# JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

## TEST -2 EXAMINATION- March-April 2017

### B.Tech VIII Semester AND M.Tech II Semester

COURSE CODE:12M1WCE211                                    MAX. MARKS: 25

COURSE NAME: Solid Mechanics in Structural Engineering

COURSE CREDITS: 03                                         MAX. TIME: 1.5 Hrs

**Note:** *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

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1. Discuss the Mohr's circles for the three dimensional state of stress.                    (5)

2. The state of stress at a point is characterized by the component $\sigma_x$= 100MPa , $\sigma_y$= -40MPa, $\sigma_z$= 80MPa, $\tau_{xy}$= $\tau_{yz}$= $\tau_{zx}$= 0.

   Determine the extremum values of the shear stresses, their associated normal stresses, the octahedral shear stresses and its associated normal stress.                    (5)

3. Show that Lame's ellipsoid and the stress director surface together completely define the state of stress at a point.                    (5)

4. Discuss the cubical dilation in analysis of strain.                    (5).

5. Discuss the maximum normal stress theory, Maximum shear stress theory, Maximum strain theory and octahedral shear stress theory.                    (5)