

## JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

## TEST -3 EXAMINATION, 2016

## M.TECH IV SEMESTER

COURSE CODE: 10M13CE432

MAX. MARKS: 35

COURSE NAME: CONSTRUCTION METHODS IMPROVEMENT

COURSE CREDITS: 03

MAX. TIME: 2 HRS

*Note: All questions are compulsory. Draw figure, sketches and give suitable example to illustrate your answers. Assume missing data suitably if required. Carrying of mobile phone during examinations will be treated as case of unfair means.*

1. Explain the importance of curing in concrete? [3]
2. Explain with figures, how cement content and slump of concrete affect the flow resistance of concrete while pumping? State the effects of pumping on the concrete properties? [6]
3. Explain the hot weather problems in concrete and describe the different techniques to be adopted for concreting in hot weather condition? [4]
4. A firm plans to purchase at least 200 quintals of scrap containing high quality metal X and low quality metal Y. Scrap can be purchased from two suppliers A and B. Scrap must contain 100 quintals of metal X and no more than 35 quintals of metal Y. The percentage of X and Y metals in terms of weight in the scrap supplied by A and B are given as

Metal	Supplier A	Supplier B
X	25%	75%
Y	10%	20%

- The price of A's scrap is Rs 200 per quintal and that of B's is Rs 400 per quintal. Formulate as a linear programming problem to determine the quantity to be purchased from each supplier so that the cost is minimum. Do not solve. [4]
5. What are the conditions that should be satisfied for more than one optimal solution to an LPP to exist? [2]
  6. Solve the following problem using simplex method: [8]
 

Maximize  $Z = 2x_1 + 3x_2 + 4x_3$

Subject to  $3x_1 + x_2 + 4x_3 \leq 600,$

$2x_1 + 4x_2 + 2x_3 \geq 480,$

$2x_1 + 3x_2 + 3x_3 = 540,$

$x_1, x_2, x_3 \geq 0$
  7. A firm makes two products X and Y, and has a total production capacity of 9 tons per day, X and Y requiring the same production capacity. The firm has a permanent contract to supply at least 2 tons of X and at least 3 tons of Y per day to another company. Each tons of

X requires 20 machine hours production time and each tons of Y requires 50 machine hours production time. The daily maximum possible number of machine hours is 360. The entire firm's output can be sold, and the profit made is Rs 80 per ton of X and Rs 120 per ton of Y. it is required to determine the production schedule for maximum profit and to calculate this profit. Use graphical method to get your solution. Use graph paper. [8]