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| **Group** | **Q.No.** | **Question** |
| I | 1 | Explain the stages in program development life cycle for the program to find the result of a student. A student declared pass if he get more 50 marks in all 5 subjects otherwise he is fail. |
| 2 | Following is the menu to be displayed to the user. On selecting a choice display appropriate result. Number should be accepted from the user.  Menu  1. Prime Factors  2. Leap Year  3. Sum of all digits  4. Number in reverse order  5. Check all digits are same or not  6. Exit |
| 3 | Write a Menu driven program to evaluate Sine, cosine, exp, and pi |
| 4 | (De Morgan’s Laws) DeMorgan’s Laws can sometimes make it more convenient for us to express a logical expression. These laws state that the expression !( condition1 && condition2 ) is logically equivalent to the expression (! condition1 ||! condition2 ). Also, the expression !( condition1 || condition2 ) is logically equivalent to the expression (! condition1 && ! condition2 ) . Use De Morgan’s Laws to write equivalent expressions for each of the following, and then write a program to show that both the original expression and the new expression in each case are equivalent.  a) !( x < 5 ) && !( y >= 7 )  b) !( a == b ) || !( g != 5 )  c) !( ( x <= 8 ) && ( y > 4 ) )  d) !( ( i > 4 ) || ( j <= 6 ) |
| 5 | (Dangling Else Problem) Determine the output for each of the following when x is 9 and y is 11 , and when x is 11 and y is 9 . The compiler ignores the indentation in a C program. Also, the compiler always associates an else with the previous if unless told to do otherwise by the placement of braces {} . Because, on first glance, you may not be sure which if an else matches, this is referred to as the “dangling else” problem. We eliminated the indentation from the following code to make the problem more challenging. [Hint: Apply indentation conventions you have learned.]  a) if ( x < 10 )  if ( y > 10 )  printf( "\*\*\*\*\*" );  else  printf ( "#####" );  printf ( "$$$$$" );  b) if ( x < 10 ) {  if ( y > 10 )  printf ( "\*\*\*\*\*" );  }  else {  printf ( "#####" );  printf ( "$$$$$" );  }  Modify the following code to produce the output shown. Use proper indentation techniques. You may not make any changes other than inserting braces. The compiler ignores the indentation in a program.  if ( y == 8 )  if ( x == 5 )  printf ( "@@@@@" );  else  printf ( "#####" );  printf ( "$$$$$" );  printf ( "&&&&&" );   1. Assuming x = 5 and y = 8 , the following output is produced.   @@@@@  $$$$$  &&&&&   1. Assuming x = 5 and y = 8 , the following output is produced.   @@@@@   1. Assuming x = 5 and y = 8 , the following output is produced.   @@@@@  &&&&&   1. Assuming x = 5 and y = 7 , the following output is produced.   #####  $$$$$  &&&&& |
| II | 1 | Give the basic structure of a C program and explain with an example to find the area and perimeter of a circle of given radius ‘r’. Give the purpose of each line in the program. |
| 2 | Why C is the most popular language? What makes it so popular? Explain history of C. |
| 3 | The Fibonacci sequence was discovered by Leonardo Fibonacci around 1200. It is given by: un+2= un + un+1 where u0=u1= 1  i) Write a program to print the first 25 Fibonacci numbers  ii) Alter your program to print the first 100 Fibonacci numbers.  iii)Now rewrite your program so that it prints all Fibonacci numbers from 1 to N |
| 4 | (Calculating Credit Limits) Collecting money becomes increasingly difficult during periods of recession, so companies may tighten their credit limits to prevent their accounts receivable (money owed to them) from becoming too large. In response to a prolonged recession, one company has cut its customers’ credit limits in half. Thus, if a particular customer had a credit limit of Rs.2000, it’s now Rs1000. If a customer had a credit limit of Rs. 5000, it’s now Rs. 2500. Write a program that analyzes the credit status of three customers of this company. For each customer you’re given:  a) The customer’s account number  b) The customer’s credit limit before the recession  c) The customer’s current balance (i.e., the amount the customer owes the company).  Your program should calculate and print the new credit limit for each customer and should determine (and print) which customers have current balances that exceed their new credit limits. |
| 5 | Convert the following flow chart into program  http://www.tenouk.com/clabworksheet/labworksheet8_files/cifelseswitchcase091.png |
| III | 1 | Explain procedural oriented programming, structure oriented programming, top-down approach, bottom up approach. |
| 2 | Write a program to compute the wages of a daily laborer as per the following rules :- Hours Worked Rate Applicable Upto first 8 hrs Rs 50/-  For next 4 hrs Rs 10/- per hr extra  For next 4 hrs Rs 20/- per hr extra  For next 4 hrs Rs 25/- per hr extra  For rest Rs 40/- per hr extra  Accept the name of the laborer and no. of hours worked. Calculate and display the wages. The program should run for N number of laborers as specified by the user. |
| 3 | Explain Increment and decrement operator by giving suitable example. |
| 4 | Write a C Program to find the LCM and GCD |
| 5 | Explain bitwise operators with suitable example. |
| IV | 1 | Steps in running a C program / various system software used in running c program |
| 2 | A colony of chameleons includes 20 red, 18 blue and 16 green individuals, who spend their time aimlessly wandering about meeting one another at random. When two chameleons of different colours meet, they both change colour to the third colour. Develop a program that will explore the numbers of each colour after each meeting has taken place. Does one colour eventually predominate, or even emerge as the only colour? Can you find an explanation for this? Develop your program in a way that will easily generalize to different initial numbers of chameleons, and explore what happens if, instead, you start with odd numbers of chameleons? With the same numbers of chameleon of each colour? |
| 3 | (“The Twelve Days of Christmas” Song) Write a program that uses repetition and switch statements to print the song “The Twelve Days of Christmas.” One switch statement should be used to print the day (i.e., “first,” “second,” etc.). A separate switch statement should be used to print the remainder of each verse. |
| 4 | Write a statement or a set of statements to accomplish each of the following tasks:  a) Sum the odd integers between 1 and 99 using a for statement. Assume the integer variables sum and count have been defined.  b) Print the value 333.546372 in a field width of 15 characters with precisions of 1 , 2 , 3 , 4 and 5 . Left justify the output. What are the five values that print?  c) Calculate the value of 2.5 raised to the power of 3 using the pow function. Print the result with a precision of 2 in a field width of 10 positions. What is the value that prints?  d) Print the integers from 1 to 20 using a while loop and the counter variable x . Assume that the variable x has been defined, but not initialized. Print only five integers per line. |
| 5 | Explain the library functions available for handling characters. (in ctype.h) |
| V | 1 | Using while loop, write a program to print all Armstrong numbers between 1 and 500. If sum of cubes of each digit of the numbers is equal to the number itself, then number is called Armstrong number. For example: 153 = (1\*1\*1) + (5\*5\*5) + (3\*3\*3) |
| 2 | Let x1,…,xn be a sequence of integers (possibly negative). For each possible subsequence xi,…xj consider its sum Si,j. Write a program that reads in the sequence in order, with n given at the beginning, and prints out the maximum sum Si,j over all possible subsequences. |
| 3 | 2’s complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2’s complement of 11100 is 00100. Write a C program to find the 2’s complement of a binary number. |
| 4 | (World Population Growth) World population has grown considerably over the centuries. Continued growth could eventually challenge the limits of breathable air, drinkable water, arable cropland and other limited resources. There’s evidence that growth has been slowing in recent years and that world population could peak some time this century, then start to decline.  For this exercise, research world population growth issues online. Be sure to investigate various viewpoints. Get estimates for the current world population and its growth rate (the percentage by which it’s likely to increase this year). Write a program that calculates world population growth each year for the next 75 years, using the simplifying assumption that the current growth rate will stay constant. Print the results in a table. The first column should display the year from year 1 to year 75. The second column should display the anticipated world population at the end of that year. The third column should display the numerical increase in the world population that would occur that year. Using your results, determine the year in which the population would be double what it is today, if this year’s growth rate were to persist. |
| 5 | Explain the loop control structure in C |
| VI | 1 | Suppose we are given n points in the plane: (x1,y1),…(xn,yn). Suppose the points are the vertices of a polygon, and are given in the counterclockwise direction around the polygon. Write a program using a while loop to calculate the perimeter of the polygon. Also do this using a for loop. |
|  | 2 | Children often play a guessing game as follows. One child, Kashinath, picks a number between 1 and 1000 which he does not disclose to another child, Ashwatha. Aswatha asks questions of the form “Is you number between x and y?” where she can choose x, y as she wants. Ashwatha’s goal is to ask few questions as possible and determine the number that Kashinath picked. Show that Ashwatha can guess the number correctly using at most 10 questions. Use ideas from the bisection method. |
| 3 | Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression: 1+x+x2+x3+………….+xn  Print x, n, and sum. Perform error checking. For example, the formula does not make sense for negative exponents – if n is less than 0. Have your program print an error message if n<0, then go back and read in the next pair of numbers of without computing the sum. Are any values of x also illegal ? If so, test for them too. |
| 4 | Perform each of these steps:  1. Read the problem statement.  2. Formulate the algorithm using pseudocode and top-down, stepwise refinement.  3. Write a C program.  4. Test, debug and execute the C program.  (Gas Mileage) Drivers are concerned with the mileage obtained by their automobiles. One driver has kept track of several tankfuls of gasoline by recording miles driven and gallons used for each tankful. Develop a program that will input the miles driven and gallons used for each tankful. The program should calculate and display the miles per gallon obtained for each tankful. After processing all input information, the program should calculate and print the combined miles per gallon obtained for all tankfuls. |
| 5 | Explain ternary operator in C. Compare it with if and switch. |
| VII | 1 | Write a "c" program to evaluate series up to n terms , where i is an integer?  1/(i+1)! + 1/(i+2)! +.............1/(i+n)!. |
| 2 | Write a C program using for statement to find the following from a given set of 20  integers  a) total number of even integers b) total number of odd integers  c) sum of all even integers d) sum of all odd integers  e) total number of positive and negative numbers f) total number of one digit, two digit, three digit and more than 3 digit numbers. |
| 3 | Write a C program, which takes two integer operands and one operator form the user, performs the operation and then prints the result. (Consider the operators +,-,\*, /, % and use Switch Statement) |
| 4 | Write a program that prints a table of the binary, octal and hexadecimal equivalents of the decimal numbers in the range 1 through 256. |
| 5 | Explain break, continue, goto and exit by giving suitable example. |
| VIII | 1 | Write a C Program to evaluate the following series.  f(x)=x-x3/3! + x5/5!-x7/7!.....into given numbers of terms. |
| 2 | The total distance traveled by vehicle in ‘t’ seconds is given by distance = ut+1/2at2 where ‘u’ and ‘a’ are the initial velocity (m/sec.) and acceleration (m/sec2). Write C program to find the distance traveled at regular intervals of time given the values of ‘u’ and ‘a’. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of ‘u’ and ‘a’. |
| 3 | A cloth show room has announced the following seasonal discounts on purchase of items.  Purchase Amount Discount (Percentage)  Mill Cloth Handloom items  1-100 - 5.0  101-200 5.0 7.5  201-300 7.5 10.0  Above 300 10.0 15.0  Write a C program using switch and If statements to compute the net amount to be paid by a customer. |
| 4 | (Roman-Numeral Equivalent of Decimal Values) Write a program that prints a table of all the Roman numeral equivalents of the decimal numbers in the range 1 to 100. |
| 5 | Compare and Contrast the followings  i) break and continue  ii) while and do ..while  iii) switch and if..else  iv) if and ?: |