American International University-Bangladesh

Course Title:	Advanced Programming with Java			Section:	A
Semester:	Spring 2024-25	Term:	Mid	Date:	13 April 2025
Type:	Lab - 2	Duration:	1H30M	Total Marks:	10
Student Name:				Student Id:	

Part-A

Garment Galaxy Pvt. Ltd. is a mid-sized garment manufacturing company that employs a variety of workers including tailors, quality checkers, and packagers. The HR department manages payroll manually, which often leads to miscalculations and delays. The management has decided to build an automated Payroll Management System using Java.

You are hired as a software developer to design a Payroll Management System that does the following:

Requirements:

- Employee Types:
  - Each employee has: id, name, role, baseSalary, and daysWorked.
  - Employees can be categorized as Tailor, Checker, or Packager.
- Salary Calculation:
  - Base salary is daily wage-based. Final salary is:
    finalSalary = baseSalary * daysWorked + role-basedBonus
  - Role-based bonus:
    - Tailor → $500
    - Checker → $300
    - Packager → $200
- Functional Requirements:
  - Use a List from the Collection framework to store employee data.
  - Use Stream API to:
    - Filter out employees who worked less than 20 days.
    - Sort the remaining employees by salary in descending order.
    - Collect them into a Map with role as the key and list of employees as the value.
  - Use Method References for:
    - Printing employee details.
    - Invoking static method for bonus retrieval.

What You Need to Implement:

- Class Structure:
  - Class Employee with attributes and methods.
  - Enum Role with method getBonus() using a static method reference.
  - Utility class PayrollProcessor for stream-based operations.
- Bonus Calculation:
  - Implement bonus fetching using method referencing like:
    Role::getBonusForRole
- Display:
  - Use method reference to print employee data:
    employees.forEach(System.out::println);

Your Task:

Build the solution using Java where:

- All employees are stored in a List<Employee>.
- Use Stream API to filter, sort, group.
- Use method referencing for clean and readable code.
- Calculate and display the total payroll (sum of final salaries of all employees who worked 20+ days).

Sample Output:

Employees who worked 20+ days:

ID: 104 | Name: Meena | Role: TAILOR | Days Worked: 25 | Final Salary: $20500.00

ID: 101 | Name: Asha | Role: TAILOR | Days Worked: 22 | Final Salary: $18100.00

ID: 106 | Name: Leela | Role: PACKAGER | Days Worked: 23 | Final Salary: $14000.00

ID: 103 | Name: Kiran | Role: PACKAGER | Days Worked: 21 | Final Salary: $13000.00

Grouped by Role:

TAILOR:

ID: 104 | Name: Meena | Role: TAILOR | Days Worked: 25 | Final Salary: $20500.00

ID: 101 | Name: Asha | Role: TAILOR | Days Worked: 22 | Final Salary: $18100.00

PACKAGER:

ID: 106 | Name: Leela | Role: PACKAGER | Days Worked: 23 | Final Salary: $14000.00

ID: 103 | Name: Kiran | Role: PACKAGER | Days Worked: 21 | Final Salary: $13000.00

Total Payroll Cost (20+ days only): $65600.00