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VTU QUESTION PAPERS

Feb-Mar 2022

MCA DEPARTMENT

18 - III Sem MCA

CBCS SCHEME

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18MCA32

Third Semester MCA Degree Examination, Feb./Mar. 2022
Programming Using Python

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. List and explain with example binary and unary operation of python. **(06 Marks)**

b. Construct memory model for each line of code

```
>>> difference = 20
>>> double = 2 * difference
>>> difference = 5
```

(08 Marks)

c. Explain with example augmented assignment operators of python. **(06 Marks)**

OR

2 a. With suitable example, explain the steps of designing a function. **(10 Marks)**

b. Explain with example python escape sequences and creating multiline string and comments. **(10 Marks)**

Module-2

3 a. Write a python program to accept a number from the keyboard and check whether the input number is zero, positive or negative and display appropriate message. Draw the flow chart. **(08 Marks)**

b. Write a python program to create a module to add two members and how to import that module in python and use it? **(06 Marks)**

c. List and explain with example relational operator of python. **(06 Marks)**

OR

4 a. Explain with example any ten string methods. **(10 Marks)**

b. Using built-in function of string, write a program to find whether the given string is palindrome or not. **(06 Marks)**

c. Write a program to replace 'shiney' with 'twinkle' for the string 'shiney shiney litter star' **(04 Marks)**

Module-3

5 a. For a given list of colors = ['red', 'orange', green'] perform the following operations on the resulting list add 'black' and 'blue' both at the end of colors list insert 'purple' at the end, insert 'yellow' at the third position, remove 'black', empty the entire list. **(10 Marks)**

b. For a given list L = [100, 10, 50, 20, 80] find length L, biggest element of L, smallest element of L, sum of L and sort L. **(10 Marks)**

OR

6 a. Write a program to find, separately sum of positive numbers and negative numbers for an input array of n numbers. **(07 Marks)**

b. Write a program to search an element using linear search. **(07 Marks)**

c. Write a program to multiply two matrices. **(06 Marks)**

Module-4

7 a. Write a event driven python program for file operations Press
1 : to open file in read mode
2 : Open the file in write mode
3 : current position of the file pointer
4. Reposition the pointer at the beginning
5: exit. **(10 Marks)**

b. Explain with example different techniques for reading files. **(10 Marks)**

OR

8 a. Given set A = {0, 1, 2, 3, 4, 9} and
set B = {1, 3, 5, 7, 9}
Perform all set operations and show the output. **(10 Marks)**

b. Write a program to invert a given dictionary
bird_obs{'canadagoose':5'fulmar':1,
'jaegar':2, 'snowgoose' : 1} and
display the inverted dictionary bird_obs. **(10 Marks)**

Module-5

9 a. Write an object oriented python program to create two Time objects and add those two time objects and display the sum of those two time objects using print time function. **(08 Marks)**

b. Write a python program to demonstrate inheritance. **(06 Marks)**

c. Write a python program to demonstrate constructor and destructor. **(06 Marks)**

OR

10 a. Write a program to create frame and place labels in them. **(08 Marks)**

b. Write a program to demonstrate the use of lambda function. **(06 Marks)**

c. Write a program to create simple menu driven [File – save, Quit] text editor. **(06 Marks)**

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18MCA33

Third Semester MCA Degree Examination, Feb./Mar. 2022
Design and Analysis of Algorithms

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. What is an algorithm? Discuss the fundamentals of algorithmic problem solving. **(10 Marks)**

b. Explain the general plan of mathematical analysis of non-recursive algorithms with an example. **(10 Marks)**

OR

2 a. Define time and space efficiency. Explain the asymptotic notations with example. **(10 Marks)**

b. Illustrate the mathematical analysis of recursive algorithm for tower of Henoi problem. **(10 Marks)**

Module-2

3 a. Explain how brute force can be applied to the bubble sort problem and determine its efficiency. **(10 Marks)**

b. Illustrate the brute force string matching with example. **(10 Marks)**

OR

4 a. Explain divide and conquer technique. Write a recursive algorithm for sequential search. **(10 Marks)**

b. Apply merge sort to sort the list 8, 3, 2, 9, 7, 1, 5, 4 in order and write merge sort algorithm. **(10 Marks)**

Module-3

5 a. Apply the DFS based algorithm to solve the topological sorting problem for the following graph.

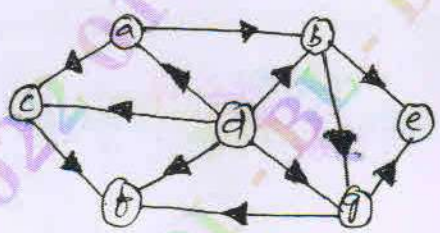

Fig Q5(a) **(10 Marks)**

b. Explain different algorithms for generating permutations with example. **(10 Marks)**

OR

6 a. Define Minimum cost Spanning Tree (MST). Find Minimum cost Spanning Tree (MST) using Prim's algorithm in the following graph.

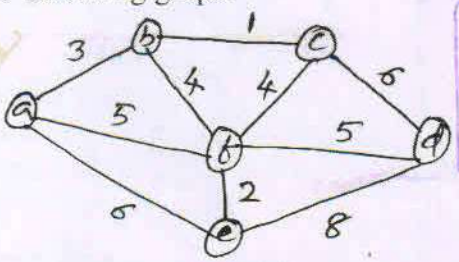

Fig Q6(a) **(10 Marks)**

b. Construct Huffman code for the following data :

Character	A	B	C	D	-
Probability	0.4	0.1	0.2	0.15	0.15

Encode the text ABACABAD and decode 1001101101110111. **(10 Marks)**

Module-4

7 a. Explain sorting by counting by applying the input enhancement technique. **(10 Marks)**

b. Explain how to find substring in strings using Horspool's algorithm. **(10 Marks)**

OR

8 a. Solve the instance given by the following data of the Knapsack problem by Dynamic programming technique.

Item	Weight	Value
1	2	12
2	1	10
3	3	20
4	2	15

Capacity w = 5

(10 Marks)

b. Apply Warshal's algorithm to the digraph shown below to compute transitive closure and analyze its sufficiency. (Ref Fig Q8(b).

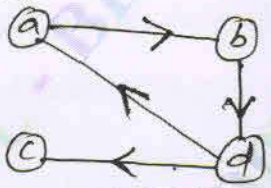

Fig Q8(b) **(10 Marks)**

Module-5

9 a. Explain backtracking concept and solve 4-queen's problem using the same. **(10 Marks)**

b. Explain the classes of NP-Hard and NP-Compete problems. **(10 Marks)**

OR

10 a. Apply backtracking to the problem of finding a Hamiltonian circuit in the following graph. (Ref Fig Q10(a).

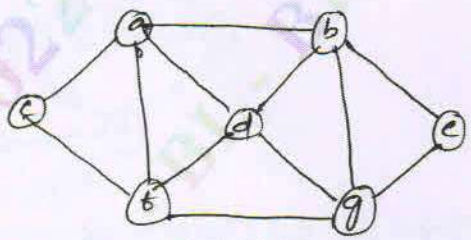

Fig Q10(a) **(10 Marks)**

b. Solve the following instance of the Assignment problem using Branch-and bound.

	Job1	Job2	Job3	Job4	
C =	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)

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18MCA34

Third Semester MCA Degree Examination, Feb./Mar. 2022
System Software

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Write and explain the instruction formats of SIC/XE architecture. **(06 Marks)**

b. Explain the architecture of SIC machine with respect to registers, data formats, instruction formats and addressing modes. **(08 Marks)**

c. Write an Assembly program in SIC/XE to perform 'ABC = ALPHA * 10-50' use register addressing for multiplication and subtraction. **(06 Marks)**

OR

2 a. Write the algorithm of PASS-1 of two pass algorithm. **(10 Marks)**

b. Find out the target address for the following SIC/XE instructions:
i) 032600 ii) 03C300 iii) 00B600 iv) 6D101000
Assume content of register as [(X) = 000090, (B) = 006000, (PC) = 003000]. **(10 Marks)**

Module-2

3 a. Discuss the symbol defining statements used in assembler with an example. **(10 Marks)**

b. Generate the object code for the following program using the OPCODES as given:
(CLEAR = B4, LDS = 6C, ADD = 18, STA = 0C)

```
DEMO    START    0
        CLEAR    X
        +LDS     #4096
        ADD      @TAB
        STA      ALPHA, X
ALPHA   RESW     256
TAB     RESB     4
        END
```

(10 Marks)

OR

4 a. Explain the working of Load-and-go assembler with proper example. **(10 Marks)**

b. Explain the concept of program relocation with diagram. Explain how realocation problem of extended format is solved using modification record. **(10 Marks)**

Module-3

5 a. Write the algorithm of an absolute loader. **(05 Marks)**

b. Write and explain the format of reallocation bit in program. **(05 Marks)**

c. Illustrate the concept of program linking performed by the loader with a block diagram. **(10 Marks)**

OR

6 a. Compare and explain linking loader and linkage editor with diagram. **(15 Marks)**

b. Write a note on MSDOS linker. **(05 Marks)**

Module-4

7 a. Explain the different data structures used by macro processor with block diagram. **(12 Marks)**

b. Explain with example concatenation of macro parameters. **(08 Marks)**

OR

8 a. List and explain basic macro processing functions with suitable example. **(10 Marks)**

b. Describe the salient features of ANSI C macro processor. **(10 Marks)**

Module-5

9 a. Write a BNF grammer for assignment statement of C program for expression SUM = A * (B + 50). Generate the parse tree for this expression using BNF grammer. **(10 Marks)**

b. Briefly discuss different machine dependent code optimization techniques. **(10 Marks)**

OR

10 a. Using the given finite automata, check if the following strings are recognized (or) not
i) abca ii) abccccabc iii) abababcab iv) abcabccaac. **(10 Marks)**

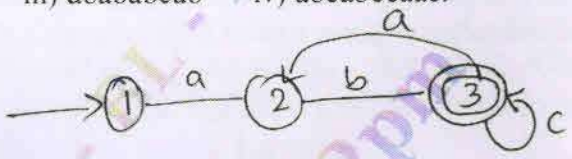

Fig.Q.10(a)

b. Write a note on:
i) P-code compiler
ii) YACC compiler. **(10 Marks)**

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18MCA351

Third Semester MCA Degree Examination, Feb./Mar. 2022
Software Testing

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Explain error, faults and failures in the process of programming and testing with a diagram. **(10 Marks)**

b. What is software quality? Explain the attributes of software quality in brief. **(10 Marks)**

OR

2 a. List and explain the six principles of software testing. **(10 Marks)**

b. What is static testing? Explain in brief. **(10 Marks)**

Module-2

3 a. Write the pseudocode for structured implementation of triangle problem and draw data flow diagram. **(10 Marks)**

b. Describe the testing life cycle with a suitable diagram. **(10 Marks)**

OR

4 a. Describe the specified, implemented and tested behaviors with the help of Venn diagram. **(10 Marks)**

b. Illustrate an error and fault taxonomies. **(10 Marks)**

Module-3

5 a. What is boundary value Analysis? Illustrate with appropriate diagram the mechanism to generate test cases in Boundary Value Analysis for a function of 2 variables in

i) Robustness Testing
ii) Robust worst case testing
iii) Worst-case Testing. **(10 Marks)**

b. What are the different forms of equivalence class testing? Explain any 2 of them with a suitable graphical representation. **(10 Marks)**

OR

6 a. Explain decision table based testing with an example. Generate the decision table for triangle problem. **(10 Marks)**

b. Write the boundary value analysis test cases for

i) Triangle problem
ii) Next date problem. **(10 Marks)**

Module-4

7 a. What is basis path testing? Explain McCabe's basis path method with an example. **(10 Marks)**

b. Discuss test coverage metrics in brief. **(10 Marks)**

OR

8 a. List the alternate life cycle models. Explain any one of them with a suitable diagram. **(10 Marks)**

b. Explain slice based testing. List out the USE relationships. **(05 Marks)**

c. Distinguish between integration testing and system testing. **(05 Marks)**

Module-5

9 a. Write short notes on the following:

i) Fault based testing

ii) Mutation analysis. **(10 Marks)**

b. Describe test oracles and self-checks as oracles. **(10 Marks)**

OR

10 a. Explain the role of risk management in quality process. **(10 Marks)**

b. List and explain about all major categories of documents. **(10 Marks)**

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20 - III Sem. M.C.A

CBCS SCHEME

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20MCA31

Third Semester MCA Degree Examination, Feb./Mar. 2022
Data Analytics using Python

Time: 3 hrs. Max. Marks:100

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

Module-1

1 a. Describe arithmetic operators, assignment operators, comparison operators and logical operators in detail with example **(08 Marks)**

b. With syntax, explain the finite and infinite looping constructs in python. What is the need for break and continue statements. **(07 Marks)**

c. Write a python program to check whether a given number is even or odd. **(05 Marks)**

OR

2 a. How to declare and call functions in python programs? Illustrate with an example script. **(08 Marks)**

b. Illustrate args and kwargs parameters in python programming language with an example. **(07 Marks)**

c. Develop a python program to calculate the area of square, rectangle and circle using function. **(05 Marks)**

Module-2

3 a. Explain any five operations performed on string with an example. **(10 Marks)**

b. Demonstrate constructors in inheritance with the help of python program. Take input as student name, subject name, marks of three subjects and calculate the percentage. **(10 Marks)**

OR

4 a. Differentiate between list tuple, sets and dictionary. **(10 Marks)**

b. Create a function product and demonstrate function overloading by accepting required input and print their product. **(10 Marks)**

Module-3

5 a. Discuss different categories of basic array manipulation with an example. **(10 Marks)**

b. Implement the python program to demonstrate the following using numpy array.
i) Array searching, sorting and splitting
ii) Broad casting. **(10 Marks)**

OR

6 a. Discuss in detail about pandas data structures. **(10 Marks)**

b. Develop a python program to perform arithmetic operations on numpy array. **(10 Marks)**

Module-4

7 a. Explain combining and merging datasets with an example. **(10 Marks)**

b. Explain Reshape and pivot operations with an example. **(10 Marks)**

OR

8 a. Discuss in detail about data transformation. **(10 Marks)**

b. Explain any five built-in string methods with an example. **(10 Marks)**

Module-5

9 a. Write short notes on :
i) Matplot library
ii) Seaborn library. **(10 Marks)**

b. Implement a python program to demonstrate data visualization using Matplotlib. **(10 Marks)**

OR

10 a. Explain the following method with an example graph.
i) hist( ) ii) kdeplot( ) iii) distplot( ) iv) joinplot( ). **(10 Marks)**

b. Create a python program to demonstrate data visualization (Line Plot, histogram, Scatter plot) using Seaborn. **(10 Marks)**

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20MCA32

Third Semester MCA Degree Examination, Feb./Mar. 2022
Internet of Things

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. What is IOT? Explain in detail on Genesis of IOT. **(10 Marks)**
b. Explain in detail IOT Challenges. **(10 Marks)**

OR

2 a. With a neat diagram, explain M2M IOT Standardized Architecture. **(10 Marks)**
b. Explain with diagram, IOT Data management and Compute Stack. **(10 Marks)**

Module-2

3 a. List and explain different types of Sensors. **(10 Marks)**
b. Explain 802.15 MAC layer with MAC Format. **(10 Marks)**

OR

4 a. Explain Zigbee protocol stack using IEEE 802.15.4. **(10 Marks)**
b. Write short notes on : i) Smart objects ii) Wireless sensor Networks (WSN). **(10 Marks)**

Module-3

5 a. Explain key advantages of Internet protocol. **(10 Marks)**
b. Explain in detail the 6LOWPAN. **(10 Marks)**

OR

6 a. What is COAP? Draw COAP message format also compare COAP and MQTT. **(10 Marks)**
b. Explain MQTT in detail along with MQTT message format. **(10 Marks)**

Module-4

7 a. Explain IOT Data Analytics Overview. **(10 Marks)**
b. Write short notes on : i) Supervised learning ii) Unsupervised learning. **(10 Marks)**

OR

8 a. Explain how IT and OT security practices and systems vary. **(10 Marks)**
b. Explain OCTAVE and FAIR formal risk analysis. **(10 Marks)**

Module-5

9 a. Explain the following with respect to Arduino programming : i) Structure ii) Functions iii) Variables iv) Flow control statements v) Data type. **(10 Marks)**
b. Explain Raspberry Pi learning board. **(10 Marks)**

OR

10 a. Explain Smart City IOT Architecture. **(10 Marks)**
b. Write a program to flash LED at a given Ontime Offtime cycle where two times are taken from a file using Python. **(10 Marks)**

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CBCS SCHEME

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20MCA33

Third Semester MCA Degree Examination, Feb./Mar. 2022
Advances in Java

Time: 3 hrs. Max. Marks:100

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 servlet architecture and life cycle method. **(10 Marks)**

b. Write a JAVA servlet program which reads two parameters from the web page say value 1, value 2, which are of type integers, and finds the sum of the two values and return bock the result as a webpage. **(06 Marks)**

c. Write any four difference between GET and PSOT request. **(04 Marks)**

OR

2 a. Explain briefly any five methods of HttpServletRequest. Illustrate it with a simple program. **(10 Marks)**

b. Write a JAVA Servlet program using cookies to remember user preferences. **(06 Marks)**

c. Explain briefly advantages of servlet over CGI. **(04 Marks)**

Module – 2

3 a. Explain the following tags with an example :
i) Declaration ii) Scriptlet iii) Expression iv) Comment. **(10 Marks)**

b. With a neat diagram, explain JSP architecture and life cycle phases of JSP. **(10 Marks)**

OR

4 a. Explain briefly any five JSP implicit object. **(10 Marks)**

b. Explain briefly three life cycle methods of JSP. **(06 Marks)**

c. Write a JSP program to perform arithmetic operation using scriptlet, declaration and expression tag. **(04 Marks)**

Module – 3

5 a. Explain briefly any 10 attributes of JSP page directive tag. **(10 Marks)**

b. Write a JSP program which uses <jsp:include> and <jsp:forward> standard action to display a webpage. **(10 Marks)**

OR

6 a. Explain the following standard action with suitable example.
i) <jsp:useBean> ii) <jsp:plugin>. **(10 Marks)**

b. Write a JSP program to get students information through a HTML and create a JAVA bean class populate bean and display the same information through another JSP. **(10 Marks)**

Module – 4

7 a. Explain briefly any 5 builtin annotation with a suitable example. **(10 Marks)**

b. Explain briefly JDBC routine process. Give an example. **(10 Marks)**

OR

8 a. Discuss any five advanced JDBC data types. **(10 Marks)**

b. Discuss the types of JDBC statements with an example. **(10 Marks)**

Module – 5

9 a. With a neat diagram explain the life cycle of stateful ession bean. **(10 Marks)**

b. Explain briefly stateless, stateful and singleton session bean. **(06 Marks)**

c. List out the differences between stateless and stateful session bean. **(04 Marks)**

OR

10 a. Write a short note on :

i) Dependency injection

ii) Instance pooling

iii) Transactions

iv) Security. **(10 Marks)**

b. With a neat diagram, explain the life cycle of Entity bean. **(10 Marks)**

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CBCS SCHEME

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20MCA342

Third Semester MCA Degree Examination, Feb./Mar. 2022
Cloud Computing

Time: 3 hrs. Max. Marks: 100

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 with suitable diagram the Cloud Computing reference model. **(10 Marks)**
b. Discuss in detail the major deployment models for Cloud Computing. **(10 Marks)**

OR

2 a. What is Cloud Computing? Explain its characteristics and benefits. **(10 Marks)**
b. Discuss about the milestones which have led to Cloud Computing. **(10 Marks)**

Module-2

3 a. Explain with suitable diagram, Virtual Machine Architecture. **(10 Marks)**
b. What are the most popular and important messages passing techniques? **(10 Marks)**

OR

4 a. Discuss in detail about Call and Return Architectures. **(10 Marks)**
b. Explain with suitable diagram , the RPC reference model. **(10 Marks)**

Module-3

5 a. What are the functions enabled by managed execution? Explain. **(10 Marks)**
b. Explain with neat diagram, the machine reference model. **(10 Marks)**

OR

6 a. Discuss in detail about the characteristics of Virtualized solutions. **(10 Marks)**
b. Explain in detail the Popek and Goldberg theorems in Virtualization. **(10 Marks)**

Module-4

7 a. Explain with suitable diagram, the Cloud Computing Architecture. **(10 Marks)**
b. What are the Open challenges in Cloud Computing? Explain. **(10 Marks)**

OR

8 a. Discuss Platform – as – a – Service reference model. **(10 Marks)**
b. With suitable example, explain in detail the types of Clouds. **(10 Marks)**

Module-5

9 a. What are the different scientific applications in Cloud Computing? **(10 Marks)**
b. Explain in detail about Dropbox and Icloud. **(10 Marks)**

OR

10 a. Explain in detail the Business and Consumer application of Cloud Computing. **(10 Marks)**
b. Discuss about media applications of Cloud Computing. **(10 Marks)**

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CBCS SCHEME

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20MCA354

Third Semester MCA Degree Examination, Feb./Mar. 2022
Software Project Management

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. What is a project? Discuss on software projects versus other types of projects. **(10 Marks)**
b. What is a management? Explain management control. **(10 Marks)**

OR

2 a. Explain the various activities covered by software project management. **(10 Marks)**
b. Discuss about traditional versus modern project management. **(10 Marks)**

Module-2

3 a. What is project evaluation? Explain five different cost benefit evaluation techniques. **(10 Marks)**
b. What is risk evaluation? Explain how to evaluate business risk. **(10 Marks)**

OR

4 a. Explain the various assessment methods used in project evaluation. **(10 Marks)**
b. Discuss on cost-benefit evaluation techniques. **(10 Marks)**

Module-3

5 a. What is requirement specification? Explain the various types of requirements. **(10 Marks)**
b. Explain the objective of activity planning. **(10 Marks)**

OR

6 a. Explain the three approaches to identify the activities. **(10 Marks)**
b. Explain risk management process. **(10 Marks)**

Module-4

7 a. Explain how to visualize the project process using gantt chart and timeline chart with example. **(10 Marks)**
b. What is project review? Explain the advantage of review and review process. **(10 Marks)**

OR

8 a. Explain cost monitoring. **(10 Marks)**
b. Explain prioritizing monitoring. **(10 Marks)**

Module-5

9 a. With a diagram, explain the various types of department and team structures. **(10 Marks)**
b. Discuss on general approach followed during the recruitment process. **(10 Marks)**

OR

10 a. Write short notes on :
(i) Oldham – Hackman job characteristics model
(ii) Maslow's hierarchy needs. **(10 Marks)**
b. Explain the various organizational structures. **(10 Marks)**

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20 V Sem. MCA

CBCS SCHEME

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18MCA51

Fifth Semester MCA Degree Examination, Feb./Mar. 2022
Programming using C# •Net

Time: 3 hrs. Max. Marks:100

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

Module-1

1 a. Briefly explain the components of .Net framework. **(10 Marks)**
b. Explain the different types of keywords in C#. **(10 Marks)**

OR

2 a. Explain type conversion, Boxing and unboxing in C#. **(10 Marks)**
b. Briefly explain the 3 types of arrays in C#. **(10 Marks)**

Module-2

3 a. With example, explain 4 different ways of using 'this' keyword in C#. **(12 Marks)**
b. With simple program explain, creating an array of objects. **(08 Marks)**

OR

4 a. Explain key value pair, Ref/out parameter and class/struct methods for returning multiple values. **(10 Marks)**
b. With program explain encapsulation by accessor and mutator and encapsulation by properties. **(10 Marks)**

Module-3

5 a. With program explain 2 ways to invoke delegate in C#. **(10 Marks)**
b. Discuss briefly about events and event Handler in C#. **(10 Marks)**

OR

6 a. With example, describe exception handling in C#. **(10 Marks)**
b. Discuss how ADO.NET provides a bridge between front end controls and backend data base. **(10 Marks)**

Module-4

7 a. Explain control properties and layout used in windows forms. **(10 Marks)**
b. List the common properties and a common event of a TextBoxes. **(10 Marks)**

OR

8 a. List the common properties of GroupBox and panel. Write a simple programme for handling GroupBox and panel in windows form. **(10 Marks)**
b. Explain WPF architecture. Add a note on new WPF controls. **(10 Marks)**

Module-5

9 a. What is AJAX? Write the need for AJAX and advantage of AJAX over other technologies. **(10 Marks)**
b. Describe the most frequently used AJAX server controls. **(10 Marks)**

OR

10 a. What is cookie? Explain how session tracking is achieved using cookies. **(10 Marks)**
b. Explain use of Gridview control in ASP.Net. **(10 Marks)**

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18MCA52

Fifth Semester MCA Degree Examination, Feb./Mar.2022
Mobile Applications

Time: 3 hrs. Max. Marks: 100

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. Discuss preliminary cost involved in mobile application development. **(10 Marks)**
b. Why mobile development is difficult? **(05 Marks)**
c. What are the myths associated with mobile application development? **(05 Marks)**

OR

2 a. What are the key issues involved in using the screen real-estate effectively? **(10 Marks)**
b. What do you understand by mobile information design and mobile platform? **(10 Marks)**

Module-2

3 a. Explain the features of android. **(10 Marks)**
b. Explain the various layers in Android OS. **(10 Marks)**

OR

4 a. Briefly discuss the anatomy of an Android application. **(10 Marks)**
b. Discuss lifecycle of an activity with an example code. **(10 Marks)**

Module-3

5 a. Define a view. Explain the different types of views. **(10 Marks)**
b. Explain various view groups with suitable code segments. **(10 Marks)**

OR

6 a. How do you display Google maps in Android application explain with code? **(10 Marks)**
b. Discuss APK file deployment in detail. **(10 Marks)**

Module-4

7 a. Explain with code procedure for sending an SMS through android application. **(10 Marks)**
b. Write an android application to download an image file from the web. **(10 Marks)**

OR

8 a. Write an android application to download a text file from the web. **(10 Marks)**
b. Explain with code asynchronous calls in networking in view of android application. **(10 Marks)**

Module-5

9 a. Discuss components of iphone SDK. **(10 Marks)**
b. Discuss anatomy of a iOS App. **(10 Marks)**

OR

10 a. Discuss anatomy of a windows phone App. **(05 Marks)**
b. Briefly explain various steps in developing derby App in windows phone 7. **(05 Marks)**
c. Write a short note on notifications in windows phone 7 app and accelerometer in windows phone 7 app. **(10 Marks)**

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18MCA53

Fifth Semester MCA Degree Examination, Feb./Mar. 2022
Machine Learning

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. What do you mean by a well – posed learning problem? Explain the important features that are required to well – define a learning problem. **(10 Marks)**

b. Elaborate the design choices of choosing the training experience and choosing the target function while designing a learning system. **(10 Marks)**

OR

2 a. Illustrate find – S algorithm over Enjoy Sport Concept Training instances are given below :

Example	Sky	Air Temp	Humidity	Wind	Water	Forecast	Enjoy Sport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

(10 Marks)

b. Define Concept and Concept learning. Explain how the concept learning task determines the Hypothesis for given target concept. **(10 Marks)**

Module-2

3 a. List the advantages of Decision Tree Representation. Which problems are appropriate for Decision Tree Learning? **(10 Marks)**

b. Present the ID_3 algorithm for Decision Tree Learning. **(10 Marks)**

OR

4 a. Consider the following set of training examples :

i) What is the entropy of this collection of training examples with respect to the target function classification?

ii) What is the Information gain of a 2 relative to these training example? **(10 Marks)**

Instance	Classification	a_1	a_2
1	+	T	T
2	+	T	T
3	-	T	F
4	+	F	F
5	-	F	T
6	-	F	T

b. Define Overfitting. How to avoid overfitting? **(10 Marks)**

Module-3

5 a. Explain in detail about the problems appropriate for neural network learning and why? **(10 Marks)**

b. Define Perceptron. Explain the concept of Single perceptron, with neat diagram. **(10 Marks)**

OR

6 a. Present the Back propagation algorithm for feed forward networks containing two layers of sigmoid units. **(10 Marks)**

b. Discuss the Perceptron training rule and Delta rule that solves the learning problem of perceptron. **(10 Marks)**

Module-4

7 a. What is Bayes theorem and Maximum posterior hypothesis? **(04 Marks)**

b. Derive an equation for MAP hypothesis using Bayes theorem. **(06 Marks)**

c. Consider a football game between two rival team : Team 0 and Team1. Suppose Team 0 wins 65% of the time and Team 1 wins the remaining matches. Among the games won by Team 0, only 30% of them come from playing on Team 1's football field. On the other hand, 75% of the victories for Team 1 are obtained while playing at home. If team 1 is to host the next match between the two teams, which team will most likely emerge as the winner? **(10 Marks)**

OR

8 a. Describe Brute – Force MAP learning algorithm. **(06 Marks)**

b. Discuss the Naïve Bayes classifier. **(04 Marks)**

c. The following table gives data set about stolen vehicles. Using Naïve Bayes classifier classify the new data (Red , SUV , Domestic).

Color	Type	Origin	Stolen
Red	Sports	Domestic	Yes
Red	Sports	Domestic	No
Yellow	Sports	Domestic	No
Yellow	Sports	Imported	Yes
Yellow	SUV	Imported	No
Yellow	SUV	Imported	Yes
Yellow	SUV	Domestic	No
Red	SUV	Imported	No
Red	Sports	Imported	Yes

Module-5

9 a. Write short notes on the following :

i) Estimating Hypothesis accuracy ii) Binomial distribution. **(10 Marks)**

b. Discuss the method of comparing two algorithms. Justify with Paired t- **(10 Marks)**

OR

10 a. Write an algorithm for k – Nearest Neighbor algorithm and [illegible] classification.

b. Discuss the learning tasks and [illegible] – learning in the context of [illegible]

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18MCA542

Fifth Semester MCA Degree Examination, Feb./Mar. 2022
Internet of Things

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Define IoT. Explain typical M2M solution. **(10 Marks)**
b. Comparison of main characteristics of M2M and IoT with example. **(10 Marks)**

OR

2 a. Explain implications for IoT with example. **(10 Marks)**
b. Describe Game changes with example. **(10 Marks)**

Module-2

3 a. Explain IoT value chains, with example. **(10 Marks)**
b. Explain M2M value chains with example. **(10 Marks)**

OR

4 a. With a neat diagram, explain IoT architecture outline. **(10 Marks)**
b. Explain emerging industrial structure for IoT. **(10 Marks)**

Module-3

5 a. Explain local and wide area networking with example. **(10 Marks)**
b. Explain Basic and Advanced device types along with Gateways. **(10 Marks)**

OR

6 a. Explain everything as a service (XaaS) **(10 Marks)**
b. Explain Business process in IoT with example. **(10 Marks)**

Module-4

7 a. Explain IoT reference model with example. **(10 Marks)**
b. Explain operational view with example. **(10 Marks)**

OR

8 a. Explain Functional view with example. **(10 Marks)**
b. Explain Information view with example. **(10 Marks)**

Module-5

9 a. Explain various levels of SOCRADES integration architecture. **(10 Marks)**
b. Explain service oriented architecture based device integration. **(10 Marks)**

OR

10 a. Explain IMC – AESOP cloud based architecture vision for IOT. **(10 Marks)**
b. Explain Data representation and visualization with example. **(10 Marks)**

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18MCA553

Fifth Semester MCA Degree Examination, Feb./Mar. 2022
Software Architecture

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Define software Architecture. Explain different categories of structures. **(10 Marks)**

b. Why software architecture is important from a wide variety of technical and non-technical reasons. **(10 Marks)**

OR

2 a. Discuss different architectural context. **(10 Marks)**

b. Explain different stakeholders for a system. **(10 Marks)**

Module-2

3 a. Explain general scenario of the availability quality attribute. **(10 Marks)**

b. Explain interoperability general scenario and tactics. **(10 Marks)**

OR

4 a. Explain the tactics for the quality attribute performance. **(10 Marks)**

b. Explain usability general scenario and tactics. **(10 Marks)**

Module-3

5 a. With a neat diagram, explain queuing model of performance for MVC. (Model View Controller). **(10 Marks)**

b. Explain gathering ASR's by interviewing stakeholders and by understanding the business goals. **(10 Marks)**

OR

6 a. Discuss about quality attribute checklist, thought experiments and buck-of the envelop analysis and experiments, simulation and prototypes. **(10 Marks)**

b. Explain the steps involved in Quality Attribute Workshop (QAW). **(10 Marks)**

Module-4

7 a. Explain the steps of Attribute Driven Design method (ADD) **(10 Marks)**

b. Explain the template used for documenting view. **(10 Marks)**

OR

8 a. Explain generate and test process of architecture design with a diagram. **(10 Marks)**

b. Explain the notations available for documenting the behavior. **(10 Marks)**

Module-5

9 a. Define layers pattern. Discuss the example, structure and consequences of layers pattern. **(10 Marks)**

b. Define broker pattern. Discuss the example, context, problem and solution of broker pattern. **(10 Marks)**

OR

10 a. Define pipes and filter pattern. Discuss the solution and structure of pipes and filter pattern. **(10 Marks)**

b. Define blackboard pattern. Discuss the solution, structure and liabilities of blackboard pattern. **(10 Marks)**

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