EIS-205

B.E. (VIIth Sem.) (CGPA) Civil Engg. Exam.-2016

ADVANCED STRUCTURAL DESIGN-I (RCC)

Paper - CE-702

Time Allowed : Three Hours
Maximum Marks : 60

Note : All questions are compulsory.

All carry equal marks.

Q.I (a) Differentiate between portal and cantilever methods. 4

or

Discuss classification of shear walls.

(b) Derive the expression for moment of resistance of a rectangular shear wall. 8

or

In a 10 m wide hall portals are provided at 4 m c/c distance. Height of hall is 4 m. Design beam and column of portal.

Q.II (a) Define retaining wall and discuss the functions of shear key. 4

or

Explain the design of the counter fort.

(b) Design the toe and heal along the stability analysis of counter for retaining wall with the following data—

Height of soil above G.L.– 6.5 m

SBC of soil – 200 KN/m², unit weight of soil = 18KN/m³, Angle of internal friction = 30⁰, spacing of counter foots = 3.0m, coeff. of friction = 0.6 m.

or

Design the stem of a cantilever retaining wall to support a levelled earth 5m high above base level. Take density of soil as 18 KN/m³ and angle of repose as 30⁰, sketch the details.

Q.III (a) Name the different components of a intze tank. 4

or

Discuss the design of a underground water tanks.

(b) Design a circular tank with flexible base of capacity 500 KL. The depth of water is to be 4m including a free board of 200 mm.

or

Design bottom ring and conical dome of an intze tank of 1.2 million litres capacity supported on 08 columns with staging height of 15.0 m

Q.IV (a) Differentiate between silo and banker. 4

or

Explain Janssen's theory.

(b) Design side walls of a rectangular bunker of capacity 300 KN to store coal using M20 concrete and Fe 415 steel. Take unit wt. of coal = 8 KN/m^3, $\phi = 25^0$, $\mu = 0.45$. 8

or

Design hopper bottom of a rectangular bunker for storing coal with given data—
Capacity = 400KN
Unit wt. of coal = 8 KN/m^3
Angle of repose = 25^0
$\mu = 0.44$

Q.V (a) Discuss prestressing of concrete. 4

or

Explain pretensioned and post tensioned.

or

(b) A simple supported prestressed concrete beam of rectangular cross section 450mm x 600 mm is loaded with UDL of 27 KN/m over span of 7.0 m. Sketch the distribution of stress at mid-span if the prestressing force is 2000KN and the tendon is located at 200mm above the bottom fibre. 8

or

Explain the method of finding reaction factors for BM in longitudinal girders.

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