~~B.E (Civil) (CBSGS)~~

Be sem-VIII (Rev) Max-June-15

Date:- 14-5-15

Sub:- CM

QP Code : 8002

(Revised Course)

(3 Hours) 100 Marks.

N.B 1) Question **No.1** is **compulsory** 2) Answer any **four** out of remaining six questions.

3) Assume suitable data, if required but state them clearly.

Q 1.a) What is construction Management? Explain functions of construction management. ---10M.

b) Details of activities of a construction project are given below. Draw network. Identify critical path. Determine values of total float, free float & independent Float of all the activities. ---10M.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Preceding Activity	----	A	A	B	D	D	D	B	C,E	G	F,I,J	K	G,H	M
Duration (days)	5	2	6	12	10	9	5	9	1	2	3	9	7	9

Q 2. a) Explain, 'Time Estimates in PERT" ---08M.

b) The interdependence of a job consisting of seven activities & time estimates are given in following table.

Draw Network & Determine- 1) Project duration corresponding to 50% probability.

2) Probability of completing the project in 35 days. ---12 M.

Activity	A	B	C	D	E	F	G
Preceding Activity	----	----	A	B	A	B	C & D
Succeeding Activity	C & E	D & F	G	G	-----	-------	-------
to	6	5	4	4	4	2	4
tm	9	8	7	7	7	5	10
tp		17	22	16	10	8	22

Z	-3	-2	-1	0	1	2	3
P (%)	0.13	2.28	15.87	50.0	84.13	97.72	99.87

Q 3 a) what do you understand by updating of network? Why it is essential?

Also explain the procedure of updating. ---- 08M.

b) Explain: - 1) Mobilisation of Project. 2) Statistical Quality Control

3) Occupational health hazards in Construction. ----- 12M.

Q 4.a) Explain "Time-Cost Optimisation" in detail. ---08 M.

b) The utility data for activities of a project is indicated below.

Determine optimum cost &optimum duration for the project.

Indirect cost is estimated as Rs.5000/- ---12M.

Activity	Normal Duration (days)	Normal Cost (Rs)	Crash Duration (days)	Crash Cost (Rs)
1-2	6	7000	3	14500
1-3	8	4000	5	8500
2-3	4	6000	1	9000
2-4	5	8000	3	15000
3-4	5	5000	3	11000
4-5	7	8000	4	15000

Q 5. a)What are the causes of time & cost overrun in a construction project?

Which methods would you suggest to control such overturns? -----10M.

b) Discuss different forms of organisations with their suitability. -----10M.

Q 6a) What are unique features of Construction in India? Explain in detail. ---10 M.

b) The following table gives the activities of a project with the details.

Draw resource histogram based on EST.

If only 10 labours are available, Then how will you schedule the activities? ---10M.

Activity	1-2	1-3	2-3	2-4	3-5	4-5
Duration(days)	8	8	8	4	9	6
Labour/day	4	6	5	3	6	5

Q 7) Write notes on followings. (Any five) -----20M.

(a) Work Breakdown structure.
(b) Job Layout
(c) L.O.B. Technique.
(d) Network Rules.
(e) Principles of management by Henry Fayol
(f) A-B-C Analysis

BE sem ~~VIII (Rev) Civil~~ VIII (Rev) may - June - 15

Civil

Sub:- CE

QP Code : 8070

[REVISED COURSE]

Date: 20-5-15

(3 Hours) [Total marks : 100]

NOTE:.

i) Question No. 1 is compulsory.
ii) Attempt any four out of the remaining six questions.
iii) Figure to the right indicates full marks
iv) Assume any suitable data and clearly state the same.

Q.1 A) Describe the various types of tunneling machines which have been developed in recent years. Describe the operation of one of these machines. Compare the use of moles with conventional tunneling method. 10

B) Classify cranes on the basis of broad construction features. Explain the application of each type and its method of operation.. 10

Q.2 A) Determine owning and operating cost per hour for two equipments from the following data: Assume other suitable data. 10

Purchased cost = Rs.30 lacs (first equipment purchased 5 years ago and second today.)
Operating factor = 0.70 for old and 0.85 for new equipment
Useful life = 10 years (2000 hours/year)
Engine capacity = 60 HP
Salvage value = 10% of purchase cost
Investment cost = 12% average annual investment
Lubrication cost = 20% of fuel cost

B) Enlist commonly used soil compacting equipments in construction industry indicating suitability? Explain any one with neat sketch. 10

Q.3 A) What are the different types of crushers used for production of aggregate? Explain any one with neat sketch. 10

B) Enlist the different types of drilling equipments. Explain in detail any one with neat sketch. 10

Q.4 A) What is meant by ground improvement? Discuss the ground improvement technique by Sand Drain with a neat sketch. 10

B) Enlist the different types of pile driving hammers. Explain in detail Double Acting Hammer with neat sketch. 10

Q.5 A) Enlist the various modern forms for concrete construction. Explain in details the slip form with sketch. 10

B) Explain the different methods of foundation grouting with sketches. 10

Q.6 A) What is liner plate? Sketch the types of liner plates used in tunnel work and state the advantages of using liner plates. 10

B) Define mass concrete? What are the problems generally faced during mass concreting? What precaution will you take for mass concreting? Explain. 10

Q.7 Write short notes on any four 20

i- Types of Cladding
ii- Use of geo-textiles in soil stabilization
iii- Stemming
iv- Balancing of equipment
v- Shaft in tunnel

RJ-Con. 9866-15.

(Sem VIII) Civil (DDRCS) Rev May-15

Civil

Sub:- DDRCS

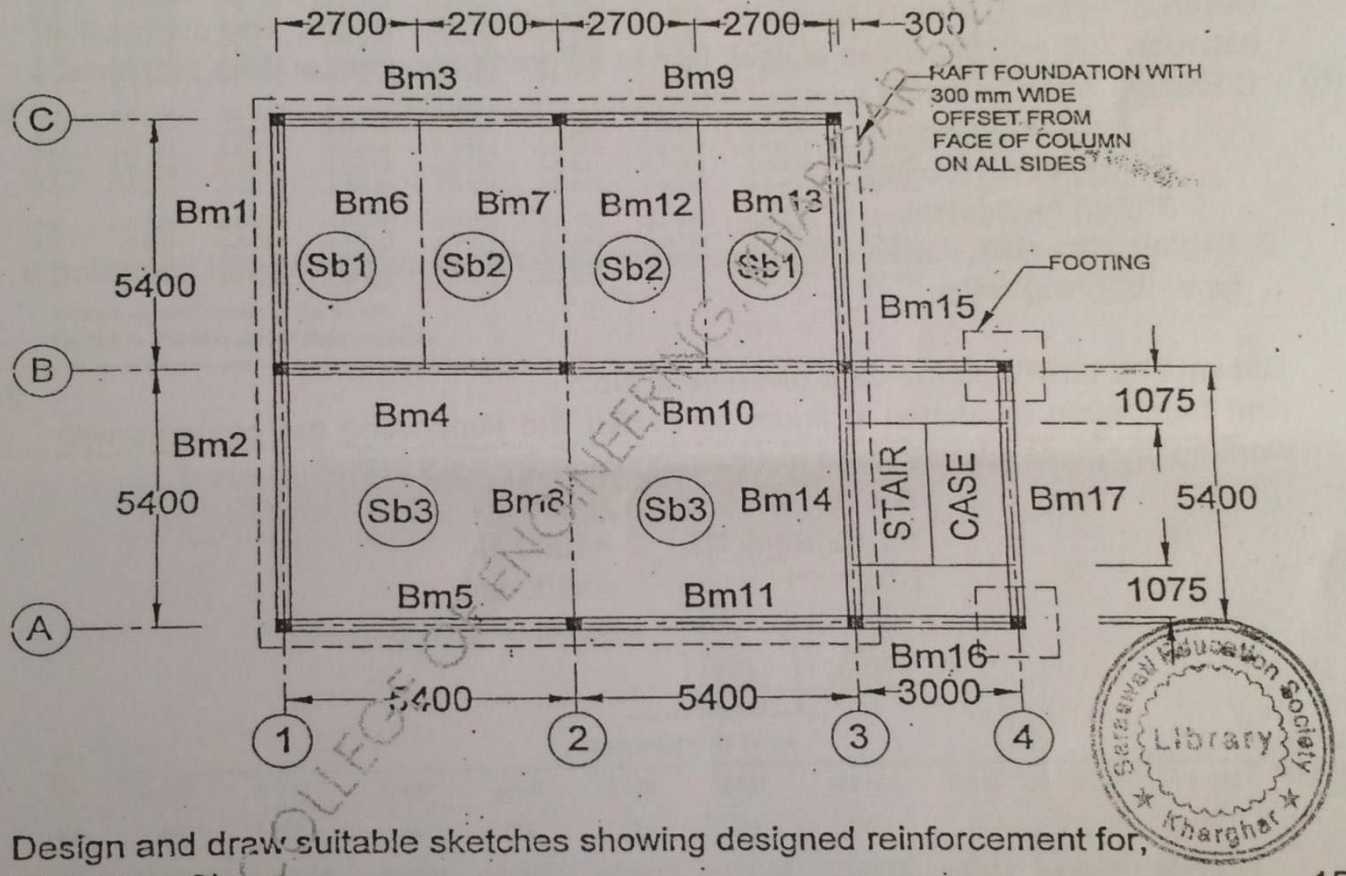
Date: 26-5-15

QP Code : 8131

(4 Hours) **[Total Marks : 100**

N.B (1) Question **No.1** is **compulsory**.
(2) Attempt any **three** questions out of remaining questions.
(3) Use of IS 456 is **permitted.**

1 Figure below shows a typical framing plan for a office building. The design live load is 4 KN/m^2 and floor finish load is 1.5 KN/m^2. All external beams and beam Bm4 and Bm10 are supporting 230 mm thick brick wall. Floor to floor height is 3.2 m. Grade of concrete M 20 and steel Fe 415. All columns are 300 mm x 300 mm. in size



Design and draw suitable sketches showing designed reinforcement for,

(a) Slab Sb_1 - Sb_2 15
(b) Beam Bm_7 - Bm_8 25

Draw to the scale suitable sketches showing designed reinforcement.

<<<OR>>>

1. (a) Design by approximate method a rectangular R.C.C water tank 6.0 m x 4.0 m in plan and 3.3 m in height. Tank is resting on firm ground. Design side walls and base slab. Grade of concrete is M 25 and steel is Fe 415. Check the design for safe stresses. Draw plan @ 1.0 m above base showing reinforcement. Also draw necessary sections showing reinforcement detail. 32

(b) Explain with sketches various type of joints for water tanks. 08

[TURN OVER

2 Design a doglegged staircase for a office building as shonw in figure given in Q. No. 1. Also show arrangmant of flights giving details. Draw reinforcement details for both flights. Use M 20 grade concrete and Fe 415 steel. 20

3 A reinforced concrete canilever retaining wall is supporting a backfill of height 4.2 m above ground level with, Density of soil = 16.5 kN/m^3, Angle of repose = 30^0 , S. B. C. of soil = 195 kN/m^2 and coefficient of friction between concrete and soil = 0.45. Design stem and toe of wall and show all stability checks. Draw reinforcement details of toe and stem showing curtailment of renforcement. Use M 25 grade concrete and Fe 500 steel. 20

4 (a) Design a circular water tank using IS code method for the capacity of 350 m^3 Depth of water in tank is limited to 4.0 m including free board. The connection between wall and base slab is rigid. Use M 25 grade concrete and Fe 500 steel. 15

(b) 1. Explain when following types of foundation are preferred- 05

1. Isolate footing
2. Combined footing
3. Raft foundation

2. Explain with neat sketch difference in the behavior of cantilever and countrfort type retaining walls.

5 Design and draw with the data given in Q. No.1 20

Raft foundation as shown in figure by dotted line supporting the columns with working loads as given below. Net bearing capacity = 65 kN/m^2

A1, A3, C1 & C3	= 800 kN
B1,A2,B3 & C2	=1000 kN
B2	=1600 kN

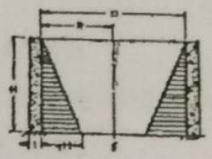
--------X--------

Table 1

TABLE 1 TENSION IN CIRCULAR RING WALL, FIXED BASE, FREE TOP AND SUBJECT TO ——— LAR LOAD

(Clause 3.1.1)

T = Coefficient × wHR kg/m



$\frac{H^2}{Dt}$	Coefficients at Point								
	0·0H	0·1H	0·2H	0·3H	0·4H	0·5H	0·6H	0·7H	0·8H	0·9H
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0·4	+0·149	+0·134	+0·120	+0·101	+0·082	+0·066	+0·049	+0·029	+0·014	+0·004
0·8	+0·263	+0·239	+0·215	+0·109	+0·160	+0·130	+0·096	+0·068	+0·034	+0·010
1·2	+0·285	+0·271	+0·254	+0·234	+0·209	+0·180	+0·142	+0·099	+0·054	+0·016
1·6	+0·265	+0·268	+0·268	+0·266	+0·250	+0·226	+0·185	+0·134	+0·075	+0·023
2·0	+0·234	+0·251	+0·273	+0·285	+0·285	+0·274	+0·232	+0·172	+0·104	+0·031
3·0	+0·134	+0·203	+0·267	+0·322	+0·357	+0·362	+0·330	+0·262	+0·157	+0·052
4·0	+0·067	+0·164	+0·256	+0·339	+0·403	+0·429	+0·409	+0·334	+0·210	+0·075
5·0	+0·025	+0·137	+0·245	+0·346	+0·428	+0·477	+0·469	+0·398	+0·259	+0·092
6·0	+0·018	+0·119	+0·234	+0·344	+0·441	+0·504	+0·514	+0·447	+0·301	+0·112
8·0	−0·001	+0·104	+0·218	+0·335	+0·443	+0·534	+0·575	+0·530	+0·381	+0·151
10·0	−0·001	+0·098	+0·208	+0·323	+0·437	+0·542	+0·608	+0·589	+0·440	+0·179
12·0	−0·005	+0·097	+0·202	+0·312	+0·429	+0·543	+0·628	+0·633	+0·494	+0·211
14·0	−0·002	+0·098	+0·200	+0·306	+0·420	+0·539	+0·639	+0·666	+0·541	+0·241
16·0	0·000	+0·099	+0·199	+0·304	+0·412	+0·531	+0·641	+0·687	+0·582	+0·265

Note 1 — w = Density of the liquid.

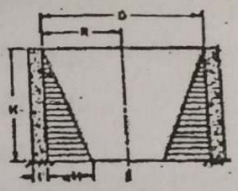
Note 2 — Positive sign indicates tension.

Table 2

TABLE 2 MOMENTS IN CYLINDRICAL WALL, FIXED BASE, FREE TOP AND SUBJECT TO TRIANGULAR LOAD

(Clause 3.1.1)

Moment = Coefficient × wH^3 kgm/m



$\frac{H^2}{Dt}$	Coefficients at Point									
	0·1H	0·2H	0·3H	0·4H	0·5H	0·6H	0·7H	0·8H	0·9H	1·0H
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0·4	+0·0005	+0·0014	+0·0021	+0·0007	−0·0042	−0·0150	−0·0302	−0·0529	−0·0816	−0·1205
0·8	+0·0011	+0·0037	+0·0063	+0·0080	+0·0070	+0·0023	−0·0068	−0·0024	−0·0465	−0·0795
1·2	+0·0012	+0·0042	+0·0077	+0·0103	+0·0112	+0·0090	+0·0022	−0·0108	−0·0311	−0·0602
1·6	+0·0011	+0·0041	+0·0075	+0·0107	+0·0121	+0·0111	+0·0058	−0·0051	−0·0232	−0·0505
2·0	+0·0010	+0·0035	+0·0068	+0·0099	+0·0120	+0·0115	+0·0075	−0·0021	−0·0185	−0·0436
3·0	+0·0006	+0·0024	+0·0047	+0·0071	+0·0090	+0·0097	+0·0077	+0·0012	−0·0119	−0·0333
4·0	+0·0003	+0·0015	+0·0028	+0·0047	+0·0066	+0·0077	+0·0069	+0·0023	−0·0080	−0·0268
5·0	+0·0002	+0·0008	+0·0016	+0·0029	+0·0046	+0·0059	+0·0059	+0·0028	−0·0058	−0·0222
6·0	+0·0001	+0·0003	+0·0008	+0·0019	+0·0032	+0·0046	+0·0051	+0·0029	−0·0041	−0·0187
8·0	0·0000	+0·0001	+0·0002	+0·0008	+0·0016	+0·0028	+0·0038	+0·0029	−0·0022	−0·0146
10·0	0·0000	0·0000	+0·0001	+0·0004	+0·0007	+0·0019	+0·0029	+0·0028	−0·0012	−0·0122
12·0	0·0000	−0·0001	+0·0001	+0·0002	+0·0003	+0·0013	+0·0023	+0·0026	−0·0005	−0·0104
14·0	0·0000	0·0000	0·0000	0·0000	+0·0001	+0·0008	+0·0019	+0·0023	−0·0001	−0·0090
16·0	0·0000	0·0000	−0·0001	−0·0002	−0·0001	+0·0004	+0·0013	+0·0019	+0·0001	−0·0079

Note 1 — w = Density of the liquid.

Note 2 — Positive sign indicates tension on the outside.

Table 3

TABLE 11 SHEAR AT BASE OF CYLINDRICAL WALL

(*Clauses* 3.1.1, 3.1.2 *and* 3.1.3)

$$v = \text{Coefficient} \times \begin{cases} wH^2 \text{ kg (triangular)} \\ pH \text{ kg (rectangular)} \\ M/H \text{ kg (moment at base)} \end{cases}$$

$\frac{H^2}{Dt}$	Triangular Load Fixed Base	Rectangular Load Fixed Base	Triangular or Rectangular Load Hinged Base	Moment at Edge
0·4	+0·496	+0·755	+0·235	—1·58
0·8	+0·374	+0·552	+0·234	—1·75
1·2	+0·339	+0·460	+0·220	—2·00
1·6	+0·317	+0·407	+0·204	—2·28
2·0	+0·299	+0·370	+0·189	—2·57
3·0	+0·262	+0·310	+0·158	—3·18
4·0	+0·236	+0·271	+0·137	—3·68
5·0	+0·213	+0·243	+0·121	—4·10
6·0	+0·197	+0·222	+0·110	—4·49
8·0	+0·174	+0·193	+0·096	—5·18
10·0	+0·158	+0·172	+0·087	—5·81
12·0	+0·145	+0·158	+0·079	—6·38
14·0	+0·135	+0·147	+0·073	—6·88
16·0	+0·127	+0·137	+0·068	—7·36

NOTE 1 — w = Density of the liquid.

NOTE 2 — Positive sign indicates shear acting inward.

BE sem-VIII (Rev) May-15

Sub:-ARRS

Date:-1/06/2015

QP Code : 8261

Civil

(3 Hours) [Total Marks : 100

N.B. : (1) Question No. **1 compulsory**.
(2) Attempt any **four** questions from the remaining **six** questions.
(3) Draw **neat** sketches wherever **necessary**.
(4) **Figures** to the **right** indicate full marks.

1. Write short notes on (any **four**) :– 20
   (a) Cathodic protection
   (b) Steel plate bonding
   (c) Fibre reinforced concrete
   (d) Realkalisation
   (e) Base Isolation.

2. (a) Explain briefly the need for strengthening of RCC structures. 10
   (b) Discuss different methods for repair and strengthening of masonry structures. 10

3. (a) Explain chloride extraction process. What are its side effects ? 10
   (b) Briefly explain shoring and underpinning. 10

4. (a) Explain the procedure for applying shotcreting as a repair technique. 10
   (b) Explain the procedure of introducing new reinforcement bars during repair of RCC structural members. 10

5. (a) Explain the fibre wrapping technique. Discuss the properties of Carbon, Aramid and Glass Fibres. 10
   (b) Explain in detail procedure for repair of magine structures. 10

6. (a) Briefly explain the use of FRP for retrofitting of damaged structures. 10
   (b) Discuss the various protective measures which can be followed to prevent environmental distress to structures. 10

7. (a) Explain different techniques adopted for the repair and restoration of heritage structures. 10
   (b) Write short notes on :– 10
      (i) Repair of parking garages
      (ii) Ultra High Performance Fibre Reinforced Concrete.

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Sem - VIII (Rev) BD&E - Civil May-15 D. 01106115

Civil

Sub:- BD & E

(REVISED COURSE) **QP Code : 8225**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No. 1 is **compulsory**, attempt any **four** from remaining **six** questions.
(2) Assume **suitable** data if **required.**

1. (a) Fill in the blanks :–
   (i) For RCC bridge slab spanning in one direction, distribution steel is to be designed for _____ . 2
   (ii) As far as possible the well shall be sunk plumb with a maximum permissible tilt and shift of _____ and _____ . 2
   (iii) Maximum axle load in case of class A-loading is _____ . 1
   (iv) Permissible tensile stresses is Fe415 are _____ . 1
   (v) Permissible flexural compressive stresses for M25 grade of concrete are _____ . 1
   (vi) Length of end block in no case shall be less than _____ . 1
   (vii) For calculating stresses in section, a modular ratio ES/EC of _____ may be adopted. 1
   (viii) Culvert is a bridge of span _____ . 1

   (b) What are advantages of balanced cantilever bridge over a continuous RCC bridge ? 5

   (c) Describe various methods for sinking of well. 5

2. (a) Sketch the wheel train for IRC–A loading giving details of axle position, axle loads clearance dimension and contact area of tyres on a 20 m S.S. span and carriage width 7·5 m deck slab. Show position along and across to develop maximum BM in the bridge. 15

   (b) What are peaguad's curve ? State their significance. 5

3. (a) A Pratt truss girder through bridge is provided for a single board gauge track. The effective span of the bridge is 40 m. The cross girders are placed 5 m apart. The stringers are spaced 2 m between centre lines. Self weight of stock rail and check rail is 600 N/m and 400 N/m respectively. Sleepers are spaced 400 mm c/c and each of size 2·8 m × 250 mm × 250 mm (density 7·5 kN/m^3). Main girders are provided at spacing of 7 m between their centre lines. Sketch influence line diagram due to DL and railway L.L and also determine design force in central top chord. 20

   Span – L = 40 m

   Total load for BM = 3498 kN

   $$CDA = 0.15 + \frac{8}{6+L}$$

[TURN OVER

4. A road bridge on a national highway has effective span 10·4 m, depth of deck slab is 500 mm, thickness of wearing coat is 80 mm. It is subjected to a LLBM 185 kN-m due to IRC ventricular load and DLBM 190 kN-m. Consider loss ratio 0·8. Use f_p = 1700 MPa grade steel and f_{ck} = 50 MPa grade concrete. Determine suitable arrangement of freysenet cables, suggest spacing, locate cable in safe cable zone with proper profile. Check the section in flexure only. 20

5. A well foundation is to be designed for an abutment of 10 m × 5 m base dimensions. The well is founded on a sandy soil. The data available is as follows. 20

Height of bearing above the maximum score level = 28 m

Permissible horizontal displacement of the bearing level = 50 mm

Height of the abutment = 6·0 m

Total vertical load including wt. of abutment and well (considering biyancy effect) = 20000 kN.

Total lateral load at the score level = 400 kN

Submerge unit weight of soil = 9·5 kN/m^3

Design the well and verify the stresses in the stening.

6. RCC T-beam and slab bridge has following details – 20

Span	–	36·4 m
Footpath	–	1·5 m on either side
Carriage width	–	7·8 m
Wearing Coat	–	80 mm thick
Live load	–	IRC-AA tracked vehicle

for slab use M25 grade of concrete

Spacing of cross girder – 5·2 m

Design longitudinal girder for flexure.

7. (a) A prestressed concrete bridge of 10 m span is subjected to class A-Atracked loading. Determine maximum SF and BM at corresponding critical sections. Assume suitable data. 15

(b) Give step by step procedure for design of a interior slab panel for a girdered bridge. Design calculation is not expected. 5
