



National University of Computer & Emerging Sciences, Karachi
Department of Computer Science
Mid-Term Examination (Spring 2021)
8th April 2021, 1:30PM – 2:30PM



Course No: CL217	Course Name: Object Oriented Programming
Instructor Name/ Names: Abeer Gauher	
Student Roll No: [REDACTED]	Section: [REDACTED]

Time Allowed: 60 minutes

Total Marks: 20

Instructions:

- Attempt all questions; read each question completely and use your question paper for rough work.
- After completion of exam, return the question paper.
- Your Student ID must be written on the paper.
- In case of any ambiguity, you may make assumption. But your assumption should not contradict any statement in the question paper.
- For Exam submission: Create a folder named "your student-id" i.e. (K20-0100).
- Paste the .cpp file for each question named as Q1.cpp, Q2.cpp and on so in that folder.
- Submissions should be made in the folder on Google Classroom.

Question 1:

[Marks: 6 Time: 15 mins]

A book shop maintains details about the books in its' shop. Each book has a book id, book title, price. The details of the books can be easily viewed.

- A customer can purchase any number of copies for a particular book where the number of copies is initialized by a constructor.
- The user is required to input the book id, book title, price and number of copies that they want to purchase.
- The user is then displayed the total bill that is needed to be paid for the required book.
- The shop also keeps track of the total number of copies sold by a static function.
- Display the bill for two customers who purchase a book from the shop. Use a copy constructor to show to show the bill for the second customer.

[Marks: 6 Time: 20 mins]

Question 2:

A bank updates its customer's account at the end of each month. The bank offers two types of accounts to its customers that are savings and checking. Every customer is required to maintain a minimum balance of 1000 Rs.

- If the balance at the end of the month is at least the minimum balance, saving account members receive a 4% interest.
- If the balance at the end of the month is at least the minimum balance, checking accounts with balances of up to Rs 1,000 more than the minimum balance receive 3% interest; otherwise, the interest is 5%.

Customers are required to input their account number, account type: (s) for savings and (c) for checking and their current balance. These details are not accessible by other customers. Display the details for two customers along with the interest received.

[Marks: 8 Time: 25 mins]

Question 3:

A shop owner maintains a record of the items in the store and the discounted price for each of those items.

- The item details are stored separately and each item has an item number, item name and the price of the item.
- The item number for an item does not change.
- The discount details are maintained separately that include the discount percent for each item and the price after the discount.

The user is required to input the item number, item name, price and the discount percent. The discount price will then be displayed for the items. Display the item details with their discounted price for three items in the store.

National University of Computer & Emerging Sciences, Karachi
Department of Computer Sciences
Mid-Term Examination (Spring 2021)
8th April 2021, 1:30PM – 2:30PM

FAST



Course No: CL217	Course Name: Object Oriented Programming
Instructor Name/ Names: Abeer Gauher	
Student Roll No: [REDACTED]	Section: [REDACTED]

Time Allowed: 60 minutes

Total Marks: 20

Instructions:

- Attempt all questions, read each question completely and use your question paper for rough work.
- After completion of exam, return the question paper.
- Your Student ID must be written on the paper.
- In case of any ambiguity, you may make assumption. But your assumption should not contradict any statement in the question paper.
- For Exam submission: Create a folder named "your student-id" i.e. (K20-0100).
- Paste the .cpp file for each question named as Q1.cpp, Q2.cpp and on so in that folder.
- Submissions should be made in the folder on Google Classroom.

[Marks: 6 Time: 15 mins]

Question 1:

A coach for a cricket team wants to maintain a record of average runs scored by each batsman in his team for an inning. Each batsman has a batsman id, batsman name, total runs scored and the total number of innings played.

- ✓ The total runs and innings are initialized by a constructor.
- The details of the batsmen are easily accessible.
- ✓ The average is calculated using the formula: $\text{avg} = \text{runs} / \text{innings}$.
- The coach also keeps track of the total number of innings played by all the players in his team through a static function.
- Display the details for two batsmen that shows the batsman id, batsman name, total runs, total innings and the average runs. Use a copy constructor to show the details for the second batsmen.

Question 2:

[Marks: 6 Time: 20 mins]

An electricity company has an automated system that allows the user to view bills based on the number of units consumed by the user. The user is required to enter his details that include a user number, the user's name and the number of units used. A user cannot view the details of another user. The system then displays all the details for the customer that are the user number, user name, units consumed and the bill of the user. The rate for the unit is given as follows:

- 100 units – Rs 1.50 per unit
- 200 units – Rs 2.50 per unit
- 300 units – Rs 3.50 per unit

Display the bill for two customers.

Question 3:

[Marks: 8 Time: 25 mins]

An organization keeps a record of all the managers that are part of their organization.

- The organization stores basic personal details such as the employee number, employee name, employee phone number in a separate database.
- The employee number for an employee does not change.
- The manager details that include the department name and the manager's salary are stored separately in another database.

The manager details such as the employee number, employee name, employee phone number, department name and the manager's salary are required as an input. Display the details for three managers along with the manager with the highest salary.