

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -I EXAMINATION- 2023

B.Tech- V Semester (CE)

COURSE CODE(CREDITS):18B11CE515(3)

MAX. MARKS: 15

COURSE NAME: Design of Concrete Structures

COURSE INSTRUCTORS: Dr. Tanmay Gupta

MAX. TIME: 1 Hour

Note: (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems. IS 456:2000 code is allowed.

Q.1 Why is it necessary to put a limit on x/d (depth of neutral axis/ effective depth) allowed in singly reinforced beams as stipulated in IS 456 Clause 38.1? [1][CO2]

Q.2 Calculate the ultimate moment carrying capacity of a rectangular beam with width $b = 250\text{mm}$, $D = 400\text{mm}$, cover = 50mm, area of tensile steel 1800mm^2 . Assume M30 and Fe250. [4] [CO2]

Q.3 Determine the total reinforcement required for a beam with width $b = 300\text{mm}$, $D = 600\text{mm}$, Factored moment = 320kNm, Cover = 25 mm, M15 and Fe 415. [4] [CO2]

Q.4 Draw stress-strain curve of concrete and show the following: [2] [CO1]

(a) Initial tangent modulus E_c , (b) Secant modulus E_s at any point A on the stress-strain curve, (c) Tangent modulus E_t at A and (d) elastic and inelastic strain components of the total strain at A .

Q.5 State four objectives of the design of reinforced concrete structure. How many limit states are there name all of them, should a structure be designed following all the limit states? [2+2] [CO1]