Project Based Learning (PBL)

Project Based Learning (PBL) helps students deepen their understanding of the content of subjects being learned while working collaboratively on a complex real-world question.

Instructions:

1. Every **division** will have **14 groups** (Each group will have **5 students**).
2. There are 14 problem statements, each group will select and work on **Any ONE** problem statement.
3. Two groups from **same division** will **NOT** be allowed to have same problem statement (14 groups of a class -> 14 different projects).

Problem Statements:

1. Simulating motion of charged particle in an electric and magnetic field using Scilab or C-Programming. (Applied Physics - II).
2. Demonstration of any application with a working model using Semiconductor Devices. (Applied Physics - II).
3. Design an optical fibre communication system. (Applied Physics - II).
4. Preparation of biodiesel by using used and unused vegetable oil. (Applied Chemistry - II).
5. Decaffeination of coffee and tea by solvent extraction method. (Applied Chemistry - II).
6. Fabrication and characterization of polymer based composite using natural fillers. (Applied Chemistry - II).
7. A fossilised bone is found to contain 0.1% of its original ^{14}C .Find the age of the fossil. (Applied Mathematics - II).
8. An apple pie with an initial temperature of 170^0C is removed from the oven and left to cool in a room with an air temperature of 20^0C. Given that the temperature of pie

initially decreases at a rate of 3^0C per minute. How long will it take for the pie to cool to a temperature of 30^0C. (Applied Mathematics - II).

9. Find the volume of a pyramid with a square base that is 20 meters tall and 20 meters on a side at the base. (Applied Mathematics - II).

10. Implement Student Result Management System in C which will prepare the marks of 'N' students for six subjects with following requirements:
    a. Get the name of the student and marks for six subjects. Calculate the total marks of the students.
    b. Display the name, marks. Sort the marks according to the total and display the result.
    c. Display the subject toppers.
    d. Display subject wise passing percentage.
    e. Display the overall topper in these students. Topper is one who has the highest total marks.
    f. Display the number of passed and failed students.

    Represent each student using structure and store all student records in a file. (Structured Programming Approach).

11. Implement Bank Management System in C with two roles - admin & staff. Admin can Add user, Delete user, Edit username/password. Staff can Create new account, Deposit Cash, Withdraw Cash, Fund Transfer, Display Account information. Represent each customer using structure and store all bank customer records in a file. (Structured Programming Approach).

12. Implement a MCQ Quiz Game in C for any one subject with two levels - basic and advanced. Player can go to advance level, only if the basic level is cleared. The player name along with high scores will be stored in file. Quiz game will have following options - play quiz, display high scores, quiz rules, quit. Each quiz question along with answers will be represented using structure. (Structured Programming Approach).

13. Prepare a solid model with the help of actual machine part from any machine provided. Also draw 2D drawing in AutoCAD. Material : Wood / Metal. (Engineering Drawing).

14. A circular ball rolls without slipping along the periphery of hexagonal plate. Draw the curve traced out by the point in contact with the surface of the plate. (Engineering Drawing).