Exam. No. of the candidate: _____

GANPAT UNIVERSITY

B.Tech. Semester VIII (CIVIL)

Regular Examination – May / June: 2012

C 801: Advanced Structural Design

**Max.Time: 3 Hours**   **Max. Marks: 70**

Instructions: -   (1) Answer to the two sections must be written in separate answer books.
                      (2) Figures to the right indicate full marks.
                      (3) Assume suitable data if required.
                      (4) IS: 456:2000 , IS:3370 and Steel table is permitted.

Section – I

1 (A) A cylindrical silo has an internal diameter of 5m and 24m deep and is filled   14
        with grain weighting 9000 N/m^3. The angle of repose for grain may be taken as
        30^0. The coefficient of friction between grain and the silo walls may be taken as
        0.45. Ratio of horizontal to vertical pressure intensity is 0.45. Determine the
        lateral pressure intensities at intervals of 4m and plot the variation of lateral
        intensity of pressure with depth. Design the silo. Use M$_{20}$ grade of concrete and
        HYSD reinforcement of Fe$_{415}$ steel.

2 (A) Figure (1) shows an arrangement for a square coal bunker. Density of coal is   18
        9000 N/m^3 & surcharge angle $\alpha = 30^0$. Design the bunker. Use M$_{20}$ grade of
        concrete and Fe$_{415}$ steel.

OR

2 (A) Figure (2) shows an arrangement for a circular coal bunker. Density of coal is   18
        9000 N/m^3 & surcharge angle $\alpha = 30^0$. Design the bunker. Use M$_{20}$ grade of
        concrete and Fe$_{415}$ steel.
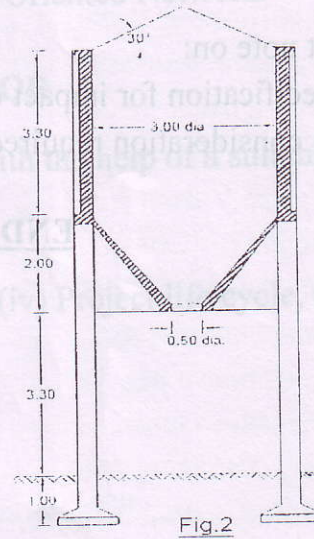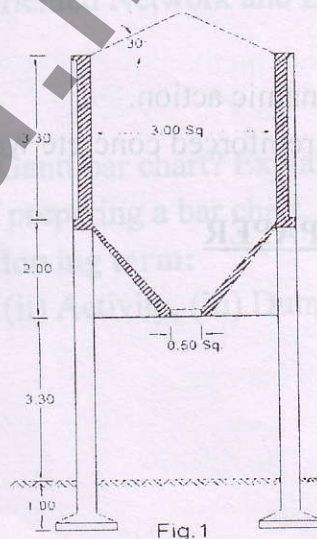
Fig.1   Fig.2   (All dimensions are in meter)

3 (A) Write differnce between Bunker and silo.

Section – II

4 (A) A reinforced concrete(single span) T beam bridge is to consist of 5 beams 1.75m   **14**
apart. The span of the bridge is 12m clear with end bearings of 600mm. The live
load on the bridge is 17000N/m^2 including impact. The carriageway over the
bridge is to be 7m wide with a footpath of 1.5m width on two side. The loading
on the footpath may be taken as 3900n/m^2. Design the bridge. Use M$_{20}$ concrete
and Fe$_{415}$ steel.

(All dimensions are in meter)
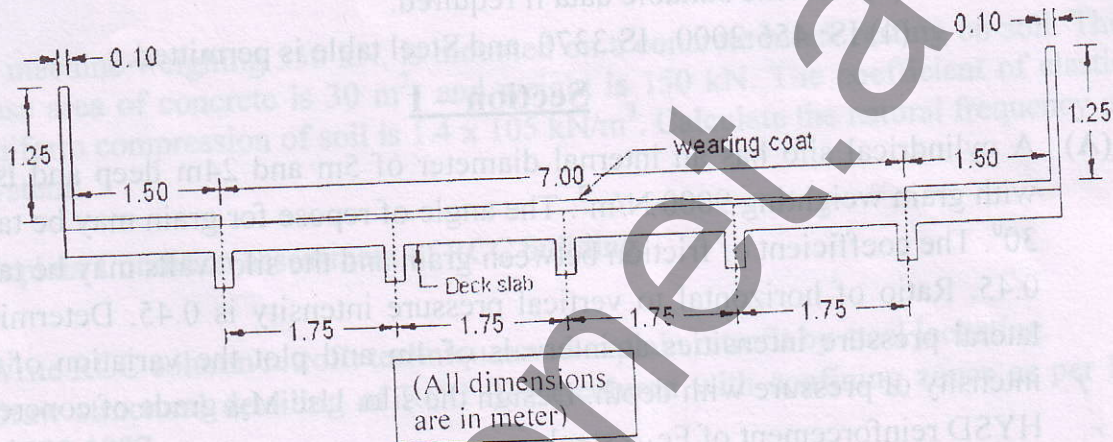
5 (A) Design a rectangular water tank resting on ground for a capacity of 75000 litres.   **15**
The materials are M$_{20}$ grade concrete and HYSD reinforcement of grade Fe$_{415}$.

Or

5 (A) Design a rectangular water tank resting on ground having a size of 3.6m x 8.0m   **15**
x 3.0m high. The materials are M20 grade concrete and HYSD reinforcement of
grade Fe415.

6 Write short note on:
(1) IRC specification for impact or dynamic action.
(2) Special consideration required for reinforced concrete water tank.

END OF PAPER