

## JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

## TEST -1 EXAMINATION- 2016

## B.Tech. IV Semester

COURSE CODE: 10B11CE411

MAX. MARKS: 15

COURSE NAME: GEOTECHNICAL ENGINEERING

COURSE CREDITS: 04

MAX. TIME: 1 HR

*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Assume necessary data as per IS code.*

1. During a sedimentation test for grain size distribution analysis, the corrected hydrometer reading for a 1000cc uniformly mixed soil suspension at the instant of starting sedimentation ( $t = 0$ ) was 1.030. After 30 minutes, the corrected hydrometer reading at an effective depth of 10 cm was noted to be 1.015. If  $G = 2.65$  and  $\eta = 0.01$  dyne – sec/cm<sup>2</sup>, find
  - a) The total wt. of soil solids placed in the 1000 cc suspension.
  - b) The diameter and %age finer (N%) corresponding to 30 min. reading. [2+2=4]
2. Earth is required to be excavated from borrow pits for building an embankment. The wet unit weight of undisturbed soil is  $18 \text{ kN/m}^3$  and its water content is 8 %. In order to build a 4 m high embankment with top width 2 m and side slopes 1 : 1, estimate the quantity of earth required to be excavated per meter length of embankment. The dry unit weight required in the embankment is  $15 \text{ kN/m}^3$  with a moisture content of 10%. Assume the specific gravity of solids as 2.67. Also determine the void ratios and the degree of saturation of the soil in both the undisturbed and remoulded states. [4]
3. Justify the statement with reasons:

“When two soils have the same plasticity index, the one with a higher liquid limit has greater compressibility and a small rate of volume change.” [3]
4. Soil samples A and B have void ratios 0.5 and 0.7 respectively. If  $1.5 \text{ m}^3$  of soil A and  $1.7 \text{ m}^3$  of soil B are mixed to form a sample C having a volume of  $3.2 \text{ m}^3$ , then what will be the porosity of sample C? [4]