



# MUTHAYAMMAL ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi, Accredited by NAAC & Affiliated to Anna University)

Rasipuram - 637 408, Namakkal Dist., Tamil Nadu

**MKC**

**CIVIL**

**Must Know Concepts (MKC)**

**2021-22**

Subject		19CEE08 / CONCRETE TECHNOLOGY		
S.No	Term	Notation (Symbol)	Concept/Definition/Meaning/Units/Equation/Expression	Units
<b>UNIT I CONSTITUENT MATERIALS</b>				
1	Pozzolonas	-	Chemically react with calcium hydroxide at ordinary temperature .	-
2	Natural pozzolonas	-	Clay and shales, diatomaceous earth	-
3	Artificial pozzolonas	-	Surkhi, fly ash, blast furnace slag, silicafume.	-
4	Bulking of sand	-	Increase in its volume.	-
5	Types of mortars	-	Mud mortar, Lime mortar, Gauged mortar	-
6	Lime mortar.	-	If lime is used as a binding material	-
7	Construction materials	-	The materials used for building construction	-
8	Hardness	-	Property of a material to resist against penetration.	-
9	Elasticity	-	The property, by which the material regains its original position after removing the load.	-
10	Strength	-	Maximum load carried by a material per unit area.	-
11	Porosity	-	Ratio between volumes of solid present in that material.	-
12	Stone	-	Important natural material used for construction .	-
13	Crushing test	-	It determines the compressive test of stones.	-
14	Cement mortar	-	Mix of cement, sand, water in desired proportion.	-
15	Processes of manufacture of cement	-	Dry process and wet process.	-
16	Setting time of cement test	-	Time required for stiffening of cement paste.	-
17	Consistency test	-	Mix of water to cement in the correct proportion.	-

18	Flexural strength	-	To determine the tensile strength	-
19	Fineness	-	The smoothness of cement.	-
20	Concrete	-	Mixture of cement, sand, aggregate and water.	-
21	Compactability	-	Air trapped during mixing is easily removed by compaction.	-
22	Stability	-	Concrete remains homogeneous and uniform.	-
23	Workability	-	Homogeneity of ease to work with concrete.	-
24	Curing	-	Supply of water to concrete to complete hydration process & gains strength.	-
25	Vibrator	-	An instrument used for compaction.	-
<b>UNIT II ADMIXTURES AND THEIR EFFECTS</b>				
26	Floating	-	Removing irregularities from the concrete surface.	-
27	Admixture	-	Plasticizer, super plasticizer, accelerator, retarder	-
28	Creep	-	Tendency of material to move slowly under influence of stress.	-
29	Fibre textile	-	It is the hair like structure and small in diameter.	-
30	Sealant	-	Used to block the passage of liquid or air through joints of materials.	-
31	Laminar composites	-	It is the material of containing several layer.	-
32	Segregation.	-	Coarse aggregate grains from the concrete mass	-
33	Admixtures	-	To improve the quality of concrete.	-
34	Types of joints in concrete.	-	Construction joints, Expansion joints	-
35	The test adopted to test the properties of cement in laboratories	-	Fineness, Consistency test	-
36	Types of admixtures	-	Chemical admixtures, Mineral admixtures	-
37	Plasticizers	-	Plasticizers for concrete increase the workability of the wet mix.	-
38	Accelerators	-	Accelerators reduce the setting	-
39	Retarders	-	Retarders increase the setting	-
40	Mineral admixtures	-	E.g.: fly ash	-
41	Accelerators	-	Accelerators reduce the setting time	-

42	Size of concrete cube	-	150mmx150mmx150mm	mm
43	Characteristic compressive strength	$f_{ck}$	Not more than 5% of test results are expected to fall	N/mm <sup>2</sup>
44	Ordinary concrete grade	$f_{ck}$	M <sub>10</sub> ,m <sub>15</sub> ,m <sub>20</sub>	N/mm <sup>2</sup>
45	Standard concrete grade	$f_{ck}$	M <sub>25</sub> ,m <sub>30</sub> ,m <sub>35</sub> , m <sub>40</sub> , m <sub>45</sub> , m <sub>50</sub> , m <sub>55</sub>	N/mm <sup>2</sup>
46	High strength concrete grade	$f_{ck}$	M <sub>60</sub> to M <sub>80</sub>	N/mm <sup>2</sup>
47	Mix ratio for M <sub>10</sub> grade concrete	-	1:3:6	-
48	Mix ratio for m <sub>15</sub> grade concrete	-	1:2:4	-
49	Mix ratio for M <sub>20</sub> grade concrete	-	1:1.5:3	-
50	Nominal mix	-	Upto M <sub>25</sub> grade of concrete	-

### UNIT III PROPORTIONING OF CONCRETE MIX

51	Design mix	-	Above M <sub>25</sub> grade of concrete	-
52	Shear force	V <sub>u</sub>	V <sub>u</sub> =F <sub>d</sub> .l	KN
53	Unit weight of aggregate	-	1750 kg/cu.m	kg/cu.m
54	Design load	-	Partial factor of safety × characteristics load	KN
55	The purpose of retarders	-	Retarders increases the setting time of concrete mix and reduce the water cement ratio.	-
56	Types of plasticizers	-	Finely divided minerals,Air entraining agents	-
57	Few mineral admixtures	-	Silica fume,GGBFS	-
58	The various admixtures used other than chemical and mineral admixtures	-	Gas forming and expansive chemicals,Curing compounds	-
59	The admixtures available in india	-	Plasticizers,super plasticizers	-
60	Natural pozzolonas	-	Clay and shales, opalinccherts, diatomaceous earth.	-
61	Mix design	-		-
62	The variable factors to be considered in connection with specifying a concrete mix	-	Water cement ratio,Consistency	-

63	The various methods of proportioning	-	Arbitrary proportion,Fineness modulus method	-
64	The common terminologies used in the statistical quality control	-	Standard deviation,Coefficient of variation	-
65	Types of mixes.	-	Nominal Mixes.Standard mixes,Designed Mixes	-
66	The factors affecting the choice of mix proportions	-	Compressive strength,Workability,Durability	-
67	The methods used to concrete mix design for ordinary concrete	-	IS method,ACI method	-
68	The principle of mix proportioning	-	Degree of workability,Air entrained agent	-
69	The properties related to mix design	-	Workability,strength	-
70	The physical properties of materials required to mix design	-	Cement,aggregate,water,admixture	-
71	Nominal mix	-	Nominal mix is permitted by IS456:2000	-
72	Design mix	-	Design mix is permitted by IS 10262-1982	-
73	The advantages of design mix	-	Cement content is low and hence the mix design is economical.	-
74	Aci	-	American concrete institute	-
75	The data used for ACI	-	Fineness modulus,Unit weight of dry rodded coarse aggregate	-

#### **UNIT IV FRESH AND HARDENED PROPERTIES OF CONCRETE**

76	Fresh Concrete	-	Freshly mixed material which can be moulded into any shape.	-
77	Workability	-	Determines the amount of useful internal work necessary to produce full compaction.	-
78	The important parameters of workability	-	Fully compaction of concrete,Lubrication to the concrete properties	-
79	The quality of concrete	-	Satisfying to the requirement of good workability.	-
80	The factors affecting workability	-	Size of aggregates,Shape of aggregates	-

81	The tests are used the measurement of workability	-	Slump test,Compacting factor test,Flow test.	-
82	Segregation	-	The constituent materials on concrete.	-
83	Compaction of concrete	-	The process adopted for expelling the entrapped air from the concrete.	-
84	The methods are adopted for compacting the concrete	-	Hand compaction Compaction by vibration	-
85	The various stages of manufacturing of concrete	-	Batching,mixing,transporting,placing,compactin g,curing,finishing.	-
86	The methods for transportation of concrete	-	Crane, bucket and rope way,Belt conveyers	-
87	The setting time of concrete	-	W/c ratio, temperature conditions, type of cement, use of mineral admixture.	-
88	Damp proofing	-	It prevent the entry of water	-
89	Effect of dampness	-	It cause cracks ,Electrical fitting may get damaged ,Termite growth is promoted	-
90	Requirement of good DPC material	-	The material should be impervious and durable It should be able to resists load	-
91	Materials used for damp proofing	-	Hot bitumen ,Cement concrete ,mortars	-
92	The methods for making high strength concrete	-	Use of admixtures,High speed slurry mixing.	-
93	The techniques adopted in high strength of concrete	-	Compaction by pressure,Polymerization in concrete.	-
94	The standard size of prism moulds	-	15 x 15 x 70 cm.	-
95	Types of curing methods	-	Water curing,Membrane curing	-
96	The ways of water curing	-	Ponding,Wet covering.	-
97	The advantages for application of heat	-	Prestressing bed can be released early for further casting.	-
98	The considerations involved in steam curing	-	A period for retaining the temperature.	-
99	Abram's water cement law	-	Strength of concrete depends on the water cement ratio used.	-

100	The tests to find the workability of concrete	-	Slump test, Compacting factor test, Flow test, Kelly ball test, Vee bee test	-
<b>UNIT V SPECIAL CONCRETES</b>				
101	Light weight concrete	-	Concrete density varies from 300 to 1850 kg/m <sup>3</sup>	-
102	Test conducted to test the properties of hardened concrete	-	Split Tensile Test, Shear strength	-
103	The requirements of fresh concrete	-	Mixability, stability	-
104	The usage of slump values	-	0 – 25 mm are used in road, 10 – 40 mm are used for foundations with light reinforcement	-
105	Batching	-	Various materials used in the concrete mix.	-
106	Hardened concrete and mention the factors influence its strength	-	Water cement ratio, Degree of compaction	-
107	Shrinkage	-	Volume change due to loss of moisture affects durability and strength	-
108	The adoptions of light weight concrete	-	Clinker, Fly ash, Slag.	-
109	The types of natural light weight aggregates	-	Saw dust, Rice husk.	-
110	The applications of fibre reinforced concrete	-	Pipes, boats, beams, wall & roof panels	-
111	The types of polymer concrete	-	Polymer impregnated concrete (PIC), Polymer cement concrete (PCC)	-
112	The properties of polymer impregnated concrete.	-	Stress- strain relationship, Compressive strength	-
113	Exfoliation	-	Raw vermiculate is a micaceous mineral and has a laminar structure.	-
114	Aerated concrete	-	Air or gas into a slurry composed of Portland cement.	-
115	High density concrete	-	Unit weight ranging from about 3360 kg/m <sup>3</sup> to 3840 kg/m <sup>3</sup> .	-
116	Sulphur infiltrated concrete	-	Sulphur impregnation has shown great improvement strength	-

117	Fibre reinforced concrete	-	The addition of small closely spaced and uniformly dispersed fibres to concrete	-
118	Types of fibres used in fibre reinforced concrete	-	Steel fibres, Polypropylene fibres, Nylons	-
119	Foamed slag	-	Its made by rapidly quenching blast furnace slag, roduced in the manufacture of iron.	-
120	The properties of foamed slag	-	Free from contamination of heavy impurities, Free from excess of sulphate.	-
121	The properties of polymer impregnated concrete.	-	Stress- strain relationship, Compressive strength, Tensile strength.	-
122	Lime mortar.	-	If lime is used as a binding material	-
123	The purpose of using accelerators	-	To permit earlier removal of formwork	-
124	Chemical admixtures	-	The molding and setting properties of concrete mix	-
125	The tests are used the measurement of workability	-	Slump test, Compacting factor test, Flow test.	-

Subject		General/Aptitude		
S.No	Term	Notation ( Symbol)	Concept/Definition/ Meaning//Equation/ Expression	Units
126	The unit weights of plain concrete	-	24 KN/m <sup>3</sup>	-
127	Unit weights of reinforced concrete	-	25 KN/m <sup>3</sup>	-
128	Spacing of reinforcement	-	(ast/Ast) * (1000)	-
129	Modular ratio	M	$M = (280 / 3 * \sigma_{cbc})$	-
130	Max B.M for circular water tank	M	$M = 0.0122 wH^3$ at base	-
131	Max S.F for circular water tank	V	$V = 0.158 wH^2$	-
132	Minimum area of steel up to 100 mm thickness	%	0.3 % of Gross cross sectional area	-

133	Minimum area of steel up to 450 mm thickness	%	0.2 % of Gross cross sectional area	-
134	Minimum cover to all the reinforcement	$\Phi$	25 mm (or) diameter of main bar	-
135	The amount of reinforcement for main bars in a slab, is based upon	-	Maximum bending moment	-
136	The width of the rib of aT-beam is generally kept between	-	1/3 to 2/3 of rib depth	-
137	The thickness of base of a retaining wall generally is	-	Width of the stem at the bottom	-
138	What is the average of first five multiples of 12?		36	-
139	What is the HCF of 1095 and 1168?		73	-
140	What is the area of triangle with base 5m and height 10m		25	-
141	A: B: C is in the ratio of 3:2:5. How much money will C get out of Rs1260?		630	-
142	What is the probability of getting an even number when a dice is rolled?		1/2	-
143	Correction for standard length	$C_a$	$LC/1$	m
144	Correction for slope	$C_{sl}$	$h^2/2L$	m
145	Correction for tension	$C_p$	$(P-P_0/AE) \times L$	m
146	The diameter of main bars in R.C.C columns shall not be less than	-	12	mm
147	The maximum area of tension reinforcement in beams shall not exceed	-	4 %	-
148	The amount of reinforcement for main bars in a slab, is based upon	-	Maximum bending moment	-
149	The width of the rib of aT-beam is generally kept between	-	1/3 to 2/3 of rib depth	-
150	The thickness of base of a retaining wall generally is	-	Width of the stem at the bottom	-
Faculty Team prepared		M.Gopinath AP/Civil	Signatures	

HOD