



**School of Computer Science & Engineering (SCOPE)**

**Continuous Assessment Test -2 (CAT-2) Winter Semester (2022-23)**

Course Name & Code: Structured and Object-Oriented Programming (BCSE102L)

Programme Name & Branch: B. Tech.

Class Numbers: General to all D1

Slot: D1

Exam Duration: 90 min

Maximum Marks: 50

**General Instruction:** While answering programming questions, students are instructed to include main method.

No.	Question	Marks
1	Ashish, an animation designer, is in need of storing positional information as well as colour information of a point in 2D space. Let x, y represent the positional and R, G, B represent the colour information respectively for a structure named <b>PixelPoint</b> . Note: Each colour code (R,G,B) in the computer system is represented between the values 0 to 255. Help your client in implementing the above using structure concept in the C language to initialize and display the details of couple of pixel points using appropriate functions.	10
2	Create a class <i>Saving_Account</i> with members as Account_number, saving_balance and Account_holder_name. Create parametrized constructor with in the class to initialize the data members. Create member functions for deposit(), withdraw(), interest(), penalty() and show(). The Interest is calculated as $sav\_bal*0.2$ . Write the C++ code in order to achieve the following tasks with sample input and output as reference: <ul style="list-style-type: none"><li>• Accept deposit and withdrawal amount from a customer and update balance</li><li>• Display the account details and interest as shown below</li><li>• Check for the minimum balance, impose penalty (Rs 20 needs to deducted if minimum balance&lt;500).</li></ul> <b>Sample Input</b> Account No.1001 Name :Nani Balance :20000 Enter Deposit Amount =10000 Enter Withdraw Amount =1000 <b>Sample Output</b> <b>Sample Output</b> Account No: 1001 Name: Nani Balance: 29000 Interest = 580 No penalty	10
3	a. Compare and contrast <i>procedural programming</i> with <i>object-oriented programming</i> language in detail. [5 marks] b. Differentiate between <i>static</i> and <i>non-static</i> data members of a class with suitable example. [5 marks]	10
4	Write a C++ program to display the electricity bill of the consumers using multiple inheritance. Create a class <i>Consumer</i> with protected fields as customer_number, name, and address. Provide member function called welcome() for displaying the welcome message, getdata() function for taking the customer_number, name, address and putdata() function for displaying the above fields. Create another class <i>Meter</i> with protected fields as start_meter_reading, last_meter_reading. Provide member function called input() for taking the meter readings and function called display() to display the same. Create a derived class <i>Electricity_bill</i> from the base class <i>Consumer</i> and <i>Meter</i> . Create one member function in the same class to calculate total electricity bill. Use the table below and below formula total_bill = bill + (bill*vat)	10

	<p>unit= last_meter_reading - start_meter_reading. bill= unit*rate</p> <table border="1" data-bbox="512 253 1043 398"> <thead> <tr> <th>unit</th> <th>rate/Unit</th> <th>vat</th> </tr> </thead> <tbody> <tr> <td>&lt;100</td> <td>2.84</td> <td>12%</td> </tr> <tr> <td>100-200</td> <td>3.10</td> <td>14%</td> </tr> <tr> <td>&gt;200</td> <td>4.10</td> <td>16%</td> </tr> </tbody> </table> <p><b>Sample Input</b> ..... Welcome to the Electricity Consumer information system ..... Enter the Customer no: 1001 Enter the Customer name : Jomy Enter the Customer address: Plot 42, Vellore Enter the starting meter reading 200 Enter the last meter reading 550</p> <p><b>Sample Output</b> The customer no: 1001 The customer name: Jomy The customer address: Plot 42, Vellore Starting meter reading=200 Last meter reading=550 Total unit consumed=350 Total bill=1664.6</p>	unit	rate/Unit	vat	<100	2.84	12%	100-200	3.10	14%	>200	4.10	16%	
unit	rate/Unit	vat												
<100	2.84	12%												
100-200	3.10	14%												
>200	4.10	16%												
5	<p>Given below a code to calculate area of rectangle through inheritance. Using the derived class calculate the area. Complete and fix the bugs, if any. Keep relevant comments to justify the errors identified. Explain the features involved in the code</p> <pre> #include&lt;iostream&gt; -----// Fix me class Rectangle { private: float length ; public: float breadth ; void Enter_lb(void) { -----/Fix me ----- } float get_l(void) { .....//Fix me ..... } }; class Rectangle1 : public Rectangle { private: float area ; public: void Rec_area(void) { area = length * breadth ; } void Display(void) { -----//Fix me ----- } }; // End of the derived class definition int main() { Rectangle1 r1 ; r1.Enter_lb(); r1.Rec_area(); r1.Display(); return 0; } </pre>	10												