MASTER OF CONSTRUCTION ENGINEERING EXAMINATION, 2017
(1st Semester)
CONSTRUCTION MANAGEMENT AND ESTIMATION OF REPAIR

Time : Three Hours

Full Marks : 100

Answer any *FOUR* questions.

Answer all parts of the same question *SERIALLY* & written together. This should be *STRICTLY ADHERED* to.

Please use a *FRESH* page while answering a *NEW* question or any part of a new question. Assume any reasonable data as considered necessary.

1. Elaborate an idea of 'Escalation Clause' in a Contract. Is it contradictory to the concept of the phrase 'Time is the essence of the contract' – Examine critically, Further discuss in brief the idea of 'Termination of Contract' all with special reference to contracts of retrofit technology.

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2. Why is it necessary that a contractor should seek a 'Completion Certificate' ? Discuss the concept of 'Liquidated Damages' & its validity during 'Defects Liability Period' for a retrofit contract.

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3. Annotate (any five)

    $5 \times 5 = 25$

    (a) 'Force Majure'.
    (b) Retention Money & Security Deposit.
    (c) EMD & its equivalence to 'consideration' in the light of 'Law of Contracts'
    (d) Safety Code to be maintained at a Repair Engineering Site.
    (e) Site Instructions Flow Chart in Retrofit Work
    (f). Schedule of rates on a Tender Document in a Retrofit Contract.

4. The condition assessment of a RC dome of supported span 18.0 M & central quarter sector angle is $55°$ reveals that the 75 mm section dome has a void percentage of 16 % to be grouted with epoxy grouts to the extent of 96 %. Determine the mass of grout material to be used with a specific gravity of 1.45 to achieve a compaction to that extent. Further nozzles / nipples (of area 1.5 mm^2) are being placed @ 400 mm c/c on the both the faces of the dome section for grouting work. Calculate the pressure necessary for the grouting work so as to categorize the Grout pump. Draw a sketch to elaborate your answer.

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5. Carbon fibre wrapping were applied to strengthen 10 columns of the ground floor of a multi-storeyed building. The fibre is 1.0 mm in thickness & 50.0 mm wide. Calculate the mass of the fibre material needed to be applied for a double layer of wrapping on a column with height 3.50 M with a section of 1.2 M X 1.4 M. Density of fibre material is 2.1 $gmcm^{-3}$. Consider an edge clearance of 2.0 cm at the ends of the columns. The columns were pre-grouted with epoxy of a specific gravity of 1.52 to achieve a compaction of 96% & the void assessment of the columns earlier revealed the void percentage to be 15 %

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