b>a.</b>	There are many technologies in hardware and software that are being developed and implemented to improve product reliability and system availability. List down a few technologies. Show the association between defect levels and MTTF values with a neat table.	10	L1	CO4
	<b>b.</b>	How does one collect customer outage data to determine the availability level of one's product and use the data to drive quality improvement? Write down the approaches. Tell how there approaches work with suitable examples.	10	L1	CO4
<b>OR</b>					
<b>Q.8</b>	<b>a.</b>	Write down the IEEE definition of "Audit" and the ISO 9000-3 definition of the concepts of certification and Audit. What are the differences between a software process maturity assessment and software project assessment? With a few examples bring out the differences between the two concepts.	10	L1	CO4
	<b>b.</b>	Recall your understanding of software project assessment and prepare a typical software project assessment method with a neat diagram. Give your thoughts on the same.	10	L1	CO4
<b>Module – 5</b>					
<b>Q.9</b>	<b>a.</b>	Which model do organizations use to plan and execute a process improvement strategy based in industry best practices? Show the different process areas that are covered in each level of this model.	10	L1	CO4



	<b>b.</b>	While performing a CMMI assessment, we need to develop a process capability baseline. What are the desired outcomes of a process capability baseline? Write in detail the outcomes.	<b>10</b>	<b>L1</b>	<b>CO4</b>
<b>OR</b>					
<b>Q.10</b>	<b>a.</b>	What are the different stages companies go through while achieving software process improvement in their products? Which are the important things they should take care at each stage?	<b>10</b>	<b>L1</b>	<b>CO4</b>
	<b>b.</b>	Why is industry leadership considered very important during software process improvement? List down the different factors that contribute towards industry leadership with proper brief on all the factors.	<b>10</b>	<b>L1</b>	<b>CO4</b>

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