

## JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- Sep- 2017

B.Tech 7<sup>th</sup> Sem/M.Tech 1<sup>st</sup> Sem

COURSE CODE: 11M1WCE113

MAX. MARKS: 15

COURSE NAME: Design of Reinforced Concrete Structures

COURSE CREDITS: 3

MAX. TIME: One Hr

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

Q1. A rectangular beam 300mm×500mm effective depth is reinforced with 4 bars of 16mm  $\emptyset$  in tension zone. Determine the stress induced in the top compression fiber of the concrete and tension steel when it is subjected to a moment of 50kNm. Use M20 grade of concrete. Also subject the grade of steel to be used. Use WSM. (3)

Q2. Using yield line theory design a square slab of side 4m to support a service load of 4kN/m<sup>2</sup>. Use M20/Fe415. (3)

Q3. For an orthotropically reinforced restrained two way rectangular slab deduce an equation to find the ultimate load using yield line theory. Slab is subjected to UDL over its entire area (4)

Q4. Design a circular water tank with flexible base of 200,000 liter capacity. Depth of water in the tank is 5m. Use M25/Fe415 steel. Unit of water is 9.8kN/m<sup>3</sup>. Draw neat leveled diagram to show reinforcement detailing. (5)

CE-17, BTMT