

(03 HOURS)

TOTAL MARKS : 80

Instructions : (1). Question No .1 is compulsory

(2) Answer any *Three Questions* from the remaining.(3) Each full question carries **20** marks.

(4) Numbers in the parenthesis are right to indicate full marks.

(5) Assume suitable data, if needed and state it clearly.



- Q.1 Attempt any *four* of the following.
- Define concrete and enlist merits and demerits of it. [05]
 - Enlist the properties of glass. [05]
 - Enlist methods of damp proofing and explain D.P.C. [05]
 - Enlist the physical properties of OPC as per BIS code and explain any one of them in brief. [05]
 - Define durability of concrete and explain factors affecting of it. [05]
 - What is the NDT of concrete? Enlist the ratings of pulse velocity for various quality grades of concrete. [05]
- Q.2 a) Design a nominal mix of M20 concrete grade for zone-II grading of fine aggregates and MSA 10 mm to carry-out DPC work at site, in accordance with clause number 9.3 of IS 456 : 2002. Tabulate the results in: 1) by mass & 2) by ratio. [12]
- Define admixture. Enlist the functions of admixture. [04]
 - Explain heat of hydration in-case of Ordinary Portland Cement. [04]
- Q.3 a) What are the points to be considered while selecting a quarry site? Explain wedging method of quarrying of stone with neat labeled sketches. [10]
- Give any two material which can used for sound insulating purpose. [02]
 - Draw a neat layout sketch of RMC plant. [08]
- Q.4 a) Define bulking of a sand and explain bulking phenomenon of sand with labeled sketches. [10]
- Define workability of a fresh concrete and enlist the laboratory tests required to measure workability of it. [03]
 - Draw a neat, labeled sketch of 'Tamping rod' with dimensions and state it's practical application. [03]
 - Explain the relation between durability and permeability of concrete. [04]
- Q.5 a) Calculate the ingredients of concrete, required to perform the 'Slump Cone Test' in the lab. If the Design mix proportions for M30 grade of concrete by ratio's are 0.45 : 1 : 1.32 : 2.86 and density of concrete as 2450 kg/m³. [12]
- Explain 'Schmidt's Rebound Hammer Test' in the case of NDT of concrete. [08]
- Q.6 a) Write any five types of Paints used in Building construction. [05]
- State & Explain Duff Abram's W/C ratio law. [05]
 - Enlist any four physical properties of CA and explain their influence on properties of concrete. [05]
 - Enlist the advantages of RMC. [05]

QP code
85942

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R209 code
1T00634



Data for Q.2 a)
Table-Proportions for Nominal Mix Concrete

Grade of Concrete	Total Quantity of Dry Aggregates By Mass per 50 kg of Cement, to be Taken as the Sum of the Individual Masses Fine and Coarse Aggregate kg, Max	Proportion of Fine Aggregate to Coarse Aggregate (by Mass)	Quantity of Water per 50 kg of Cement, Max litres
M5	800	Generally 1:2 but subject to an upper limit of 1:1.5 and a lower limit of 1:2.5	60
M7.5	625		45
M10	480		34
M15	330		32
M20	250		30

Note:- The proportion of fine to coarse aggregates should be adjusted from upper limit to lower limit progressively as the grading of fine aggregates becomes finer and the maximum size of coarse aggregates becomes larger. The graded coarse aggregate shall be used.

Example

For an average grading of fine aggregate(that is zone-II of table 4 of IS383), the proportions shall be 1:1.5, 1:2 and 1:2.5 for maximum size of aggregates 10 mm, 20 mm and 40 mm respectively

Data for Q. 5 a)

Slump Cone Mould :- The mould for the test specimen shall be in the form of the frustum of a cone having the following internal dimensions:

Dimensions	cm
Bottom diameter	20
Top diameter	10
Height	30
