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Roll Number:_____

Thapar Institute of Engineering and Technology, Patiala

Department of Civil Engineering

END SEMESTER EXAMINATION

B. E. (Second Year): Semester-III (2019/20) (CED)	Course Code: UCE308 Course Name: Building Materials
16, December , 2019	Monday, 9:00 – 12.00 Hrs
Time: 3 Hours, M. Marks: 100	Name of Faculty: RS

Note: ***Attempt all questions***
Assume missing data, if any, suitably

Q.1 (a)	Explain the functions of Tricalcium Silicate compound of cement? Explain whether or not the properties of cement depend on the quality of clinker.	(10)
Q.1 (b)	The sieve analysis has been conducted on fine aggregate. The total weight of the sample is 1000 gm. After sieve analysis, the values appeared are tabulated below. Sieve Size (mm): 4.75 | 2.36 | 1.18 | 0.6 | 0.3 | 0.15 Wt. Retained (g): 0 | 100 | 250 | 350 | 200 | 100 Find the fineness modulus of fine aggregate and interpret the significance of the fineness modulus index number.	(10)
Q.2 (a)	Comment on the following statements; a) "Pure bending in a reinforced concrete beam plays a critical role in the evaluation of flexural strength of concrete". b) "Pozzolanic material helps in increasing the CSH gel in concrete".	(10)
Q.2 (b)	How is the indirect tensile strength conducted in a laboratory to find the tensile strength of concrete? Draw a schematic diagram of testing arrangement and stress profile also.	(10)
Q.3	Differentiate between mineral admixture and chemical admixture. Describe any one type of mineral and chemical admixture in detail.	(5)
Q.4	The Definition of High Performance concrete given by American Concrete Institute (ACI) and U.S. Federal Highway Administration (FHWA) is written below: **Definition Given by ACI** ➢ *HPC is defined as a concrete meeting special combination of performance and uniformity requirements that cannot always be achieved routinely using conventional constituents and normal mixing, placing, and curing practices.* **Definition Given by FHWA** ➢ *HPC is concrete that has been designed to be more durable and if*	(5+5)

	necessary, stronger than conventional concrete. HPC mixtures are essentially composed of the same materials as conventional concrete mixtures. But the proportions are designed or engineered to provide the strength and durability needed for the structural and environmental requirements of the project Differentiate between the HPC definition provided by ACI and FHWA. Which definition has been adopted in construction practice and why?	
Q. 5	The engineer in-charge at the site conducted the test on brick and found the bricks are lying in the category of class first, second, third and fourth. Write the name of the various tests of bricks. For what applications will the engineer recommend the first, second, third and fourth class bricks if the building construction at the site is going on?	(5)
Q.6	What are the merits of brick masonry over stone masonry?	(5)
Q. 7 (a)	In what way are the tensile stress-strain behavior of mild steel, Cold twisted deformed (CTD) bar, and Thermomechanically treated (TMT) bars different from each other.	(5)
Q.7 (b)	Describe the followings; a) Seasoning of Timber b) Star Shakes c) Heart Wood d) Layer between cambium and Heart wood e) Cup Shakes	(10)
Q. 8	Briefly describe the typical applications of I section, channel section, angle section, built up section and rolled steel plate sections. Draw the neat sketch of each section also.	(10)
Q. 9	Briefly describe the essence of; a) Asphalt b) Bitumen c) Insulating material d) Thinner used in paints e) Varnish	(10)