Title of Subject	: Design of Reinforced Concrete Structures	Date :	12/03/2020
Subject Code	: 3160212		
Assignment No	: 01		
Assignment Title	: Building Layout and Design		

Q-1: G+3 residential frame building (whole structure) of having 5 bays of 5 m in X–direction and 6 bays of 4 m in Y-direction. Prepare and draw structural layout and designate all structural members like columns, beams, and slabs etc.

Q-2: For the RC frame structural layout as prepared above in problem Q.1(b), Calculate the axial loads and bending moments on any one intermediate column. Clearly mention designation of selected column.

Q-3: For the building lay out shown in Fig.01 with following details, Draw the load distribution diagram and estimate the loads on a typical floor beams B13 & B14.
Number of storey: G+3
Floor to floor height: 3.15 m
External walls: 250 mm including plaster
Internal walls: 150 mm including plaster
Imposed load: Roof = 1.5 kN/mm2, Floor = 4.0 kN/mm²
Floor finish: Roof = 1.5 kN/mm2, Floor = 1.0 kN/mm²

Q-4: Analyse the continuous beam B11-B12 at typical floor level of a given layout (fig.01) by substitute frame method

Q-5: Design the continuous beam B11-B12 at typical floor level of a given layout (fig.01) for flexure and shear. Draw diagram of beams showing reinforcement details

Q-6: Prepare structural layout and nominate all the members like slabs, beams, columns of G+3 building (whole structure) of having 5 bays of 5 m in X –direction and 6 bays of 4 m in Y-direction.
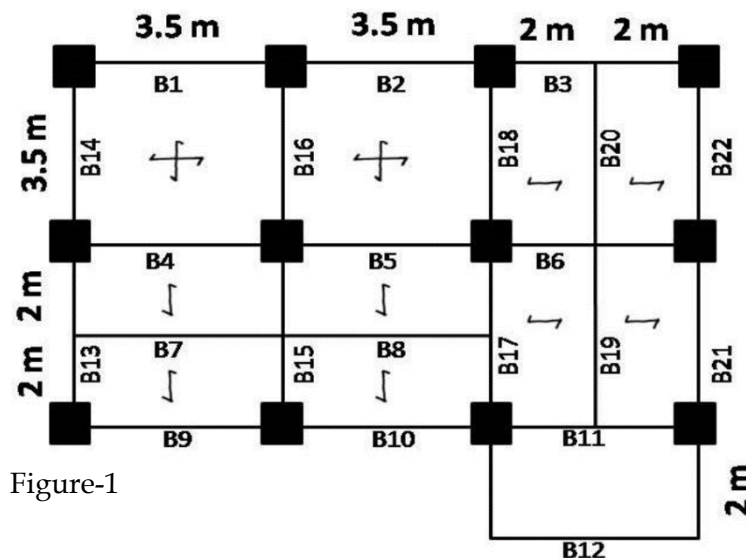

Figure-1

Title of Subject	: Design of Reinforced Concrete Structures	Date :	12/03/2021
Subject Code	: 3160212		
Assignment No	: 02		
Assignment Title	: Design of Retaining Wall		

Q-1: The counterfort retaining wall has to retain the earth with a horizontal top 7.5 m above ground level. Fix the basic dimensions for retaining walls. Take SBC of soil = 180 KN/m2, Φ = 30˚, μ = 0.55 and unit wt. of soil = 16.2 KN/m2. Determine dimensions of the retaining wall. Use M20 and Fe 415 grade of concrete and steel respectively.

Q-2: Check Stability against Overturning & Sliding for Wall given in Q-1

Q-3: The cantilever retaining wall must retain the earth with a horizontal top 5.5 m above ground level. Fix the basic dimensions for retaining walls. Take SBC of soil = 200 KN/m2, Φ = 30˚, μ = 0.5 and unit wt. of soil = 18 KN/m2. Determine dimensions of the retaining wall. Use M20 and Fe 415 grade of concrete and steel, respectively. check the stability of wall. design stem and draw diagram showing reinforcement details.

Q-4: Explain the different types of Retaining Wall.

Q-5: The cantilever retaining wall has to retain the earth with a horizontal top 4 m above ground level. Density of earth is 17 kN/m3. Angle of internal friction ϕ is 30 degree. SBC of soil is 150 kN/m2. Coefficient of friction μ is 0.55. Determine dimensions of the retaining wall. Use M20 grade of concrete and Fe 415 grade of steel. Check Stability of Wall, Design Toe and draw diagram showing reinforcement details.

Title of Subject	:	Design of Reinforced Concrete Structures	Date	:	12/03/2020
Subject Code	:	3160212			
Assignment No	:	03			
Assignment Title	:	Design of Water Tanks			

Q-1: Design a circular tank with flexible base for a capacity of 5,00,000 liters below ground level. Use M30 grade concrete and Fe-415 grade of steel.

Q-2: Fix the basic dimensions of overhead circular tank with flat bottom and supported on ring beam with the following data. Capacity of tank 4.5 lacs liters. Use M30 grade concrete and Fe 415 grade steel.

Q-3: Fix the basic dimension of rectangular underground tank and design constants of capacity 70,000 liters. Use M30 concrete and Fe415 grade steel. Take saturate unit weight of soil 18 kN/m^3 and $\Phi = 30^\circ$
    Design Water tank for
    (1) Tank is empty and surrounding soil is saturated
    (2) Tank if full and no soil outside.

Q-4: The rectangular water tank open at top resting on ground having size 3.4 m x 7.2 m x 3.5 m. Design short wall. Use M30 and Fe 415.
  (1) Design long wall.
  (2) Design base slab and draw detailed plan and section of water tank showing all the dimensions and reinforcements.

Q-5: The rectangular water tank rest on the ground. Length of tank = 6 m, width of tank = 4 m & Depth of water = 3.5m. Use M30 concrete and Fe 415 grade of steel. Design long walls & short walls with checks.

Title of Subject	:	Design of Reinforced Concrete Structures	Date	:	12/03/2020
Subject Code	:	3160212			
Assignment No	:	04			
Assignment Title	:	Design of Flat Slabs			

Q-1: Elaborate the limitations of direct design method used for flat slab & Explain proportioning of Flat slab components as per IS:456-2000.

Q-2: Design an interior panel of a flat slab having equal panels of 6 m X 6 m. The internal columns are 400 mm in diameter and the column head is 800 mm in diameter. The storey height above and below slab is 4 m. Design the flat slab with drop and column head. Take live load 4 kN/m^2 . Use M20 concrete and Fe-415 grade steel.

Q-3: Design an interior panel of a flat slab of panel size 5m x 5m without providing drop and column head. Size of columns = 300mm x 400 mm, Live load = 4 kN/m2, Floor finish = 1 kN/m2,Height of column 4m above and below slab. Use M20 concrete and Fe 415 steel.

Q-4: Design an interior panel of flat slab having equal panels of 6 m $\times$ 6 m. The internal columns are 500mm in diameter and column head is 1000 mm in diameter. The Storey height above and below slab is 4 m. Design the flat slab with drop and column head. Live load 4 kN/m2. Use M20 grade of concrete and Fe 415 grade of steel.

Q-5: A 200 mm thick R.C.C. flat slab is loaded by live load of 4 KN/m2 and floor finish load of 1 KN/m2. It is supported by 4 columns of size 300 x 400 mm, without providing drop and column head. The columns are placed at 4.5 m x 6 m centre to centre. Design the slab considering an interior Panel.

Title of Subject	: Design of Reinforced Concrete Structures	Date :	12/03/2020
Subject Code	: 3160212		
Assignment No	: 05		
Assignment Title	: Earthquake Resistant Design of building		

Q-1: Mention the ductile detailing criteria for flexural members and explain where it is required. & Explain ductile detailing of column as per IS: 13920 with sketch.

Q-2: Explain Philosophy of Earthquake resistant design. Give four virtue of good earthquake resistant design.

Q-3: Calculate base shear for the three storey RC frame building (hospital) has size 25 m X 25 m located in Surat, using seismic coefficient method for following data:
Type of soil = Hard
Intensity of dead load = 15 kN/m² (Including all members)
Intensity of imposed load = 5 kN/m²
Storey height = 3.5 m
Also determine the seismic forces and shears at each floor level.

Q-4: A public building with seismic weight of 40000 KN with height of 30.5m is in Zone-III, Resting on medium soil site. Ductile detailing is to be done for the frame. Find total Base shear.

Q-5: Calculate base shear for three storey RC frame school building located in Bhuj using seismic coefficient method for the following data. Number of bay in x direction = 3, Number of bay in y direction = 3, Bay width 4m in both direction, Height of storey = 3m, Dead load = 12 Kn/m2 , Live load = 4 Kn/m2 , Zone V.