Narasaraopeta Engineering College (Autonomous)
Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16MCA301

MCA - III Semester Regular and Supplementary Examinations, November-2018.
SOFTWARE ENGINEERING

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Define Software
   (b) Distinguish between Functional & Non Functional Requirements with examples
   (c) List out various Architectural styles
   (d) Draw use case diagram for weather station.
   (e) Write down the metrics for maintenance
   (f) Illustrate various software risks

[2+2+2+2+2+2]

PART-B

4X 12 = 48

2. (a) Discuss the characteristics of Software in detail. 4M
   (b) Draw a diagram for Process Framework activity and explain how software is developed 8M
       using the Framework.

3. (a) Justify your answer "Risk is Mitigated in spiral model in each phase." 4M
   (b) Define System Requirements. Explain it with suitable examples and diagrams. 8M

4. (a) List out the software quality guidelines and attributes. Draw a diagram for Architectural
       Context diagram for safe home security function. 6M
   (b) Explain in detail about various inheritances among objects in context with library system
       as an example. 6M

5. (a) Discuss the black box approaches to test the behaviour of a software with related examples. 6M
   (b) Write down the formulae for length of program and minimum volume of an algorithm. 6M

6. (a) Discuss various measures for measuring quality of a software. 6M
   (b) Briefly discuss various design concepts. 6M

7. (a) Write a procedure to develop a risk table with example to analyse it for defining a cut-off
       line. 6M
   (b) Give the formula for risk exposure and explain it with an example. 6M

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Narasaraopeta Engineering College (Autonomous)
Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16MCA302

MCA - III Semester Regular and Supplementary Examinations, November-2018.
OBJECT ORIENTED ANALYSIS AND DESIGN USING UML

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) What is Object Orientation?
   (b) What is the Relationship? List out the types of Relationships.
   (c) Define Interaction.
   (d) Difference between Fork and Join.
   (e) What is Time and Space?
   (f) What is Deployment?

[2+2+2+2+2+2]

PART-B

4X 12 = 48

2. (a) Write about Building Blocks of UML.
   (b) Write about the principles of Modelling.

3. (a) Explain the relationships that are possible among the classes in the UML representation with your own Example.
   (b) Define Package. What are the stereotypes of the Package?

4. (a) Write about Interaction Diagram. Explain them with suitable Example.
   (b) Compare and contrast Sequence and Collaboration Diagram?

5. (a) What is use case? What are the notations and relationships used to describe use case diagrams?
   (b) Define Activity Diagram and write its uses.

6. (a) Define Event and Signal. What are the four kinds of events that can be modelled by UML? Explain Briefly.
   (b) Draw a state chart diagram for the student object who applies, takes admission and finally graduates.

7. (a) Discuss architectural modelling? What are different types of components?
   (b) Draw the Component and Deployment Diagrams for University Management System.

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Subject Code: R16MCA303

MCA - III Semester Regular and Supplementary Examinations, November-2018.
DESIGN AND ANALYSIS OF ALGORITHMS

Time: 3 hours   Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) What is performance measurement?
   (b) What is the general divide-and-conquer recurrence relation?
   (c) What is the use of Dijkstra's algorithm?
   (d) What are the features of dynamic programming?
   (e) What is the manner in which the state-space tree for a backtracking algorithm is constructed?
   (f) What are NP- hard and NP-complete problems?

   [2+2+2+2+2+2]

PART-B

4X 12 = 48

2. (a) Discuss various Asymptotic notations used for best case, average case and worst case analysis of algorithms.   [6M]
   (b) Write an algorithm to find the factorial of a number and find the time complexity of the algorithm.   [6M]

3. (a) Explain quick sort algorithm and simulate it for the following data:
   20, 35, 10, 16, 54, 21, 25   [8M]
   (b) Write the Time complexity of Quick sort in Best and Average cases.   [4M]

4. (a) Write an algorithm for kruskal's minimum spanning tree and explain with an example.   [6M]
   (b) What is a single source shortest path problem? Give the greedy algorithm to generate shortest paths.   [6M]

5. Design a three stage system with device types D1, D2 and D3. The costs are $30, $15 and $20 respectively. The cost of the system is to be no more than $105. The reliability of each device type is 0.9, 0.8 , 0.5.   [12M]

6. (a) Describe the 4-queens problem using backtracking.   [6M]
   (b) Let w = {2, 4, 6} and m=6. Find all possible subsets of w that sum to m. Do this using Sum of Subsets. Draw the state space tree that is generated.   [6M]

7. Consider the traveling salesperson instance defined by the cost matrix:

$$
\begin{matrix}
\infty & 20 & 30 & 10 & 11 \\
15 & \infty & 16 & 4 & 2 \\
3 & 5 & \infty & 2 & 4 \\
19 & 6 & 18 & \infty & 3 \\
16 & 4 & 7 & 16 & \infty
\end{matrix}
$$

(a) Obtain the reduced cost matrix

(b) Draw the state space tree and describe the progress of the method from node to node.

[4M+8M]

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Subject Code: R16MCA304

MCA - III Semester Regular and Supplementary Examinations, November-2018.
WEB TECHNOLOGIES

Time: 3 hours   Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. a) Explain Table Tag with an example.
   b) What is the full form of AWT & its disadvantages?
   c) Write a short note on Session Tracking.
   d) Explain the role of Tomcat Server in web application deployment?
   e) How can you explain JavaBeans' Introspection?
   f) What is the abbreviation of JDBC-ODBC?

                                                            [2+2+2+2+2+2]

PART-B

                                                            4X 12 = 48

2. a) Design a table with 3 attributes i.e., StudNo, StudName, StudAvgMarks by using HTML Tags.
   b) Explain a Java Script for form validation (At-least 6 validations)?

3. a) What are the similarities and dissimilarities of swing and AWT.
   b) How can you develop simple home page by using swing and JApplet?

4. a) Explain the Life Cycle of Servlet.
   b) Explain the use of javax.servlet.HTTP package.

5. a) What is the role of JSP in designing dynamic web applications?
   b) Mention the advantages and disadvantages of MVC model?

6. a) List out the steps that involved in creating a new bean. Explain each step in detail.
   b) What are the various JSP implicit objects? Explain any 3 of them?

7. a) How does JDBC API helps in achieving loose coupling between Java Program & JDBC Drivers API?
   b) What is the limitation of Prepared Statement and how to overcome it?

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