BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: MTECH **SEMESTER: II**
BRANCH: CIVIL **SESSION: SP/19**

SUBJECT: **CE522 EARTH AND EARTH RETAINING STRUCTURES**

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1 An earthen dam (Fig1) is constructed to hold water course with following geo-engineering parameters:- [10]
The dam is divided into ten number of slices.
Area of slice 1, 2,3,5,7,8,9,10 = 100 m^2 each.
Area of slice 4 = 25m^2. Area of slice 6 = 200m^2. The width of dam (B) =10m.

Saturated unit weight of soil/rock in dam = 20 kN/m^3. Unit weight of water = 10 kN/ m^3,,
The angle between vertical and tangent to the base of dam of slice no 1,2,3,4,5,6,7,8,9,10 =

33^0, 38^0, 42^0,46^0, 55^0,64^0, 68^0,70^0,75^0,79^0 respectively.

Cohesion and Angle of internal friction of rock/soil in dam material = 30 kN/ m^2 and 30^0 respectively.
Determine the total Resisting force on the dam without considering seepage force.

Q.2 Determine the total Disturbing force on the dam and Factor of safety by Fellinius method without considering seepage force. [10]

Q.3 Determine the Factor of safety without considering seepage force by Bishop's simplified method. [10]

Q.4 Considering that there is effect of seismicity with seismicity factor of 0.01, determine disturbing force with seismicity and by Fellinius method. [10]

Q.5 Define geo-textiles, geo-membranes, geo-grids, geo-nets, geo-synthetic clay liner, Reinforced earth. [2+2+2+2+2]

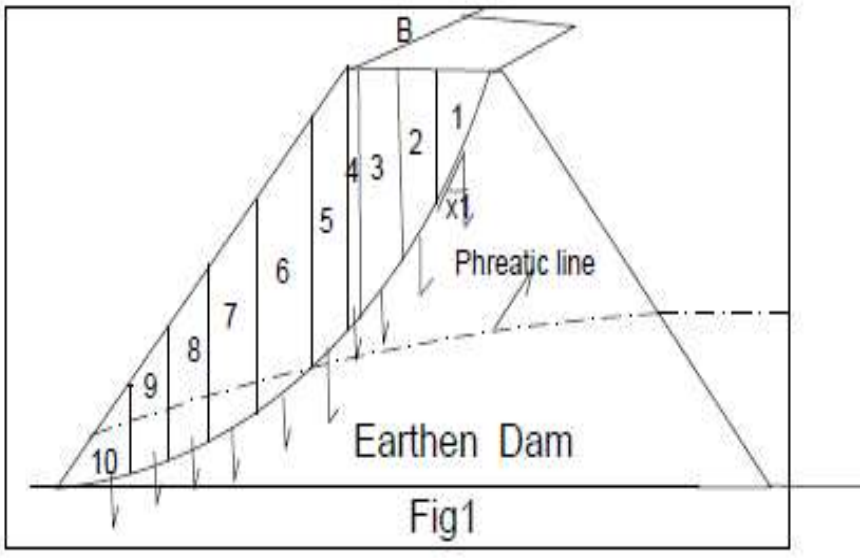

Fig1

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