B. Construction Engineering 3rd Year 2nd Semester Examination 2019

DESIGN OF STRUCTURE - II   Part I

Time : Three hours   Full Marks : 100

Use of IS 456 code is allowed. Design should be explained with neat sketches.
Answer any two questions. Maximum 50 Marks

1. a) Derive the moment of resistance for the balanced section adopting working stress method of design using **M25 grade of concrete and Fe500** and Calculate the Moment of Resistance for a rectangular beam of size 300 mm X 500 mm with 3-20 mm diameter Tor steel as tensile main reinforcement with adequate shear reinforcement. [CO1]
   10

   b) Design a corner roof slab of a residential building having clear size of 3200 mm x 3750 mm supported on 250 mm wide beams. Use M25 grade of concrete & Fe500 steel. Show reinforcement details in plan at important sections.   15
   [CO2]

2. Design a **Continuous Beam** having three spans of 3.75 m, 4.25 m & 3.75 m subjected to a uniformly distributed load of 15 KN /m DL and 10 KN/m LL using coefficient method as stipulated adopting working stress method. The grade of concrete is M25 and Fe500 grade of steel is used. Draw neat sketches of at important cross sections showing reinforcement for bending and shear.   25
   [CO2]

3. (a) Design a circular column having subjected to an axial load of 400 KN. The effective length of column is 3.5 m, Use M25 grade of concrete and Fe500 grade of steel.   10

   b) Find the safety of the same column as designed if it is subjected to an eccentric load of 250 KN with an eccentricity of 100 mm about one of the axes instead of the 400 KN axial load only.   15

   [CO3]

B. Construction Engineering 3rd year 2nd semester Examination – 2019
Subject: Design of Structure -II

Total Time: Three hours
Full Marks: 100

PART-II(Full Marks-50)
Use Separate answer sheet for each part.
IS456:2000 is allowed in the exam hall. Apply Limit state method of design.

CO1 [05]	Answer any one from (a) and (b) in this block [1] (a) Write a short notes on Limit state serviceability. [5] (b) Distinguished between Limit State method and working stress method. [5]
CO2 [15]	[2]Design the RCC Slab of 4X5 meter with two adjacent edge continuous and sketch the drawing also. Use the following data [15] LL= 2.5 KN/m^2 M25 grade concrete & FE-500 HYSD Bar Size of beam is 300X500 MM Size of column 500X400 mm Use Limit state method for design.
CO3 [15]	*[3]Answer any one from (a), (b) in this block:* (a) Design a beam with both end continuous & Clear length 8m with the following data Live load on beam = 30 KN/m^2 M25 grade concrete & FE-500 HYSD Bar Size of column 500X400 mm, Depth of beam should be restricted 450 mm. Use Limit state method for design. Shown also reinforcement details. [15] (b) Design a beam of both end continuous & 7m clear length with LL on the beam is 20 KN/m^2 & beam is supporting on a Column of 500X400 mm. If M25 Grade concrete with Fe-500HYSD Bar were used then show also the reinforcement details. [15]
CO4 [10]	[4] A column of 4 meter length with cross section 500X400. The axial load of the column is 2000KN. Assume M25 Grade concrete and Fe-500 HYSD Bar used, if safe bearing capacity of Soil is 12 T/M^2 then design a suitable footing. Show also the details of reinforcement of footing. [10]
CO5 [5]	[5] Write the names of different type of retaining wall along with sketches [5]

CO1: Understand the design philosophy of different methods of Concrete Structures (K2).
CO2: Analyse & Design of Reinforced Slab, Beams and Columns (K4)
CO3: Demonstrate, application & Design of Beam-Column Problems (K3)
CO4: Analyse & Design of Footings (K4)
CO5: Calculate forces and Design of Retaining structures (K2)
CO6: Describe Flat Slab Design Consideration, Concentrated Load on slab & Elementary Bridge Design (K1)