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**VACHANA PITAMAHA DR.P.G.HALAKATTI**

**COLLEGE OF ENGINEERING AND TECHNOLOGY ,VIJAYPUR**

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## QUESTION PAPERS

## 1st,2nd,3rd,4th & 5thSEMESTER

## MCA

## DEC. 2019/JAN. 2020

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16/17MCA32

# Third Semester MCA Degree Examination, Dec.2019/Jan.2020
## Java Programming

Time: 3 hrs. Max. Marks: 80

**Note:** ***Answer any FIVE full questions, choosing ONE full question from each module.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

### Module-1

1 a. Explain briefly the Object Oriented principles of Java. **(08 Marks)**
b. Discuss the various primitive data types used in Java. **(08 Marks)**

**OR**

2 a. Explain the working of enhanced for loop with suitable example. **(08 Marks)**
b. What is StringBuffer? What is its usage? Write suitable example. **(08 Marks)**

### Module-2

3 a. Explain parameterized constructor with suitable example. **(08 Marks)**
b. What is the difference between methods overloading and method overriding? Explain with proper example. **(08 Marks)**

**OR**

4 a. What are constructors? Explain constructor overloading with examples. **(08 Marks)**
b. Explain the following with suitable example: i) Super ii) Final. **(08 Marks)**

### Module-3

5 a. Explain different access specifiers used in Java with suitable example. **(08 Marks)**
b. Write a Java program for the implementation of multiple inheritance using interfaces to calculate the area of a rectangle and triangle. **(08 Marks)**

**OR**

6 a. What is an exception? How exception can be handled in Java with example. **(08 Marks)**
b. What are packages in Java? Why is it required to package Java program? Give example. **(08 Marks)**

### Module-4

7 a. What is multi threading? Write a Java program to create multiple threads in Java by implementing Runnable interface. **(08 Marks)**
b. What is enumeration? Explain values( ) and valuesOf( ) methods. **(08 Marks)**

**OR**

8 a. What is autoboxing? Illustrate with a programming example. **(08 Marks)**
b. What is thread? Explain how to create threads in Java with an example. **(08 Marks)**

### Module-5

9 a. What is an applet? Write a Java applet program which handles keyboard event. **(08 Marks)**
b. Write a note on Swing Button. **(08 Marks)**

**OR**

10 a. With an example, explain the LinkedList collection classes. **(08 Marks)**
b. Explain about URL connection class. **(08 Marks)**

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13MCA34

# Third Semester MCA Degree Examination, Dec.2019/Jan.2020
## Computer Graphics

Time: 3 hrs. Max. Marks:100

**Note:** ***Answer any FIVE full questions.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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1 a. What is OpenGL? Describe OpenGL related libraries and header files. **(05 Marks)**
b. Explain OpenGL point and line functions with examples. **(07 Marks)**
c. Differentiate absolute and relative coordinate specification. **(02 Marks)**
d. Explain OpenGL functions to set display callback routine and to display initial graphics, to the display window. **(06 Marks)**

2 a. Explain briefly the procedure for DDA line drawing algorithm. **(06 Marks)**
b. Explain Midpoint circle algorithm deriving the decision parameter and given radius r = 10. **(09 Marks)**
c. Explain boundary-fill algorithm in brief. **(05 Marks)**

3 a. Explain 2D translation, rotation, reflection and scaling. **(10 Marks)**
b. What is composite transformation? Show that composition of 2 scaling is multiplicative. **(05 Marks)**
c. Explain Pivot-point Rotation with example. **(05 Marks)**

4 a. Explain OpenGL geometric transformation functions and Matrix operations in brief. **(07 Marks)**
b. Explain 3D Rotation about all axis. **(05 Marks)**
c. Write a program to create [without using built in function] a square by implementing shear algorithm along i) x-axis ii) y-axis. **(08 Marks)**

5 a. Explain Liang-Barsky line clipping algorithm. **(10 Marks)**
b. What is polygon clipping? Explain the algorithm for convex polygon fill area clipping with example. **(10 Marks)**

6 a. Explain 3D viewing pipeline. **(05 Marks)**
b. Explain depth curing, surface Rendering in 3-dimensional viewing. **(05 Marks)**
c. Derive the 3-dimensional transformation matrices from world to viewing coordinate. **(10 Marks)**

7 a. Derive Oblique parallel projection matrix. **(10 Marks)**
b. Derive perspective projection transformation matrix. **(10 Marks)**

8 a. What is Bezier spline curve? Derive its equation and explain its properties. **(10 Marks)**
b. Explain the following:
i) Design an animation sequence
ii) Traditional animation techniques. **(10 Marks)**

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13MCA41

# Fourth Semester MCA Degree Examination, Dec.2019/Jan.2020
## Analysis and Design of Algorithms

Time: 3 hrs. Max. Marks:100

**Note:** ***Answer any FIVE full questions.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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1 a. Briefly discuss the steps used in design and analysis of algorithm. **(06 Marks)**

b. Define asymptotic Notations. **(04 Marks)**

c. Give general plan for non-recursive algorithm. Design and analysis an algorithm to find maximum element in an array. **(10 Marks)**

2 a. Explain in general Brute force strategy. Write an algorithm for bubble sort and analyze. **(10 Marks)**

b. Give the general framework of divide and conquer technique. Write an algorithm and analyze merge sort. **(10 Marks)**

3 a. Differentiate between BFS and DFS. **(04 Marks)**

b. Define topological sorting problem and find the topological ordering for the following graph using source removal technique.

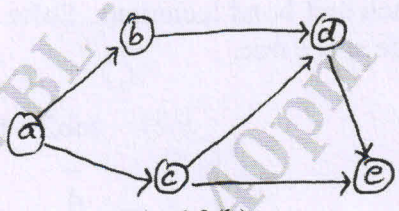


Fig.Q3(b) **(08 Marks)**

c. Explain Johnson Trotter algorithm. Apply the algorithm to generate permutations for n = 3. **(08 Marks)**

4 a. Explain Horspool string matching algorithm. Trace the algorithm to find the pattern BARBER in the string JIM-SAW-ME-IN-BARBER. **(10 Marks)**

b. Write on algorithm to sort numbers using comparison counting sort and sort the following numbers in ascending order 62, 25, 91, 98, 12, 32. **(10 Marks)**

5 a. Define transitive closure of a diagraph and explain Warshall's algorithm to find the transitive closure of the following graph.

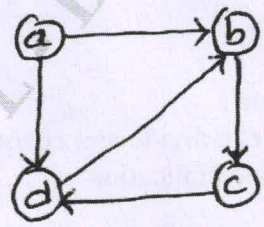


Fig.Q5(a) **(10 Marks)**

b. Apply dynamic programming algorithm to the following knapsach and find maximum profit. Given capacity of knapsack W = 4. **(10 Marks)**

| Items | Weight | Value |
|---|---|---|
| 1 | 3 | 25 |
| 2 | 1 | 20 |
| 3 | 2 | 40 |

6 a. Using Kruskal's algorithm find the minimum spanning tree of the following graph.

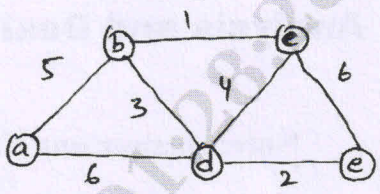


Fig.Q6(a) **(10 Marks)**

b. Apply Dijkstra's algorithm and solve the single source shortest path problem for the given graph consider as a source node.

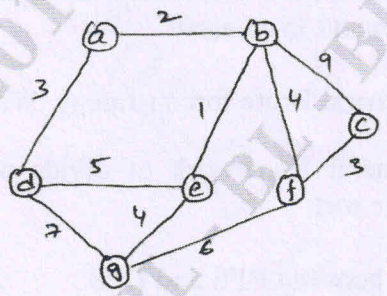


Fig.Q6(b) **(10 Marks)**

7 a. Explain branch and bond technique. Solve the following assignment problem and draw the complete state space tree.

| Job1 | Job2 | Job3 | Job4 | |
|---|---|---|---|---|
| 9 | 2 | 7 | 8 | Person a |
| 6 | 4 | 3 | 7 | Person b |
| 5 | 8 | 1 | 8 | Person c |
| 7 | 6 | 9 | 4 | Person d |

**(10 Marks)**

b. Solve the following knapsack problem using branch and bound technique knapsact capacity w = 10.

| Item | Weight | Value |
|---|---|---|
| 1 | 4 | 40 |
| 2 | 7 | 42 |
| 3 | 5 | 25 |
| 4 | 3 | 12 |

**(10 Marks)**

8 Write short notes on :

a. Differentiate between divide and conquer and dynamic programming
b. Strassen's matrix multiplication
c. Decision trees
d. P and NP complete problems. **(20 Marks)**

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16/17MCA42

# Fourth Semester MCA Degree Examination, Dec.2019/Jan.2020
## Advanced Web Programming

Time: 3 hrs. Max. Marks: 80

**Note:** ***Answer any FIVE full questions, choosing ONE full question from each module.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

### Module-1

1 a. What is jQuery? Explain the document ready handler with syntax. How jQuery is structured? **(08 Marks)**

b. Explain different methods used for adding and removing class names with example. **(08 Marks)**

**OR**

2 a. Explain any four basic selectors of jQuery with suitable examples. **(08 Marks)**

b. Illustrate with an example append( ), wrap( ), empty( ) and val( ) methods. **(08 Marks)**

### Module-2

3 a. Explain file handling functions in PHP with example. **(08 Marks)**

b. Compare cookies and sessions in PHP. How to create a cookie and sessions? Give an example. **(08 Marks)**

**OR**

4 a. Explain with example scalar types in PHP. **(08 Marks)**

b. Write a program to read student data from an XML file and store into the MySQL database and retrieve. **(08 Marks)**

### Module-3

5 a. Explain built-in methods for arrays and list in Ruby. **(08 Marks)**

b. Discuss any four string handling functions in PHP with suitable examples. **(08 Marks)**

**OR**

6 a. Explain directory structure of rails application with a neat diagram. **(06 Marks)**

b. Explain the form handling in rails. **(06 Marks)**

c. Write a note on RAILS. **(04 Marks)**

### Module-4

7 a. Explain SaaS and social networking with respect to Web 2.0. **(08 Marks)**

b. What is JSON? Explain JSON format. **(08 Marks)**

**OR**

8 a. Describe SOAP. Explain different styles of SOAP with an example. **(08 Marks)**

b. Explain REST with sample REST call. Explain WSDL. **(08 Marks)**

### Module-5

9 a. Explain d3.js selects method. Write a note on D3.js. **(08 Marks)**

b. Explain the features of D3.js. **(08 Marks)**

**OR**

10 a. Explain the stack layout in D3. **(08 Marks)**

b. Illustrate Graphing Mean Daily Plaza traffic. **(08 Marks)**

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16/17MCA443

# Fourth Semester MCA Degree Examination, Dec.2019/Jan.2020
## Software Architecture

Time: 3 hrs. Max. Marks: 80

**Note:** ***Answer FIVE full questions, choosing ONE full question from each module.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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### Module-1

1 a. Explain the concept of Architecture Business Cycle is detail. **(08 Marks)**
b. What are the different factors which influence the architecture is an organization? **(08 Marks)**

**OR**

2 a. Explain why software architecture is important. **(08 Marks)**
b. Explain software architecture in project life-cycle context. **(08 Marks)**

### Module-2

3 a. Explain availability quality attribute with the help of general scenario? **(08 Marks)**
b. What do you mean by tactics? Explain security tactic with proper diagram. **(08 Marks)**

**OR**

4 a. Explain the categories of design decision. **(08 Marks)**
b. What are the parts of a quality attribute scenario? How can it be applied for modifiability? **(08 Marks)**

### Module-3

5 a. Discuss on quality attribute checklist through experiments and back of the envelope analysis. **(08 Marks)**
b. Explain the means of identifying ASRs. **(08 Marks)**

**OR**

6 a. Explain the business Goals and an Architecture with a diagram. **(08 Marks)**
b. Explain the analysis of quality attribute performance. **(08 Marks)**

### Module-4

7 a. Explain Attribute Driven Design (ADD) and the steps involved in ADD process **(08 Marks)**
b. What are the techniques which help to keep the implementation code and the architecture consistent? **(08 Marks)**

**OR**

8 a. Explain the test activities and the architects role in testing. **(08 Marks)**
b. Explain the component-and-connector view in documenting software architecture. **(08 Marks)**

### Module-5

9 a. Discuss the structure of model-view-controller pattern. **(08 Marks)**
b. Explain the broker architectural pattern. **(08 Marks)**

**OR**

10 a. Discuss pattern classification with suitable example. **(08 Marks)**
b. Explain blackboard architectural pattern with a neat diagram. **(08 Marks)**

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13MCA42

# Fourth Semester MCA Degree Examination, Dec.2019/Jan.2020
## Advanced Java Programming

Time: 3 hrs. Max. Marks:100

**Note:** ***Answer any FIVE full questions.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

1 a. Describe Servlet. Illustrate the phases of the servlet life cycle with appropriate method implementation. **(10 Marks)**

b. Briefly explain the different HTTP request headers and different methods to handle it in servlet. **(10 Marks)**

2 a. Write a Java Servlet Program that handles Form Data. **(10 Marks)**

b. What is Session Tracking? Explain different techniques of session tracking with the help of examples. **(10 Marks)**

3 a. Explain different types of JSP Scripting elements with examples. **(10 Marks)**

b. How JSP works? Explain with a neat diagram, **(10 Marks)**

4 a. Write a JSP program to implement verification of a particular user login and display Welcome page. **(10 Marks)**

b. Explain the different types of JSP directive tags and list out attributes for page directive. **(10 Marks)**

5 a. Explain with examples the different JDBC data types. **(10 Marks)**

b. Explain the steps in writing JDBC program with sample code. **(10 Marks)**

6 a. Explain about JARs in details. **(07 Marks)**

b. What are Annotations? Explain built in annotations. **(08 Marks)**

c. Define Java Beans and its features. **(05 Marks)**

7 a. With the help of a neat block diagram, explain life cycle of a stateless session beans. **(10 Marks)**

b. Explain briefly:
i) Message Driven Beans
ii) Entity Beans. **(10 Marks)**

8 Write a brief note on the following:
a. Instance Pooling
b. Dependency Injection
c. Introspection
d. Transaction Processing. **(20 Marks)**

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16/17MCA52

# Fifth Semester MCA Degree Examination, Dec.2019/Jan.2020
## Programming Using C# and .Net

Time: 3 hrs. Max. Marks: 80

**Note:** ***Answer any FIVE full questions, choosing ONE full question from each module.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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### Module-1

1 a. Explain the architecture of .NET framework 4.0 and describe its component. **(08 Marks)**

b. What is namespace? Explain the steps involved in creating a namespace and illustrate few common namespaces. **(08 Marks)**

**OR**

2 a. What is Boxing and unboxing? Write a C# program to demonstrate boxing and unboxing. **(06 Marks)**

b. Write short notes on:
i) Windows work flow foundation
ii) Windows Card Space. **(10 Marks)**

### Module-2

3 a. Define the following class and explain with program:
i) Partial class
ii) Sealed class. **(08 Marks)**

b. Explain with example the method of implementing encapsulation using class properties and accessors and mutators. . **(08 Marks)**

**OR**

4 a. Explain the characteristics of abstract classes and abstract methods. **(05 Marks)**

b. List the difference between properties and indexers with example. **(05 Marks)**

c. Write a program to add two complex number using operator overloading. **(06 Marks)**

### Module-3

5 a. What are delegates? Explain the steps involved in creating and using delegate in C# program. **(06 Marks)**

b. What is connection object? Explain the procedure of getting connected to a database and running the following queries with relevant example:
i) Insert record to a table.
ii) Select records from a table and place in grid. **(10 Marks)**

**OR**

6 a. Describe the architecture of ADO .NET. **(06 Marks)**

b. Explain try-catch finally statement with example. **(04 Marks)**

c. What is data adapter? Write a C# code to create a data set from a data adapter. **(06 Marks)**

## Module-4

7 a. Illustrate working with following controls with a windows form application example:
   i) CheckBox
   ii) RadioButton
   iii) GroupBox. **(09 Marks)**

b. Explain different types of keyboard events. Demonstrate with coding some of the keyboard handling. **(07 Marks)**

**OR**

8 a. Write a program for addition of two numbers from text boxes and display the result in the form using button click event. **(04 Marks)**

b. Explain WPF architecture. **(08 Marks)**

c. Write short notes on MDI windows. **(04 Marks)**

## Module-5

9 a. Explain session tracking in detail. **(08 Marks)**

b. Explain different AJAX server controls. **(08 Marks)**

**OR**

10 a. Explain web application development with ASP .NET by writing steps to explain validation controls. **(08 Marks)**

b. Explain in detail multitier application architecture. **(06 Marks)**

c. Write short note on UpdatePanel in ASP .NET AJAX. **(02 Marks)**

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16/17MCA53

# Fifth Semester MCA Degree Examination, Dec.2019/Jan.2020
# Mobile Applications

Time: 3 hrs. Max. Marks: 80

***Note: Answer any FIVE full questions, choosing ONE full question from each module.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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## Module-1

1 a. Explain the reasons/preliminary considerations to build a mobile application. **(08 Marks)**
b. Outline the architecture of Android. **(08 Marks)**

2 a. Compare and contrast between different mobile platforms. **(08 Marks)**
b. Explain the terms to understand mobile application users. **(08 Marks)**

## Module-2

3 a. Explain briefly the life cycle of an Activity and Fragments. **(10 Marks)**
b. Describe anatomy of an android application. **(06 Marks)**

4 a. Write short notes on components of android applications. **(10 Marks)**
b. Differentiate between linear layout and absolute layout. **(06 Marks)**

## Module-3

5 a. Describe Views and View Groups in Android application with syntax. **(08 Marks)**
b. Write short notes on basic views and spinner views. **(08 Marks)**

6 a. Outline the working of Google Maps in Android Applications. **(08 Marks)**
b. Illustrate the three methods of getting location based data. **(08 Marks)**

## Module-4

7 a. Explain briefly how SMS and Mail works in android. **(10 Marks)**
b. How do you publish android applications? List out the steps briefly. **(06 Marks)**

8 a. Analyze the methods for accessing web services through android application. **(08 Marks)**
b. What is content provider in android? List and explain different content providers. **(08 Marks)**

## Module-5

9 a. Explain briefly the steps to create native ios application. **(08 Marks)**
b. Give the hardware, tools and installations required to setup windows phone SDK for developing software for windows phone. **(08 Marks)**

10 a. Write short notes on ios story board. **(08 Marks)**
b. Explain briefly accelerometer in Windows Phone 7. **(08 Marks)**

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16/17MCA541

# Fifth Semester MCA Degree Examination, Dec.2019/Jan.2020
# Web 2.0 and Rich Internet Applications

Time: 3 hrs. Max. Marks: 80

***Note: Answer any FIVE full questions, choosing ONE full question from each module.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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## Module-1

1 a. What is Ajax? Explain the key principles of good Ajax application. **(10 Marks)**

b. With a neat diagram explain briefly Ajax web application model. **(06 Marks)**

**OR**

2 a. Create a simple Ajax application to send data to the server using GET method and display the server response on the browser. **(08 Marks)**

b. Explain the following XMLHttpRequest object properties and methods:
(i) ready state (ii) status (iii) open **(08 Marks)**

## Module-2

3 a. Write an Ajax application to create and use an array of XMLHttpRequest object. **(08 Marks)**

b. What are the advantages and disadvantages of array of XMLHttpRequest object. **(08 Marks)**

**OR**

4 a. Write a Ajax program to download java script. **(08 Marks)**

b. Write a Ajax program to display all header information. **(08 Marks)**

## Module-3

5 a. Write a program to access XML data directly and display third person's first and last name using javascript. **(08 Marks)**

b. List and explain any 8 Java script built-in property which work with the nodes in XML document. **(08 Marks)**

**OR**

6 a. With an example explain briefly DOM. **(06 Marks)**

b. Write a program using Ajax and DOM to replace elements in an HTML document. **(10 Marks)**

## Module-4

7 a. What is Bootstrap? Explain briefly default grid system of Bootstrap. Write a program to illustrate fixed and fluid grid system. **(08 Marks)**

b. What is responsive design? With an example explain how to create responsive design in bootstrap. **(08 Marks)**

**OR**

8 a. List and explain three difference types of list supported by bootstrap. **(10 Marks)**

b. Create a bootstrap web application using search form, inline form and horizontal form. **(06 Marks)**

## Module-5

| | | | |
|---|---|---|---|
| 9 | a. | Explain briefly Novbar and Novbar link features of bootstrap. | **(09 Marks)** |
| | b. | Explain briefly Breadcrumbs features of bootstrap. | **(07 Marks)** |

**OR**

| | | | |
|---|---|---|---|
| 10 | a. | With an example explain briefly checkbox buttons and radio buttons. | **(06 Marks)** |
| | b. | Explain briefly bootstrap tooltips and popover methods. | **(10 Marks)** |

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16/17MCA554

# Fifth Semester MCA Degree Examination, Dec.2019/Jan.2020
# Software Project Management

Time: 3 hrs. Max. Marks: 80

**Note:** ***Answer any FIVE full questions, choosing ONE full question from each module.***

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## Module-1

1 a. What is project? Explain the characteristics of the project and how software projects different from other types of project. **(10 Marks)**

b. Briefly explain the activities covered by Software Project Management. **(06 Marks)**

**OR**

2 a. What is management? List and explain management activities. **(06 Marks)**

b. Explain the differences between Software Development Life Cycle And Project Management Life Cycle. **(10 Marks)**

## Module-2

3 a. Calculate the Net Present Value (NPV) for each of the projects A, B and C shown in the table, using the discount rate 6%. Decide which is the best project to choose as per NPV method.

| Year | Project A (Rs.) | Project B (Rs.) | Project C (Rs.) |
|---|---|---|---|
| 0 | –8000 | –9000 | –10,000 |
| 1 | 4000 | 1000 | 2000 |
| 2 | 4000 | 2000 | 2000 |
| 3 | 2000 | 4000 | 6000 |
| 4 | 1000 | 3000 | 2000 |
| 5 | 500 | 3500 | 2000 |
| Net profit | 4000 | 4500 | 4000 |

**(08 Marks)**

b. What is project evaluation? Explain the following cost-benefit evaluation techniques.
i) Net profit ii) Payback period iii) Return on investment. **(08 Marks)**

**OR**

4 a. What is Accounting? Briefly explain the accounting concepts in which the science of accenting is based. **(10 Marks)**

b. Explain the following with respect to accounts :
i) Profit and Loss account
ii) Balance sheet. **(06 Marks)**

## Module-3

5 a. Draw an AON network for the following set of activities by considering the precedence relation between the activities. Indentify the critical path and project completion time. **(09 Marks)**

| Activity | Precedents | Duration in months |
|---|---|---|
| A | – | 6 |
| B | – | 4 |
| C | A | 3 |
| D | B | 4 |
| E | B | 3 |
| F | – | 10 |
| G | E, F | 3 |
| H | C, D | 2 |

b. What is Risk? Briefly explain the categories of Risk and Risk Management approaches. **(07 Marks)**

**OR**

6 a. List and explain Boehm identified top ten risks and its counter measures. **(10 Marks)**

b. List and explain the three approaches used for identifying activities or tasks that make up a project. **(06 Marks)**

## Module-4

7 a. With the help of project control cycle model and project reporting structure explain project monitoring. **(08 Marks)**

b. What is project review? Explain the advantages of project review and Review process model. **(08 Marks)**

**OR**

8 a. Explain how to visualize the project progress using Gantt chart and Slip chart example each. **(08 Marks)**

b. What is software configuration management? Explain the propose of software configuration management. **(08 Marks)**

## Module-5

9 a. Explain Oldman Hackman job characteristics model. **(08 Marks)**

b. Explain the Maslow's hierarchy of needs. **(04 Marks)**

c. Write a note on leadership. **(04 Marks)**

**OR**

10 a. Explain the different team structure used in the organization for project development. **(08 Marks)**

b. What is stress? Explain stress management techniques. **(08 Marks)**

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13MCA51

# Fifth Semester MCA Degree Examination, Dec.2019/Jan.2020
## Object Oriented Modeling and Design Patterns

Time: 3 hrs. Max. Marks:100

**Note:** ***Answer any FIVE full questions.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

1 a. What is Object Orientation? Explain briefly the stages involved in OO Methodology. **(10 Marks)**

b. Explain with neat diagram of Models in OOMD. **(10 Marks)**

2 a. Explain with a neat diagram Ternary association and links. **(08 Marks)**

b. With a neat diagram, explain class model of a windowing system. **(12 Marks)**

3 a. Explain aggregation concurrency within an object with an example each. **(10 Marks)**

b. Explain use case diagram for a vending machine. **(10 Marks)**

4 a. Explain sequence diagram for a session with an online stock broker. **(10 Marks)**

b. Explain with suitable example how activity diagram will show client control by sending and receiving event. **(10 Marks)**

5 a. Explain development stages in process. **(10 Marks)**

b. Explain different types of Development life cycle. **(10 Marks)**

6 a. Explain any 3 Domain class model. **(10 Marks)**

b. Explain any 3 Domain state model. **(10 Marks)**

7 a. Explain with suitable diagram bridge in class design. **(10 Marks)**

b. Explain with suitable diagram strategy in class design. **(10 Marks)**

8 Short notes on:

a. Package

b. Swim lanes

c. Time Event

d. Qualified Associations. **(20 Marks)**

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13MCA52

# Fifth Semester MCA Degree Examination, Dec.2019/Jan.2020
## System Simulation and Modeling

Time: 3 hrs. Max. Marks:100

**Note:** ***1. Answer any FIVE full questions.***
***2. Statistical tables can be provided.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

1 a. Define Simulation. What are the advantages of simulation? **(06 Marks)**

b. Name the entities, attributes, activities, events and events for the following system:
i) Small appliance repair shop ii) Grocery store. **(06 Marks)**

c. With the help of flow chart, explain the steps in simulation study. **(08 Marks)**

2 a. Explain one discrete distribution and one continuous distribution and calculate mean and variance of the same. **(08 Marks)**

b. Hurricane hitting the eastern coast of India follows Poisson distribution with mean 0.8 per year. Determine:
i) Probability of not hitting the eastern coast in a year.
ii) The probability of more than two hurricanes hitting the eastern coast in a year. **(06 Marks)**

c. Lifetime of a bulb following pdf

$$f(x) = \begin{cases} 0.4e^{-0.4x} & x \geq 0 \\ 0 & \text{otherwise} \end{cases}$$

i) What is the probability it is still alive after 5 years?
ii) What is the probability it dies between 3 and 6 years? **(06 Marks)**

3 a. Briefly explain linear congruential method and generate five random numbers using multiplicative congruential method with $x_0 = 5$, $a = 10$ and $m = 64$. **(08 Marks)**

b. Explain Kolmogorov-Smirnov test to test the generated random numbers are uniformly distributed or not. **(06 Marks)**

c. Develop a random variate generator for x with pdf $f(x) = \begin{cases} \lambda e^{-\lambda x} & x \geq 0 \\ 0 & \text{otherwise} \end{cases}$ **(06 Marks)**

4 a. Define Queue and explain the characteristics of queuing system. **(10 Marks)**

b. Dr. Raman is a dentist who schedules all his patients for 30 minutes appointments. Some of the patients take more or less than 30 minutes depending on the type of dental work to be done. The following summary shows the various categories of work, their probabilities and the time actually needed to complete the work.

| Category | Time required | Probability of category |
|---|---|---|
| Filling | 45 minutes | 0.40 |
| Crown | 60 minutes | 0.15 |
| Cleaning | 15minutes | 0.15 |
| Extraction | 45 minutes | 0.10 |
| Check up | 15 minutes | 0.20 |

Simulate the dentist's clinic for 4 hours and determine average waiting time for the patients as well as the idleness of the doctor. Assume that all the patients show up at the clinic at exactly their scheduled arrival time starting at 8am. Use the following random numbers for handling the above problem: 40, 82, 11, 34, 25, 66, 17, 79. **(10 Marks)**

5 a. Explain Event scheduling algorithm. **(06 Marks)**

b. Write a note on list processing and operational. **(06 Marks)**

c. With the help of flow chart, explain simulation in Java for single server queue. **(08 Marks)**

6 a. Briefly explain the steps involved in developing input model. **(06 Marks)**

b. Write a note on quantile-quantile plot. **(06 Marks)**

c. Records pertaining to the monthly number of job related injuries at an underground coalmine were being studied by a federal agency. The values for the past 100 months were as follows:

| Injuries/month | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Frequency of occurrence | 35 | 40 | 13 | 6 | 4 | 1 | 1 |

Apply the Chi-square test to these data to test the hypothesis that the underlying distribution is Poisson. Use the level of significance $\alpha = 0.05$, $\chi^2_{0.05(4)} = 9.49$, $\chi^2_{0.05(3)} = 7.81$, $\chi^2_{0.05(2)} = 5.99$ **(08 Marks)**

7 a. What is verification of a simulation model? List the suggestions for verification of a model. **(10 Marks)**

b. Describe 3 steps approach to validation by Naylor and Finger. **(10 Marks)**

8 a. Explain terminating or transient simulation with respect to output analysis. **(07 Marks)**

b. Explain point estimation and interval estimation to estimate parameters. **(08 Marks)**

c. Explain the methods of reducing initialization bias in steady state simulation. **(05 Marks)**

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13MCA53

# Fifth Semester MCA Degree Examination, Dec.2019/Jan.2020
## Programming using C# .NET

Time: 3 hrs. Max. Marks:100

**Note:** ***Answer any FIVE full questions.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

1 a. Explain benefits of .NET frame work. **(05 Marks)**
b. What is managed and unmanaged code? Explain the process of compilation and execution of a code by just in time compiler. **(05 Marks)**
c. What are preprocessor directives? Explain with example. **(10 Marks)**

2 a. What are reference types? Explain different predefined reference types with example. **(05 Marks)**
b. What are arrays? Write a C# program to read and display the multidimensional array. **(05 Marks)**
c. Explain Null Coalescing operator with example. **(10 Marks)**

3 a. What are partial class and partial methods? Explain why partial classes are important with an example. **(10 Marks)**
b. What are different ways of passing parameters to a method? Explain with examples. **(10 Marks)**

4 a. What is encapsulation? Explain the advantages of encapsulation and demonstrate how properties are used to implement encapsulation. **(10 Marks)**
b. What are runtime polymorphisms? Explain with example. **(10 Marks)**

5 a. What are multicast delegates? Explain with an example. **(10 Marks)**
b. What are checked and unchecked statements in C#? Explain with example. **(05 Marks)**
c. What are exceptions? Explain how exceptions are handled in C# with example. **(05 Marks)**

6 a. What are tool tip? Explain different properties of tool tips. **(05 Marks)**
b. Write a code snippet to create GUI for entering two number to perform arithmetic operation and display the result in a label on button click. **(10 Marks)**
c. Explain different events and properties of combo box with example. **(05 Marks)**

7 a. What is dataset? Explain different components of dataset. **(05 Marks)**
b. Write a C# program to connect to database, populate the dataset with multiple table and display the result in a grid view control. **(10 Marks)**
c. What is connection string? Explain connection string parameters. **(05 Marks)**

8 a. With neat diagram, explain 'N' tier application architecture. **(10 Marks)**
b. Explain different standard web control used in web application development. **(05 Marks)**
c. What are Namespaces? Explain any four system namespaces provided by C#. **(05 Marks)**

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13MCA556

# Fifth Semester MCA Degree Examination, Dec.2019/Jan.2020
## Software Project Management

Time: 3 hrs. Max. Marks:100

**Note:** ***Answer any FIVE full questions.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

1 a. Define project. Explain different activities covered by Software Project Management. **(04 Marks)**

b. Discuss how the normal project differs from a software project. **(06 Marks)**

c. Explain step wise project planning with a neat diagram. **(10 Marks)**

2 a. Discuss the different cost-benefit evaluation techniques. **(10 Marks)**

b. Explain different methods of evaluating individual projects. **(06 Marks)**

c. Write a note on Risk evaluation. **(04 Marks)**

3 a. What are the different objectives of activity planning? **(05 Marks)**

b. Write the rules and convention as used in activity on arrow networks. **(05 Marks)**

c. Create a precedence activity network using the following details.

| | Activity | Duration (weeks) | Percents |
|---|---|---|---|
| A | Hardware selection | 6 | |
| B | System configuration | 4 | |
| C | Install hard-ware | 3 | A |
| D | Data Migration | 4 | B |
| E | Draft office procedure | 3 | B |
| F | Recruit staff | 10 | |
| G | User training | 3 | E, F |
| H | Install and Test system | 2 | C, D |

Calculate the earliest and latest start and ends dates and the float associated with each activity in the networked created. Identify the critical path. **(10 Marks)**

4 a. What is Risk Management? Describe the various methods for managing Risk. **(06 Marks)**

b. Explain Risk Planning and Control. **(06 Marks)**

c. State the different factors to be considered for Hazard Risk identification. **(08 Marks)**

5 a. Discuss the various methods to visualize project progress. **(08 Marks)**

b. Explain how the project can take back to target. **(06 Marks)**

c. Write a flow chart for creating Framework project control cycle. **(06 Marks)**

6 a. Explain different types of contract. **(10 Marks)**

b. Define a contract. Write the different stages in contract placement. **(10 Marks)**

7 a. Explain the process of selecting the right person for the job. **(06 Marks)**

b. Write a note on Oldham Hackman Job characteristics model. **(06 Marks)**

c. Discuss the various models utilized in motivating a staff. **(08 Marks)**

8 a. Explain in detail decision making in Software Project Management. **(10 Marks)**

b. Describe the different project team structure. **(10 Marks)**

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16/17MCA541

# Fifth Semester MCA Degree Examination, Dec.2019/Jan.2020
# Web 2.0 and Rich Internet Applications

Time: 3 hrs. Max. Marks: 80

***Note: Answer any FIVE full questions, choosing ONE full question from each module.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

## Module-1

1 a. What is Ajax? Explain the key principles of good Ajax application. **(10 Marks)**

b. With a neat diagram explain briefly Ajax web application model. **(06 Marks)**

**OR**

2 a. Create a simple Ajax application to send data to the server using GET method and display the server response on the browser. **(08 Marks)**

b. Explain the following XMLHttpRequest object properties and methods:
(i) ready state (ii) status (iii) open **(08 Marks)**

## Module-2

3 a. Write an Ajax application to create and use an array of XMLHttpRequest object. **(08 Marks)**

b. What are the advantages and disadvantages of array of XMLHttpRequest object. **(08 Marks)**

**OR**

4 a. Write a Ajax program to download java script. **(08 Marks)**

b. Write a Ajax program to display all header information. **(08 Marks)**

## Module-3

5 a. Write a program to access XML data directly and display third person's first and last name using javascript. **(08 Marks)**

b. List and explain any 8 Java script built-in property which work with the nodes in XML document. **(08 Marks)**

**OR**

6 a. With an example explain briefly DOM. **(06 Marks)**

b. Write a program using Ajax and DOM to replace elements in an HTML document. **(10 Marks)**

## Module-4

7 a. What is Bootstrap? Explain briefly default grid system of Bootstrap. Write a program to illustrate fixed and fluid grid system. **(08 Marks)**

b. What is responsive design? With an example explain how to create responsive design in bootstrap. **(08 Marks)**

**OR**

8 a. List and explain three difference types of list supported by bootstrap. **(10 Marks)**

b. Create a bootstrap web application using search form, inline form and horizontal form. **(06 Marks)**

## Module-5

9 a. Explain briefly Novbar and Novbar link features of bootstrap. **(09 Marks)**

b. Explain briefly Breadcrumbs features of bootstrap. **(07 Marks)**

**OR**

10 a. With an example explain briefly checkbox buttons and radio buttons. **(06 Marks)**

b. Explain briefly bootstrap tooltips and popover methods. **(10 Marks)**

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16/17MCA554

# Fifth Semester MCA Degree Examination, Dec.2019/Jan.2020
## Software Project Management

Time: 3 hrs. Max. Marks: 80

**Note:** ***Answer any FIVE full questions, choosing ONE full question from each module.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

### Module-1

1 a. What is project? Explain the characteristics of the project and how software projects different from other types of project. **(10 Marks)**

b. Briefly explain the activities covered by Software Project Management. **(06 Marks)**

**OR**

2 a. What is management? List and explain management activities. **(06 Marks)**

b. Explain the differences between Software Development Life Cycle And Project Management Life Cycle. **(10 Marks)**

### Module-2

3 a. Calculate the Net Present Value (NPV) for each of the projects A, B and C shown in the table, using the discount rate 6%. Decide which is the best project to choose as per NPV method.

| Year | Project A (Rs.) | Project B (Rs.) | Project C (Rs.) |
|---|---|---|---|
| 0 | –8000 | –9000 | –10,000 |
| 1 | 4000 | 1000 | 2000 |
| 2 | 4000 | 2000 | 2000 |
| 3 | 2000 | 4000 | 6000 |
| 4 | 1000 | 3000 | 2000 |
| 5 | 500 | 3500 | 2000 |
| Net profit | 4000 | 4500 | 4000 |

**(08 Marks)**

b. What is project evaluation? Explain the following cost-benefit evaluation techniques.
i) Net profit ii) Payback period iii) Return on investment. **(08 Marks)**

**OR**

4 a. What is Accounting? Briefly explain the accounting concepts in which the science of accenting is based. **(10 Marks)**

b. Explain the following with respect to accounts :
i) Profit and Loss account
ii) Balance sheet. **(06 Marks)**

## Module-3

5 a. Draw an AON network for the following set of activities by considering the precedence relation between the activities. Indentify the critical path and project completion time. **(09 Marks)**

| Activity | Precedents | Duration in months |
|---|---|---|
| A | – | 6 |
| B | – | 4 |
| C | A | 3 |
| D | B | 4 |
| E | B | 3 |
| F | – | 10 |
| G | E, F | 3 |
| H | C, D | 2 |

b. What is Risk? Briefly explain the categories of Risk and Risk Management approaches. **(07 Marks)**

**OR**

6 a. List and explain Boehm identified top ten risks and its counter measures. **(10 Marks)**

b. List and explain the three approaches used for identifying activities or tasks that make up a project. **(06 Marks)**

## Module-4

7 a. With the help of project control cycle model and project reporting structure explain project monitoring. **(08 Marks)**

b. What is project review? Explain the advantages of project review and Review process model. **(08 Marks)**

**OR**

8 a. Explain how to visualize the project progress using Gantt chart and Slip chart example each. **(08 Marks)**

b. What is software configuration management? Explain the propose of software configuration management. **(08 Marks)**

## Module-5

9 a. Explain Oldman Hackman job characteristics model. **(08 Marks)**

b. Explain the Maslow's hierarchy of needs. **(04 Marks)**

c. Write a note on leadership. **(04 Marks)**

**OR**

10 a. Explain the different team structure used in the organization for project development. **(08 Marks)**

b. What is stress? Explain stress management techniques. **(08 Marks)**

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