EASY

(1, 'Write a function in C++ to count the number of uppercase alphabets present in a text. Input: AI={ “Artificial Intelligence is Intelligence demonstrated by machines, as opposed to the natural intelligence displayed by animals and humans.”} output:3 Testcases: CPP={"c++ is a Programming Language."} JAVA={"Java is a Interpreteur Language."}', '(E) Function Ups', 'Function', 'easy'),

(2, 'Write a user defined function Reverse(int A[],int n) which accepts an integer array and its size as arguments(parameters) and reverse the array. Input arr={10,20,30,40,50} Output {50,40,30,20,10} Testcases: {2,4,6,8,10} {3,6,9,12,15} {5,10,15,20,25}', '(E) Reverse', 'Function', 'easy'),

(3, 'Write a user-defined function EXTRA\_ELE(int A[ ], int B[ ], int N) in C++ to find and display the extra element in Array A. Array A contains all the elements of array B but one more element extra. (Restriction: array elements are not in order) Example If the elements of Array A is 14, 21, 5, 19, 8, 4, 23, 11 and the elements of Array B is 23, 8, 19, 4, 14, 11, 5 Then output will be 21 Testcases:', '(E) Extra', 'Array', 'easy'),

(4, 'Write a user defined function in C++ to find the sum diagonal elements from a two dimensional array. Input: 24 16 14 2 5 4 12 3 4 Output:33 Testcases: Case:1 2 6 2 5 12 3 Case 2: 4 16 1 2 15 4 1 31 14', '(E) Diagonal', 'Array', 'easy'),

(5, 'Write a user-defined function AddEnd4(int A[][4],int R,int C) in C++ to find and display the sum of all the values, which are ending with 4 (i.e., unit place is 4). For example if the content of 2D array ={{24,16,14}, {19, 5, 4}} The output should be 42 Testcases: input 1: {{24,16,14}, {19, 5, 46}}, Input 2:6 input 1: {{24,16,14,33}, {19, 53, 43,3}},Input 2:3', '(E) AddEnd4', 'Array', 'easy'),

(6, 'Given an array arr[] of length N and Q queries of 3 types (1, 2, 3) whose operations are as follows: Type 1: query has input as 1 and the task is to reverse the array. Type 2: query has input as (2 x) and the task to find the index of x in the result array. Type 3: query has input as (3 x y) and the task is to swap the elements at index x and y in the array. The task is to print the result for the query of type 2. Examples: Input: N = 5, arr[] = {3, 7, 8, 1, 33}, Q = 4, Queries[][] = {{1}, {2, 8}, {3, 2, 4}, {2, 1} Output: 2 1 Explanation: Process query wise, first is 1 so reverse the list [33, 1, 8, 7, 3], Second query 2 8 so find index of element 8 which is 2, third query is 3 2 4 so swap 2nd and 4th index new array=[33, 1, 3, 7, 8] now the last query is 2 1 so find index of element 1 which is 1 so output 2 1.', '(E) Query', 'Array', 'easy'),

(7, Given an array A[] of n numbers and another number x, the task is to check whether or not there exist two elements in A[] whose sum is exactly x. Input: arr[] = {0, -1, 2, -3, 1} x= -2 Output: Yes ( -3 + 1 = -2 ) Testcases: {4,6,7,2,4},x=3 {-3,-4,45,2,3},x=-1', '(E) Two Elements', 'Array', 'easy'),

(8, 'Given an unsorted array and an element x, search x in the given array. Write recursive C++ code for this. If the element is not present, return -1. Input: arr[] = {12, 34, 54, 2, 3} x=11 Output: Element 11 is present at index 2 Testcases: {1,6,2,4,8},6 {23,56,84,5,-3},2 {78,56,4},0', '(E) Search', 'Array', 'easy'),

(9, 'Write a program in C++ to convert decimal number to binary number. Input any decimal number : 65 Output : The Binary value is : 1000001 Testcases: 1. 111 2. 15.2 3. 0 4. B12 5. 1A.2', '(E) D to B', 'Numbers', 'easy'),

(10, 'Write a program to generate Multiplication table. Sample Input: 2 Output : 1 \* 2 = 2 2 \* 2 = 4 3 \* 2 = 6 4 \* 2 = 8 Testcases: 5 -2 6 16', '(E) Table', 'Loops', 'easy'),

(11, 'Write a program to count the number of vowels and consonants in a string. Input: string Output: Number of vowels : 1 Number of constant : 5 Testcases: 1. HYPOTHECATION 2. MATRICULATION 3. MANIPULATION 4. SEDIMENTATION 5. EXPERIMENTATION', '(E) Vow\'s & Con\'s', 'Strings', 'easy'),

(12, 'Write a \'C++\' program to check whether a given number is palindrome or not. Input:123321 Output: It is a palindrome Testcases: 121 -900 008 @333', '(E) Palindrome', 'Numbers', 'easy'),

(13, 'Write a C++ program to find whether the person is eligible for vote or not. And if that particular person is not eligible, then print how many years are left to be eligible. Input : Enter your age: 7 Output: You are allowed to vote after 11 years Testcases:-12 34 0 9', '(E) Vote', 'Control', 'easy'),

(14, 'Write a C++ program to take two arrays as input and merge or concatenate two arrays and store the result in third array. Sample Input: Enter number of Element in array A: 7 Enter elements: 1 2 3 4 5 6 7 Enter number of Element in array B: 5 11 22 33 44 55 Output: Merged in array C 1 2 3 4 5 6 7 11 22 33 44 55 Testcases:', '(E) Merge', 'Array', ''),

(15, 'You are given with an array consisting of Celsius values you are asked to convert it into Fahrenheit. Input: 4.4,10,12.7,70 Output: 39.92,50,54.86,158 Testcases: -5 -0 0', '(E) Conversion', 'Numbers', 'easy'),

(16, 'Write a program to find the sum of the series 1!/1+2!/2+3!/3+4!/4+5!/5 Sample Input: 5 Sample Output: 34 Testcases:-6 6 k 42', '(E) Series', 'Numbers', 'easy'),

(17, 'Find the M<sup>th</sup> maximum number and N<sup>th</sup> minimum number in an array and find the sum and difference of it. Sample Input: Array of elements = {14, 16, 87, 36, 25, 89, 34} M = 1 N = 3 Sample Output: 1 st Maximum Number = 89 3 rd Minimum Number = 25 Sum = 114 Difference = 64 Testcases: 1. {16, 16, 16 16, 16}, M = 0, N = 1 2. {0, 0, 0, 0}, M = 1, N = 2 3. {-12, -78, -35, -42, -85}, M = 3 , N = 3 4. {15, 19, 34, 56, 12}, M = 6 , N = 3values 5. {85, 45, 65, 75, 95}, M = 5 , N = 7 ', '(E) Max-MIn', 'Array', 'medium'),

(18, 'Write a program to convert a string into upper case and lower case and find the reverse of it. Sample Input: Good morning all Sample Output: GOOD MORNING ALL good morning all lla gninrom doog Testcases: 1.She is Good 2.1234tellme 3.0000.000 4.OK! ', '(E) String Convert', 'Strings', 'easy'),

(19, 'Write a constructor in the Car class given below that initializes the brand class field with the string “Ford”. Call the getBrand() method in the main method of the Sample class and store the value of the brand in a variable, and print the value. class Car { String brand; //your constructor here public String getBrand() { return brand; } } Testcases:', '(M) Constructor', 'Constructor', 'medium'),

(20, 'Write a program to print the names of students by creating a Student class. If no name is passed while creating an object of Student class, then the name should be "Unknown", otherwise the name should be equal to the String value passed while creating object of Student class.(Use Constructors)', '(E) Student', 'Class', 'easy'),

(21, 'Define a class Ele\_Bill in C++ with the following descriptions: Private members: Cname of type character array Pnumber of type long No\_of\_units of type integer Amount of type float. Calc\_Amount( ) This member function should calculate the amount as No\_of\_units\*Cost. Amount can be calculated according to the following conditions: No\_of\_units Cost First 50 units Free Next 100 units 0.80 @ unit Next 200 units 1.00 @ unit Remaining units 1.20 @ unit Public members: \* A function Accept( ) which allows user to enter Cname, Pnumber, No\_of\_units and invoke function Calc\_Amount(). \* A function Display( ) to display the values of all the data members on the screen. Testcases:', '(E) Ele\_Bill', 'Class', 'easy'),

(22, 'Consider the following class State : class State { protected : int tp; public : State( ) { tp=0;} void inctp( ) { tp++;}; int gettp(); { return tp; } }; Write a code in C++ to publically derive another class ‘District’ with the following additional members derived in the public visibility mode. Data Members: Dname string Distance float Population long int Member functions: DINPUT( ) : To enter Dname, Distance and population DOUTPUT( ): To display the data members on the screen. Testcases:', '(M) State', 'Inheritance', 'medium'),

(23, 'Write a program in C++ to find the sum of the series using the constructor overloading. Input: 9+99+999+9999+99999 Output: 111105 Testcases:', '(M) Sum Series', 'Constructor', 'medium'),

(24, 'Write a C++ program to convert binary number to octal using Constructor. Input: 1100 Output: 14 Testcases:', '(E) B to O', 'Numbers', 'easy'),

(25, 'Write a C++ program to find the number and sum of all integer between 100 and 200. which are divisible by 9 with constructor and destructor. Sample Output: Numbers between 100 and 200, divisible by 9: 108 117 126 135 144 153 162 171 180 189 198 The sum : 1683 Testcases:', '(E) Div by 9', 'Loops', 'easy'),

(26, 'Create a class named \'Programming\'. While creating an object of the class, if nothing is passed to it, then the message "I love programming languages" should be printed. If some String is passed to it, then in place of "programming languages" the name of that String variable should be printed. For example, while creating the object if we pass "cpp", then "I love cpp" should be printed. Testcases:', '(M) Programming', 'Class', 'medium'),

(27, 'Create a class to print an integer and a character using two functions having the same name but different sequence of the integer and the character parameters. For example, if the parameters of the first function are of the form (int n, char c), then that of the second function will be of the form (char c, int n). Testcases:', '(M) Fun. Overload', 'Overloading', 'medium'),

(28, 'Write a program to print the area and perimeter of a triangle having sides of 3, 4 and 5 units by creating a class named \'Triangle\' with a function to print the area and perimeter. Testcases:', '(E) Triangle', 'Function', 'easy'),

(29, 'Create a class \'Student\' with three data members which are name, age and address. The constructor of the class assigns default values to name as "unknown", age as \'0\' and address as "not available". It has two functions with the same name \'setInfo\'. First function has two parameters for name and age and assigns the same whereas the second function takes has three parameters which are assigned to name, age and address respectively. Print the name, age and address of 10 students. Hint - Use array of objects Testcases:', '(M) Student', 'Constructor', 'medium'),

(30, 'Create a class \'Degree\' having a function \'getDegree\' that prints "I got a degree". It has two subclasses namely \'Undergraduate\' and \'Postgraduate\' each having a function with the same name that prints "I am an Undergraduate" and "I am a Postgraduate" respectively. Call the function \'getDegree\' by creating an object of each of the three classes. Testcases:', '(E) Degree', 'Class', 'easy'),

(31, 'A boy has his money deposited Rs 10000, RS 15000 and Rs20000 in banks-Bank A, Bank B and Bank C respectively. We have to print the money deposited by him in a particular bank. Create a class \'Bank\' with a function \'getBalance\' which returns 0. Make its three subclasses named \'BankA\', \'BankB\' and \'BankC\' with a function with the same name \'getBalance\' which returns the amount deposited in that particular bank. Call the function \'getBalance\' by the object of each of the three banks. Testcases:', '(E) Bank', 'Class', 'easy'),

(32, 'All the banks operating in India are controlled by RBI. RBI has set a well defined guideline (e.g. minimum interest rate, minimum balance allowed, maximum withdrawal limit etc) which all banks must follow. For example, suppose RBI has set minimum interest rate applicable to a saving bank account to be 4% annually; however, banks are free to use 4% interest rate or to set any rates above it. Write a program to implement bank functionality in the above scenario. Note: Create the classes namely Customer, Account, RBI (Base Class) and few derived classes (SBI, ICICI, PNB etc). Assume and implement required member variables and functions in each class. Testcases:', '(E) Bank', 'Class', 'easy'),

(33, 'Write a C++ code to find area of square and circle using abstract class and pure virtual function. Input: Enter radius of the circle: 5 Enter the length of the square: 4 Output : Area of square: 16 Area of circle: 78.5 Testcases: Enter radius of the circle:4 Enter the length of the square:6 Enter radius of the circle:6 Enter the length of the square:3</pre>', '(E) Abstract', 'Class', 'easy'),

(34, 'In C++ programming, this is a keyword that refers to the current instance of the class. Create class called Employee with attributes: int empid char(20), float salary. Use this pointer to refer to current instance and display the employee details. Testcases:', '(E) Employee', 'Class', 'easy'),

(35, 'C++ Program to to display address of each element of an array. Output: Displaying address using arrays: &arr[0] = 0x61fef0 &arr[1] = 0x61fef4 &arr[2] = 0x61fef8 Displaying address using pointers: ptr + 0 = 0x61fef0 ptr + 1 = 0x61fef4 ptr + 2 = 0x61fef8<', '(E) Address', 'Array', 'easy'),

(36, 'Write a CPP program to find the Square root and Cube root of a number. Square Root Input: 1296 Cube root Input: 27 Output: 36 3', '(E) Sqrt-Cube', 'Numbers', 'easy'),

(37, 'Write a C++ program to check whether number is perfect or not. Input :6 Ouput : Perfect number Testcases: 28 8 128 486</pre>', '(E) Perfect Number', 'Numbers', 'easy'),

(38, 'Write a C++ program to find the smallest element missing in a sorted natural numbers array? Input: {0, 1, 2, 3, 5, 6, 7} Output 4 Testcases: {56,57,59,60} {11,13,14,16}</pre>', '(E) Min', 'Array', 'easy'),

(39, 'Write a program to find Nth Fibonacci Number. Input : 8 Output :21 Testcases: ', '(E) Fibonacci ', 'Numbers', 'easy'),

(40, 'Write a program to Count the number of words in a paragraph. Input: “Machine learning (ML) is a kind of AI (artificial intelligence) that lets software applications become more precise at anticipating results without being specifically programmed to do so. Machine learning algorithms utilize historical data as input to anticipate/predict the latest output values.” Output: No. of words = 41 Testcases:', '(E) Words', 'Strings', 'easy');

(41, 'Write a C++ program that reads an integer and print the least significant digit and the next least significant digit. Example: Input: Enter an integer number : 7235 Output: The least significant digit is 5 The next least significant digit is 3', ' Testcases:', '(E) LSD', 'Numbers', 'easy'),

(42, 'Declare a class box, with length(Public variable) and width(Private variable) use setwidth ()and getwidth() function to set and display width and length. Input: Enter the Length of box :6 Enter the Width of box :9 Output: Length of box :6 Width of box :9', ' Testcases:', '(M) Box', 'Class', 'medium'),

(43, 'Write a program to print the prime numbers between the range from M to N. Sample Input: M = 1 N = 10 Sample Output: 2,3,5,7', ' Testcases: 1. M = 15, N = 05 2. M = 25, N = 50 3. M = 15, N = 100 4. M = 0 , N = 0 5. M = 200 , N = 200 ', '(E) Prime', 'Numbers', 'easy'),

(44, 'Write a program to print the following pattern. Sample Input: Number of rows:5 Sample output: 2 4 4 16 16 16 256 256 256 256 65536 65536 65536 65536 65536', ' Testcases: 1) 0 2) -1 3) 4.5 4) 6 5) 5', '(E) RT-Pattern', 'Loops', 'easy'),

MEDIUM

(45, 'Define a class Employee with Emp\_name, Emp\_id, Address, Mail\_id, Mobile\_no as members. Inherit the classes, Programmer, Assistant Professor, Associate Professor and Professor from employee class. Add Basic Pay (BP) as the member of all the inherited classes and set 97% of BP as DA, 10 % of BP as HRA, 12% of BP as PF, 0.1% of BP for staff club fund. Generate pay slips for the employees with their gross and net salary. Input: Enter Name of the Employee : Suresh Enter Address of the Employee : Vetri Nagar Enter ID of the Employee :7001 Enter Mobile Number : 9898989898 Enter E-Mail ID of the Employee : aff@gmail.com ENTER THE BASIC PAY OF THE PROGRAMMER => 80000 Output: ====================== PROGRAMMER PAYMENT SLIP ======================= BASIC PAY => 80000 DEARNESS ALLOWANCE => 77600 HOUSE RENT ALLOWENCE => 8000 PROVIDENT FUND => 9600 CLUB FUND => 800 GROSS PAY => 175200 NET PAY => 164800', ' Testcases:', '(M) Employee', 'Class', 'medium'),

(46, 'Write a program to enter the marks of a student in five subjects. Then calculate the total and aggregate, display the grade obtained by the student. If the student scores an aggregate greater than 75%, then the grade is Distinction. If aggregate is 60>= and <75, then the grade is First Division. If aggregate is 50 >= and <60, then the grade is Second Division. If aggregate is 40>= and <50, then the grade is Third Division. Else the grade is Fail. Perform the above for 10 students[Use array of objects] Input: Please Enter the marks of five subjects: 50 50 50 50 50 Output: Total Marks = 250 Average Marks = 50 Grade Third Division', ' Testcases:', '(M) Students Grade', 'Array', 'medium'),

(47, 'Write a Program in C++ to calculate income tax for the employee based on the following condition. if taxableincome<=60000, tax=0; if taxableincome >60000 and taxableincome <=150000, tax= taxableincome \*0.05; if taxableincome >150000 or taxableincome <=500000),tax= taxableincome \*0.1; else tax=tableinc\*0.15; Input: Enter your Income : 800000 Output: Your income tax is : 1,20,000', ' Testcases:', '(M) Tax', 'Control', 'medium'),

(48, 'Write a C++ program to add all the numbers from 1 to a given number. Add 1 to 4: 10 Add 1 to 100: 5050', '(E) Sum of 1st N', 'Loops', 'easy'),

(49, 'C++ has a logical operator &&, which can also be written as "and" . The && operator is very useful, it takes in two values. For example, a && b works like: Return true if a and b are true and false otherwise. The && operator is equivalent to perform the above function Make a function using &&.', ' Testcases:', '(M) Logical AND', 'Control', 'medium'),

(50, '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 Examples footballPoints(3, 4, 2) ➞ 13 footballPoints(5, 0, 2) ➞ 15 footballPoints(0, 0, 1) ➞ 0', ' Testcases:', '(M) Win-Lose', 'Function', 'medium'),

(51, 'Write a function that returns true if given array is empty, and false otherwise. Examples isEmpty({}) ➞ true isEmpty({1, 2, 3}) ➞ false', ' Testcases:', '(M) isEmpty', 'Function', 'medium'),

(52, 'Create a class to print the area of a square and a rectangle. The class has two functions with the same name but different number of parameters. The function for printing the area of rectangle has two parameters which are its length and breadth respectively while the other function for printing the area of square has one parameter which is the side of the square. Input: 7 7,8 Output: 49 56', ' Testcases:', '(M) Area', 'Class', 'medium'),

(53, 'Create a class called add for adding two numbers using operator overloading. Input: 10 5 Output: 15', ' Testcases:', '(M) Add', 'Overloading', 'medium'),

(54, 'In this challenge, a farmer is asking you to tell him how many legs can be counted among all his animals. The farmer breeds three species: chickens = 2 legs cows = 4 legs pigs = 4 legs The farmer has counted his animals and he gives you a subtotal for each species. You have to implement a function that returns the total number of legs of all the animals. Input & Output: animals(2, 3, 5) ➞ 36 animals(1, 2, 3) ➞ 22 animals(5, 2, 8) ➞ 50 Testcases:', '(M) Farmer', 'Control', 'medium'),

(55, 'Write a program to find area of Circle, Rectangle and Triangle using constructor overloading. Input: a)3 b)6,7 c)2,3 Output: 28.26 42 3 Testcases:', '(M) Area Circle', 'Overloading', 'medium'),

(56, 'Write a program in C++ to print Floyd’s Triangle by using constructor & destructor Print the Floyd\'s Triangle: --------------------------- Input number of rows: 5 1 01 101 0101 10101 Testcases:', '(M) Floyd’s Triangle', 'Loops', 'medium'),

(57, 'Create a class named \'Rectangle\' with two data members- length and breadth and a function to calculate area which is \'length\*breadth\'. The class has three constructors which are : 1 - no parameter - values of both length and breadth are assigned zero. 2 - two parameters - two values are assigned as length and breadth respectively. 3 - one parameter - both length and breadth with same value Create objects of \'Rectangle\' class having none, one and two parameters and print its area Input 3,3 or 3 Output : Area 0,9,9 Testcases:', '(M) Rectangle', 'Constructor', 'medium'),

(58, 'Create two classes named Mammals and MarineAnimals. Create another class named BlueWhale which inherits both the above classes. Now, create a function in each of these classes which prints "I am mammal", "I am a marine animal" and "I belong to both the categories: Mammals as well as Marine Animals" respectively. Now, create an object for each of the above class and try calling 1 - function of Mammals by the object of Mammal 2 - function of MarineAnimal by the object of MarineAnimal 3 - function of BlueWhale by the object of BlueWhale 4 - function of each of its parent by the object of BlueWhale Testcases:', '(M) Mammals', 'Inheritance', 'medium'),

(59, 'Make a class named Fruit with a data member to calculate the number of fruits in a basket. Create two other class named Apples and Mangoes to calculate the number of apples and mangoes in the basket. Print the number of fruits of each type and the total number of fruits in the basket. Testcases:', '(M) Fruit', 'Class', 'medium'),

(60, 'We want to calculate the total marks of each student of a class in Physics, Chemistry and Mathematics and the average marks of the class. The number of students in the class are entered by the user. Create a class named Marks with data members for roll number, name and marks. Create three other classes inheriting the Marks class, namely Physics, Chemistry and Mathematics, which are used to define marks in individual subject of each student. Roll number of each student will be generated automatically. Testcases:', '(M) Student Marks', 'Class', 'medium'),

(61, 'We want to store the information of different vehicles. Create a class named Vehicle with two data member named mileage and price. Create its two subclasses. \*Car with data members to store ownership cost, warranty (by years), seating capacity and fuel type (diesel or petrol). \*Bike with data members to store the number of cylinders, number of gears, cooling type(air, liquid or oil), wheel type(alloys or spokes) and fuel tank size(in inches). Make another two subclasses Audi and Ford of Car, each having a data member to store the model type. Next, make two subclasses Bajaj and TVS, each having a data member to store the make-type. Now, store and print the information of an Audi and a Ford car (i.e. model type, ownership cost, warranty, seating capacity, fuel type, mileage and price.) Do the same for a Bajaj and a TVS bike. Testcases:', '(M) Vehicle', 'Class', 'medium'),

(62, 'Create a Class called FLOAT contains one float data member. Overload all 4 arithmetic operators so that they operate on the objects of FLOAT. Input F1=2.5, F2=1.2 Output: F1+F2=3.7 Testcases:', '(M) Overload', 'Overloading', 'medium'),

(63, 'Define a class String. Write overload function == to compare two strings. Input: First string Apple Second string Orange Output: both not equal Testcases:', '(M) ==', 'Overloading', 'medium'),

(65, 'Write a program to find out the greatest and the smallest among three numbers using pointers. Inpur: 10,34,-90 Output: Smallest :-90, Bigest: 34 Testcases:', '(M) Pointer 3 Nums', 'Pointer', 'medium'),

(66, 'Write a program to order the array of elements in non-decreasing order. Arr={-45,78,23,89,-90} Output={-90,-45,23,78,89} Testcases:', '(E) Sort', 'Array', 'medium'),

(67, 'Write a C++ program to demonstrate the use of try, catch block with the argument as an integer and string using multiple catch blocks. ', '(M) Exception', 'Exception', 'medium'),

(68, 'Write a program to illustrate array index out of bounds exceptions. Testcases:', '(M) AIOB', 'Exception', 'medium'),

(69, 'Write a program in C++ to store n elements in an array, sort and print the elements using pointer. Input: Input the number of elements to store in the array :5 5 7 2 9 8 Output: 2 5 7 8 9', '(M) Sort Pointer', 'Pointer', 'medium'),

(70, 'Write a program in C++ to count the number of vowels and consonants in a string using a pointer. Input: Input a string: string Output: Number of vowels : 1 Number of constant : 5', '(M) Vows-Cons', 'Pointer', 'medium'),

(71, 'Write a program in C++ to print a string in reverse using a pointer. Input: Hello Output: olleH', '(M) Reverse', 'Pointer', 'medium'),

(73, 'A person can have various roles and responsibilities at the same time. A woman plays multiple roles in her life such as a mother, wife, daughter, daughter in law, sister etc. A man behaves as an employee in an office, son or husband at home, customer at a mall etc. A mobile is one device but offers various features such as camera, radio etc. Write a C++ program to implement one of the above scenarios using run time polymorphism. Testcases:', '(M) Person', 'Overloading', 'medium'),

(74, 'Given N and an array(say coins[]) that contains some numbers(coins in rupees). N is a coin, and the array contains various coins. The task is to make the change of N using the coins of the array. Make a change in such a way that a minimum number of coins are used. Let us take a input array coins[] = {10, 25, 5}, total coins = 3 We have N = 30. The output is two as we can use one 25 rupee coin and a 5 rupee coin to make 30. (25 + 5 = 30) Similarly, coins[] = {1, 9, 6, 5}, total coins = 4 N = 13 The output is three as we need two 6 rupees coins and one 1 rupee coin. (6 + 6 + 1 = 13) Testcases:', '(M) Coins', 'Array', 'medium'),

(75, 'Write a C++ program to demonstrate the working of a COPY CONSTRUCTOR Sample input & output (P1 & P2 are objects) p1.x = 10, p1.y = 15 p2.x = 10, p2.y = 15', '(M) Copy', 'Constructor', 'medium'),

HARD

(178, 'Given an array of distinct elements of size N, the task is to rearrange the elements of the array in a zig-zag fashion so that the converted array should be in the below form: arr[0] < arr[1] > arr[2] < arr[3] > arr[4] < . . . . arr[n-2] < arr[n-1] > arr[n]. Input: N = 7 , arr[] = {4, 3, 7, 8, 6, 2, 1} Output: arr[] = {3, 7, 4, 8, 2, 6, 1} Explanation: The given array is in zig-zag pattern as we can see 3 < 7 > 4 < 8 > 2 < 6 >1 Input: N = 4 , arr[] = {1, 4, 3, 2} Output: arr[] = {1, 4, 2, 3} Explanation: The given array is in zig-zag pattern as we can see 1 < 4 > 2 < 3 ', '(H) zig-zag', 'Array', 'hard'),

(179, 'Minimum Jumps To Reach End of an Array: Given an array of non-negative integers, A, of length N. You are initially positioned at the first index of the array. Each element in the array represents your maximum jump length at that position. Return the minimum number of jumps required to reach the last index. If it is not possible to reach the last index, return -1. Input: arr[] = [1, 3, 5, 8, 9, 2, 6, 7, 6, 8, 9] Output: 3 Explanation: Provided in the above image Input: arr[] = [2, 3, 1, 1, 4] Output: 2 Explanation: Travel from 2 -> 3 -> end. ', '(H) Jumps', 'Array', 'hard'),

(180, 'Given an integer array A[] consisting of N non-negative integers representing an elevation map, where the width of each bar is 1. The task is to compute the total volume of water that can be trapped after rain. Examples : Input: A[] = { 0 , 1, 0, 2, 1, 0, 1, 3, 2, 1, 2, 1 } Output: 6 Explanation: <img src="images/rain.jpg" /> The rain water trapped is represented by the blue region. Trap 1 unit of water between the first and third block Trap 4 units of water between the second and third blocks. Therefore, the total volume of water is – 1 + 4 + 1 = 6 units. ', '(H) Rain', 'Array', 'hard'),

(181, 'Given two integer arrays A1[ ] and A2[ ] of size N and M respectively. Sort the first array A1[ ] such that all the relative positions of the elements in the first array are the same as the elements in the second array A2[ ]. Input: N = 11 M = 4 A1[] = {2, 1, 2, 5, 7, 1, 9, 3, 6, 8, 8} A2[] = {2, 1, 8, 3} Output: 2 2 1 1 8 8 3 5 6 7 9 Explanation: Array elements of A1[] are sorted according to A2[]. So 2 comes first then 1 comes, then comes 8, then finally 3 comes, now we append remaining elements in sorted order. ', '(H) 2 Array', 'Array', 'hard'),

(183, 'Create three classes Person, Professor and Student. The class Person should have data members name and age. The classes Professor and Student should inherit from the class Person. The class Professor should have two integer members: publications and cur\_id. There will be two member functions: getdata and putdata. The function getdata should get the input from the user: the name, age and publications of the professor. The function putdata should print the name, age, publications and the cur\_id of the professor. The class Student should have two data members: marks, which is an array of size 6 and cur\_id. It has two member functions: getdata and putdata. The function getdata should get the input from the user: the name, age, and the marks of the student in 6 subjects. The function putdata should print the name, age, sum of the marks and the cur\_id of the student. For each object being created of the Professor or the Student class, sequential id\'s should be assigned to them starting from 1. Solve this problem using virtual functions, constructors and static variables. You can create more data members if you want. ', '(H) Student-Teacher', 'Function', 'hard'),

(184, 'You are given three classes A, B and C. All three classes implement their own version of func. In class A, func multiplies the value passed as a parameter by 2 In class B, func multiplies the value passed as a parameter by 3 In class C, func multiplies the value passed as a parameter by 5 Write a Class D which inherits from classes A,B,C', '(H) 3 Classes', 'Function', 'hard'),

(185, 'A student signed up for workshops and wants to attend the maximum number of workshops where no two workshops overlap. You must do the following: Implement 2 structures: 1.struct Workshop having the following members: •The workshop\'s start time. •The workshop\'s duration. •The workshop\'s end time. 2.struct Available\_Workshops having the following members: a.An integer, n (the number of workshops the student signed up for). b.An array of type Workshop array having size n. Implement 2 functions: 1.Available\_Workshops\* initialize (int start\_time[], int duration[], int n) 2.int CalculateMaxWorkshops(Available\_Workshops\* ptr)', '(H) Workshop', 'Function', 'hard'),

(186, 'Write a program to illustrate division by zero exception, get the two input from the user, use divide(int, int). Input : 5,0 Output: divide by zero.', '(H) div by 0', 'Exception', 'hard'),

(188, 'Write a C++ program to throw multiple exceptions and define multiple catch statement. Input : int x = 0.00001 Output : The number is too small Accept only positive integer.', '(H) Multi Exception', 'Exception', 'hard'),

(189, 'You are given a class - Complex. class Complex { public: int a,b; }; Operators are overloaded by means of operator functions, which are regular functions with special names. Their name begins with the operator keyword followed by the operator sign that is overloaded. The syntax is: type operator sign (parameters) { /\*... body ...\*/ } You need to overload operators + and << for the Complex class. The operator + should add complex numbers according to the rules of complex addition: (a+ib)+(c+id) = (a+c) + i(b+d) Overload the stream insertion operator << to add "a+ib" to the stream: cout<< c << endl;', '(H) Complex', 'Overloading', 'hard'),

(190, 'You are required to compute the area of a rectangle using classes. Create two classes: 1. Rectangle The Rectangle class should have two data fields-width and height of int types. The class should have display() method, to print the width and height of the rectangle separated by space. 2. RectangleArea The RectangleArea class is derived from Rectangle class, i.e., it is the sub-class of Rectangle class. The class should have read\_input() method, to read the values of width and height of the rectangle. The RectangleArea class should also overload the display() method to print the area (widthxheight) of the rectangle.', '(H) Area', 'Class', 'hard'),

(191, 'Write the code to implement the concept of inheritance for Vehicles. You are required to implement inheritance between classes. You have to write four classes in C++ i.e. one superclass, two sub classes and one driver class. Vehicle is the super class whereas Bus and Truck are sub classes of Vehicle class. Transport is a driver class which contains main method. Detailed description: Detailed description of Vehicle (Super class): The class Vehicle must have following attributes: 1.Vehicle model 2.Registration number 3.Vehicle speed (km/hour) 4.Fuel capacity (liters) 5.Fuel consumption (kiloM) The Vehicle class must have following methods: 1.Parameterized constructor that will initialize all the datamembers with the given values. 2.Getters and Setters for each data member that will get and setthe values of data members of class. 3.A method fuelNeeded() that will takedistance (in kilo meter) as an argument.It will calculate the amount of fuel needed for the given distance and will return the value of fuel needed for given distance. You can use the attributes ‘Fuel consumption’defined within above Vehicle class to determine the fuel needed forthe given distance. You are required to implement this functionality by yourself. 4.A method distanceCovered() that willtake time (in hours) as an argument. It will calculate the distance for the given time and speed and returns the value of distance. The formula to calculate speed is given as speed = distance/time. You can use this formula to calculate the distance. 5.A display() method that will display all the information of a vehicle. Derive 2 classes Bus and Truck from Vehicle class', '(H) Vehicle', 'Inheritance', 'hard');