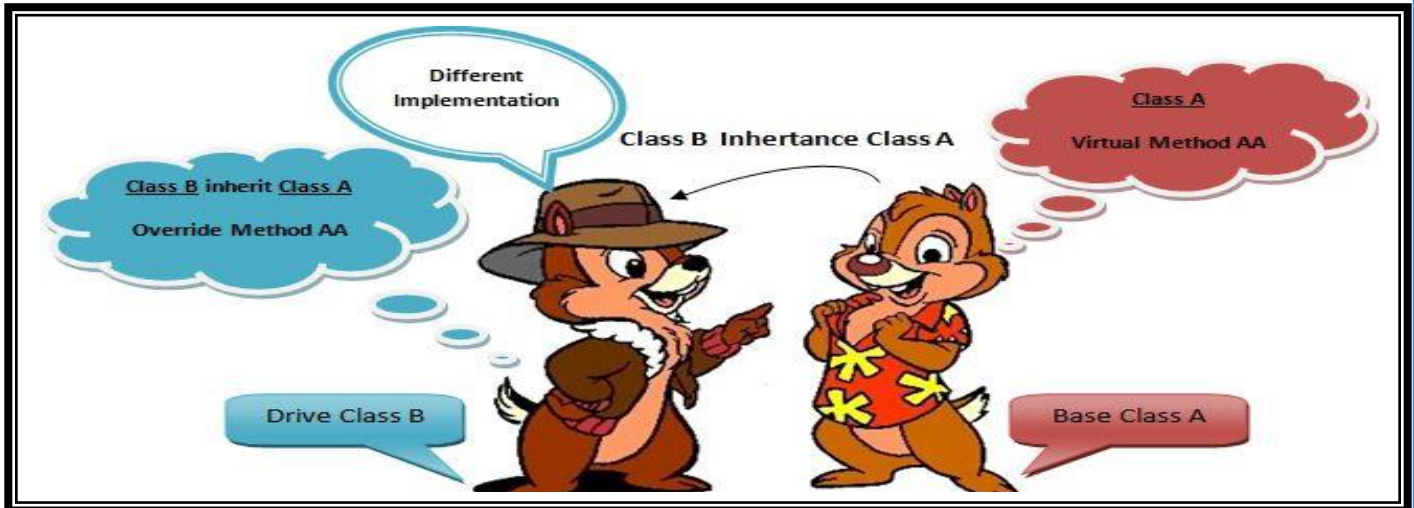


DARBHANGA COLLEGE OF ENGINEERING, DARBHANGA



COURSE FILE OF Object Oriented Programming (05 1401)



Faculty Name:

MR. DHIRENDRA KUMAR

**ASSISTANT PROFESSOR,
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**



विज्ञान एवं प्रावैधिकी विभाग

Department of Science and Technology
Government of Bihar

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Department of Computer Science & Engineering

Vision

To bring forth cultured graduates meeting the expectation of national and multi-national industries exceling in the field of computing as well as in higher studies and research.

Mission

1. To provide strong theoretical knowledge of computer science with practical training which meets the industries expectations.
2. To train necessary skills to further higher studies and professional growth.
3. To inculcate ethical valued in graduates through various social-cultural activities.

Program Educational Objectives (PEOs)

- **PEO 1:** Students will be able to effectively communicate, understand the problems of industries, environment, society and endeavor to find the solutions with high ethical responsibilities.
- **PEO 2:** Students will be able to engage in life-long learning, pursue higher studies and contribute to the evolving research & development.
- **PEO 3:** Students will be able to demonstrate their professional skills and leadership roles across multi-disciplinary domains.

Program Specific Outcomes (PSOs)

- **PSO - 1:** Students should be able to develop and test sustainable cost effective software for automization in busineses application and society.
- **PSO - 2:** Students should be able to use new technologies and tools for executing multi-disciplinary projects.

Program Outcomes (POs)

PO 1: Engineering Knowledge : *An ability to apply knowledge of computing and mathematics which is appropriate to computer science.*

PO 2: Problem analysis: *An ability to identify, formulate, and develop solutions to computational challenges.*

PO 3: Design/development of solutions: An ability to design, implement, and evaluate a computational system to meet the desired solutions of problem with feasibility.

PO 4: Conduct investigations of complex problems: Use research-based knowledge and methods including design of experiments, analysis and interpretation of data, and synthesis them to get the valid conclusions.

PO 5: Modern tool usage: An ability to use appropriate techniques, skills, and tools necessary for computing practice and makes human effort less.

PO 6: The engineer and society: An ability to analyze impacts of computing on individuals, organizations, and society.

PO 7: Environment and sustainability: Understand the impact of the professional engineering solutions on society in environmental contexts, and provide a solution for sustainable development.

PO 8: Ethics: An understanding of professional, ethical, legal, security, and social issues and responsibilities for the computing profession.

PO 9: Individual and team work: An ability to function effectively on teams to accomplish shared idea, computing design, evaluation, or implementation goals.

PO 10: Communication: An ability to communicate and engage effectively with diverse stakeholders.

PO 11: Project management and finance: An ability to apply design and development principles in the construction of software systems of varying complexity.

PO 12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Objectives

- This course provides an introduction to **Object Oriented Programming (OOP)** using the **C++** programming language.
 - Its main objective is to teach the basic concepts and techniques which form the **object oriented programming paradigm**.

- Students completing the course should know:
 - The **model** of object oriented programming: **abstract data types, encapsulation, inheritance and polymorphism**.
 - **Fundamental features** of an object oriented language like Java: **object classes and interfaces, exceptions** and libraries of **object collections**.
 - How to take the statement of a business problem and from this determine **suitable logic for solving the problem**; then be able to proceed to code that logic as a program written in Java.
 - How to **test, document and prepare** a professional looking package for each business project.

Object-Oriented Programming Learning Outcomes

On completion of the course students should be able to:

Understand the features of C++ supporting object oriented programming
Understand the relative merits of C++ as an object oriented programming language
Understand how to produce object-oriented software using C++
Understand how to apply the major object-oriented concepts to implement object oriented programs in C++, encapsulation, inheritance and polymorphism
Understand advanced features of C++ specifically stream I/O, templates and operator overloading

7. Syllabus

7A. 05 1301 OBJECT ORIENTED PROGRAMMING

L- T- P : 3-0-3

Credit : 5

1. Introduction to C++ : Object Oriented Technology, Advantages of OOP, Input- output in C++, Tokens, Keywords, Identifiers, Data Types C++, Derives data types. The void data type, Type Modifiers, Typecasting, Constant, Operator, Precedence of Operators, Strings. Lecture : 3
2. Control Structures: Decision making statements like if-else, Nested if-else, goto, break, continue, switch case, Loop statement like for loop, nested for loop, while loop, do-while loop. Lecture : 3
3. Functions : Parts of Function, User- defined Functions, Value- Returning Functions, void Functions, Value Parameters, Function overloading, Virtual Functions. Lecture : 3
4. Classes and Data Abstraction : Structure in C++, Class, Build- in Operations on Classes, Assignment Operator and Classes, Class Scope, Reference parameters and Class Objects (Variables), Member functions, Accessor and Mutator Functions, Constructors, default Constructor, Destructors. Lecture : 15
5. Overloading & Templates : Operator Overloading, Function Overloading, Function Templates, Class Templates. Lecture : 5
6. Inheritance : Single and Multiple Inheritance, virtual Base class, Abstract Class, Pointer and Inheritance, Overloading Member Function. Lecture : 5
7. Pointers and Arrays : Void Pointers, Pointer to Class, Pointer to Object, The this Pointer, Void Pointer, Arrays. Lecture : 6
8. Exception Handling : The keywords try, throw and catch. Creating own Exception Classes, Exception Handling Techniques (Terminate the Program, Fix the Error and Continue, Log the Error and Continue), Stack Unwinding. Lecture : 5

Text Books :

1. Thinking in C++, Volume 1 & 2 by Bruce Eckel, Chuck Allison, Pearson Education
2. Mastering C++, 1/e by Venugopal, Tata McGraw Hill.
3. Object Oriented Programming with C++, 3/e by E. Balaguruswamy, Tata McGraw Hill.
4. Starting Out with Object Oriented Programming in C++, by Tony Gaddis, Wiley India.

Reference Books :

1. The C++ Programming language 3/e by Bjarne Stroustrup, Pearson Education.
2. C++, How to Programme, 4e, by Deitel, Pearson Education.
3. Big C++ by Cay Horstmann, Wiley India.
4. C++ Primer, 3e by Stanley B. Lippmann, Josee Lajoie, Pearson Education.
5. C++ and Object Oriented Programming Paradigm, 2e by Debasish Jana, PHI.
6. Programming with C++, 2/e by Ravichandran, Tata McGraw Hill.
7. C++ Programming Black Book by Steven Holzner, Dreamtech Press.

7B. GATE Syllabus

L- T- P : 3-0-3

Credit : 5

1. Introduction to C++ : Object Oriented Technology, Advantages of OOP, Input- output in C++, Tokens, Keywords, Identifiers, Data Types C++, Derives data types. The void data type, Type Modifiers, Typecasting, Constant, Operator, Precedence of Operators, Strings. Lecture : 3
2. Control Structures : Decision making statements like if-else, Nested if-else, goto, break, continue, switch case, Loop statement like for loop, nested for loop, while loop, do-while loop. Lecture : 3
3. Functions : Parts of Function, User- defined Functions, Value- Returning Functions, void Functions, Value Parameters, Function overloading, Virtual Functions. Lecture : 3
4. Classes and Data Abstraction : Structure in C++, Class, Build- in Operations on Classes, Assignment Operator and Classes, Class Scope, Reference parameters and Class Objects (Variables), Member functions, Accessor and Mutator Functions, Constructors, default Constructor, Destructors. Lecture : 15
5. Overloading & Templates : Operator Overloading, Function Overloading, Function Templates, Class Templates. Lecture : 5
6. Inheritance : Single and Multiple Inheritance, virtual Base class, Abstract Class, Pointer and Inheritance, Overloading Member Function. Lecture : 5
7. Pointers and Arrays : Void Pointers, Pointer to Class, Pointer to Object, The this Pointer, Void Pointer, Arrays. Lecture : 6

8. Exception Handling : The keywords try, throw and catch. Creating own Exception Classes, Exception Handling Techniques (Terminate the Program, Fix the Error and Continue, Log the Error and Continue), Stack Unwinding. Lecture : 5

Text Books :

1. Thinking in C++, Volume 1 & 2 by Bruce Eckel, Chuck Allison, Pearson Education
2. Mastering C++, 1/e by Venugopal, Tata McGraw Hill.
3. Object Oriented Programming with C++, 3/e by E. Balaguruswamy, Tata McGraw Hill.
4. Starting Out with Object Oriented Programming in C++, by Tony Gaddis, Wiley India.

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2. C++, How to Programme, 4e, by Deitel, Pearson Education.
3. Big C++ by Cay Horstmann, Wiley India.
4. C++ Primer, 3e by Stanley B. Lippmann, Josee Lajoie, Pearson Education.
5. C++ and Object Oriented Programming Paradigm, 2e by Debasish Jana, PHI.
6. Programming with C++, 2/e by Ravichandran, Tata McGraw Hill.
7. C++ Programming Black Book by Steven Holzner, Dreamtech Press.

8. Time Table

Darbhangha College of Engineering, Darbhanga

Dept. Name: Computer Science and Engineering

Faculty Name: Mr. Dharendra Kumar

	1(10:00-10:50)	2(10:50-11:40)	3(11:40-12:30)	4(12:30-01-20)	5(01:20-01:50)	6(01:50-02:40)	7(02:40-03:30)	8(03:30-04:20)
Mon	-----	-----	----	Lunch	Object Oriented Programming (4 th SEM, ME+CE)		
Tue	-----	-----	----		-----		
Wed	-----	-----	-----	----		Object Oriented Programming (4 th SEM, ME+CE)	-----	
Thru	-----	Data Structures (CS, 4 th SEM)		-----	-----
Fri	Object Oriented Programming LAB(4 th SEM, CE)	Object Oriented Programming	LAB(4 th SEM, ME)	Object Oriented Programming		Object Oriented Programming (4 th SEM ME+CE)	Object Oriented Programming	-----
Sat	-----	-----	-----		-----	-----	-----

9. Student List

Darbhanga College of Engineering, Darbhanga

4th Semester Civil Engineering

Subject Name:-

S.N.	Registration No.	Student Name
1	16101111001	KANHAIYA KUMAR YADAV
2	16101111002	VISHAL RAJ
3	16101111003	VINEET KUMAR
4	16101111004	RISHI KUMAR
5	16101111005	KIRTHI
6	16101111006	MITESH KUMAR MITESH
7	16101111007	ANKESH KUMAR
8	16101111008	SHUDHANSHU SHEKHAR JHA
9	16101111009	SHIKHA
10	16101111010	KUMAR PRIYANSHU
11	16101111011	MOTILAL MANJHI
12	16101111012	KESHAV KUMAR
13	16101111013	CHANDAN KUMAR
14	16101111014	PREMRANJAN KUMAR
15	16101111015	RAJNISH KUMAR
16	16101111016	AMAR KUMAR
17	16101111017	SAURAV KUMAR SHANU
18	16101111018	RAHUL KUMAR
19	16101111019	ABHISHEK KUMAR SHUKLA
20	16101111020	NARENDRA KUMAR
21	16101111021	RUPAK RAJ
22	16101111022	RAHUL RAVI
23	16101111023	SANTOSH KUMAR
24	16101111024	PRINCE KUMAR
25	16101111025	NEERAJ KUMAR
26	16101111026	PRABHAT RANJAN
27	16101111027	MD ZAKI AHMAD
28	16101111028	HEMANT KUMAR
29	16101111029	AMIT RAJ
30	16101111030	RAKESH KUMAR
31	16101111031	MUSAFIR KUMAR
32	16101111032	AJAZ AHMAD
33	16101111033	POOJA KUMARI
34	16101111034	SHIVAMVEER KUMAR
35	16101111035	SUNIL KUMAR

36	16101111036	ATISH DEEPANKAR
37	16101111037	VIKRAM BHARTI
38	16101111038	DIPESH KUMAR
39	16101111039	CHANDRAMANI KUMAR
40	16101111040	AMIT KUMAR
41	16101111041	RAJEEV RANJAN
42	16101111042	SOPHIA KHATOON
43	16101111043	SDITI
44	16101111044	PRIADARSHI KUMAR
45	16101111045	RAJVANSHI KUMAR SINGH
46	16101111046	BHUDEV KUMAR
47	16101111047	SUDHIR KUMAR
48	16101111048	CHANDRESH KUMAR
49	16101111049	DILIP KUMAR
50	16101111050	RAMESH KUMAR SAH
51	16101111051	UMAG BHARDWAJ
52	16101111053	MD SALIK ANWAR
53	16101111054	RAUSHAN KUMAR
54	16101111055	SAIMA FIRDAUS
55	16101111056	DURGESH KUMAR
56	16101111058	RAMRATAN KUMAR
57	16101111059	SHANKAR RAM
58	17101111901	PANKAJ KUMAR SAH
59	17101111902	RAHUL KUMAR
60	17101111903	ANKESH KUMAR
61	17101111904	ADARSH KUMAR
62	17101111905	PRATEEK KUMAR
63	17101111906	SANATAN KUMAR JHA
64	17101111907	SACHIN KUMAR
65	17101111908	MRITYUNJAY KUMAR
66	17101111909	BIBEKANAND KUMAR
67	17101111910	KUMAR SUMAN SAURABH
68	17101111911	PINKEE KUMARI
69	17101111912	JAI KUMAR

10. Course Handout

Institute / College Name :	Darbhanga College Of Engineering		
Program Name	B.Tech. COMPUTER SCIENCE AND ENGINEERING		
Course Code/ Branch	051401 / Civil Engineering (4 TH SEMESTER)		
Course Name	Object Oriented Programming		
Lecture / Tutorial (per week):	3/0	Course Credits	5
Course Coordinator Name	DHIRENDRA KUMAR		

1. Scope and Objectives of the Course

This course is designed as an entry level programming course for students who have prior programming experience. This course introduces the concepts of object-oriented programming to students with a background in the procedural paradigm. The course begins with a brief review of control structures and data types with emphasis on structured data types and array processing. It then moves on to introduce the object-oriented programming paradigm, focusing on the definition and use of classes along with the fundamentals of object-oriented design. Other topics include an overview of programming language principles, simple analysis of algorithms, basic searching and sorting techniques. Brief review of control structures, functions, and primitive data types - Object-oriented programming: Object-oriented design; encapsulation and information-hiding; separation of behaviour and implementation; classes, subclasses, and inheritance; polymorphism; class hierarchies. Later on it also introduces the concept of pointers and exception handling.

2. Textbooks

TB1: Object Oriented Programming with C++, 3/e by E. Balaguruswamy, Tata McGraw Hill.

TB2: Thinking in C++, Volume 1 & 2 by Bruce Eckel, Chuck Allison, Pearson Education

TB3: Mastering C++, 1/e by Venugopal, TataMcGraw Hill.

TB4: Starting Out with Object Oriented Programming in C++, by Tony Gaddis, Wiley India.

3. Reference Books

RB1: The C++ Programming language 3/e by Bjarne Stroustrup, Pearson Education.

RB2: C++, How to Programme, 4e, by Deitel, Pearson Education.

RB3: Big C++ by Cay Horstmann, Wiley India.

RB4: C++ Primer, 3e by Stanley B. Lippmann, Josee Lajoie, Pearson Education.

RB5: C++ and Object Oriented Programming Paradigm, 2e by Debasish Jana, PHI.

RB6: Programming with C++, 2/e by Ravichandran, Tata McGraw Hill.

RB7: C++ Programming Black Book by Steven Holzner, Dreamtech Press.

S.No.	Link of Journals, Magazines, websites and Research Papers
	http://www.cplusplus.com/doc/tutorial/
	https://www.w3schools.in/cplusplus-tutorial/
	https://www.youtube.com/watch?v=xnh7ip5gpzc&list=PLfVsf4Bjg79DLA5K3GLbIwf3baNVFO2Lq
	https://www.youtube.com/watch?v=LZFoktwiars&list=PL0gIV7t6l2iIsR55zsSgeiOw9Bd_IUTbY

1. Course Plan

Lecture Number	Date of Lecture	Topics	Text Book / Reference Book / Other reading material	Page numbers of Text Book(s)
6		Introduction to C++	TB1	
-		Object Oriented Technology, Advantages of OOP, Input-output in C++, Tokens, Keywords, Identifiers, Data Types C++, Derives data types. The void data type, Type Modifiers, Typecasting, Constant, Operator, Precedence of Operators, Strings.		
5		Control Structures	TB1	
		Decision making statements like if-else, Nested if-else, goto, break, continue, switch case, Loop statement like for loop, nested for loop, while loop, do-while loop.		
6		Functions	TB1	
		Parts of Function, User-defined Functions, Value-Returning Functions, void Functions, Value Parameters, Function overloading, Virtual Functions.		

7		Classes and Data Abstraction	TB1	
		Structure in C++, Class, Build-in Operations on Classes, Assignment Operator and Classes, Class Scope, Reference parameters and Class Objects (Variables), Member functions, Accessor and Mutator Functions, Constructors, default Constructor, Destructors.		
5		Overloading & Templates	TB1	
		Operator Overloading, Function Overloading, Function Templates, Class Templates.		
6		Inheritance	TB2	
		Single and Multiple Inheritance, virtual Base class, Abstract Class, Pointer and Inheritance, Overloading Member Function.		
7		Pointers and Arrays	RB6	
		Void Pointers, Pointer to Class, Pointer to Object, The this Pointer, Void Pointer, Arrays. .		
8		Exception Handling	RB6	
		The keywords try, throw and catch. Creating own Exception Classes, Exception Handling Techniques (Terminate the Program, Fix the Error and Continue, Log the Error and Continue), Stack Unwinding.		

1. **Evaluation Scheme:**

Component 1	Mid Semester Exam	20
Component 2	Assignment Evaluation	10

Component 3**	End Term Examination**	70
	Total	100

** The End Term Comprehensive examination will be held at the end of semester. The mandatory requirement of 75% attendance in all theory classes is to be met for being eligible to appear in this component.

SYLLABUS

Topics	No of lectures
Introduction to C++ : Object Oriented Technology, Advantages of OOP, Input-output in C++, Tokens, Keywords, Identifiers, Data Types C++, Derives data types. The void data type, Type Modifiers, Typecasting, Constant, Operator, Precedence of Operators, Strings.	3
Control Structures : Decision making statements like if-else, Nested if-else, goto, break, continue, switch case, Loop statement like for loop, nested for loop, while loop, do-while loop.	3
Functions : Parts of Function, User-defined Functions, Value-Returning Functions, void Functions, Value Parameters, Function overloading, Virtual Functions.	3
Classes and Data Abstraction : Structure in C++, Class, Build-in Operations on Classes, Assignment Operator and Classes, Class Scope, Reference parameters and Class Objects (Variables), Member functions, Accessor and Mutator Functions, Constructors, default Constructor, Destructors.	15
Overloading & Templates : Operator Overloading, Function Overloading, Function Templates, Class Templates.	5
Inheritance : Single and Multiple Inheritance, virtual Base class, Abstract Class, Pointer and Inheritance, Overloading Member Function.	5
Pointers and Arrays : Void Pointers, Pointer to Class, Pointer to Object, The this Pointer, Void Pointer, Arrays.	6
Exception Handling : The keywords try, throw and catch. Creating own Exception Classes, Exception Handling Techniques (Terminate the Program, Fix the Error and Continue, Log the Error and Continue), Stack Unwinding.	5

Evaluation and Examination Blue Print:

Internal assessment is done through quiz tests, presentations, assignments and project work. Evaluation is a very transparent process and the answer sheets of sessional tests, internal assessment assignments are returned back to the

students.

The components of evaluations alongwith their weightage followed by the University is given below

Mid sem	20%
Assignments/Quiz Tests/Seminars	10%
End term examination	70%

This Document is approved by:

Designation	Name	Signature
Course Coordinator	DHIRENDRA KUMAR(4 TH SEM MECHANICAL)	
H.O.D	Dr.	
Principal	Dr.	
Date		

11. Lecture plan

Unit I :

Object oriented programming concepts – Objects – Classes – Methods and messages – Abstraction and encapsulation – Inheritance – Abstract classes – Polymorphism –C++ – Classes – Access specifiers – Function and data members – Default arguments – Function overloading – Friend functions – Const and volatile functions – Static members – Objects – Pointers and objects – Constant objects – Nested classes – Local classes.

Objective:

The student should be able to define classes and objects. The student should make himself conversant with function overloading and he should be able to understand the need for polymorphism and encapsulation.

Session No	Topics to be covered	Time Mts	Ref (Page No)	Teaching Method
1	OOP concepts	50	1(2-3)	BB
2	Objects, classes, methods and messages	50	1(4-5)	BB
3	Abstraction and encapsulation	50	1(6-8)	BB
4	Inheritance	50	1(9)	BB
5	Abstract classes, polymorphism. Introduction to C++, classes – access specifiers, function and data members	50	1(48-58)	BB
6	Default arguments, function overloading, friend functions	50	1(119-122, 127-135)	BB
7.	const and volatile functions, static members	50	1(135-139)	BB
8	Pointers and objects, constant objects	50	1(79-82, 90-92)	BB
9	Nested classes, local classes	50	1(82-88)	BB

Unit II:

9

Constructors – Default constructor – Parameterized constructors – Constructor with dynamic allocation – Copy constructor – Destructors – Operator overloading – Overloading through friend functions – Overloading the assignment operator – Type conversion – Explicit constructor.

Session No	Topics to be covered	Time Mts	Ref(Page No)	Teaching Method
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10	Constructors - default constructor	50	1(170-179)	BB
11	Parameterized constructors, constructors with dynamic allocation	50	1(183-199)	BB
12	Copy constructor	50	1(199-207)	BB
13	Destructors	50	1(217-226)	BB
14	Operator overloading	50	1(232-246)	BB
15	Overloading through friend functions	50	1(246-251)	BB
16	Overloading the assignment operator	50	1(251-255)	BB
17	Type conversion	50	1(269-280)	BB
18	Explicit constructor	50	1(181-183)	BB

Objective: The student should get in depth knowledge of constructor and operator overloading.

Unit III:

Function and class templates – Exception handling – Try-catch-throw paradigm – Exception specification – Terminate and unexpected functions – Uncaught exception.

Objective: The student should be able to comprehend the need for templates and exception handling.

Session No.	Topics to be covered	Time Mts	Ref(Page No)	Teaching Method
19	Function template	50	1(285-313)	BB
20	Function template	50		BB
21	Class template	50	1(315-337)	BB

22	Class template	50		BB
23	Exception handling	50	1(342-345)	BB
24	Try-catch-throw paradigm	50	1(345-358)	BB
25	Exception specification	50	1(358-366)	BB
26	Terminate and unexpected functions	50	1(369-373)	BB
27	Uncaught exception	50	1(373-376)	BB

Unit IV:

9

Inheritance – Public – Private and protected derivations – Multiple inheritance – Virtual base class – Abstract class – Composite objects runtime polymorphism – Virtual functions – Pure virtual functions – RTTI – typeid – Dynamic casting – RTTI and templates – Cross casting – Down casting .

Objective: The student should be able to discriminate between different types of inheritance.

Session No	Topics to be covered	Time Mts	Ref(Page No)	Teaching Method
28	Inheritance – public, private, and protected derivations	50	1(384-400)	BB
29	Multiple inheritance	50	1(400-405)	BB
30	Virtual base class, abstract class	50	1(407-412)	BB
31	Composite objects	50	1(415-423)	BB
32	Virtual functions – pure virtual functions	50	1(436-455)	BB
33	RTTI – typeid	50	1(459-472)	BB
34	Dynamic casting	50	1(472-482)	BB
35	RTTI and templates	50	1(484-490)	BB
36	cross casting, down casting .	50	1(490-492)	BB

Unit V:**9**

Streams and formatted I/O – I/O manipulators – File handling – Random access – Object serialization – Namespaces – STD namespace – ANSI string objects – Standard template library.

Objective: The student should be able to gain in-depth knowledge of files and namespaces

Session No	Topics to be covered	Time Mts	Ref(Page No)	Teaching Method
37	Streams	50	1(496-500)	BB
38	Formatted I/O	50	1(500-515)	BB
39	I/O manipulators	50	1(515-526)	BB
40	File handling	50	1(530-543)	BB
41	Random access	50	1(544-551)	BB
42	Object serialization	50	1(551-552)	BB
43	Namespaces, std namespace	50	1(558-573)	BB
44	ANSI String Objects	50	1(577-586)	BB
45	Standard template library	50	1(588-630)	BB

12. Assignments

Assignment – 1

Object Oriented Programming

Q.1. What do you mean by Software crisis?

Q.2. a) What is the Procedure oriented Programming?

b) What are its main Characteristics?

Q.3. Write a program to sum of digits of given integer number.

Q.4. Define Tokens and describe its types.

Q.5. What are the data type in C++?

Assignment – 2

Object Oriented Programming

Q.1. Define control Structure and its types?

Q.2. a) What is the function prototyping?

b) What are constructors and destructors?

Q.3. Write a c++ program to find area of circle, triangle and rectangle. Use function overloading concept.

Q.4. Define a class to represent a bank account. Include the foll members:

Data Members: 1) Name of depositor

2) Account number

3) Type of account

4) Balance amount in the account

Member Functions: 1) to assign initial values

2) To deposit an amount

3) To withdraw amount after checking the balance 4) To display name and balance

13. Having No Tutorial !

14. Sessional Question Papers

Darbhanga College of Engineering, Darbhanga

Department of Computer Science and Engineering

Mid-Semester Examination 2018 CIVIL & MECHANICAL

Course:- Object Oriented Programming (051401)	Semester:- 4th Sem, ME & CE
Marks:- 20	Time Allowed:- 2 Hour

Information for You

1. This Examination paper contains **5-Questions** each of **5-Marks**.
2. Attempt any **4-Questions**. **Question - 5 is compulsory**.

Advices to you

- 1. You should write your answers clearly in your own words.
- 2. Draw the figures whenever it is required.

1. Define and write the syntax for the following :

- a) If Statement
- b) Void Function
- c) for Statement
- d). switch Statement
- e). main() Statement

Or,

- 1.1). Why the concept of data type is used in the C++ programming?
- 1.2). How is the data type classified under various categories in OOPs?

2. Differentiate between the following:

- a) Object Oriented Programming & Procedure Oriented Programming .
- b) while loop Statement & do-while loop Statement.

3. a). What do you mean by function prototyping? 2

b). Write a C++ program to show the use of function prototyping. 3

4. a). Write a C++ program to implement the mathematical operations addition, subtraction, multiplication and division. Take the input from the user . 3

b). What is the use of user define function in programming? How it is defined? 2

5. Write a C++ program to print the two integers given by user as shown in example_fig.- OOPs using concept of function calling.

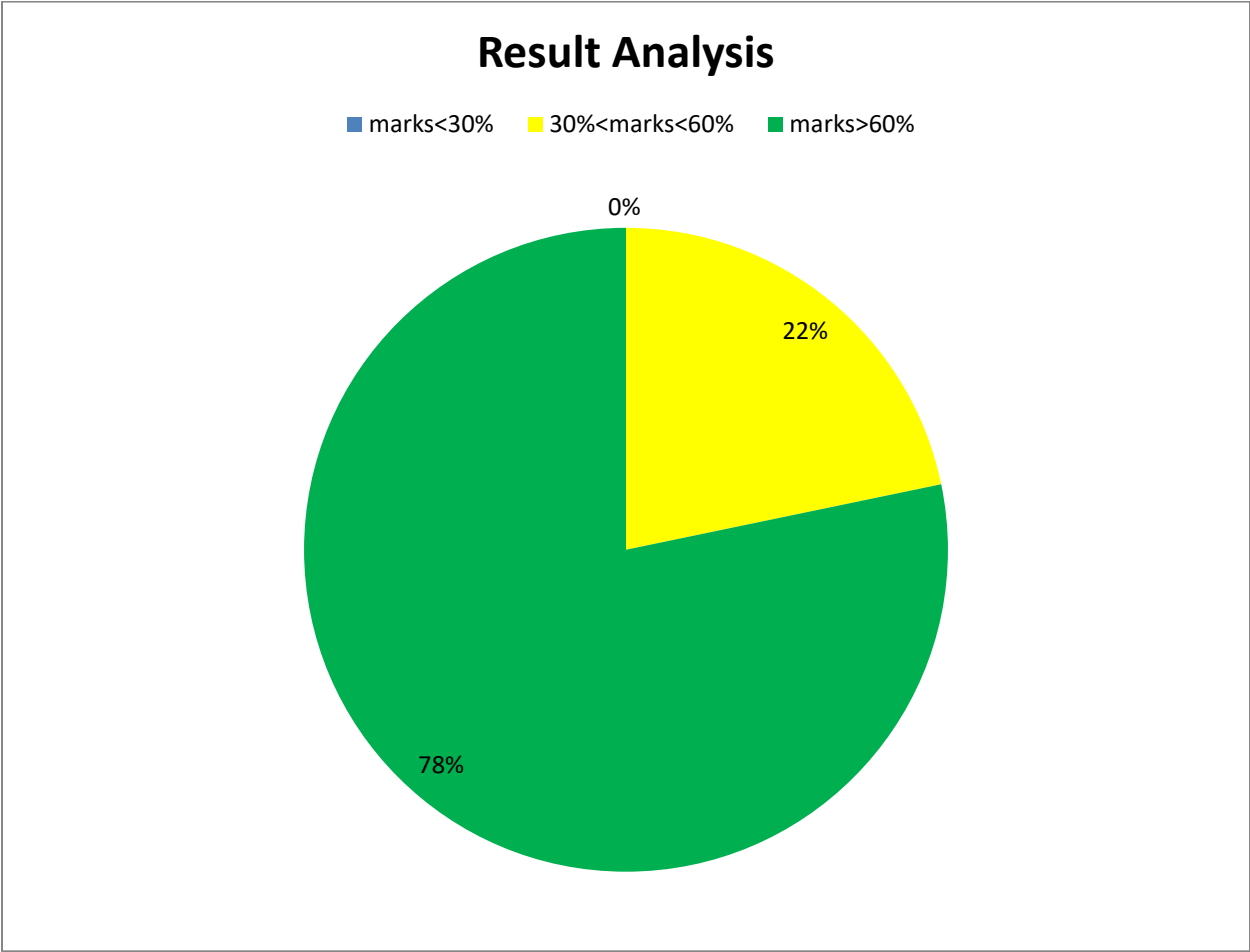
6	9
9	6
6	9
9	6

Example_fig.- OOPs

20. Results:

Darbhanga College of Engineering, Darbhanga							
4th Semester Civil Engineering							
Subject Name:- Object Oriented Programming							
S.N.	Registration No.	Student Name	Attand. (5)	Assignment (5)	Mid Sem (20)	Total (30)	Percentage
1	16101111001	KANHAIYA KUMAR YADAV	5	5	9	19	63%
2	16101111002	VISHAL RAJ	5	5	14	24	80%
3	16101111003	VINEET KUMAR	5	5	9	19	63%
4	16101111004	RISHI KUMAR	5	5	14	24	80%
5	16101111005	KIRTHI	5	5	8	18	60%
6	16101111006	MITESH KUMAR MITESH	5	5	7	17	57%
7	16101111007	ANKESH KUMAR	5	5	3	13	43%
8	16101111008	SHUDHANSHU SHEKHAR JHA	5	5	18	28	93%
9	16101111009	SHIKHA	5	5	12	22	73%
10	16101111010	KUMAR PRIYANSHU	5	5	10	20	67%
11	16101111011	MOTILAL MANJHI	5	4	10	19	63%
12	16101111012	KESHAV KUMAR	5	5	12	22	73%
13	16101111013	CHANDAN KUMAR	5	5	10	20	67%
14	16101111014	PREMRANJAN KUMAR	5	5	14	24	80%
15	16101111015	RAJNISH KUMAR	5	5	8	18	60%
20	16101111020	NARENDRA KUMAR	5	5	8	18	60%
21	16101111021	RUPAK RAJ	5	5	4	14	47%
22	16101111022	RAHUL RAVI	5	5	7	17	57%
23	16101111023	SANTOSH KUMAR	5	5	10	20	67%
24	16101111024	PRINCE KUMAR	5	5	17	27	90%
25	16101111025	NEERAJ KUMAR	5	5	8	18	60%
26	16101111026	PRABHAT RANJAN	5	5	6	18	60%
27	16101111027	MD ZAKI AHMAD	5	5	6	16	53%
28	16101111028	HEMANT KUMAR	5	5	6	16	53%
29	16101111029	AMIT RAJ	5	5	5	15	50%
30	16101111030	RAKESH KUMAR	5	5	7	17	57%
31	16101111031	MUSAFIR KUMAR	5	5	12	22	73%
32	16101111032	AJAZ AHMAD	5	5	6	16	53%
33	16101111033	POOJA KUMARI	5	5	17	27	90%
34	16101111034	SHIVAMVEER KUMAR	5	5	9	19	63%
35	16101111035	SUNIL KUMAR	5	5	10	20	67%
36	16101111036	ATISH DEEPANKAR	5	5	8	18	60%
37	16101111037	VIKRAM BHARTI	5	5	16	26	87%
38	16101111038	DIPESH KUMAR	5	5	9	19	63%
39	16101111039	CHANDRAMANI KUMAR	5	5	10	20	67%
40	16101111040	AMIT KUMAR	5	5	15	25	83%
41	16101111041	RAJEEV RANJAN	5	5	11	21	70%
42	16101111042	SOPHIA KHATOON	5	4	14	23	77%
43	16101111043	SDITI	5	4	6	14	47%
44	16101111044	PRIADARSHI KUMAR	5	5	8	18	60%
45	16101111045	RAJVANSHI KUMAR SINGH	5	5	9	19	63%
46	16101111046	BHUDEV KUMAR	5	4	10	19	63%
47	16101111047	SUDHIR KUMAR	5	5	9	19	63%
48	16101111048	CHANDRESH KUMAR	5	5	10	20	67%
49	16101111049	DILIP KUMAR	5	5	9	19	63%
50	16101111050	RAMESH KUMAR SAH	5	5	10	20	67%
51	16101111051	UMAG BHARDWAJ	5	5	14	24	80%
52	16101111053	MD SALIK ANWAR	5	5	9	19	63%
53	16101111054	RAUSHAN KUMAR	5	5	17	27	90%
54	16101111055	SAIMA FIRDAUS	5	5	10	20	67%
55	16101111056	DURGESH KUMAR	5	5	10	20	67%
56	16101111058	RAMRATAN KUMAR	5	5	12	22	73%
57	16101111059	SHANKAR RAM	5	5	9	19	63%
58	17101111901	PANKAJ KUMAR SAH	5	5	7	17	57%
59	17101111902	RAHUL KUMAR	5	5	14	24	80%
60	17101111903	ANKESH KUMAR	5	5	14	24	80%
61	17101111904	ADARSH KUMAR	5	5	6	16	53%
62	17101111905	PRATEEK KUMAR	5	5	11	21	70%
63	17101111906	SANATAN KUMAR JHA	5	5	11	21	70%
64	17101111907	SACHIN KUMAR	5	5	7	17	57%
65	17101111908	MRITYUNJAY KUMAR	5	5	15	25	83%
66	17101111909	BIBEKANAND KUMAR	5	5	9	19	63%
67	17101111910	KUMAR SUMAN SAURABH	5	5	18	28	93%
68	17101111911	PINKEE KUMARI	5	5	13	23	77%
69	17101111912	JAI KUMAR	5	5	16	26	87%

21. Result Analysis



22. Lab Course

Institute / School Name	Darbhanga College Of Engineering		
Program Name	B.Tech.		
Course Code	051401		
Course Name	Object Oriented Programming Lab		
Labs (per week)	3 hours	Course Credits	2
Course Coordinator Name	Mr. DHIRENDRA KUMAR (4 TH SEM CIVIL)		

4. Scope and Objectives of the Course

[The purpose of this lab is to give the students an understanding of object oriented concepts as well as make students program in c++.](#)

5. Reference Books

RB1: FIT Lab Manual

6. Lab Plan

S. No.	Experiment Detail
1	Write a C program to find sum, difference, division and multiplication of two numbers.
2	Write a C program to swap two no. without using 3 rd variable.
3	Write a C program to check whether a number is prime or not.
4	Write a C program to find factorial of a number.

5. Programs on concepts of classes and objects.

6. Programs using inheritance.

- i. Single inheritance
- ii. Multiple inheritance
 1. Multi-level inheritance
 2. Use of virtual base classes

7. Programs using static polymorphism.

- i. Function overloading
- ii. Ambiguities while dealing with function overloading

8. Programs on dynamic polymorphism.

- i. Use of virtual functions

ii. Use of abstract base classes

9. Programs on operator overloading.

i. Operator overloading using member operator functions.

ii. Operator overloading using non-member operator functions.

iii. Advantages of using non-member operator functions.

10. Programs on dynamic memory management using new, delete operators.

11. Programs on copy constructor and usage of assignment operator.

12. Programs on exception handling.

2. Evaluation Scheme:

Component 1*	Lab Performance / File work/Internal viva	20
Component 3**	End Term	30
	total	50

*Lab Performance will be evaluated weekly

**The End Term examination for practical courses is held at the end of semester and includes conduct of experiment and an oral examination (viva voce). The mandatory requirement of 75% attendance in all lab classes is to be met for being eligible to appear in this component

This document is approved by

Designation	Name	Signature
Course Coordinator	Dhirendra Kumar	
HoD		
Principal		
Date		

CO4	2	2	3	3	-	-	-	-	-	-	2	-	2	-
CO5	2	2	2	3	-	-	2	-	-	-	-	2	-	-

Mapping of COs and PSOs:

CO/PSO	PSO1	PSO2
CO1	3	0
CO2	3	0
CO3	3	2
CO4	2	0
CO5	0	0

Correlation Level: 1- Slight (Low) 2- moderate (Medium) 3 – Substantial (High)

Object Oriented Programming (Lab)

Course Outcome (3):

At the end of this course, the students will be able to

CO1: (Develop 6) program for basic concept of OOP features and C++ concept.

CO2: (Implement 3) program using unary and binary Operator Overloading and also Develop program using concept of inheritance, polymorphism and Function Overloading.

CO3: (Interpret 2) the concept of abstract class and virtual functions.

Mapping of COs and POs:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	1	-	-	-	-	-	-	-	-
CO2	3	3	3	2	-	-	-	-	-	-	-	-
CO3	3	3	3	2	-	-	-	-	-	-	-	-

Mapping of COs and PSOs:

CO/PSO	PSO1	PSO2
CO1	3	0
CO2	3	0
CO3	3	2

Correlation Level: 1- Slight (Low) 2- moderate (Medium) 3 – Substantial (High)

Note: The attainment level be 80% of the full marks for acedmic year 2014_18	80%	
Our attainment Criteria	50.00 %	3
	40.00 %	2
	30.00 %	1

IDA (Indirect Assesment)		
IDA		
Course Exit Survey	Attainment	For
4	3	CO1
5	3	CO2
3	3	CO3
4	3	CO4
4	3	CO5

CO Attainment Target	
2	CO1
2	CO2
2	CO3
2	CO4
2	CO5

CO-PO Matrix															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO 1		3	3	3	3	0	0	0	0	0	0	0	0	3	0
CO 2		3	3	3	2	0	0	0	0	0	0	0	0	3	0
CO 3		3	3	3	2	0	0	0	0	0	0	0	0	3	2
CO 4		2	3	2	2	0	0	0	0	0	0	0	0	2	0
CO 5		3	2	3	2	0	0	0	0	0	0	0	0	0	0

Acadmic year 2014_18														
Surveys	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Program Exit Survey	2.58	2.3	2.41	2.21	2.24	2.15	2.33	2.53	2.42	0	2.36	2.46	2.25	2.35
Alumni Feedback	2	2	-	-	2	2	3	2	3	0	2	3	-	-
Parent Feedback	2.01	-	-	-	2.25	2.15	2.15	2.13	-	1	-	2.25	-	-
Guest Lecture / Expert Lecture/ workshop Resource person Feedback	2	-	-	2	2	-	1	1	-	1	-	2	-	-
Guest Lecture / Expert Lecture/ Workshop Student Feedback	2	-	2	3	2	-	3	-	-	-	-	2	-	-
External Examiner Feedback	2	-	2	2	-	-	-	1	-	2	-	-	-	-
In-plant training by industry person	3	-	-	-	-	-	-	3	3	1	-	2	-	-
Industrial Visit by industry person	-	-	-	-	-	-	3	-	3	-	3	-	-	-
Employer Feedback	2	2	-	-	2	-	2	3	2	3	2	2	-	-
Co-curricular activities	-	-	-	-	2	3	2	3	2	3	2	3	-	-
Extra-curricular activities	-	-	-	-	-	2.07	2.01	2.16	2.25	2.05	-	2.05	-	-
Recruiters	2	-	1	2	-	2	1	2	1	-	2	-	-	-
Attainment	2.17666667	2.1	1.8525	2.242	2.07	2.22833333	2.149	2.182	2.33375	1.864286	2.226667	2.345	2.125	2.35

Note: Program Exit Survey will be same for all the courses of a particular branch

Note: The data entered against each POs is fictional just to understand the actual scenario but soon it will be validated

24. CO Attainments

CO Attainment for academic year 2014-18			Academic year 2013-17			Academic year 2012-16			Academic year 2011-15		
Total continuous Assessment	Internal Asst	External	Total continuous Assessment	Internal Asst	External	Total continuous Assessment	Internal Asst	External	Total continuous Assessment	Internal Asst	External
Total Number of Students	45	45	45	64	64	64	64	64	70	70	70
Avg of numbers	9	8	25	9	9	25	9	9	9	8	25
No of Students getting more than Avg. Marks	45	26	12	12	58	27	1	1	3	40	54
% of students	100.00	57.78	26.67	18.75	90.63	42.19	1.56	1.56	4.29	57.14	77.14
Attainment level Achieved	3	3	0	3	3	2	0	0	0	3	3
Attainment % of full marks	80	80	80	80	80	80	80	80	80	80	80
Attainment marks	8	8	24	8	8	24	8	8	8	8	24
No of Students getting more than Attainment Marks	45	0	33	64	58	36	64	20	71	40	67
% of students on attainment basis	100	0	73.33	100	90.625	56.25	100	31.25	101.4	57.14	95.71
Attainment level Achieved	3	0	3	3	3	3	3	1	3	3	3
CO Direct Assessment	0.9			2.3			0		2.7		
CO Direct Assessment	2.4			3			2.6		3		
DA	IDA		DA	IDA			DA	IDA	DA	IDA	
C01	0.9	3	1.32	Not Attained	C01	2.3	3	2.44	C01	2.7	3
C02	0.9	3	1.32	Not Attained	C02	2.3	3	2.44	C02	2.7	3
C03	0.9	3	1.32	Not Attained	C03	2.3	3	2.44	C03	2.7	3
C04	0.9	3	1.32	Not Attained	C04	2.3	3	2.44	C04	2.7	3
C05	0.9	3	1.32	Not Attained	C05	2.3	3	2.44	C05	2.7	3
DA	IDA		DA	IDA			DA	IDA	DA	IDA	
C01	2.4	3	2.52	Attained	C01	3	3	3	C01	3	3
C02	2.4	3	2.52	Attained	C02	3	3	3	C02	3	3
C03	2.4	3	2.52	Attained	C03	3	3	3	C03	3	3
C04	2.4	3	2.52	Attained	C04	3	3	3	C04	3	3
C05	2.4	3	2.52	Attained	C05	3	3	3	C05	3	3

Note: Here two attainment criterias are shown

1. Based on Average of marks

2. Based on 80% of full marks

25. PO Attainment

PO Attainment Academic Year 2014_15													
CS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13
CO1	1.32	1.32	1.32	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.32
CO2	1.32	1.32	1.32	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.32
CO3	1.32	1.32	1.32	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.32
CO4	0.88	1.32	0.88	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88
CO5	1.32	0.88	1.32	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PO Attained (DA)	1.23	1.23	1.23	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97
PO Attained (DA)	2.09	2.09	1.85	2.04	2.07	2.23	2.15	2.18	2.23	1.86	2.23	2.35	2.35
PO Attained	1.42	1.40	1.36	1.22	0.44	0.45	0.43	0.44	0.47	0.37	0.45	0.47	1.20
PO Attainment level	1	1	1	1	1	1	1	1	1	1	1	1	1
PO Attained/Not Attained	Attained	Attained	Attained	Attained	Not Attained	Not Attained	Not Attained	Not Attained	Not Attained	Not Attained	Not Attained	Not Attained	Not Attained

PO Attainment Academic Year 2015_19													
CS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13
CO1	2.44	2.44	2.44	2.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.44
CO2	2.44	2.44	2.44	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.44
CO3	2.44	2.44	2.44	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.44
CO4	1.63	2.44	1.63	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63
CO5	2.44	1.63	2.44	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PO Attained (DA)	2.28	2.28	2.28	1.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.79
PO Attained (DA)	2.18	2.09	1.85	2.24	2.07	2.23	2.15	2.18	2.23	1.86	2.23	2.35	2.35
PO Attained	2.26	2.24	2.19	1.88	0.44	0.45	0.43	0.44	0.47	0.37	0.45	0.47	1.86
PO Attainment level	1	1	1	1	1	1	1	1	1	1	1	1	1
PO Attained/Not Attained	Attained	Attained	Attained	Attained	Not Attained	Not Attained	Not Attained	Not Attained	Not Attained	Not Attained	Not Attained	Not Attained	Not Attained

Note: PO Attained is calculated after taking the average of the points. While dividing kindly consider only those points which will have nonzero input.												
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