JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- APRIL-2023

COURSE CODE(CREDITS): 18B1WCE831 MAX. MARKS: 25

COURSE NAME: ADVANCED REINFORCED CONCRETE DESIGN

COURSE INSTRUCTORS: Chandra Pal Gautam MAX. TIME: 1 Hour 30 Minutes

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Note: *All questions are compulsory. Marks are indicated against each question in square brackets.*

Q.1. **(a)** Mention different types of footings and the conditions in which they are preferred. **(b)** Differentiate between one way shear and two-way shear check used in design of footing. **(c)** Differentiate between working stress method, Ultimate load method and Limit state method.

[CO-2] [2+2+2 = 6]

Q.2 Design a square footing to carry an axial load of 1200 kN through a column of size 450 mm x 450 mm. Bearing capacity of soil is 105 kN/m^2. Assume footing to be 1.25 m below ground level and concrete of grade M25 and Fe415 steel. **[CO-3] [10]**

Q.3 Calculate size of footing and design for soil pressure, if the footing is subjected to a load of 2500 kN, moment along x axis (Mux) = 450 kN/m and moment along y axis (Muy) = 250 kN/m. Width of the footing is 4 m. **[CO-2] [4]**

Q.4. A rectangular combined footing is to be provided for two columns. Column 1, having size 400 mm x 600 mm is transferring a load of 2400 kN whereas column 2, having size 400 mm x 600 mm is transferring a load of 1500 kN. Centre to center distance between 2 column is 4 m, width of the footing is 4.2 m and soil bearing capacity is 160 kN/m^2. Calculate the size of footing and net soil pressure. **[CO-3] [5]**