on soil at site = KN/m². Adopt M-25 grade concrete m id tor steel Fe=415 grade and design t lowing : (20)

(a) Base section of ney

(b) Foundation for himney

6. What is Battery c nkers ? Explain the design of Battery o: ker. (20)

7. Distinguish betwe bunker and a silo. Using Airy's theor ow that the height upto which a bin b s as a shallow one is given by (20)

$$h = b\left[\mu + \frac{\sqrt{1+\mu^2)}}{+\mu'}\right.$$

8. What are Marine tures ? Explain the repair of marine str e. (20)

Roll No. .....

23521

M. Tech. 3rd Sem. Civil Engineering (Specialisation in Structural Design) Examination– December, 2016

DESIGN OF STRUCTURES-III

Paper : MTSD-301

Time : 3 hours ***Max. Marks : 100***

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after the examination.

Note: Attempt any **five** questions. All questions carry equal marks.

1. A cylindrical silo has an internal diameter 6 m and 20 m (cylindrical portion) with a conical hopper bottom. The material stored

is wheat with ensity of 8 KN/m³. The coefficient of ion between wall and materials is 0. The ratio of horizontal to vertical pressu 0.40. Angle of response = 25 degrees. gn the reinforcements in the silo walls pt M-20 grade concrete and Fe-415) bars. Adopt Janssen theory for pres calculation. (20)

2. A coal bunker be designed to store 300 KN of coal hav unit weight of 8 KN/m³. The bunker sh be square with 3 metre sides. The stor al is to be surcharged at an angle of res which is 30 degrees for coal. Adopt M- ade concrete and Fe-415 steel and desig side walls and hopper bottom and tch the details of reinforcements (20)

3. Design a silo for storing maize, having unit weight of 6870 N/m². The silo has 6 m internal diameter and height of the cylindrical portion is 15 m. The conical dome has a slope of 40⁰ with horizontal, and has an opening of 60 cm diameter. Use Airy's theory. Take μ = 0.521 and μ' = 0.432. Use M 20 grade concrete. (20)

4. Define in details "Flood atterns' and flood irregularities and their effects. (20)

5. A concrete Chimney of height 80 m with the external diameter of shaft being 4 m at top 5 m at bottom is required in a place where the wind intensity is 1.5 KN/m². Thickness of fire brick lining = 10 cm. Temperature difference between the inside and outside of shaft = 75°C. Permissible bearing pressure