Name: **ID:**

Student sign: **Invigilator sign:**

PART A (CLOSED BOOK - 52 Marks), Max. time: 2 hours

➕ **Write NEAT and CLEAN and to the point answers.**
➕ **Use the space judiciously. Use Part B answer book (back pages) for any rough work**

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1. Briefly define the following in context of civil engineering materials [16]:

Tempering:

Quoin closer:

Chisel:

Glass transition temperature:

ASR:

ITZ:

Pozzolan:

Urban heat island:

Nominal maximum aggregate size:

Gradation:

Bulking:

Entrained air:

Superplasticizer:

Drying Shrinkage:

Plastic shrinkage:

Contraction joint:

2. How does creep in concrete lead to loss of prestress [4].

3. Briefly explain any 4 improvements in wood after seasoning. Compare air vs kiln seasoning. [4]

Air	Kiln

4. Derive the formula for flexural strength in 3-point bending test. (Assume: P= max. total load, L= span length, b= specimen width, d= specimen depth) [4]

5. Compare the stress-strain relationship for FRP composite and steel. Mention 2 applications of FRP in construction industry. [4]

6. Clearly explain using suitable figures why compressive strength of a standard concrete cube is observed to be higher than that of a standard concrete cylinder? [4]

7. You have two FRC specimens A & B. The only difference in their mix design being of fiber type. 'A' uses asbestos fibers. 'B' uses PP fibers. For the two specimens, compare the following properties (a) bond with matrix (b) ductility of the composite (c) resistance of the composite to impact loads (d) tendency for fiber pull out. [4]

8. Differentiate between true stress and engineering stress. Tensile test was conducted on a TMT steel circular rebar to measure its mechanical properties. Given that the percentage elongation observed was 18% and elongation length between gauge points was 11.8 cm. What was the diameter of steel bar used for the test? [4]

9. What is the purpose of [4]:

TFOT:

Flash point test:

Adding sand to lime mortar:

Not using fat lime for thick walls:

10. Draw four types of bonds in brick masonry [4].