Code No: RT31011 **R13** SET - 1

III B. Tech I Semester Supplementary Examinations, May - 2016
GEOTECHNICAL ENGINEERING – I
(Civil Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1	a)	What is zero air void line?	[4M]
	b)	Define plasticity index. What is its importance?	[3M]
	c)	State the different modes of soil water.	[4M]
	d)	What are the assumptions made by Boussinesq's in deriving the expression for stress in soil due to a point load on the ground surface?	[4M]
	e)	Briefly explain e-p and e-log p curves.	[4M]
	f)	What is critical void ratio? On which factor does it depend?	[3M]

PART –B

2	a)	Explain the Effect of compaction on soil properties.	[8M]
	b)	Describe the formation of soil due to mechanical weathering.	[4M]
	c)	How compaction of soil is controlled in field?	[4M]
3	a)	What is the use of classification of soils? Discuss Indian standard classification system?	[8M]
	b)	What are the different soil indices used in identification of soil? Describe each one. Give their uses.	[8M]
4	a)	A soil strata consists of 3 layers of thickness 1m, 1.5m and 2.0 m having the co-efficient of permeability of 2 x 10^{-3}cm/s, 1.5 x 10^{-3}cm/s and 3 x 10^{-3}cm/s respectively. Estimate the average co-efficient of permeability in the direction i) parallel to the bedding plane ii) normal to the bedding plane.	[8M]
	b)	Derive an expression to determine coefficient of permeability of soil by laboratory falling head permeability test.	[8M]
5		A rectangular area of 2m x 4m carries a uniformly distributed load 80 kN/sq.m at ground surface. Find the vertical pressure at 5m below the centre and corner of the loaded area. Solve the problem by a) dividing the rectangle into four equivalent rectangles, b) 2:1 method.	[16M]
6	a)	Discuss Terzaghi's theory of consolidation by stating the various assumptions and its validity.	[7M]
	b)	Describe square root time fitting method.	[6M]
	c)	Define coefficient of compressibility and coefficient of volume change.	[3M]

7 a) Sketch stress strain diagrams for loose sand, dense sand, soft clay and stiff clay and comment. [10M]

b) When do you use the following shear tests and give reasons: [6M]
(a) shear box;
(b) vane shear test;
(c) unconfined compression test .

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