LOVELY PROFESSIONAL UNIVERSITY

Academic Task No. 1

School of Computer Applications **Faculty of** Technology & Sciences

Name of the faculty member Dr. Anil Sharma

Course Code: CAP445 Course Title: Object Oriented Programming lab

Max. Marks: 30 **Is Rubric Applicable:** _NA___

Date of Allotment: 30-Sep-2021 Date of Submission: 09-Oct-2021

Important Guidelines:

1. All questions in this Academic Task are compulsory.

2. It is mandatory to attempt all questions of the assignment in your own handwriting on A4 size sheets/pages with a blue colour ink pen. Any other mode of attempt (typed or printed codes or table) except hand written/drawn will not be accepted/considered as valid submission(s) under any circumstances.

3. Every attempted sheet/page should carry clear details of student such as Name, Registration number, Roll number, Question number and Page number. The page numbers should be written clearly on the bottom of every attempted sheet in a prescribed format as: for page 1; **Page 1 of 4**, for page 2; **Page 2 of 4**, for page 3; **Page 3 of 4** and for page 4; **Page 4 of 4**, in case your assignment/document is of 4 pages.

4. After attempting the answer(s), student needs to take photograph of each of these answer sheets/pages and needs to convert the **jpeg** format images into a sequential single **pdf** format document (can be done with many free online available converters).**Documentation of the code is necessary.**

5. This PDF file should be uploaded onto the UMS interface on or before the last date of the submission.

6. Refrain from indulging into plagiarism as copy cases will be marked zero.

S. No.	SET	Objectives of Academic Activity	Topic/Question Details	Evaluation Parameters	Expected Outcomes
1	SET A	understand the concepts of object-oriented programming distinguish between the procedure-oriented and object-oriented programming language	1. Implement using classes. Create a function that takes an array of numbers between 1 and 10 (excluding one number) and returns the missing number. Example: missingNum([1, 2, 3, 4, 6, 7, 8, 9, 10]) ➞ 5 2. A person having account in a bank. His balance in bank account is 50000. He is also getting 2000 Rs. from PM Fund every month and 5% of interest on the amount saved quarterly. Create one application where you have applied the concept of multiple inheritance which will display extra amount he is getting annually? 3. You work in a toy car workshop, and your job is to build toy cars from a collection of parts. Each toy car needs 4 wheels, 1 car body, and 2 figures of people to be placed inside. Given the total number of wheels, car bodies and figures available, how many complete toy cars can you make?	10 marks per question	

2	B	understand the concepts of object-oriented programming
		
		distinguish between the procedure-oriented and object-oriented programming language
			1. Using classes Your job is to create a function, that takes 3 numbers: a, b, c and returns true if the last digit of a * b = the last digit of c. Check the examples below for an explanation.
			
			Example:
			
			lastDig(25, 21, 125) ⟶ true
			
			// The last digit of 25 is 5, the last digit of 21 is 1, and the last
			
			// digit of 125 is 5, and the last digit of 5*1 = 5, which is equal
			
			// to the last digit of 125(5).
			
			2. Write a program in C++, define a Employee class with employee id, Name and department. Define one function to find the highest and lowest paid salary to employees.
			3. Create a function which validates whether a bridge is safe to walk on (i.e. has no gaps in it to fall through).
			Example:
			isSafeBridge("####") ⟶ true
			
			isSafeBridge("## ####") ⟶ false
			
			isSafeBridge("#") ⟶ true
				10 marks per question	

3	C	understand the concepts of object-oriented programming distinguish between the procedure-oriented and object-oriented programming language	1. Implement using classes. Create a function that takes an array of numbers and returns an array where each number is the sum of itself + all previous numbers in the array. Example: cumulativeSum([1, 2, 3]) → [1, 3, 6] 2. Suppose you are trying to watch some lectures to study for your next exam but you keep getting distracted by meme compilations, adds, songs, promos on your favorite video platform. Your job is to create a function that takes a string and checks to see if it contains the following words or phrases: • "songs" • "meme" • "adds" • "promos" If it does, return "NO!". Otherwise, return "Safe watching!" 3. Write a program to overload all unary operators using constructor overloading also implement constructor with default argument.	10 marks per question	

4	D	understand the concepts of object-oriented programming distinguish between the procedure-oriented and object-oriented programming language	1. An employee working at a very bizzare company, earns one penny on their first day. However, for every day that passes, their base amount doubles, so they earn two pennies on the second day and four pennies on the third day (totalling 7 pennies). Given a number of days, return how many pennies the employee accumulates. Implement the program using classes. 2. Imagine a tollbooth at a bridge. Cars passing by the booth are expected to pay a Rs. 50 toll. Mostly they do, but sometimes a car goes by without paying. The tollbooth keeps track of the number of cars that have gone by, and of the total amount of money collected. 3. Create a function which simulates the game "rock, paper, scissors". The function takes the input of both players (rock, paper or scissors), first parameter from first player, second from second player. The function returns the result as such: "Player 1 wins" "Player 2 wins" "TIE" (if both inputs are the same) The rules of rock, paper, scissors, if not known: Both players have to say either "rock", "paper" or "scissors" at the same time. Rock beats scissors, paper beats rock, scissors beat paper.	10 marks per question	

5	E	understand the concepts of object-oriented programming distinguish between the procedure-oriented and object-oriented programming language	1. Implement the concept of classes to create a function that takes the number of wins, draws and losses and calculates the number of points a football team has obtained so far. • wins get 3 points • draws get 1 point • losses get 0 points 2. Create a class product; take appropriate data members and functions which calculate net profit for a product after selling the product. 3. Suppose there is Bank and there are different branches in Jalandhar, Phagwara, Hoshiarpur etc. President of the Bank want to know about the detail of the branch managers who has more working experience. Write a program using the concept of inheritance.	10 marks per question	

6	F	understand the concepts of object-oriented programming distinguish between the procedure-oriented and object-oriented programming language	1. A person having account in a bank. His balance in bank account is 50000. He is also getting 2000 Rs. from PM Fund every month and 5% of interest on the amount saved quarterly. Create one application where you have applied the concept of multiple inheritance which will display extra amount he is getting annually? 2. Create a class employee to accept the various details of the employee. Also find the highest paid employee in the company. Write this program with the help of hybrid inheritance using four classes & derivation mode must be protected. 3. sums the total number of digits between two numbers, inclusive. For example, between the numbers 19 and 22 we have: Example: // 19, 20, 21, 22 (1 + 9) + (2 + 0) + (2 + 1) + (2 + 2) = 19 Create a class and make appropriate data members and member functions. 4.	10 marks per question	

7	G	understand the concepts of object-oriented programming distinguish between the procedure-oriented and object-oriented programming language	1. Write a program in C++, define a Employee class with employee id, Name and department. Define one function to find the highest and lowest paid salary to employees. 2. You have to generate restaurant bill for a customer with the details as give below: Customer ID, Customer Name, Customer Address, and Contact No. Total payable amount. Create a proper menu of ten items display rate of each item. Generate the bill as the customer order the item as per quantity. Implement operator overloading 3. Write a program to implement hierarchical inheritance using five classes & derivation mode must be private. All the classes must represent student information.	10 marks per question	

Student List

S.No	Regd. No	Name	RollNumber	Allocated Set
1	12112607	Esther Etonam Ablavi Kpetemey	RD2110A107	A
2	12112618	Sahil Gaurav	RD2110A108	B
3	12112360	Rishu Kumari	RD2110B104	C
4	12112366	Deepak Basak	RD2110B105	D
5	12113416	Aqeel Rai	RD2110B117	E
6	12113507	Priya Kumari	RD2110B118	F
7	12101865	Saurabh Kumar Jha	RD2110B45	G
8	12101985	Shubham Kumar Singh	RD2110B46	A
9	12101922	Rupali Verma	RD2110B47	B
10	12102006	Praveen Gaur	RD2110B48	C
11	12102011	Rishu Raj	RD2110B49	D
12	12101974	Shivam Kumar	RD2110B50	E
13	12102076	Divya Bharati	RD2110B51	F

14	12102118	Ashish Kumar Pal	RD2110B52	G
15	12102130	Amit Babani	RD2110B53	A
16	12102134	Akhil Kumar Verma	RD2110B54	B
17	12102137	Saksham Verma	RD2110B55	C
18	12102200	Abhinay Sharma	RD2110B56	D
19	12102162	Abdulkadir Salihu Tataru	RD2110B57	E
20	12102226	Singh Prakash Udhav	RD2110B58	F
21	12102231	Deepak Kumar	RD2110B59	G
22	12102245	Ashwani Kumar	RD2110B60	A
23	12102289	Vivek Kumar	RD2110B61	B
24	12102293	Aadil Ahmad Yatoo	RD2110B62	C
25	12102282	Thota Venkata Sai	RD2110B63	D
26	12102284	Rohan Sharma	RD2110B64	E
27	12102710	Abhay Khajuria	RD2110B65	F
28	12102715	Rahul Syal	RD2110B66	G
29	12102635	Harpreet Kaur	RD2110B67	A
30	12102541	Sonia	RD2110B68	B
31	12102558	Shreyanshi Shakya	RD2110B69	C
32	12102559	Jasveer Singh	RD2110B70	D
33	12102530	Aryan Mot	RD2110B72	E
34	12101118	Parth Malhotra	RD2110B73	F
35	12100837	Shivam Shukla	RD2110B74	G
36	12100180	Muddam Balaji	RD2110B75	A
37	12105482	Shubham Roy	RD2110B76	B
38	12103820	Sumit Soni	RD2110B77	C
39	12102728	Sahil Dhingra	RD2110B78	D
40	12102801	Atul Kumar	RD2110B79	E
41	12102850	Abhinav Kumar	RD2110B80	F
42	12102895	Nishant Raj Singh	RD2110B81	G
43	12102875	Trina Mahapatra	RD2110B82	A
44	12102924	Ajay Upadhyay	RD2110B83	B
45	12102866	Sheetal	RD2110B84	C
46	12102899	Nitin Shukla	RD2110B85	D
47	12102947	Ishika Keshwani	RD2110B86	E
48	12102983	Atul Kumar Gupta	RD2110B87	F
49	12103005	Raju Basak	RD2110B88	G
50	12103336	Gokul Krishna P G	RD2110B89	A
51	12110972	Gaurav Kumar	RD2110B90	B
52	12111089	Mohd Navaid	RD2110B91	C
53	12111090	Yuvraj Singh	RD2110B92	D
54	12111026	Rishav Sagar	RD2110B93	E

55	12111506	Pappu Sai Koushik	RD2110B94	F
56	12111504	Raviranjan Kumar	RD2110B95	G