MANSOURA UNIVERSITY **3rd year archtectural**

FACULTY OF ENGINEERING **soil mech&foundation**

STRUCTURAL DEPARTEMENT **[2013]** **3 HOURS [OPEN BOOK]**

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any missing data can be assumed .

try in all questions .

QUESTION NO [1]

The maximum and minimum void ratio that could be obtained from a sample of sand are 0.85 and 0.53 respectively .Determine the relative density of the sample in its natural state if its dry unit weight is 1.55 gm /cu cm .Assume asuitable value for the specific gravity of the solid particles .If the moisture content of soil became 30% .Determine the degree of saturation ,saturated, submerged,wet and dry unit weight.

QUESTION NO [2]

Figure [1] shows the plan of alarge circular raft foundation .The centre shaded area transmits a contact pressure of 80 KN/m2 and the outer area transmits a contant pressure of 200 KN/m2 calculate the intensity of vertical stress induced at points A ,B ,C in the soil mass 6.0 m below the load .

QUESTION NO [3]

A strip footing 0f width 2.0 m is placed on the surface of sand having angle of internal frection equal 20 degree and unit weight 1.85 ton/ m^3.The water table is at 5.0 m below ground surface .If the flood cause the water table rise to the surface ,What happened in B.C ,by what percentage is the bearing capacity of the foundation changed .

QUESTION NO [4]

1]-Design a strip footing to carry concrete wall subjected to vertical load with 28 t/m and moment 5.5 m.t/m .given the following data ,allowable B.C equal 2.5 kg/cm2 and the depth of foundation 1.5 m .

11]-Two columns A [25x200 cm] ,B [30x200 cm] as shown in fig [2] carrying load 90 ton/m and 110 ton /m respectively the distance centre to centre of columns is 5.0 m .The net allowable B.C 2.5 kg/cm2 .Design and draw with detail the foundation .

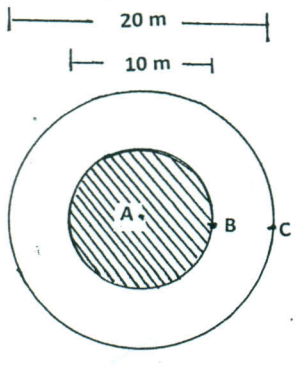

FIG [1]

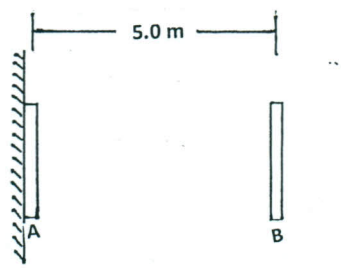

FIG [2]

with my best wishes
mervat ragab