BACHELOR OF ENGINEERING (CIVIL ENGINEERING) FOURTH YEAR SECOND SEMESTER EXAM 2022

CONCRETE TECHNOLOGY PART-I

Time: Three Hours

Full Marks 100 (50 marks for 1st part)

Use a separate Answer-Script for each part
[No code or handbook is allowed, assume any suitable data]

No. of questio			Marks (50)	
	n a mix proportion of following concrete (15)		15	7
	ade designation- M40			
b) Ty	pe of cement -OPC 43 grade conforming to IS 8112		S A	
c) Ty	pe of mineral admixture -Fly ash conforming to IS 3812 (Part I)			1
d) Ma	iximum nominal size of aggregate -20mm			
	nimum cement content -320 kg/m'			
	ximum water-cement ratio -0.45			
	orkability-75 mm (slump)			
h) Exp	posure condition -mild (for reinforced concrete)			
	thod of concrete placing- Pumping		1.	
	gree of supervision -Good			
	pe of aggregate -Crushed angular aggregate			
	ximum cement (OPC) content-450 kg/m'			1
p) Ch	emical admixture type- Superplasticizer	0.00		
	DATA FOR MATERIALS			
	ment used- OPC 43 grade conforming to IS 8112			1 6
(b) Spe	ecific gravity of cement- 3.15			
c) Fly	ash Conforming to- IS 3812 (Part I)			1
	ecific gravity of fly ash - 2.2			
	emical admixture- Superplasticizer conforming to IS 9103			
	cific gravity of:			
	arse aggregate-2.74			
	e aggregate-2.74			
	ter absorption:			1
	arse aggregate-0.5%			
	e aggregate-1%			
h) Fre	e (surface) moisture:			1

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lo. of uestio ns					H	•			Marks (50)
1) Coa	Siev	nggregate-Nil 2 e analysis: Table I Valt (Clause 4	ie of X 1.2)	egate- N IS Sieve Sizes	Analys Coai Aggre		ible 4 Water Content per Concrete For Nominal Ma		
	SI No. (1)	(2)	Value of X	mm	Fraci		Aggregate		
	i)	MIO	5.0	-	ہے۔		(Clause 5.3)		_
	ii)	M15 M20 M25	5.5	20	100.17	SI No.	Nominal Maximum Size of Aggregate mm	Water Content ¹⁾ kg	
	iii)	M30 M35		20 10 4.75	100 10 0 7	(1)	(2) 10 20	(3) 208 186	-
		M40 M45 M50	6.5	2.36		ii) iii) !Water	40 content corresponding to saturate	165	
		M55 M60	8.0	Con	oming	T dic.	content corresponding to an analysis	, ,	
	IV)	M65 and above	0.0					Ť	
G)									

BACHELOR OF ENGINEERING (CIVIL ENGINEERING) FOURTH YEAR SECOND SEMESTER EXAM 2022

CONCRETE TECHNOLOGY PART-I

Time: Three Hours

Full Marks 100 (50 marks for 1st part)

Use a separate Answer-Script for each part [No code or handbook is allowed, assume any suitable data]

qu	o. of estio		Marks (50)
	1	percentage of C3S, C2S, C3A and C4AF. What is lime saturation factor of this cement? pasis of the result comment on this cement.	
3) a) b)		down the chemical reactions takes place while adding water into cement. y describe the dry process of manufacturing of cement.	5
4)	Answer a)	er any three of the followings Fiber reinforced concrete Superplasticiser	5X3 = 15

CONCRETE TECHNOLOGY PART-I

Time: Three Hours

Full Marks 100 (50 marks for Ist part)

Ose a separate Answer-Script for each part	
[No code or handbook is allowed, assume any suitable da	ta]

o. of estio ns								50	1ark (50)
	Table 3 Ap	pproximate Air ((Clause 5.2)	Content	8	80				
SI No.	Nominal Maxim of Aggreg mm	ate	trapped Air, as Percentage lume of Concrete	Smm	50	CURVE 3			
(1)	(2)		(3)	5	0	\leftarrow			
i)	10		1.5	5_		CURV	E 2		
ii)	20		1.0	£ 4	0	A X	-		
iii)	40		0.8	. 98		XX			
				£ 3	0 CURVE				
				SIVE					
1				£ 20	0				
1				š				7	
				ۆ 10 ئۇ 10	0				
				8 (
1				-	0.25 0.3 0.35	0.4 0.45 0.5	0.55 0.	6 0.65	
						FREE WATER CEMENT RATIO	0		
	Table 5	Volume of Coars	e Aggregate per Unit	eT al	Augregate for I	different Zones of			
	Table 5	Volume of Coars Aggregate f	e Aggregate per Unit for Water-Cement/Wa	Volume of Total ster-Cementition Vause 5.5)	Aggregate for I is Materials Rat	Different Zones of tio of 0.50	Fine		
		Volume of Coars Aggregate f	(C	Volume of Total ster-Cementition Clause 5.5)	Aggregate for I is Materials Rat	Different Zones of tio of 0.50	Fine		
	SI No	Aggregate i	Volume of Coarse Aggre	Volume of Total ster-Cementition Clause 5.5) egate per Unit Volum Ag	Aggregate for I is Materials Rai ne of Total Aggrega gregate	Different Zones of tio of 0.50	Fine		
	SI No	Aggregate in a size of Aggregate mm	Volume of Coarse Aggre	Volume of Total ster-Cementition Clause 5.5) egate per Unit Volum Ag	Aggregate for I is Materials Rai ne of Total Aggrega gregate Zone II	Different Zones of tio of 0.50 te for Different Zones	Fine		
	SI No.	Aggregate 1 minal Maximum Size of Aggregate mm (2)	Volume of Coarse Aggree Zone IV (3)	Volume of Total ster-Cementition Clause 5.5) Egate per Unit Volum Age Zone III	Aggregate for I is Materials Rui ne of Total Aggrega gregate Zone II (5)	Different Zones of tio of 0.50 te for Different Zones	Fine		
	SI No. No.	Aggregate initial Maximum Size of Aggregate mm (2)	Volume of Coarse Aggree Zone IV (3) 0.54	Volume of Total ster-Cementitiou Clause 5.5) gate per Unit Volum Agi , Zone III (4) 0.52	Aggregate for I is Materials Rai ne of Total Aggrega gregate Zone II	Different Zones of tio of 0.50 te for Different Zones Zone I	Fine		
	SI Noi No.	Aggregate initial Maximum Size of Aggregate mm (2) 10 20	Zone IV (3) 0.54 0.66	Volume of Total ster-Cementitiou Clause 5.5) sgate per Unit Volum Ag Zone III (4) 0.52 0.64	Aggregate for I Is Materials Rut ne of Total Aggrega gregate Zone II (5) 0.50	Different Zones of the of 0.50 te for Different Zones Zone 1 (6) 0.48	Fine		
	SI No. No.	Aggregate initial Maximum Size of Aggregate mm (2)	Volume of Coarse Aggree Zone IV (3) 0.54	Volume of Total ster-Cementitiou Clause 5.5) gate per Unit Volum Agi , Zone III (4) 0.52	Aggregate for I	Different Zones of tio of 0.50 te for Different Zones Zone I (6) 0.48 0.60	Fine		
	(I) i) ii) iii) NOTES	Aggregate i	Zone IV (3) 0.54 0.66 0.73	Volume of Total ster-Cementition Clause 5.5) gate per Unit Volum Agg Zone III (4) 0.52 0.64 0.72	Aggregate for I	Zone I (6) 0.48 0.60 0.69	Fine		
	SI Noi No.	Aggregate 1 ninal Maximum Size of Aggregate mm (2) 10 20 40 te based on aggregates	Volume of Coarse Aggree Zone (V (3) 0.54 0.66 0.73 in saturated surface dry cond	Volume of Total ster-Cementitiou Clause 5.5) gate per Unit Volum Ag, Zone III (4) 0.52 0.64 0.72	Aggregate for I s Materials Rat me of Total Aggrega gregate Zone II (5) 0.50 0.62 0.71	Different Zones of tio of 0.50 Tone I (6) 0.48 0.60 0.69	Fine of Fine		
	SI Noi No. (1) ii) iii) NOTES I Volumes a 2 These volu	Aggregate i minal Maximum Size of Aggregate mm (2) 10 20 40 re based on aggregates mes are for crushed (ar	Volume of Coarse Aggree Zone (V (3) 0.54 0.66 0.73 in saturated surface dry condingular) aggregate and suitable	Volume of Total tter-Cementitiou Clause 5.5) gate per Unit Volum Ag, Zone III (4) 0.52 0.64 0.72	Aggregate for I Is Materials Rat me of Total Aggrega gregate Zone II (5) 0.50 0.62 0.71 . made for other shape sources, normally, cr	Different Zones of tio of 0.50 Tone I (6) 0.48 0.60 0.69	Fine of Fine		
	(I) i) ii) iii) NOTES I Volumes a 2 These volu 3 Suitable ac	Aggregate i minal Maximum Size of Aggregate mm (2) 10 20 40 re based on aggregates mes are for crushed (ar fjustments may also be	Zone IV (3) 0.54 0.66 0.73 in saturated surface dry condingular) aggregate and suitable emade for fine aggregate fro	Volume of Total ster-Cementitiou Clause 5.5) gate per Unit Volum Ag Zone III (4) 0.52 0.64 0.72	Aggregate for I	Different Zones of tio of 0.50 To of 0.50 Zone I (6) 0.48 0.60 0.69 To faggregate. ushed sand or mixed sa	Fine of Fine		
	(1) i) ii) iii) NOTES I Volumes a 2 These volu 3 Suitable ac need lesser if	Aggregate in minal Maximum Size of Aggregate mm (2) 10 20 40 to based on aggregates mes are for crushed (artijustments may also be inc aggregate content. I mended that fine aggregate content.	Zone IV (3) 0.54 0.66 0.73 in saturated surface dry condingular) aggregate and suitable e made for fine aggregate from that case, the coarse aggregate greate conforming to Grading is greate conforming to Grading is	Volume of Total ster-Cementitiou Clause 5.5) gate per Unit Volum Ag Zone III (4) 0.52 0.64 0.72 Intion. e adjustments may be must other than natural safe volume shall be size	Aggregate for I	Different Zones of tio of 0.50 To of 0.50 Zone I (6) 0.48 0.60 0.69 To faggregate. ushed sand or mixed sa	Fine of Fine		
	(1) i) ii) iii) NOTES I Volumes a 2 These volu 3 Suitable ac need lesser if	Aggregate in minal Maximum Size of Aggregate mm (2) 10 20 40 to based on aggregates mes are for crushed (artijustments may also be inc aggregate content. I mended that fine aggregate content.	Zone IV (3) 0.54 0.66 0.73 in saturated surface dry condingular) aggregate and suitable emade for fine aggregate fro	Volume of Total ster-Cementitiou Clause 5.5) gate per Unit Volum Ag Zone III (4) 0.52 0.64 0.72 Intion. e adjustments may be must other than natural safe volume shall be size	Aggregate for I	Different Zones of tio of 0.50 To of 0.50 Zone I (6) 0.48 0.60 0.69 To faggregate. ushed sand or mixed sa	Fine of Fine		
	(1) i) ii) iii) NOTES I Volumes a 2 These volu 3 Suitable ac need lesser if	Aggregate in minal Maximum Size of Aggregate mm (2) 10 20 40 to based on aggregates mes are for crushed (artijustments may also be inc aggregate content. I mended that fine aggregate content.	Zone IV (3) 0.54 0.66 0.73 in saturated surface dry condingular) aggregate and suitable e made for fine aggregate from that case, the coarse aggregate greate conforming to Grading is greate conforming to Grading is	Volume of Total ster-Cementitiou Clause 5.5) gate per Unit Volum Ag Zone III (4) 0.52 0.64 0.72 Intion. e adjustments may be must other than natural safe volume shall be size	Aggregate for I	Different Zones of tio of 0.50 To of 0.50 Zone I (6) 0.48 0.60 0.69 To faggregate. ushed sand or mixed sa	Fine of Fine		× ×
The	(1) i) ii) iii) NOTES 1 Volumes a 2 These volu 3 Suitable ac need lesser fi 4 It is recome	Aggregate in minal Maximum Size of Aggregate mm (2) 10 20 40 te based on aggregates mes are for crushed (artijustments may also be ine aggregate content. I mended that fine aggregate to ascertain the suit	Zone IV (3) 0.54 0.66 0.73 in saturated surface dry condingular) aggregate and suitable made for fine aggregate from that case, the coarse aggregate conforming to Grading 4 qubility of proposed mix propularity of proposed mix prop	Volume of Total ster-Cementitiou Clause 5.5) gate per Unit Volum Ag Zone III (4) 0.52 0.64 0.72 Intion. e adjustments may be must other than natural safe volume shall be size	Aggregate for I	Different Zones of tio of 0.50 To of 0.50 Zone I (6) 0.48 0.60 0.69 To faggregate. ushed sand or mixed sa	Fine of Fine		
1	(1) i) ii) iii) NOTES 1 Volumes a 2 These volu 3 Suitable ac need lesser fi 4 It is recome	Aggregate in minal Maximum Size of Aggregate mm (2) 10 20 40 te based on aggregates mess are for crushed (ar fjustments may also be ine aggregate content. I mended that fine aggregate to ascertain the suit sittion of OPC	Zone IV (3) 0.54 0.66 0.73 in saturated surface dry condingular) aggregate and suitable e made for fine aggregate from that case, the coarse aggregate greate conforming to Grading is greate conforming to Grading is	Volume of Total ster-Cementitiou Clause 5.5) gate per Unit Volum Ag Zone III (4) 0.52 0.64 0.72 Intion. e adjustments may be an other than natural safe volume shall be steen other than safe volumes of the safe volumes of the safe volumes.	Aggregate for I	Different Zones of tio of 0.50 To of 0.50 Zone I (6) 0.48 0.60 0.69 To faggregate. ushed sand or mixed sa	Fine of Fine		10

BACHELOR OF ENGINEERING (CIVIL ENGINEERING) FOURTH YEAR 2nd SEM. EXAM. 2022

Subject: CONCRETE TECHNOLOGY. PART-II TIME: 3 Hours

Full Marks: 100

(50 marks for each part)

Use a separate Answer-Script for each part

No. of questions	Part II (Answer all questions)	Marks (10X5=50)
1. (a) (b)	Write Short note Bleeding and segregation Carbonation of concrete.	5X2 =10
2.	What do you mean by flexural strength of concrete? Describe the procedure of measuring the flexural strength of concrete in the laboratory.	2+8=10
3.	What do you mean by workability of concrete? Describe the factors affecting the workability of concrete.	2+ 8=10
4.	What do you mean by shrinkage and creep of concrete? Describe different type of shrinkage occurred in concrete.	4+6=10
5.	What are the properties of self-compacting concrete? Describe J-ring test for measuring the workability of self-compacting concrete.	3+7=10