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: CAP 444 **Course Title: Object Oriented Programming**

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

Date of Allotment: 29-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	Questions	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. How and when virtual class is useful? Explain the concept with the help of an appropriate example. 2. What is the difference between public member functions and friend functions? Illustrate it with the help of proper program. 3. Write a program using classes and parameterized constructor Given a two digit number, return true if that number contains one even and one odd digit.	10 marks per question	
2	B	understand the concepts of object-oriented programming distinguish between the procedure-oriented and object-oriented programming language	1. Explain the concept of friend functions in detail. Illustrate with the help of program. 2. How virtual functions can be helpful? Explain the concept with the help of a suitable example. 3. Write a program using classes You are in charge of the cake for a child's birthday. You have decided the cake will have one candle for each year of their total age. They will only be able to blow out the tallest of the candles. Count how many candles are tallest.	10 marks per question	

3	C	understand the concepts of object-oriented programming distinguish between the procedure-oriented and object-oriented programming language	1. Differentiate between multiple and multilevel inheritance. Also discuss about the ambiguity in the multiple inheritance. Give a program to solve the ambiguity. 2. Create a function that takes an array of numbers and return its median. If the input array is even length, take the average of the two medians, else, take the single median. Example: median([2, 5, 6, 2, 6, 3, 4]) ➞ 4 median([21.4323, 432.54, 432.3, 542.4567]) ➞ 432.4 3. Explain any five object oriented programming paradigm also relate it with real life situation. Give program also.	10 marks per question	
4	D	understand the concepts of object-oriented programming distinguish between the procedure-oriented and object-oriented programming language	1. Suppose there is XYZ Company and there are different departments like production, marketing, finance, sales etc. Manager of the company want to know about the detail of the employees who are highly paid in each of the department. Write a program using the concept of classes to implement the same. 2. Give a detail difference between private and protected access specifiers. Also illustrate it with the help of proper program. 3. Explain the different types of constructors in details. Discuss the real life scenario when we actually require these constructors. Give program on each.	10 marks per question	

5	E	understand the concepts of object-oriented programming distinguish between the procedure-oriented and object-oriented programming language	1. Explain the concept of access specifiers in details. Explain each and every access specifier (using each access specifiers with data members and derivation mode) with the help of multiple inheritance. 2. Differentiate between data abstraction and encapsulation. Give the program to implement the both concepts. 3. Create a function that takes in two arrays and returns true if the second array follows the first array by one element, and false otherwise. In other words, determine if the second array is the first array shifted to the right by 1. Example: ([1, 2], [5, 1]) ⟶ true ([1, 2], [5, 5]) ⟶ false	10 marks per question	
6	F	understand the concepts of object-oriented programming distinguish between the procedure-oriented and object-oriented programming language	1. Discuss the concept of constructors and its types in details. Give any six properties of the constructors. Write a program to use multiple constructors in the class. 2. Differentiate between C and C++ Programming language. Give the syntax of program. 3. Write a function that partitions the array into two subarrays: one with all even integers, and the other with all odd integers. Return your result in the following format: Example: EvenOddPartition([5, 8, 9, 2, 0]) ⟶ [[8, 2, 0], [5, 9]]	10 marks per question	

7	G	understand the concepts of object-oriented programming distinguish between the procedure-oriented and object-oriented programming language	1. Explain the basic object-oriented programming paradigms in detail. Write a program to implement the concept of encapsulation, reusability, polymorphism and data hiding. 2. How and when friend class and friend functions are useful? Also give program to illustrate the difference. 3. Create a function that accepts a string, checks if it's a valid email address and returns either true or false, depending on the evaluation. The string must contain an @ character. The string must contain a . character. The @ must have at least one character in front of it. e.g. "e@edabit.com" is valid while "@edabit.com" is invalid. The . and the @ must be in the appropriate places. e.g. "hello.email@com" is invalid while "john.smith@email.com" is valid. Using classes.	10 marks per question	

8	H	understand the concepts of object-oriented programming distinguish between the procedure-oriented and object-oriented programming language	1. What do you mean by function definition inside the class and outside the class? Explain with example code. 2. Differentiate between parameterized and copy constructor. Illustrate the difference with the help of a program. 3. Create a function to find only the root value of x in any quadratic equation ax^2 + bx + c. The function will take three arguments: a as the coefficient of x^2 b as the coefficient of x c as the constant term Implement it using friend function.	10 marks per question	
9	I	understand the concepts of object-oriented programming distinguish between the procedure-oriented and object-oriented programming language	1. You have to generate electricity bill for a customer with the details as give below: Customer ID, Customer Name, Customer Address, Contact No, Units Consumed, Total payable amount Following are the norms to calculate the unit amount: a) for initial 100 units it will cost 6rpu b) for next 100 units it will cost 8rpu c) for next all units it will cost 10rpu. Implement the concept of hybrid inheritance in this program. 2. Discuss the concept of operator overloading in detail. Overload any five binary operator. Explain the program in detail. 3. Discuss the concept of message passing, dynamic binding and reusability in detail. Illustrate it with the help of program.	10 marks per question	

10	J	understand the concepts of object-oriented programming distinguish between the procedure-oriented and object-oriented programming language	1. Explain the different types of inheritance in detail. Give program on each by using specific access specifiers. 2. Discuss the concept of polymorphism, friend functions, destructors in detail. Also give program on each. 3. Use classes to Create a function that takes the month and year (as integers) and returns the number of days in that month. Don't forget about leap years!	10 marks per question	
11	K	understand the concepts of object-oriented programming distinguish between the procedure-oriented and object-oriented programming language	1. Give the proper difference between procedures oriented and object oriented programming language. Illustrate the difference with the help of example. 2. What do you mean by array of object? Explain the concept with the help of a suitable example. 3. Use classes to write a function that takes an integer i and returns a string with the integer backwards followed by the original integer. Example: 123 reverseAndNot(123)→ "321123"	10 marks per question	

Allocated Set of CA

S.No	Reg.Number	Name	RollNumber	Assignment Set
1	12110286	Himansu Kumar Das	RD2110A03	A
2	12110287	Manish Kumar Tripathy	RD2110A04	B
3	12110310	Nitish Sharma	RD2110A05	C
4	12110266	Milan Ray	RD2110A06	D
5	12110164	Vishal Ojha	RD2110A07	E
6	12110150	Hetain Sood	RD2110A08	F
7	12110156	Babita	RD2110A09	G
8	12110231	Kuncham Harinath Reddy	RD2110A10	H
9	12111769	Mayank Burnwal	RD2110A100	I
10	12111810	Satyam	RD2110A102	J

11	12111790	Shivam Kumar Choudhury	RD2110A103	K
12	12112542	Kanav Jasrotia	RD2110A106	A
13	12112607	Esther Etonam Ablavi Kpetemey	RD2110A107	B
14	12112618	Sahil Gaurav	RD2110A108	C
15	12112743	Himanshi Gupta	RD2110A109	D
16	12110187	Renbithung M Ngullie	RD2110A11	E
17	12112748	Mohd Hanzla	RD2110A110	F
18	12112759	Padala Gangadhara Reddy	RD2110A111	G
19	12113075	Ankit Kumar mishra	RD2110A112	H
20	12113079	Sandeep .	RD2110A113	I
21	12113094	ANKIT KUMAR SONI	RD2110A114	J
22	12113138	Gautam Kumar	RD2110A115	K
23	12113165	Amarnath Pathak	RD2110A116	A
24	12105453	Manish Kumar Sharma	RD2110A12	B
25	12105428	Pratik Raj	RD2110A13	C
26	12105410	Mwelwa Bangwe	RD2110A14	D
27	12105383	Ananya Guha	RD2110A15	E
28	12105389	Prabhat Kumar	RD2110A16	F
29	12100268	Avinash Kumar	RD2110A17	G
30	12100232	Satish Kumar Choudhary	RD2110A18	H
31	12100139	Manish Das	RD2110A19	I
32	12100272	Gulam Nabi	RD2110A20	J
33	12100375	Radha Gobinda Das	RD2110A21	K
34	12100353	Kamalkant	RD2110A23	A
35	12100417	Neha Singh	RD2110A24	B
36	12100685	Kiran Panwar	RD2110A25	C
37	12100524	Shiv Kumar Singh Gautam	RD2110A26	D
38	12100442	Ajay Kumar Upadhyay	RD2110A27	E
39	12100459	Shahid Sadiq	RD2110A28	F
40	12100165	Dolly Kumari	RD2110A29	G
41	12100167	Jobin John K	RD2110A30	H
42	12100174	Anchal Sagar	RD2110A31	I
43	12101308	Sandeep Kumar Gupta	RD2110A32	J
44	12101057	Abinash Prusty	RD2110A33	K
45	12101059	Kanhugopal Dutta	RD2110A34	A
46	12101060	Subhankar Mallick	RD2110A35	B
47	12101629	Yogesh	RD2110A36	C
48	12101625	Aashima	RD2110A37	D
49	12101626	Archana Kumari	RD2110A38	E
50	12101663	Ashish Kaushal	RD2110A39	F
51	12101673	Arjit Biswal	RD2110A40	G

52	12101666	Monika Rastogi	RD2110A41	H
53	12101696	Vikas Pal	RD2110A42	I
54	12101712	Mohammad Abdul Samad	RD2110A43	J
55	12101723	Anshu kumar	RD2110A44	K
56	12111686	KUMARI MEENU PUNDIR	RD2110A96	A
57	12111682	Md Nur Nazar	RD2110A97	B
58	12108431	Kajal Kumari	RD2110A99	C
59	12112360	Rishu Kumari	RD2110B104	D
60	12112366	Deepak Basak	RD2110B105	E
61	12113416	Aqeel Rai	RD2110B117	F
62	12113507	Priya Kumari	RD2110B118	G
63	12101865	Saurabh Kumar Jha	RD2110B45	H
64	12101985	Shubham Kumar Singh	RD2110B46	I
65	12101922	Rupali Verma	RD2110B47	J
66	12102006	Praveen Gaur	RD2110B48	K
67	12102011	Rishu Raj	RD2110B49	A
68	12101974	Shivam Kumar	RD2110B50	B
69	12102076	Divya Bharati	RD2110B51	C
70	12102118	Ashish Kumar Pal	RD2110B52	D
71	12102130	Amit Babani	RD2110B53	E
72	12102134	Akhil Kumar Verma	RD2110B54	F
73	12102137	Saksham Verma	RD2110B55	G
74	12102200	Abhinay Sharma	RD2110B56	H
75	12102162	Abdulkadir Salihu Tataru	RD2110B57	I
76	12102226	Singh Prakash Udhav	RD2110B58	J
77	12102231	Deepak Kumar	RD2110B59	K
78	12102245	Ashwani Kumar	RD2110B60	A
79	12102289	Vivek Kumar	RD2110B61	B
80	12102293	Aadil Ahmad Yatoo	RD2110B62	C
81	12102282	Thota Venkata Sai	RD2110B63	D
82	12102284	Rohan Sharma	RD2110B64	E
83	12102710	Abhay Khajuria	RD2110B65	F
84	12102715	Rahul Syal	RD2110B66	G
85	12102635	Harpreet Kaur	RD2110B67	H
86	12102541	Sonia	RD2110B68	I
87	12102558	Shreyanshi Shakya	RD2110B69	J
88	12102559	Jasveer Singh	RD2110B70	K
89	12102530	Aryan Mot	RD2110B72	A
90	12101118	Parth Malhotra	RD2110B73	B
91	12100837	Shivam Shukla	RD2110B74	C
92	12100180	Muddam Balaji	RD2110B75	D

93	12105482	Shubham Roy	RD2110B76	E
94	12103820	Sumit Soni	RD2110B77	F
95	12102728	Sahil Dhingra	RD2110B78	G
96	12102801	Atul Kumar	RD2110B79	H
97	12102850	Abhinav Kumar	RD2110B80	I
98	12102895	Nishant Raj Singh	RD2110B81	J
99	12102875	Trina Mahapatra	RD2110B82	K
100	12102924	Ajay Upadhyay	RD2110B83	A
101	12102866	Sheetal	RD2110B84	B
102	12102899	Nitin Shukla	RD2110B85	C
103	12102947	Ishika Keshwani	RD2110B86	D
104	12102983	Atul Kumar Gupta	RD2110B87	E
105	12103005	Raju Basak	RD2110B88	F
106	12103336	Gokul Krishna P G	RD2110B89	G
107	12110972	Gaurav Kumar	RD2110B90	H
108	12111089	Mohd Navaid	RD2110B91	I
109	12111090	Yuvraj Singh	RD2110B92	J
110	12111026	Rishav Sagar	RD2110B93	K
111	12111506	Pappu Sai Koushik	RD2110B94	A
112	12111504	Raviranjan Kumar	RD2110B95	B