TED (10) **3025**
(Revision -2010)

N19-05041

Reg. No……
Signature …….

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, OCTOBER/NOVEMBER – 2019

THEORY OF STRUCTURE-II

[Maximum Marks: 100] [Time: 3 Hours]

PART-A

[Maximum Marks: 10]
(Answer ***all*** questions in one or two sentences. Each question carries 2 marks)

I. 1. What is meant by Moment of Resistance of a beam?
2. Mention any two conditions for the Stability of a dam.
3. Write the Differential equation to determine deflection.
4. Define Stiffness factor.
5. Give relation to maximum deflection for a fixed beam carrying a Udl throughout the span (5x 2 = 10)

PART-B

[Maximum Marks: 30]
(Answer any ***Five*** of the following questions. Each question carries 6 marks)

II. 1. Write the assumptions in the theory of simple bending.
2. The maximum shear force in a rectangular beam is 100 KN sectional area of the beam is 42000 mm^2. Sketch the shear stress distribution diagram.
3. A short column 220 x 220 mm is subjected to an eccentric load of 60KN at an eccentricity of 40mm in the plane bisecting the opposite faces. Find the maximum and minimum intensities of stress in the base sections.
4. Using Maculay's method derive the relation for maximum slope and maximum deflection for a simply supported beam with a central point load.
5. Continues beam ABC, AB=8m, BC=8m is loaded with point load of 10KN at the middle of each span. Calculate the support moments by Theorem of three moments' A and B are simply supported.
6. What are the various advantages of a Fixed beam over a Simply supported beam.
7. A beam 4m long simply supported at its ends carrying a point load at its centre. If the slope at ends of the beam is not to exceed 1 degree. Find the deflection at the centre of the beam.

(5x 6 = 30)

PART-C

[Maximum Marks: 60]

(Answer ***one*** full question from each Unit. Each question carries 15 marks)

UNIT -I

III. (a). Show that the neutral axis of a beam section always passes through its centroid. (5)

(b). A rectangular beam 250mm side and 300mm deep is over a span of 5m with a UdL of 2050 N|m. Determine (1). The maximum stress developed at a section 1m from right hand support. (2). Position and magnitude of the Maximum stress developed in the material of the whole length of the beam. (10)

OR

IV. (a). Show that for a rectangular section the distribution of shear stress is parabolic. (5)

(b). A beam I section 200 x 400mm has a web and flange thickness 20mm. Calculate the maximum intensity of shear stress across the section of the beam. If it carries a shearing force of 400 KN at a section. (10)

UNIT -II

V. (a). Sketch and explain the shapes of stress distribution diagram for eccentric loaded column. (5)

(b). A masonry dam has a trapezoidal cross section. The height above the foundation is 62m with its water face vertical. The width at the top is 4.5m. Calculate the necessary minimum base width to ensure that no tension shall be developed when water is stored up to 60m Take masonry as 22.6 KN/m^3 and weight of water 9.81 KN/m^3 (10)

OR

VI. (a). Calculate the fixing moment values of a fixed beam with a span of 3.6m and carrying uniformly distributed load 17kN/m for the entire span. Draw the Bending moment diagram of the beam under this loading. (5)

(b). A concrete dam of rectangular section 16m height and 5m wide contains water up to the height of 13m. Find (a). Total pressure per meter length of dam. (b). The point where the resultant pressure cuts the base. (c). Maximum and minimum intensities of pressure at the base. Assume unit weight of concrete as 25 KN/m^3 and unit weight of water w = 9.81 KN/m^3 (10)

UNIT –III

VII. (a). Derive the expression for maximum slope and minimum deflection for a simply supported beam of span I carrying a point load W at the centre by Mohr's Theorem. (8)

(b). A beam of uniform section 200mm x 300mm is simply supported at the end. It carries a UDL of 10 KN/m over the entire span 5m. Find the maximum slope and deflection. Take E = 2 x 10^5 N/mm^2. (7)

OR

VIII. (a). Use double integration method to deduce the formula for maximum slope and maximum deflection of a cantilever loaded with a point load at free end. (7)

(b).A cantilever 5m long carries a point load of 60KN at a point distant 4m from the fixed end. Moment of inertia = 15000cm^4. E=2x10^4 KN/cm^2. Determine (1) deflection at the load point (2) slope at the load point. (8)

UNIT -IV

IX. A continues beam ABC is simply supported over two spans AB and BC of 6m and 5m respectively. The span AB is carrying a udl of 20KN/m and the span BC is carrying a point load of 50KN at its midspan. Find the support moment and the reactions. (15)

OR

X. Continuous beam ABC, 8m long rests on three simple supports A, B and C such that AB=BC=4m. It carries a point load of 4KN at the mid length of AB and a uniformly distributed load of 4KN/m for BC. Draw the bending moment diagram of the beam by using the Moment distribution method. (15)