

Roll No.																			
----------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



**PRESIDENCY  
UNIVERSITY**  
BENGALURU

**School of Engineering**

**Mid - Term Examinations - November 2024**

**Semester:** 5<sup>th</sup>

**Date:** 06-11-2024

**Course Code:** CIV2019

**Time:** 09.30am to 11.00am

**Course Name:** Advanced Concrete Technology

**Max Marks:** 50

**Weightage:** 25%

---

**Instructions:**

- (i) Read all questions carefully and answer accordingly.  
(ii) Do not write anything on the question paper other than roll number.

**Part A**

**Answer ALL the Questions. Each question carries 2marks.**

**5Qx2M=10M**

- |          |                                                                                                                                                                                                                                                       |                |           |            |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------|------------|
| <b>1</b> | Concrete is a composite material composed mainly of cement, coarse and fine aggregates and water. Name basic properties of concrete.                                                                                                                  | <b>2 Marks</b> | <b>L1</b> | <b>C01</b> |
| <b>2</b> | Cement is the mixture of lime stone and clay which is burnt together under very controlled conditions, ground and then mixed with gypsum to prevent flash setting. What is 43 grade cement?                                                           | <b>2 Marks</b> | <b>L1</b> | <b>C01</b> |
| <b>3</b> | Modulus of elasticity of concrete is the ratio of stress to strain of the concrete under the application of loads. It indicates a material's resistance to being deformed when a stress is applied to it. In relation to this define poisson's ratio. | <b>2 Marks</b> | <b>L1</b> | <b>C02</b> |
| <b>4</b> | Cement is a binder, a substance that sets and hardens and can bind other materials together. List the important properties of cement.                                                                                                                 | <b>2 Marks</b> | <b>L1</b> | <b>C01</b> |
| <b>5</b> | Creep and shrinkage are time-dependent strains that involve the movement of water. Creep strains occur when water is forced to move by stress. Write the factors affecting creep.                                                                     | <b>2 Marks</b> | <b>L1</b> | <b>C02</b> |

**Part B**

**Answer ALL Questions. Each question carries 10 marks.**

**4QX10M=40M**

- |          |                                                                                                                                                                          |                 |           |            |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------|------------|
| <b>6</b> | Hydration is the process by which Portland cement becomes a firm, hardened mass after the addition of water. Illustrate about bogue's compounds formed during hydration. | <b>10 Marks</b> | <b>L2</b> | <b>C01</b> |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------|------------|

**Or**

- 7 Cement, a covering substance, is used to bind aggregates and reinforce elements. Over the years, the cement industry in India has grown, thanks to technology. In the production of concrete, there are numerous types of cement used. Based on the components used to create it, each variety of cement has unique qualities, applications, and advantages. Explain about rapid hardening cement. **10 Marks L2 CO1**
- 8 The modulus of elasticity found from actual loading is termed as static modulus of elasticity. As concrete is an imperfect elastic material, stress strain diagram is a curved line. In relation to this explain tangent modulus, secant modulus and chord modulus. **10 Marks L2 CO2**
- Or**
- 9 Shrinkage is a cause of dimensional instability. Shrinkage is the broad term used to describe the reduction of volume of concrete. Shrinkage is due to loss of moisture. Summarize about different types of shrinkage. **10 Marks L2 CO2**
- 10 The durability of cement concrete is defined as its ability to resist weathering action, chemical attack, abrasion, or any other process of deterioration. Construct the flow chart of recommendation of ways to have durable concrete with desirable composition. **10 Marks L3 CO2**
- Or**
- 11 Durable concrete will retain its original form, quality, and serviceability when exposed to its environment. Different concrete requires different degrees of durability depending on the service environment, properties desired and design life of the structure. Build the flow chart for factors affecting durability. **10 Marks L3 CO2**
- 12 Aggregates are used as structural fillers occupying nearly 70-80% of volume of concrete. 15 billion tons of aggregates are used in concrete worldwide. Natural or Artificial obtained by crushing stone or sand. Construct the flow chart of aggregate properties and their influence on concrete properties. **10 Marks L3 CO1**
- Or**
- 13 When water is added to the cement, its ingredients react to each other with the help of water and forms some complex chemical compounds. These complex compounds are called Bogue's compounds. Construct the graph for the development of strength of Bogue's compounds. **10 Marks L3 CO1**