

**M. CIVIL ENGG. 1<sup>ST</sup> SEMESTER EXAMINATION, 2017****(1st/~~2nd~~ Semester/~~Repeat~~/~~Supplementary~~ /~~Spl. Supplementary~~ /~~Old~~/~~Annual~~/~~Bi-Annual~~)****SUBJECT: SUBSOIL INVESTIGATION**

(Name in full)

**PAPER** ××××Time: ~~Two hours~~ / Three hours / ~~Four hours~~ / ~~Six hours~~**Full Marks 100**  
**(50 marks for each part)**

Use a separate Answer Script for each part

No. of Question	Page: 1 of 2	Marks
	<ul style="list-style-type: none"> <li>• <i>Maintain neatness.</i></li> <li>• <i>Assume reasonable data if it is not supplied.</i></li> <li>• <i>Answer any five questions</i></li> <li>• <i>All drawings-must be drawn by pencil</i></li> <li>• <i>No code etc. will be needed to answer the questions of this part.</i></li> </ul>	
(1)	<p>(a) Write short notes on any five from the followings:</p> <p>(i) Influence of GWT on foundation,</p> <p>(ii) Objectives of sub soil exploration,</p> <p>(iii) Depth of exploration,</p> <p>(iv) Semi-direct and indirect methods of exploration,</p> <p>(v) Representative &amp; non representative samples,</p> <p>(vi) Mode of operation of "shell &amp; auger" method,</p> <p>(vii) Areas suitable for extensive use of Soundings &amp; probing.</p> <p>(b) Name the different types of samplers. Discuss on standard split spoon sampler.</p>	5×3=15 2+3=5
(2)	<p>(a) What are the utilities of plate load test? A 30 cm square bearing plate settles by 8 mm in the plate load test on cohesionless soil, when the intensity of loading is 180 kN/m<sup>2</sup>. Estimate the settlement of a shallow foundation of 1.6m square under the same intensity of loading.</p> <p>(b) Discuss briefly about any three from the followings:</p> <p>(i) Percussion drilling,</p> <p>(ii) Seismic reflection method,</p> <p>(iii) Direct wave,</p> <p>(iv) Simplified mud boring</p> <p>(c) Discuss about the requirements of good sampling process.</p>	2+3=5 3×3=9 6
(3)	<p>(a) What should be the responsibilities of designer to ensure the proper execution of sub soil exploration?</p> <p>(b) Discuss about the information required from sub soil exploration.</p> <p>(c) What information should a good soil test report contain?</p>	6+7+7=20
(4)	<p>(a) Write short notes on any five from the followings:</p> <p>(i) Advantages of wash boring,</p> <p>(ii) Sampling from trial pits,</p> <p>(iii) Limitations of soundings,</p>	5×3=15

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- (4) (a) (iv) Number and disposition of trial pits,  
(v) Required safety measures to examine test pits,  
(vi) Types of structure in view of its orientation with respect to soil,  
(b) What precautions should be taken during SPT test? 5
- (5) (a) Discuss the Electrical Resistivity Method in detail. 15+5  
(b) "Will the result be more realistic if Seismic Refraction Method is being applied in combination with Electrical Resistivity Method to assess the probable picture of the soil below GL?"-give your view with proper logic.
- (6) (a) Name the phases of the four phased sequence of the subsoil investigation for a mega project. 4  
(b) Discuss in detail about each phase out of the four phases of the subsoil investigation for such a mega project. (4 × 4) =16