JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS-2022

B.Tech-VI Semester (Civil)

COURSE CODE (3 CREDITS): 18B11CE611   MAX. MARKS: 35

COURSE NAME: CONCRETE TECHNOLOGY

COURSE INSTRUCTORS: Dr. Tanmay Gupta   MAX. TIME: 2 Hours

Note: All questions are compulsory. Marks are indicated against each question in square brackets. IS 10262:2019 and IS 456:2000 are allowed.

Q1. Using IS 10262-2019 guidelines for concrete mix proportioning design a M25 concrete mix for a RCC structure subjected to mild exposure conditions during its service life for the following requirements:

(a) Design stipulations:

Degree of Workability: 100 mm slump

Degree of quality control: Weigh batching, occasional supervision, no past experience with this grade, standard deviation = 5.5MPa

(b) Characteristics of materials:

Cement: OPC 43, Specific gravity of cement: 3.15, Bulk density of cement: 1450kg/m³

Aggregates:	Fine Aggregate River sand (Zone II)	Coarse aggregates crushed granite
Max nominal size	----	20mm
Specific Gravity	2.60	2.65
Bulk density (kg/m³)	1700	1800
Fineness modulus	2.3	6.0
Free moisture content	2%	1%

If no admixture is utilized find out mix proportioning for SSD and dry conditions both. **[10]**

Q2. If Weight of saturated aggregate in water is 1304.3 gm, Weight of the saturated surface - dry aggregate in air is 2044.9 gm and Weight of oven dried aggregate in air is 2030.9 gm. Find out its specific gravity, apparent specific gravity, water absorption and bulk specific gravity? **[4]**

Q3. What are various methods of batching of concrete explain each of them briefly. For a nominal mix of 1:1.5:3 as per Table 9 IS 456:2000 find out weight of Sand and Coarse aggregate required per bag of cement. **[2+2]**

Q.4 Calculate the gel/space ratio and the theoretical strength of a sample of concrete made with 600gm of cement with 0.45 water/cement ration, on full hydration and at 70% hydration. **[3]**

Q.5 Strength of a sample of fully matured concrete is found to be 30.00MPa, find the strength of identical concrete at age of 14 days when cured at an average temperature of 35°C in during daytime and 5°C at nighttime. (Plowman's coefficient A =21, B = 61) **[2]**

Q.6 A concrete pump is placed 35 m from a building of height 40 m. The placing boom projects 3 m extra height over the building and it can reach a vertical height of another 20 m with four 90° bends and three 30° bends. The average output required is 30 m³/h. The diameter of the pipeline is 125 mm. The slump of concrete is 70 mm. First find out the theoretical length of pipeline. **[3]**

Q.7 Discuss in detail effects of inclusion of fly ash in concrete. **[3]**

Q.8 With the help of neat chart diagram explain classification of admixtures. **[2]**

Q.9 Why there is a need of taking due precautions in transportation of concrete, what considerations one shall have during transportation? Explain any 4 methods of concrete transportation. **[2+2]**