

B.L.D.E Association's

VACHANA PITAMAHA DR.P.G.HALAKATTI

COLLEGE OF ENGINEERING AND TECHNOLOGY ,VIJAYPUR

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QUESTION PAPERS

1st, 2nd, 3rd, 4th & 5th SEMESTER

MCA

DEC. 2018/JAN. 2019

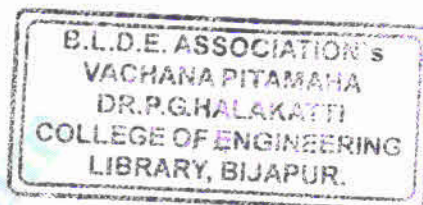
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CBCS SCHEME



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16/17MCA11

First Semester MCA Degree Examination, Dec.2018/Jan.2019

Data Structures Using C

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing ONE full question from each module.Module-1

- 1 a. Explain unformatted I/O statements in C with proper syntax. (08 Marks)
- b. Explain all looping control statements with syntax. (08 Marks)

OR

- 2 a. Explain various categories of functions in C. (08 Marks)
- b. Define an Array. Explain 1D and 2D arrays with syntax. (08 Marks)

Module-2

- 3 a. Define Pointers. Explain pointers variables and illustrate their usage with examples. (08 Marks)
- b. Define structures with syntax. Write a program in C for accessing the member variables of the structure STUDENT. The structure STUDENT has member variables : USN(int) , name (char array) and marks in 3 subjects (int). (08 Marks)

OR

- 4 a. Define Data structures. Explain different types of data structures. (08 Marks)
- b. Explain any two built in string functions. Write a C program to compare two strings without using built in functions. (08 Marks)

Module-3

- 5 a. Define Prefix and Postfix expressions. Write a program to convert infix to postfix expressions. (08 Marks)
- b. What is Recursion? Write a program to generate n Fibonacci series, using recursion. (08 Marks)

OR

- 6 a. What is QUEUE? Explain various types of queue and operations performed on it. (08 Marks)
- b. Write a program in C to implement simple queue. (08 Marks)

Module-4

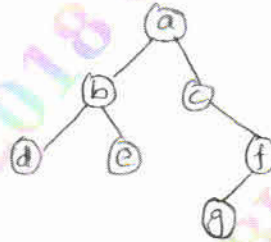
- 7 a. Differentiate Static Vs Dynamic memory allocation. How dynamic memory allocation is done in C? (08 Marks)
- b. Explain Circular linked list. Write functions to implement following operations : (08 Marks)
 - i) Insert front
 - ii) Insert rear.

OR

- 8 a. Explain Dequeue. Give functions for following operations on dequeue using linked list : (08 Marks)
 - i) Create a node
 - ii) Insert front.
- b. Discuss about various applications of linked list. (08 Marks)

Module-5

- 9 a. What is Binary tree? Explain with example different types of binary trees. (08 Marks)
b. Discuss various tree traversal methods. Find inorder, preorder and postorder traversal of following tree. (08 Marks)



OR

- 10 a. Explain Sorting. Explain bubble sorting with example. (08 Marks)
b. Write a program in C to implement quick sort. (08 Marks)

First Semester MCA Degree Examination, Dec.2018/Jan.2019

Web Technologies

Time: 3 hrs.

Max. Marks: 80

*Note: Answer FIVE full questions, choosing ONE full question from each module.*Module-1

- 1 a. Write the differences between Internet and World Wide Web. (04 Marks)
- b. Discuss in detail, different phases of HTTP. (08 Marks)
- c. What is a web server? Explain its file structure. (04 Marks)

OR

- 2 a. With a neat diagram, explain working of SMTP. (08 Marks)
- b. Write the differences between GET and POST method. (04 Marks)
- c. Mention the duties of IETF (Internet Engineering Task Force). (04 Marks)

Module-2

- 3 a. What are the different levels of style sheet? Explain. (06 Marks)
- b. Describe the various selector forms with suitable examples. (06 Marks)
- c. Explain the box model of CSS. (04 Marks)

OR

- 4 a. What are the differences between HTML and XHTML? (04 Marks)
- b. Explain nested lists and definition lists in XHTML. (06 Marks)
- c. Create a student registration form to accept name, gender, date of birth, qualification, address and pin code. Provide reset and submit buttons. (06 Marks)

Module-3

- 5 a. Name the primitive data types in JavaScript. How are objects different from primitives? Explain. (06 Marks)
- b. When do we use the three built-in windows of JavaScript? Explain with a code snippet. (04 Marks)
- c. Write the JavaScript code to find median of a set of numbers stored in an array. (06 Marks)

OR

- 6 a. List the built-in JavaScript character classes along with their meanings. (06 Marks)
- b. Discuss the purpose of the following JavaScript functions:
 - i) split()
 - ii) match()
 - iii) replace()
 - iv) search()
 (04 Marks)
- c. What is DOM? Describe the DOM tree structure with the help of a simple document. (06 Marks)

Module-4

- 7 a. Explain even handling in DOM2. (06 Marks)
 b. Discuss the various forms of accessing XHTML elements. (06 Marks)
 c. What is stacking of elements? Explain with an example. (04 Marks)

OR

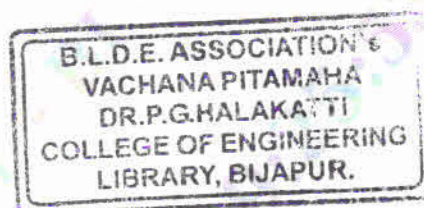
- 8 a. How does an XSLT processor process an XSLT style sheet with an XML document? Explain. (08 Marks)
 b. Write short notes on:
 i) Document Type Definition
 ii) Web services (08 Marks)

Module-5

- 9 a. Explain the following in PERL with suitable examples:
 i) Hashes
 ii) References (08 Marks)
 b. Discuss the various operations available under pattern matching in PERL. (08 Marks)

OR

- 10 a. What is a query string? Explain its format. (04 Marks)
 b. What is a cookie? Why is it used? How cookies are handled in PERL? Give an example. (08 Marks)
 c. What are the categories of PERL variables? Give examples. (04 Marks)



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First Semester MCA Degree Examination, Dec.2018/Jan.2019
Discrete Mathematical Structures

Time: 3 hrs.

Max. Marks: 80

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

Module-1

1.
 - a. How many rows appear in a truth table for the compound proposition $(p \rightarrow r) \vee (\sim s \rightarrow \sim t) (\sim u \rightarrow v)$. (02 Marks)
 - b. Define Tautology. Show that the compound proposition $[(p \vee q) \wedge (\sim p \vee r)] \rightarrow (q \vee r)$ is a Tautology. (04 Marks)
 - c. Let $p(x)$ be the statement " $x+1 > 2x$ ". Determine the truth values of each of the following statements if the domain consists of all integers?
 i) $\exists x p(x)$ ii) $\forall x p(x)$ iii) $\exists x \sim p(x)$ iv) $\forall \sim p(x)$ (04 Marks)
 - d. Use rules of inference to show that the hypothesis "Randy works hard", "If Randy work hard, then he is a dull boy", and "If Randy is a dull boy, then he will not get the job" imply the conclusion "Randy will not get the job". (06 Marks)

OR

2.
 - a. Define the dual of a logical statement. Write the dual of the compound proposition $(p \wedge \sim) \vee (q \wedge F)$. (03 Marks)
 - b. Show that $\sim[p \vee (\sim p \wedge q)]$ and $\sim p \wedge \sim q$ are logically equivalent by using laws of logic. (04 Marks)
 - c. Write the negation of the following quantified statement:
 i) "There exists a pig that can swim and catch fish"
 ii) "No monkey can speak French". (04 Marks)
 - d. Give a proof by contradiction of the statement "If $3n + 2$ is odd, then n is odd". (05 Marks)

Module-2

3.
 - a. Find the sets A and B if $A - B = \{1, 5, 7, 8\}$, $B - A = \{2, 10\}$ and $A \cap B = \{3, 6, 9\}$. (02 Marks)
 - b. Show that the congruence modulo 'm' is an equivalence relation on the set of integers. (04 Marks)
 - c. Let $A = \{a, b, c\}$ and $B = P(A)$ is the power set of A and the relation R on B defined by xRy if $x \subseteq y$. Show that (B, R) is a POSET, and draw its Hasse diagram. Is it a Lattice? (06 Marks)
 - d. Let f and g be the functions from the set of integers to the set of integers defined by $f(x) = 2x + 3$ and $g(x) = 3x + 2$. Find $f \circ g$ and $g \circ f$. (04 Marks)

OR

4.
 - a. Define power set of a set, write the power set of $A = \{0, \phi, \{\phi\}\}$. (02 Marks)
 - b. Let R be an equivalence relation on Set A . Then show that the following statements are equivalent $\forall a, b \in A$. (05 Marks)
 i) aRb ii) $[a] = [b]$ iii) $[a] \cap [b] \neq \phi$.

- c. Draw the Hasse diagram for divisibility relation on the set $A = \{3, 5, 9, 15, 24, 45\}$. Find the (i) least and greatest elements, (ii) minimal and maximal elements, (iii) LUB of $\{3, 5\}$ and (iv) GLB of $\{15, 45\}$. (05 Marks)
- d. Verify the function $f: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = 2x + 1$ is bijection or not. (04 Marks)

Module-3

- 5 a. How many license plates can be made using either two letters followed by four digits or two digits followed by four letters? (04 Marks)
- b. State Pigeonhole principle. Show that, if there are 30 students in a class, then at least two have last names that begin with the same letter. (04 Marks)
- c. Find the coefficient of $x^{12}y^{13}$ in the expansion of $(2x - 3y)^{25}$. (04 Marks)
- d. A person deposits Rs. 10,000 in an account at a bank that yields 11% per year with interest compounded annually. How much will be in the account after 30 years? (04 Marks)

OR

- 6 a. If a department contains 10 men and 15 women then in how many ways are there to form a committee with six members if it must have same number of men and women? (05 Marks)
- b. How many ways are there for eight men and five women to stand in a line so that no two women stand next to each other? (05 Marks)
- c. Find the solution to the recurrence relation $a_n = 6a_{n-1} - 11a_{n-2} + 6a_{n-3}$ with the initial conditions $a_0 = 2$, $a_1 = 5$ and $a_2 = 15$. (06 Marks)

Module-4

- 7 a. Let S be the sample space for a random experiment E and let A and B be events from S such that $P(A) = 0.4$, $P(B) = 0.3$ and $P(A \cap B) = 0.2$. Determine :
(i) $P(\overline{A \cup B})$ (ii) $P(A \cap \overline{B})$ (iii) $P(\overline{A} \cap \overline{B})$
(iv) $P(\overline{A} \cap B)$ (v) $P(\overline{A} \cup B)$ (vi) $P(A \cup \overline{B})$. (06 Marks)
- b. Define independent events. If A and B are independent events then shown that (i) A and \overline{B} are independent (ii) \overline{A} and B are independent (iii) \overline{A} and \overline{B} are independent. (05 Marks)
- c. One bag contains 15 identical (in shape) coins, in which nine are silver and six are Gold. A second bag contains 16 more of these coins in which six are silver and 10 are gold. If one coin from the first bag randomly selected and then places it in the second bag, and then a coin selected at random from the second bag. What is the probability that it is a gold coin? (05 Marks)

OR

- 8 a. The freshman class of a private Engineering college has 300 students. It is known that 180 can program in JAVA, 120 in VISUAL BASIC, 30 in C++, 12 in JAVA and C++, 18 in VISUAL BASIC and C++, 12 in JAVA and VISUAL BASIC and 6 in all 3 languages,
(i) A student is selected at a random, what is the probability that she can program in exactly two languages?
(ii) Two students are selected at random, what is the probability that they can both program in JAVA and both program only in JAVA? (05 Marks)
- b. Let A , B and C be independent events taken from a sample space S . If $P(A) = \frac{1}{8}$, $P(B) = \frac{1}{4}$ and $P(A \cup B \cup C) = \frac{1}{2}$, then find $P(C) = ?$ (05 Marks)

Module-5

- c. A company involved in the integration of personal computers gets its graphics cards from three sources. The first source provides 20% of the cards, the second source 35% and the third source 45%. Past experience has show that 5% of the cards from the first source are found to be defective, while those from the second and third sources are found to be defective 3% and 2%, respectively, of the time. (i) What percentage of the company's graphics cards are defective? (ii) If a graphics card is selected and found to be defective, what is the probability it was provided by the third source? (06 Marks)

- 9 a. Define the following with an example each,
(i) Regular graphs (ii) Complete graphs (iii) Bipartite graphs. (06 Marks)
b. Explain Konigsberg bridge problem. (05 Marks)
c. Use Dijkstra's algorithm to find the length of a shortest path between the vertices a and z in the following weighted graph [Refer Figure Q9(c)] (05 Marks)

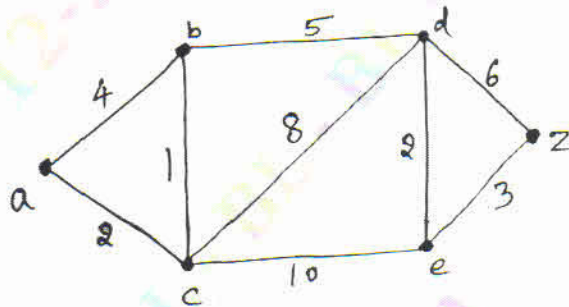


Fig Q9(c)

OR

- 10 a. How many edges are there in a graph with 10 vertices each of degree six? (02 Marks)
b. Define Isomorphism of Graphs, verify the following graphs are isomorphic or not? (05 Marks)

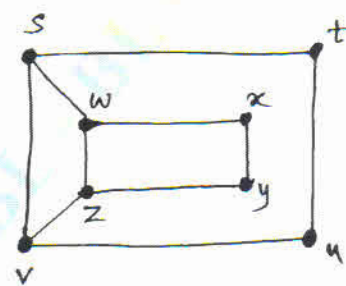
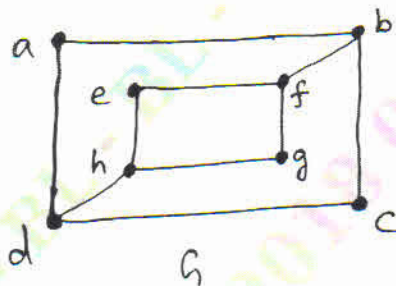


Fig Q10(b)

- c. Define planar graphs. Show that the complete graph K_5 is nonplanar. (05 Marks)
d. Define chromatic number of a graph. Find the chromatic number of the following graph :

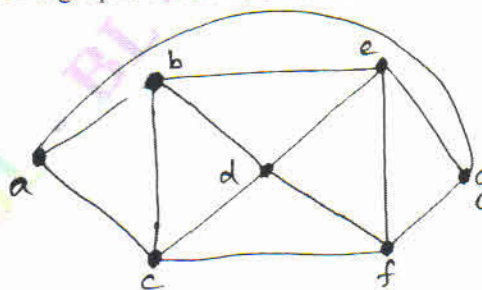


Fig Q10(d)

(04 Marks)

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16/17MCA22

Second Semester MCA Degree Examination, Dec.2018/Jan.2019
Object Oriented Programming Using C++

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. What is OOP? Explain the various features of OOP. (08 Marks)
- b. Explain the following :
 - i) No default to int
 - ii) Namespaces
 - iii) General form of C++
 - iv) Bool Data type. (08 Marks)

OR

- 2 a. What are friend functions and friend classes Give example. (04 Marks)
- b. Differentiate structures and classes. (04 Marks)
- c. Explain the following :
 - i) Nested Classes
 - ii) Empty classes
 - iii) Local classes
 - iv) Object assignment. (08 Marks)

Module-2

- 3 a. With an example, illustrate how to create, initialized and uninitialized array of objects using constructors. (08 Marks)
- b. Explain:
 - i) this pointer
 - ii) Pointer to Derived types. (08 Marks)

OR

- 4 a. What is a reference? Explain the types of references. (04 Marks)
- b. Define constructor and Destructor. Explain copy constructor with example. (07 Marks)
- c. What is function overloading? Write overloaded functions for computing area of a triangle, circle and a rectangle. (05 Marks)

Module-3

- 5 a. What is operator overloading? How are they implemented in C++? Mention the rules for operator overloading. (05 Marks)
- b. Explain a friend to overload ++ or --. (05 Marks)
- c. Describe the significance of overloading new and delete operator with suitable example. (06 Marks)

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.

OR

- 6 a. What is inheritance? Discuss the various forms of inheritance? (08 Marks)
 b. Write a program to illustrate inheriting from multiple base classes. (04 Marks)
 c. What are virtual base classes? Write an example program to illustrate virtual base classes. (04 Marks)

Module-4

- 7 a. Distinguish between virtual and pure virtual function. (06 Marks)
 b. What are generic functions? Write the restrictions on generic functions. (06 Marks)
 c. Explain early and late binding with suitable example. (04 Marks)

OR

- 8 a. What is Generic sort? Write an example program to illustrate generic sort. (04 Marks)
 b. Explain the following :
 i) typename and export keywords
 ii) Generic classes
 iii) Terminate and unexpected Handlers
 iv) uncaught_exception () function (08 Marks)
 c. What is exception handling? List the different exception handling options. (04 Marks)

Module-5

- 9 a. What are I/O streams in C++? Give the stream class hierarchy. (06 Marks)
 b. Define manipulators. List the various predefined manipulators supported by C++ I/O streams. (04 Marks)
 c. How are opening and closing of a file handled in C++? Distinguish between text and binary files. (06 Marks)

OR

- 10 a. Write a C++ program to illustrate the standard manipulators set iosflags () and reset iosflags (). (06 Marks)
 b. What is file mode? Describe the various file mode operations available in C++. (04 Marks)
 c. Write a note on :
 i) STL
 ii) String classes. (06 Marks)

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16/17MCA25

Second Semester MCA Degree Examination, Dec.2018/Jan.2019 System Software

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain the architecture of SIC machine with respect to registers, data formats, instruction formats and addressing modes. (08 Marks)
- b. Write and explain the instruction formats of SIC/XE architecture. (04 Marks)
- c. Write an assembly language program in SIC/XE to perform 'ABC = ALPHA * 10-50'. Use register addressing to perform multiplication and subtraction. (04 Marks)

OR

- 2 a. Write the algorithm of PASS-1 of two pass algorithm. (08 Marks)
- b. Find the target addressing for the following SIC/XE instruction:
i) 032600 ii) 03C300 iii) 00B600 iv) 6D101000. (08 Marks)

Module-2

- 3 a. Discuss symbol defining statements used in assembler with example on each. (08 Marks)
- b. Generate the object code for following SIC/XE program. [OPCODES : CLEAR = B4, LDS = 6C, ADD = 18, STA = 0C]. (08 Marks)

DEMO	START	O
	CLEAR	X
	+LDS	#4096
	ADD	@TAB
	STA	ALPHA, X
ALPHA	RESW	256
TAB	RESE	4
	END	

OR

- 4 a. Explain the working of load-and-go assembler with proper example. (08 Marks)
- b. What is program relocation? Explain how relocation problem of extended format is solved using modification record. (08 Marks)

Module-3

- 5 a. Write the algorithm of an absolute loader. (04 Marks)
- b. Give the format of relocation bits used by loader. Explain the same with example. (04 Marks)
- c. Illustrate the concept of program linking. Performed by loader with block diagram. (08 Marks)

OR

- 6 a. Compare and explain linking loader and linkage editor with diagram. (08 Marks)
 b. Write a note on MSDOS linker. (08 Marks)

Module-4

- 7 a. Explain the different data structures used by macro processor with block diagram. (10 Marks)
 b. Explain with an example the concatenation of macro parameters. (06 Marks)

OR

- 8 a. List and explain basic macro processing functions with suitable example. (08 Marks)
 b. Describe the salient features of ANSI C macro processor. (08 Marks)

Module-5

- 9 a. Write the BNF grammar to the assignment statement of C program for the expression 'SUM = A * (B + 50)'. Generate the parse tree for this expression using the same grammar. (08 Marks)
 b. Briefly discuss different machine dependent code optimization techniques. (08 Marks)

OR

- 10 a. Using the given finite automata, check whether following strings are recognized or not recognized.
 i) abca ii) abccccabc iii) abababcab iv) abcabcabccaac. (08 Marks)

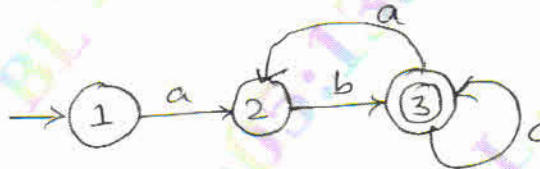
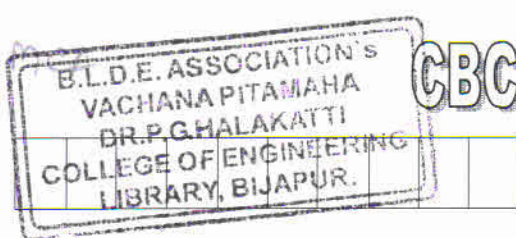


Fig.Q.10(a)

- b. Write a note on:
 i) P-code compiler
 ii) YACC compiler.

(08 Marks)



Third Semester MCA Degree Examination, Dec.2018/Jan.2019

Computer Networks

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Define Computer Networks. Explain the uses of computer networks in business applications and home applications. (08 Marks)
- b. Explain Local Area Network in detail. (08 Marks)

OR

- 2 a. Describe the architecture of internet with diagram. (08 Marks)
- b. Explain OSI reference model with diagram. (08 Marks)

Module-2

- 3 a. What is framing? Explain the four framing methods. (08 Marks)
- b. Explain four different error-correcting codes. (08 Marks)

OR

- 4 a. Explain the following :
 - i) Simplex stop and wait protocol for error free channel
 - ii) Simplex stop and wait protocol for noisy channel. (08 Marks)
- b. Explain the Go-back-N sliding window protocol. (08 Marks)

Module-3

- 5 a. How connection oriented service is implemented in network layer? (08 Marks)
- b. Discuss about distance vector routing algorithm with suitable network. (08 Marks)

OR

- 6 a. What is congestion control? Discuss the approaches to congestion control. (08 Marks)
- b. Discuss about Broadcast routing in network layer. (08 Marks)

Module-4

- 7 a. Explain the following :
 - i) Nesting of segments, packets and frames
 - ii) Socket primitives in TCP (08 Marks)
- b. Write socket programming with respect to internet file server. (08 Marks)

OR

- 8 a. Write short notes on : i) TCP ii) UDP. (08 Marks)
- b. Discuss about the elements of transport protocols. (08 Marks)

Module-5

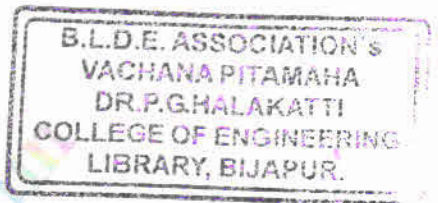
- 9 a. Explain the following : i) Domain Name System ii) Electronic Mail. (08 Marks)
- b. Explain the DNS resource record types. (08 Marks)

OR

- 10 a. Discuss about static and dynamic web pages. (08 Marks)
- b. Explain in detail about server farm and web proxies. (08 Marks)

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16/17MCA32

Third Semester MCA Degree Examination, Dec.2018/Jan.2019

Java Programming

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain the key attributes of Object Oriented Principles. (06 Marks)
- b. Explain the following : i) Type casting ii) this. (06 Marks)
- c. Explain the use of break as a form of 'goto' with an example. (04 Marks)

OR

- 2 a. Explain the left shift and right shift operators. (04 Marks)
- b. What is Enhanced for loop? Write a Java program to search an element in an array using enhanced for loop. (06 Marks)
- c. Write any three methods of String class to compare strings with syntax and example. (06 Marks)

Module-2

- 3 a. Explain about static variable, static method and static block, with suitable example. (06 Marks)
- b. Explain about method overloading and constructor overloading, with suitable program. (06 Marks)
- c. What is varargs? What are the restrictions of varargs? (04 Marks)

OR

- 4 a. How Super class constructors and members are called in Java? (06 Marks)
- b. Explain the following :
i) Dynamic method dispatch ii) Abstract class. (10 Marks)

Module-3

- 5 a. What are Interfaces? How to implement multiple interfaces in Java? (06 Marks)
- b. Define a Package. Explain the creation of package using any example. (06 Marks)
- c. What do you mean by Static import? (04 Marks)

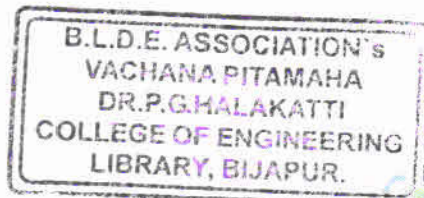
OR

- 6 a. What is an Exception? Give the general structure of an exception handling mechanism. How to define multiple catch blocks? (08 Marks)
- b. Explain how to create your own exceptions. Give an example. (08 Marks)

Module-4

- 7 a. What is Synchronization? Explain how inter thread communication can be achieved in multithreading using Producer and Consumer Program. (10 Marks)
- b. Define Thread and Multithreading. What are the 2 ways of creating threads? (06 Marks)

OR



16/17MCA32

- 8 a. What is Enumeration? Explain values () and valueOf () methods with example. (08 Marks)
b. Explain the following :
i) Type Wrappers ii) Autoboxing and Autounboxing. (08 Marks)

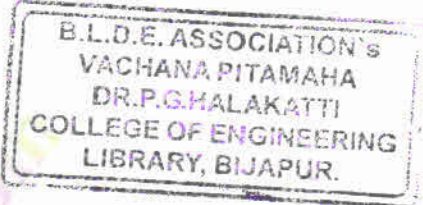
Module-5

- 9 a. What are Applets? Explain the life cycle of an Applets using an example program. (08 Marks)
b. Write a Java Program which uses DatagramSocket to demonstrate client – server communication. (08 Marks)

OR

- 10 a. Explain the following :
i) URLConnection ii) Collection Interfaces. (08 Marks)
b. Explain ArrayList class and LinkedList class, with suitable example. (08 Marks)

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16/17MCA33

Third Semester MCA Degree Examination, Dec.2018/Jan.2019 Analysis and Design of Algorithms

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Which are the different ways of computing GCD of two numbers? Write any 2 algorithm to find it and apply for the given input $m = 6, n = 10$. (08 Marks)
- b. With a neat flowchart, explain the fundamentals of algorithmic problem solving. (08 Marks)

OR

- 2 a. List out importance problem types. Explain any two of them. (08 Marks)
- b. What is asymptotic notation? List and explain the asymptotic notations. (08 Marks)

Module-2

- 3 a. Write an algorithm to sort given n elements using bubble sort and find its time efficiency. (08 Marks)
- b. Write an algorithm to implement Brute Force's string matching process and apply the same for the given input.
Text string = [NOBODY_NOTICE_HIM]
Pattern string = [NOT]. (08 Marks)

OR

- 4 a. Write an algorithm to sort n elements using merge sort. Apply the same to sort the given list [E, L, E, M, E, N, T, S] in alphabetical ordering. (08 Marks)
- b. Design and analyze the binary search algorithm to find the key element in a given sorted n elements. (08 Marks)

Module-3

- 5 a. Define BFS and DFS. Obtain the differences and similarities between these. Traverse the given graph using BFS and DFS method (Refer Fig.5(a)). (12 Marks)



Fig.Q.5(a)

- b. Obtain the topological ordering for the following graph Fig.Q.5(b) using source removal method. (04 Marks)

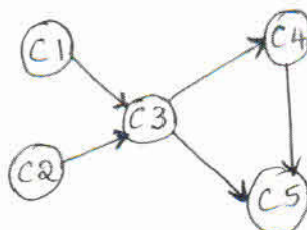
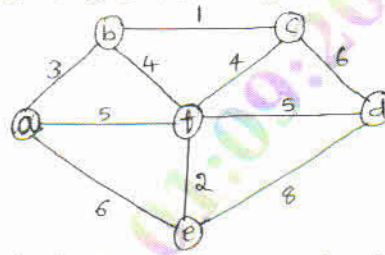


Fig.Q.5(b)

OR

- 6 a. Find the MST for the given graph (Fig.Q.6(a)) using Kruskal's algorithm. (05 Marks)

Fig.Q.6(a)



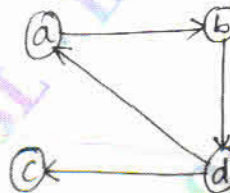
- b. Write an algorithm to find the single-source shortest path using Dijkstra's algorithm. (05 Marks)
- c. Find the Huffman code for the following data by obtaining Huffman tree: (06 Marks)

Character	A	B	C	D	-
Probability	0.35	0.1	0.2	0.2	0.15

Module-4

- 7 a. Write an algorithm to compute transitive closure / path matrix for the given graph. And obtain the transitive closure for the given graph shown in Fig.Q.7(a) using Warshall's algorithm. (08 Marks)

Fig.Q.7(a)



- b. Find the optimal solution for the given Knapsack instance using 0/1 Knapsack method with capacity $M = 5$. (08 Marks)

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

OR

- 8 a. Write an algorithm to sort given n elements using distribution counting method. Apply the same for the following input: [13, 11, 12, 13, 12, 12]. (08 Marks)
- b. Explain Horspool's string matching algorithm with a suitable example. (08 Marks)

Module-5

- 9 a. What is decision tree? Obtain the decision tree to find minimum of 3 numbers. (08 Marks)
- b. Explain N-Queens problem using back-tracking method. (08 Marks)

OR

- 10 a. Construct the state-space tree for the sum of subset problem for the given data: $W = \{5, 10, 12, 13, 15, 18\}$, and $M = 30$ (08 Marks)
- b. Find the optimal solution for the given assignment problem which is represented as a matrix as show below:

	J1	J2	J3	J4
a	9	2	7	8
b	6	4	3	7
c	5	8	1	8
d	7	6	9	4

(08 Marks)

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Third Semester MCA Degree Examination, Dec.2018/Jan.2019

Software Engineering

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Describe software engineering code of ethics and professional practices as defined by IEEE/ACM. (08 Marks)
- b. Why software engineering is important? Explain the attributes of good software. (08 Marks)

OR

- 2 a. Explain the phases in Rational Unified Process. (08 Marks)
- b. List and explain the Extreme Programming practices. (08 Marks)

Module-2

- 3 a. Explain the terms "user-requirements" and "system requirements". List different readers of user requirements and system requirements. (08 Marks)
- b. With a neat diagram, explain the different types of activities that are performed in the requirement engineering process. (08 Marks)

OR

- 4 a. Explain the CBSE process with a neat diagram. (08 Marks)
- b. With a neat diagram, explain the different types of non-functional requirements. (08 Marks)

Module-3

- 5 a. What is meant by system model? With an ATM model explain the context model. (08 Marks)
- b. Explain the role of software architecture. (08 Marks)

OR

- 6 a. Explain Architectural styles for C and C view. (08 Marks)
- b. Explain state machine models with an example. (08 Marks)

Module-4

- 7 a. Explain function oriented design. (08 Marks)
- b. Write a note on cohesion and coupling. (08 Marks)

OR

- 8 a. Briefly explain the architectural patterns for distributed systems. (08 Marks)
- b. Discuss the complexity matrix for function oriented design. (04 Marks)
- c. Write a note on Software as Service. (04 Marks)

Module-5

- 9 a. Explain project schedule and staffing. (08 Marks)
- b. Explain the activities of software configuration management plan. (08 Marks)

OR

- 10 a. Describe in details the process of testing. (08 Marks)
- b. Mention the differences between white box testing and block box testing. (08 Marks)

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Third Semester MCA Degree Examination, Dec.2018/Jan.2019
Enterprise Resource Planning

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. What is an Enterprise? What is the role of Enterprise? Discuss with example. (08 Marks)
 b. Discuss the benefits of ERP. (08 Marks)

OR

- 2 a. What is data warehouse? Write the uses of data warehouse. (08 Marks)
 b. Discuss the difference between knowledge verification and discovery. (08 Marks)

Module-2

- 3 a. Explain the different phases of ERP implementations. (08 Marks)
 b. Discuss the different phases of ERP life cycle. (08 Marks)

OR

- 4 a. Explain the role and responsibilities of ERP vendors. (08 Marks)
 b. Write the golden rules for successful project management. (08 Marks)

Module-3

- 5 a. Discuss the functional module of ERP software. (08 Marks)
 b. Explain subsystem of controlling. (08 Marks)

OR

- 6 a. Discuss the following :
 i) Material and capacity planning (04 Marks)
 ii) Shop Floor control. (04 Marks)
 b. Explain the subsystem of personnel management in Human Resource. (08 Marks)

Module-4

- 7 a. Explain the different ERP market tiers with their characteristics. (08 Marks)
 b. Write short notes on oracle corporation. (08 Marks)

OR

- 8 a. What are the different product modules available from JD Edwards? (08 Marks)
 b. Discuss the detail about SAP AG business applications and solutions. (08 Marks)

Module-5

- 9 a. What is Enterprise Application Integration? Explain the uses, and implementation pitfalls of EAI in detail. (08 Marks)
 b. Explain the future directions in ERP and trends. (08 Marks)

OR

- 10 a. Explain the important of the integration of ERP with internet and WWW. (08 Marks)
 b. Discuss about ERP and E-Business. (08 Marks)

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Fourth Semester MCA Degree Examination, Dec.2018/Jan.2019

Advanced Java Programming

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain the process of servlet life cycle in web container. (10 Marks)
- b. What are the needs, benefits and advantages of JSP? (06 Marks)

OR

- 2 a. With an example, explain the structure of servlet program. (10 Marks)
- b. Briefly explain the HTTP status codes during server response. (06 Marks)

Module-2

- 3 a. Explain the following page directive attributes along with an example: (10 Marks)
 - (i) import
 - (ii) errorpage and iserrorpage
 - (iii) session
 - (iv) buffer and autoflush
- b. Explain the different types of JSP elements. (06 Marks)

OR

- 4 a. Write a JSP program to read data from a HTML form (Gender, data from radio buttons and colours data from check boxes) and display. (10 Marks)
- b. Write a JSP program to include an applet along with necessary applet code. (06 Marks)

Module-3

- 5 a. Define package. With an example, explain the usage of sub packages. (06 Marks)
- b. Write a JSP program to get student information through a HTML and create a Java Bean class, populate bean and display the same information through another JSP. (10 Marks)

OR

- 6 a. Discuss built-in annotations with an example. (10 Marks)
- b. Write a note on : (i) Advantages of Java Bean (ii) Java Bean API. (06 Marks)

Module-4

- 7 a. With example, explain the essential steps of JDBC program. (10 Marks)
- b. Define EJB. Briefly explain the advantages of EJB. (06 Marks)

OR

- 8 a. Explain the types of statement objects in JDBC with an example. (10 Marks)
- b. Explain the following advanced JDBC data types: (06 Marks)
 - (i) BLOB
 - (ii) CLOB
 - (iii) ARRAY

Module-5

- 9 a. What is Session Bean? Explain three types of Session Bean. (10 Marks)
- b. Explain the steps in developing EJBs. (06 Marks)

OR

- 10 a. What is message-driven beans? Explain the life cycle of message driven beans. (10 Marks)
- b. Explain the following terms: (06 Marks)
 - (i) Interceptors.
 - (ii) Naming and object stores.

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Fourth Semester MCA Degree Examination, Dec.2018/Jan.2019 Advanced Web Programming

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. What is jQuery? Explain the document ready handler with syntax. (04 Marks)
- b. Explain different methods used for adding and removing class names with examples. (08 Marks)
- c. Explain wrap() and unwrap() methods with examples. (04 Marks)

OR

- 2 a. Explain HTML() and Text() methods for replacing HTML and text contents. (06 Marks)
- b. Write a short note on : on() method. (04 Marks)
- c. Explain any two methods to fade an element in and out of visibility. (06 Marks)

Module-2

- 3 a. Write a program to accept student information and store in database using PHP form handling. (10 Marks)
- b. Explain for and foreach looping statements in PHP with example. (06 Marks)

OR

- 4 a. Differentiate \$_POST and \$_GET in PHP with examples. (08 Marks)
- b. Write a note on : Pattern Matching in PHP. (04 Marks)
- c. Define a PHP session. Explain with example. (04 Marks)

Module-3

- 5 a. Write a note on : Ruby methods. (06 Marks)
- b. Define MVC application. Write a note on RAILS. (06 Marks)
- c. Differentiate if() and unless() control statements in Ruby. (04 Marks)

OR

- 6 a. Write a RAILS application program that accepts two integer values and produce the sum of two values and return it to the client. (10 Marks)
- b. Define Hash variable. Explain hash variable and any two of its associated methods in Ruby. (06 Marks)

Module-4

- 7 a. What is JSON? Explain with examples how Javascript array and object literals are used for JSON syntax. (08 Marks)
- b. Write a short note on :
 - (i) Iterative Development
 - (ii) Social Networking.
 (08 Marks)

OR

- 8 a. Differentiate JSON and XML (04 Marks)
b. Explain Web services. (04 Marks)
c. Write a short note on :
(i) SAAS
(ii) Folksonomies (08 Marks)

Module-5

- 9 a. What is D3.js? List and explain the features of D3.js. (08 Marks)
b. Explain D3.js SVG. (08 Marks)

OR

- 10 a. Explain D3.js scales. (08 Marks)
b. Explain the role of D3.js axes component. (08 Marks)

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16MCA51

Fifth Semester MCA Degree Examination, Dec.2018/Jan.2019

Object Oriented Modeling and Design Pattern

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Outline the various Object Oriented Themes. (06 Marks)
- b. Describe the following terms:
 - i) Enumeration
 - ii) Aggregation
 - iii) Composition
 - iv) Abstract class
 - v) Reification

Give example for each. (10 Marks)

OR

- 2 a. State the purposes of building a model. (04 Marks)
- b. Briefly explain the class model, state model and interaction model. (04 Marks)
- c. Explain with examples:
 - i) Value and Attribute
 - ii) Operation and Method
 - iii) Link and Association
 - iv) Qualified Association. (08 Marks)

Module-2

- 3 a. What is an event? With example describe the different types of events in state modeling. (08 Marks)
- b. Describe sequence diagram with active objects, passive objects and transient objects. (08 Marks)

OR

- 4 a. What are the guidelines to be followed while drawing use case diagram? Draw the use case model for vending machine. (08 Marks)
- b. Discuss the use of branching and concurrency in activity diagram. (08 Marks)

Module-3

- 5 a. Explain the procedure to be followed to construct a domain class model. (10 Marks)
- b. Write and explain the steps performed in constructing a domain state model. (06 Marks)

OR

- 6 a. Describe the steps for constructing application interaction model. (10 Marks)
- b. Explain the steps for constructing application state model. (06 Marks)

Module-4

- 7 a. With the help of architecture of ATM system describe how to break a system into subsystems in system design. (12 Marks)
b. Discuss about making a reuse plan in system design. (04 Marks)

OR

- 8 a. Briefly explain the design optimization with reference to class design. (08 Marks)
b. Explain the steps to be performed in designing algorithm for class design. (08 Marks)

Module-5

- 9 a. Define pattern. Explain the pattern description template. (08 Marks)
b. Briefly explain Forwarder-Receiver pattern. (08 Marks)

OR

- 10 a. Explain the structure of client – dispatcher server pattern. (08 Marks)
b. Describe whole-part design pattern. (08 Marks)

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Fifth Semester MCA Degree Examination, Dec.2018/Jan.2019
Programming using C# and .NET

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain benefits of .NET framework. (06 Marks)
 b. Explain the components of .NET framework with the help of architectural diagram. (10 Marks)

OR

- 2 a. Write a C# program to explain boxing and un-boxing. (06 Marks)
 b. What is jagged array? Write a program in C# to read a jagged array and display the sum of all elements present in jagged array of 3 inner arrays. (10 Marks)

Module-2

- 3 a. Write a C# program to explain accessor and mutator and properties used in encapsulation. (10 Marks)
 b. List the difference between properties and indexes. (06 Marks)

OR

- 4 a. Write a C# program to explain interface inheritance and implementation of interfaces. (06 Marks)
 b. Explain array of objects with the help of a program. (05 Marks)
 c. Write a C# program to calculate square and addition of number using delegates. (05 Marks)

Module-3

- 5 a. Write a C# program using try, catch, finally and explain checked and unchecked statements. (06 Marks)
 b. Explain what is event? Write a C# console application to demonstrate the concept of multiple event handler for a single event. (10 Marks)

OR

- 6 a. Explain the components of ADV.NET entity frame work. (06 Marks)
 b. Discuss the components of dataset. (04 Marks)
 c. Explain DataAdapter for creating dataset with an example program. (06 Marks)

Module-4

- 7 a. Explain the steps involved in creating MDI form. (06 Marks)
 b. Discuss the properties, events of checked text box control. Write a C# program and illustrate checked box. (10 Marks)

OR

- 8 a. Explain WPF architecture with a neat diagram. (08 Marks)
 b. Explain XAML elements with an example. (04 Marks)
 c. Explain Markup extension classes in XAML. (04 Marks)

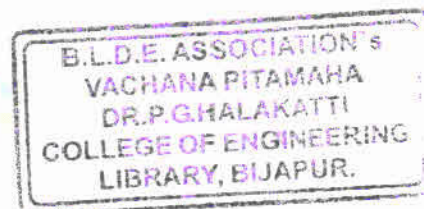
Module-5

- 9 a. Explain the architecture of multitier application. (08 Marks)
 b. Explain web application development with ASP.NET by using steps to explain validation controls. (08 Marks)

OR

- 10 a. What is AJAX? Need for AJAX. (06 Marks)
 b. Explain AJAX server controls:
 (i) ScriptManager control (ii) Update panel control (10 Marks)

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16MCA53

Fifth Semester MCA Degree Examination, Dec.2018/Jan.2019

Mobile Applications

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. What is mobile applications? Explain the importance of mobile application in today's scenario. (08 Marks)
- b. What are the development process of mobile application in the business world. (08 Marks)

OR

- 2 a. What do you understand by mobile information design and mobile platform? Explain it. (08 Marks)
- b. Explain the effective use of screen real estate and features of mobile applications. (08 Marks)

Module-2

- 3 a. Explain the fundamentals of developing an android application. (08 Marks)
- b. Explain how to build the Derby App in android. (08 Marks)

OR

- 4 a. What are the components of android applications? Explain with an example. (08 Marks)
- b. Discuss the components involved in android for activities and fragments. (08 Marks)

Module-3

- 5 a. Explain in detail how to design user interfaces using views. (08 Marks)
- b. Write in details, How to display Google maps in your own android applications. (08 Marks)

OR

- 6 a. What is the prospective of deploying APK file in android applications? (08 Marks)
- b. Differentiate the basics of android UI design and location based services. (08 Marks)

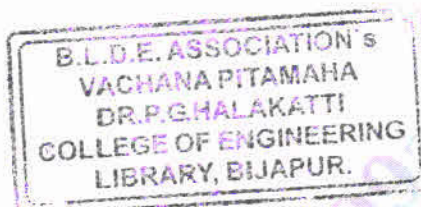
Module-4

- 7 a. Write the basic concept of android messaging services for sending SMS and Email. (08 Marks)
- b. What is the process for binding activities to services in android applications? (08 Marks)

OR

- 8 a. What are the techniques involved to create own services and binding web services in android? (08 Marks)
- b. Explain the concepts of networking in the terms of communicating between service and activity. (08 Marks)

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.



16MCA53

Module-5

- 9 a. How to build Derby App in window phone 7? Explain. (08 Marks)
b. Explain the Anatomy of window phone 7 App. (08 Marks)

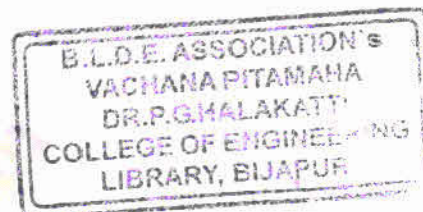
OR

- 10 Write the short notes on following with appropriate example:
a. Components of XCODE
b. Tools required for window phone 7
c. Getting useful iOS things
d. Derby App in iOS.

(16 Marks)

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16/17MCA541

Fifth Semester MCA Degree Examination, Dec.2018/Jan.2019

Web 2.0 and Rich Internet Application

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. What is AJAX? Discuss the principles and technologies behind AJAX. (06 Marks)
- b. What is the use of XMLHttpRequest Object? List its any 5 properties for internet explorer. (06 Marks)
- c. Explain the Asynchronous communication in AJAX application model. (04 Marks)

OR

- 2 a. Discuss about readystate and status properties. List any 5 properties for each. (06 Marks)
- b. Illustrate the method of URL encoding to send data to the server using GET method. (06 Marks)
- c. Explain the AJAX web application model. (04 Marks)

Module-2

- 3 a. Suggest the method of handling two XHR objects in the same page. (08 Marks)
- b. Demonstrate the callback function in google suggest to process the data received from google server. (08 Marks)

OR

- 4 a. How to defeat caching in browsers? Explain. (08 Marks)
- b. Explain how HTML header information can be retrieved using AJAX. (08 Marks)

Module-3

- 5 a. Illustrate how to access XML data directly. (06 Marks)
- b. List any 5 PHP Server variables. Explain how these variables can be accessed. (06 Marks)
- c. Write the tree structure for an example XML code. List any 5 node properties of XML. (04 Marks)

OR

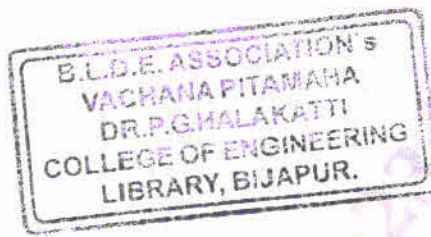
- 6 a. Demonstrate how the cross browser white space is handled. (06 Marks)
- b. How timeouts can be handled in AJAX? Explain. (06 Marks)
- c. What is DOM? List any 5 properties of DOM. (04 Marks)

Module-4

- 7 a. Write the Bootstrap file structure and its basic HTML template. (06 Marks)
- b. What is Responsive design? Explain the significance of helper classes. (06 Marks)
- c. Discuss : i) Blockquotes ii) Abbreviations. (04 Marks)

OR

- 8 a. Write notes on : i) Code ii) Table classes. (06 Marks)
- b. Explain button classes and button sizes. (06 Marks)
- c. Demonstrate the use of GLYPHICONS. (04 Marks)



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Module-5

- 9 a. Explain Tabular, Basic pills and Stackable navigation elements in boot strap. (06 Marks)
b. Discuss : i) Modal ii) Scrollspy. (06 Marks)
c. How breadcrumbs can be designed? Explain. (04 Marks)

OR

- 10 a. How to implement buttons with dropdowns? Explain. (06 Marks)
b. Discuss i) Tooltip ii) Popover iii) Affix. (06 Marks)
c. Demonstrate the design of Image slider using Carousel. (04 Marks)

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Fifth Semester MCA Degree Examination, Dec.2018/Jan.2019
Software Project Management

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Define Project. Illustrate the ISO 12207 software development life cycle using a neat diagram. (08 Marks)
- b. Discuss the key aspects in which modern software project management practices differ from those of traditional software project management. (08 Marks)

OR

- 2 a. Explain in detail stepwise project planning with a diagram. (08 Marks)
- b. Identify the important characteristics of software development projects which make these harder to manage compared to other types of projects. (08 Marks)

Module-2

- 3 a. List and give examples of the basic accounting principles. (04 Marks)
- b. Express the usage of Decision trees in risk evaluation. (06 Marks)
- c. How do you calculate ROI? Explain with example. (06 Marks)

OR

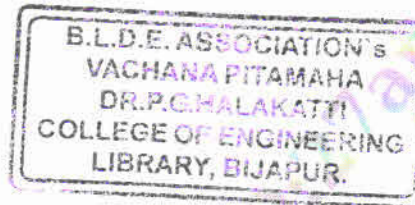
- 4 a. Outline the important activities of programme management. (08 Marks)
- b. Illustrate the cost benefit evaluation techniques. (08 Marks)

Module-3

- 5 a. Indicate the rules and conventions used in formulating activity_on_ arrow network. (08 Marks)
- b. Create a precedence activity network using the following details. Calculate the earliest and latest start and end dates and the float associated with each activity in the network and also identify the critical path.

Activity	Duration (weeks)	Precedents
A	5	
B	7	A
C	6	B
D	5	A
E	10	D
F	15	B
G	8	B
H	8	G
I	4	C
L	4	G
K	5	E, F
L	3	I, H

(08 Marks)



16MCA554

OR

- 6 a. Explain a framework for Dealing with a Risk. (08 Marks)
b. Explain forward pass and backward pass for project scheduling with example. (08 Marks)

Module-4

- 7 a. Discuss the digital about configuration management. (08 Marks)
b. Explain the project control cycle with a neat diagram. (08 Marks)

OR

- 8 a. Illustrate the different Visualizing method for monitoring a project. (08 Marks)
b. What do you mean by Schedule Variance (SV) and Time Variance (TV)? Explain about the most common methods of earned value analysis in software project. (08 Marks)

Module-5

- 9 a. What are the categories of design making and the obstacles of good decision making? Explain. (08 Marks)
b. Indicate the Oldham – Hackman job characteristics model and methods of improving motivations. Discuss. (08 Marks)

OR

- 10 a. Explain about all the five basic stages of development should go through by each team. Who all are the different types of people needed to form A team suggested by B ELBIN? Discuss. (10 Marks)
b. Discuss theory X and theory Y presented by Donald Mc GREGOR. (06 Marks)

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