ADAMAS UNIVERSITY
SCHOOL OF ENGINEERING AND TECHNOLOGY
END-SEMESTER EXAMINATION: DECEMBER 2019

(Academic Session: 2019 – 20, Semester Term: Aug 2019– Dec 2019)

Name of the Program:(BCA) Semester: V
Stream: (BCA)
PAPER TITLE: Programming Paradigm
PAPER CODE: ECS33103
Maximum Marks: 40 Time duration: 3 hours
Total No of questions:9 Total No of Pages:2

(Any other information required for the student may be mentioned here)

Answer all the Groups

Group A

(Answer all the questions)

5 × 1 = 5

1. a) Why swing components are known as light weight components?
   b) Can we create non static variables in Java?
   c) What are the uses of "extend" and, 'implement" in java?
   d) What is byte code?
   e) Define use of this keyword.

Group B

(Answer any three questions)

5 × 3 = 15

2. Explain Object oriented programming feature in details?

3. i) Explain Java byte code? 2.5+2.5

   ii)State difference between strong typing and weak typing in Java with suitable example?

4. i)Write a program in Java for window adapter?

   ii)Write a program in Java to find simple interest,Where Principal=1000,Rate of interest=6%,Time-6years 2.5+2.5

5. Write a program in java for Stack trace using hash table?

6. i)Explain Event listener in Java ?

   ii) State difference between abstract class and interface with suitable example? 2.5+2.5

Group C

(Answer any two questions)

$2 \times 10 = 20$

7. i)Write a program in Java for object messaging by creating an instance of a class?

   ii) Difference between Java AWT and Swing?

   iii) Write a Java code for thread creation. 3+4+3

8. i)Briefly explain Java AWT hierarchy?

   ii)Explain use of generic method in Java

   by taking suitable example. 5+5

9. i)Explain Object cloning by an example?

   ii)Explain use of thread in Java. 3+3+4

   iii)Explain JVM architecture with neat diagram

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Name of the Program: BCA
Semester: V
Stream: CSE
PAPER TITLE: Design and Analysis of Algorithm
PAPER CODE: ECS33101
Maximum Marks: 40
Time duration: 3 hours
Total No of questions: 9
Total No of Pages: 2

Answer all the Groups

Group A

(Answer all the questions)

$5 \times 1 = 5$

1. a) Define Algorithm.
   b) What do you mean by asymptotic analysis of an algorithm?
   c) Which algorithmic strategies is applied for Matrix Inversion?
   d) What is the time complexity of Bubble Sort?
   e) In which traversal of binary tree the output will produce sorted key values in an ascending order?

Group B

(Answer any three questions)

$5 \times 3 = 15$

2. Explain about Depth First Traversal in details. [5]

3. Input: set[] = {3, 34, 4, 12, 5, 2}, sum = 9 [5]

   Output: True //There is a subset (4, 5) with sum 9.

   Justify the above result with the proper explanation.

4. a) What is Minimum Cost Spanning Tree? [1+4]

   b) Find the Minimum Cost Spanning Tree of the below graph.

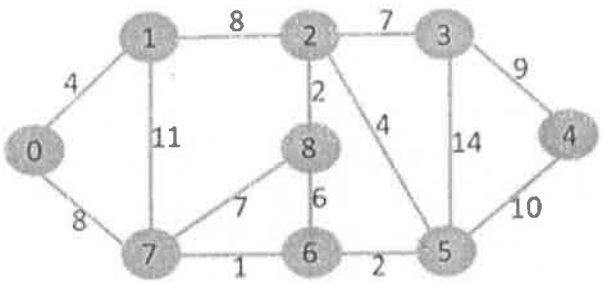

Fig. 1

5. Solve the following recurrence relation [2.5*2=5]

a) $T(n) = 3T(n/3) + n$

b) $T(n)=2T(n/2)+n^2$

6. The pre-order traversal of a binary search tree is given by [2.5*2=5]

{12, 8, 6, 2, 7, 9, 10, 16, 15, 19, 17, 20}. Then find the post-order and in –order traversal of this tree.

Group C

(Answer any two questions)

$2 \times 10 = 20$

7. Find out the Huffman Code for each character where character set is {a,e,i,o,u,s,t} and the corresponding frequency set is{ 10,15,12,3,4,13,1} [10]

8. Explain different Algorithmic Strategies in details. [10]

9. a) Explain Topological Sorting in details. [5+2+3]

b) How Topological Sorting differs from DFS?

c) Write the steps of Dijkstra's shortest path algorithm.

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END-SEMESTER EXAMINATION: DECEMBER 2019

(Academic Session: 2019 – 20, Semester Term: Aug 2019– Dec 2019)

Name of the Program: BCA
Stream: CSE
PAPER TITLE: Mobile Computing
Maximum Marks: 40
Total No. of questions: 09

Semester: V
PAPER CODE: EEC33101
Time duration: 3 hours
Total No of Pages: 02

Note:

1. Please follow all the Instructions given on the cover page of the Answer Booklet Strictly.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.
4. No Mobile Phones will be permitted in the Examination Hall.

Answer all the Groups

Group A

(Answer all the questions)

$5 \times 1 = 5$

1. a) What do you mean by *Dwell* time? Explain in brief.

b) If each Bluetooth radio channel has a 1 MHz bandwidth, then calculate the total number of hops per second.

c) Name the cryptographic technique used by WTLS, in context of WAP. What is the full form of WAP?

d) Write down an example of a first generation cellular network. What is the full form of AMPS?

e) Name the Ad Hoc network which supports both infrastructure based as well as infrastructure less communication.

Group B

(Answer any three questions)

$3 \times 5 = 15$

2. Explain the classifications of wireless Ad-Hoc networks, depending upon topology and their deployment. Compare various enabling technologies for implementing wireless Ad-Hoc communication networks. [2+3]

3. Explain the significance of WAP proxy in the WAP architecture. Compare the use of WTLS to SSL/TLS in WAP architecture. [3+2]

4. Explain Mesh topology, Ring topology and Star topology with the aid of suitable illustrations. Draw and explain Datagram switching and comment on the overall delay of this switching technique. [4+1]

5. Explain the frame structure of GSM with suitable sketches. In this context explain *hyperframes* and *multiframes* and *superframes*. [3+2]

6. Explain CDMA with the aid of suitable example. Briefly explain each sequential step followed to implement this multiple access scheme. [3+2]

Group C

(Answer any two questions)

$2 \times 10 = 20$

7. a) What do you mean by PDA in context of WAP. Explain the basic issues of WTLS protocol.

b) Draw and explain the significance of OBU, RSU and TPM in case of VANETs.

[2+4+4]

8. What is the limitation of cell sectoring due to which microcell concept was introduced? Explain. Explain (with suitable diagram) the significance of Microcell zonal concepts in reducing the number of handoff for a MS. [4+6]

9. a) Explain in brief, the four different channels defined by common air interface for communication between base station and mobiles. Also, explain the role of MSC in supervising the *fixed* and *dynamic* channel assignment strategies.

b) Write a short note on IEEE 802.11 Wireless LAN standard. [2+4+4]

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END-SEMESTER EXAMINATION: DECEMBER 2019
(Academic Session: 2019 – 20, Semester Term: Aug 2019– Dec 2019)

Name of the Program: BCA
Stream: CSE
PAPER TITLE: Management Information Systems
Maximum Marks: 40
Total No of questions:9

Semester: V

PAPER CODE: MBA33141
Time duration: 3 hours
Total No of Pages: 2

Answer all the Groups

Group A

(Answer all the questions)

$5 \times 1 = 5$

1. a) An HR manager has to decide whether a worker is eligible for overtime payment at the end of a month. Explain with reasons as to whether this is a structured or an unstructured decision.
   b) What is a cross-functional business process? Explain with an example
   c) What is elasticity in the context of cloud computing?
   d) How are the e-commerce and e-business related?
   e) Give two examples of use of data mining in the banking industry.

Group B

(Answer any three questions)

$3 \times 5 = 15$

CASE : Jurong Health Services

Jurong Health Services, a Singapore based health-care provider, is a pioneer in use of information technology.

Among the many systems implemented by the hospital are self-service kiosks to enable patients to register themselves by merely scanning their national identification cards and obtaining a queue number generated by the Enterprise Queue Management System. This unique number is used throughout the patient's visit that day for all service itineraries in the hospital. Patients refer to live screens located in the waiting areas that display a real-time queue status that shows their turn. This system has not only enabled Jurong Health to cut down on expenses but also to improve efficiency, as patients do not need different numbers for different services. It also reduces waiting time and increases patient satisfaction.

Similarly, the Visitor Management System self-service kiosks enable visitors to scan their identification cards and register themselves to gain access to the hospital wards. Visitors can also register themselves and obtain an e-pass from the Visitor Registration counters that grants them access to the wards that they want to visit. The identification card or e-pass must then be scanned at smart gates when entering and leaving the ward. The smart gates log not only visitor information but also track staff, as they are also required to use the same gantries to visit a particular ward. Through the implementation of the Visitor Management system, the hospital can control access to the wards, and visitors or staff can be easily tracked and contacted in case of a need.

Another IT system implemented is the Warehouse Management System, which eliminates the tedious process of manually counting inventory. The system uses passive radio frequency identification (RFID) technology and a two-bin shelving system to automate inventory top-up requests and improve inventory management. Once

the primary compartment of the storage bin is empty, the clinical staff transfers the relevant RFID tag into a drop-box, where the reader automatically sends a request for drug replenishment, thus avoiding stock-outs.

JurongHealth has also implemented a Real-Time Location Tracking System to automatically track patients and medical equipment using Wi-Fi triangulation, low frequency exciters, and about 6,000 active RFID tags attached to patients or medical equipment. These tags continuously communicate with the low frequency exciters to transmit data to the backend system for processing, allowing hospital staff to precisely locate patients and equipment, thus eliminating the need for tedious manual searching.

2. From the above case, give one example each of a customer problem and internal organisation problem faced by Jurong. Which of the above systems help in resolving the identified problems and how ?

3. What are the inputs to Jurong's Visitor Management system and what are its outputs? What is the processing that happens in the system? How does the system increase operational efficiency?

4. Would you consider Jurong's Warehouse Management System as an Enterprise Resource Planning System or a Knowledge Management System or both or neither? Justify your answer.

5. Would you consider Jurong's Real-Time Location Tracking System as a Transaction Processing System or a Management Information System or both or neither? Justify your answer.

6. Suppose systems similar to those in Jurong are to be implemented in a Government hospital in West Bengal like PG. Identify ONE organizational and ONE technology challenge that you are likely to face. How would you mitigate those challenges?

Group C

(Answer any two questions)

$2 \times 10 = 20$

7. Explain with a diagram, what is meant by client-server computing. What is the difference between two-tiered client server architecture and multitier client-server architecture? (6+4)

8. What are the basic, generic strategies to deal with Porter's competitive forces ? How does information technology help in execution of these strategies ? Explain with examples from the online retail business like Amazon or Flipkart or any other company of your choice.

9. Explain with examples from a manufacturing company (for example Maruti or any other company of your choice) what is meant by planning, organizing, leading and controlling in the context of managerial activities. Of these 4 activities, where would a factory supervisor spend most of his time? Would this be same or different for the CEO (head) of the company? Justify your answer.