



**MUZAFFARPUR INSTITUTE OF TECHNOLOGY, MUZAFFARPUR**  
**B.Tech 6<sup>th</sup> Semester Mid-Term Examination, 2018**  
**Soil mechanics and Rock Mechanics (011X15)**

**Time: 2 hours**

**Full Marks: 20**

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**Instructions: (i) Attempt any four questions. Attempt at least one question from group A and B.**  
**(ii) Question No. 1 is compulsory.**  
**(iii) All questions carry equal marks.**

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**1. Chose the correct option of the following**

**(a) For triaxial test which of the following statement is true**

- i. Failure plane is horizontal plane
- ii. Failure plane is vertical plane
- iii. Failure plane makes some angle with horizontal
- iv. None of these

**(b) In which of the following shear strength test volume change behavior cannot be measured**

- (i) Triaxial compression test
- (ii) Direct shear test
- (iii) Vane shear test
- (iv) (i) and (ii) both

**(c) According to the 'Mohs Scale' hardness of diamond is considered as**

- (i) 10
- (ii) 9
- (iii) 2
- (iv) 1

**(d) As per geological classification marble is considered as**

- (i) Hard Rock
- (ii) Metamorphic rock
- (iii) Igneous Rock
- (iv) Soft Rock

**(e) Unconfined compressive strength can be written as**

- (i) Twice of compressive stress
- (ii) Half of unconfined shear strength
- (iii) Twice of cohesion of soil
- (iv) None of these

### Group A

2. What are the different laboratory tests for determination of strength behavior of soil?  
Explain any one of the test.
3. A direct shear test was performed in a 6cm x 6cm shear box on a sample of dry, cohesionless soil. Under a normal load of 40kg, failure occurred when the shearing force reached 26.65kg. Plot the Mohr's strength envelope and determine the angle of shearing resistance of the soil.
4. Derive the expression for the shear strength of soil for vane shear test.

### Group B

5. As per geological classification, what are the different types of rocks?
6. Write in brief about slake durability test.
7. Write a short note on the different properties of the rock.