Faculty of Engineering and Technology			
Ramaiah University of Applied Sciences			
Department	Computer Science and Engineering	Programme	B. Tech. in CSE
Semester/Batch	4th / 2017		
Course Code	19CSC213A	Course Title	Programming Paradigms
Course Leader(s)	MS. G. Roopa/ Ms. Naveeta		

Assignment			
Register No.		Name of Student	

Sections		**Marking Scheme**	**Max Marks**	**First Examiner Marks**	**Moderator Marks**
Question 1	QA.1	Illustration of how C programmers manually and explicitly free memory	01		
	QA.2	Illustration of how Java programmers rely on the Garbage Collector	01		
	QA.3	Comparison of the manual and the automated approaches	02		
	QA.4	The stance taken with justification.	02		
		Part A Max Marks	**6**		
Question 2	QB.1	Introduction to an Airline reservation system	01		
	QB.2 to QB.8	Design of the Airline reservation system	05		
	QB.9	Implementation of the Airline reservation system	06		

	QB.10	Demonstration of the Airline reservation system	02		
		Part B: Max Marks	**14**		
		Total Assignment Marks	**20**		

Course Marks Tabulation				
Component- 1(B) Assignment	**First Examiner**	**Remarks**	**Moderator**	**Remarks**
Q1				
Q2				
Marks (out of 20)				

Signature of First Examiner Signature of Second Examiner

Instructions to students:

1. Maximum marks is **20**
2. The assignment has to be neatly word processed as per the prescribed format.
3. The maximum number of pages should be restricted to **8**
4. The printed assignment must be submitted to the course leader.
5. **Submission Date: 30/03/2020**

RAMAIAH UNIVERSITY OF APPLIED SCIENCES

Assignment

Part A **(6 Marks)**

Preamble

In this section, the student is required to develop an essay based on his understanding using available scientific literature. The answer to this question should not exceed 3 A4 Pages.

In program development, garbage collection is a form of automatic memory management. The *garbage collector*, reclaims *garbage*, or memory occupied by objects that are no longer in use by the program.

Garbage collection is essentially automates manual memory management, which requires the programmer to specify which objects to deallocate, where, and return to the memory system.

Develop a debate on "Automated garbage collection (as Garbage Collector of Java) is superior to manually keeping track of memory by a programmer (as in C)"

Your debate should address the following:

1. Illustrate how C programmers manually and explicitly free memory in programs using an appropriate example.
2. Illustrate how Java programmers rely on the Garbage Collector in automatically freeing memory objects.
3. Comparison of the manual and the automated approaches.
4. The stance taken with justification.

Question 2 **(14 Marks)**

There are three types of aircrafts (referred to as flights) based on different types of seats available. Type1: Small seats corresponding to Economy fare for passenger tickets; Type2: Big seats corresponding to Business fare for passenger tickets and Type3: Huge seats corresponding to First Class fare for passenger tickets. A flight provides a row of seats in each of the Types mentioned above with a passage dividing each row in the middle. Each row may consist of two(A,B) or four(A,B,C.D) or six (A,B,C,D,E,F) seats. In a Type 1 flight, all rows for economy class and will consist of a maximum of 6 seats per row. In a Type 2 flight, rows numbered 1 to 10 are for business class and will consist of a maximum of 4 seats per row. In a type 3 flight, rows numbered 1 to 10 are for first class and will consist of a maximum of two seats per row and rows 11 to 20 are for business class with a maximum of 4 seats per row. In

a type 2 flight, Economy rows are from row 11 onwards and in a type 3 flight, row number 21 onwards is for Economy class. An Economy fare passenger can check in a maximum of 15Kgs; a Business class passenger, 25 Kgs and a First Class passenger, 30 Kgs. Excess baggage may be purchased by a passenger based on the following norms: 15 plus to 20 Kgs for Economy by paying Rs.2000 per additional Kg; 25 plus to 35 Kgs for Business class by paying Rs.3000 per additional Kg and 30 plus Kgs to 40 Kgs for First class by paying Rs.4000 per additional Kg.

Perform the following:

B1. Write an Introduction to Airline Reservation Software.

B2. Identify appropriate objects(and thereby classes) for the above specification with the objective of achieving the behaviour of booking tickets for passenger(s) based on their choice of Economy or Business or First class in a given type of flight subject to provision of the corresponding type of seat by the aircraft and availability of seat(s).

Hint: Design and implement an inheritance hierarchy (Class for Flight with Economy fare seats; Class for Flight with Economy and Business Class seats and Class for Flight with Economy, Business and First class) and reservation methods. Reservation methods accept as one of their parameters as the class of travel: Economy or Business or First Class.

B3. Indicate the arguments for the constructor of a flight object, for each of the above mentioned types of flights.

B4. Indicate the arguments for the constructor of a passenger object.

B5. Design and Implement a Cancel method that accepts the PNR of a passenger ticket.

B6. Design and implement a polymorphic method buyExcessBaggage(int k), where k is the number of additional Kgs to be purchased. Implement a method called makePayment(int R) to implement buyExcessBaggage(int k).

B7. Design a method named getBaggageLimit(pnr), where pnr is of type String, that may be called from a main or a client program that accepts the PNR of a passenger's ticket and returns baggage limit based on the class of the ticket.

B8. Identify Exceptions that need to be handled in Airline Reservation Software and implement exception handlers for the same. (For example, PNR passed to cancel method is not mapped to any ticket in the database).

B9. Implement a Java program for Airline reservation software based on the design in 2 to 8 above.