MAHARASHTRA JEEVAN PRADHIKARAN
RESEARCH AND TRAINING CENTRE, NASHIKROAD

Professional Examination of Sub Divisional Officers / Engineers / Assistant Engineer Grade- I

October 2011

Subject :- General Civil Engineering (Written)

Date :- 18/10/2011

Time :- 10.00 to 13.00
Marks :- 75

Note :-
(1) Question No.1 is compulsory. Solve any five questions from remaining.
(2) Figure in the bracket on the right hand indicate full marks.
(3) Use of slide rule. Log table calculator is allowed.
(4) Marks are reserved in Each question. For clear sketches (whenever necessary).
(5) Make suitable assumption wherever necessary and specify then clearly.
(6) Mobile is not allowed.

Question No.1 :- (15)

(I) **Design R.C.C. slab** showing slab and beam arrangement for the roof of a quarter having size 8.00 m x 14.90 m. with central beam parallel to short span assume live load- 500 kg/m², Floor finish 50 kg/m² clear cover 4.5 cm.
(Concrete grade M-20, Reinforcement- H.S.D.Bars)
Draw a sectional sketch showing details of reinforcement.

OR

(II) **Design R.C.C. column footing** to take a vertical load of 150 M.T, safe bearing capacity of soil is 7.5 M.T./m²
Size of column 40 cm x 60 cm one side of footing limited to 3.00 m.
(Concrete grade –M-30, reinforcement- H.Y.S.D. bars)
Draw sketches showing details of reinforcement.

Question No.2 :- Write short note on the following (any Three) (12)

(a) Different types of steel and its use.
(b) Gunniting of structures
(c) Effect of water content in mortars
(d) Uplift pressure
(e) Curing of concrete
(f) Water Audit
g) Energy audit

Question No.3 :- Differentiate between the following (any three) (12)

(a) Schedule A & Schedule B of B-1 contract
(b) Old Tendering process and E-Tendering process
(c) GTS bench mark and Temporary bench mark
(d) C.I. pipes & D.I. pipes

(e) Ruling Gradient and hydraulic gradient
(f) BWSC pipes & PSC pipes.

Question No.4 :- Answer in brief (Any three) (12)

(a) List of various pipes commonly used.
(b) Well sinking method
(c) Define the formwork and list the requirement of good formwork
(d) Precautions about storing and use of explosive
(e) Measures for the welfare of labour on worksite.

Question No.5 :- Give rate analysis for following (any Two) (12)

(a) P.C.C. M.150 for foundation (Excluding reinforcement)
(b) Excavation for pipe line trenches in hard murum lift 0 to 1.50 M.
(c) Filling in plinth and floors murum bedding
(d) Cement plaster 20 mm thick in C.M. (1:2)

Question No.6 :- Write detailed specifications for following (Any three) (12)

(a) Excavation in soft materials and Hard materials for pipe trenches.
(b) Fixing of sluice valve, scour valve & Air valve
(c) Providing & constructing two tap stand post
(d) Bore well
(e) Providing & fixing in position Air valve shaft

Question No.7 :- A)Draw flow diagram of W.T.P. showing T.P. units and direction of flow with approximate dimensions for 5 MLD capacity. (6)

B) Define programme 24x7 its necessity and how the scheme is planned & prepared. (6)

Question No.8 :- A) Describe total sanitation campaign programme with sanitary units for Rural area having 5000 population (6)

B) Draw the sketch of filter Bed section with showing details of filter media. (6)

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MAHARASHTRA JEEVAN PRADHIKARAN
RESEARCH AND TRAINING CENTRE, NASHIKROAD

Professional Examination of Sub Divisional Officers / Engineers / Assistant Engineer Grade- I October 2011

Candiate Seat No.

Subject :- General Civil Engineering (Oral)

Date :- 18/10/2011

Time :- 14.00 to 14.30
Marks :- 75

Note :-
(1) All Questions are compulsory.
(2) Figure on RHS indicates marks.
(3) Use of Calculator is allowed.
(4) Mobile is not allowed.

Question No	1	2	3	4	5	6	7	8	9	10	Total
Marks obtained											

Signature of Supervisor----------

Signature of Examiner--------

Question No.1 :- **Fill in the blanks** (15)

(1) .....% G.I.A. is applicable to urban W.S.S. under MSNA.

(2) The Superintending Engineer can accord the technical sanction to the W.S.Scheme costing Rs..... Lakhs to ..... lakhs

(3) Design period is considered as ..... years for designing Rural water supply scheme.

(4) Recuperation test of supply well is to be taken in month of may for..... days.

(5) ..... Pipes are not to be used in urban areas

(6) The defect liability period for E.S.R. is.....

(7) The final setting time for OPC is .....

(8) When allowable bearing capacity of soil is low.....foundation is used.

(9) The safe Bearing capacity of B.C soil is.....

(10) .....percentage of cost of items of water retaining structure such as GSR/ ESR/ MBR/ WTP shall be retained till satisfactory hydraulic testing.

Question No.2 :- **What is the increase in % over normal schedule Rates (Any Five)** (15)

(1) Excavation for sewerage system in town

(2) Hilly and inaccessible area

(3) Sugarcane area

(4) Works in Municipal area

(5) Works in corporation area

(6) Defence area

(7) Works in tribal area

Question No.3 :- **How many cement bag are required for the following (with their unit) ?** (15)

(1) R.C.C. M-30 with finishing in C.M. 1:3 proportion

(2) R.C.C. M.20 without finishing

(3) R.C.C. M-15 without finishing

(4) U.C.R. Masonry IInd sort in 1:4 proportion

(5) 12 mm thick plaster in C.M. 1:3 proportion

Question No.4 :- **State basic rates with their units (Any Five)** (15)

(1) Structural steel

(2) Cement

(3) Tor steel

(4) Sand

(5) Aggregate

(6) Plastering

(7) Excavation in hard rock

(8) Centering of slab @ 3.50 m. height

(9) Concreting at ground level

(10) Concreting at IInd floor

Question No.5 :- Give the weights of following bar per meter length (15)

(1) 6 mm M.S. bar

(2) 8 mm tor steel

(3) 10 mm tor steel

(4) 12 mm tor steel

(5) 16 mm tor steel

Question No.6 :- Give long term of following terms (Any Five) (15)

(1) UIDSSMT

(2) NRDWP

(3) M.S.L.

(4) M.S.N.A.

(5) I.S.M.B.

(6) S.T.P.

(7) G.I.S.

(8) U.F.W.

MAHARASHTRA JEEVAN PRADHIKARAN
MAHARASHTRA ENVIRONMENTAL ENGINEERING
TRAINING & RESEARCH ACADEMY, NASHIK

Professional Examination of Sub Divisional Officers / Engineers / Assistant Engineer Grade- I
October 2012

Subject :- General Civil Engineering (Written)

Date :- 9/10/2012 Time :- 10.00 to 13.00
Marks :- 75

Note :-
(1) Question No.1 is compulsory. Solve any five questions from remaining.
(2) Figure in the bracket on the right hand indicate full marks.
(3) Use of slide rule. Log table calculator are allowed.
(4) Marks are reserved in Each question. For clear sketches (whenever necessary).
(5) Make suitable assumption wherever necessary and specify then clearly.
(6) Mobile, Laptop & Tablets are not allowed.

Question No.1 :- Design a simple beam for a clear span of 5.10 m length of bearing at each 150 mm. (15)

Superimposed dead load = 18 KN/m
Live load = 12 KN/m
Concrete Grade M15 & steel grade Fe415
Calculate the sectional dimensions of beam and reinforcement area keep b/d = 0.5

OR

Question No.1 :- Design R.C.C. slab required to carry L.L. of 200 kg/m^2. (15)
The span of slab 4.5 m x 4.5 m clear inside with walls for support on all sides with corners held down. Make suitable assumptions as per IS code.

Concrete Grade M15 & steel grade Fe415

Question No.2 :- Write short Notes (any three) (12)

(a) Precautions to be taken in brick construction.

(b) Uses of contour maps.

(c) State the advantages of steel structure.

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(d) Construction joints.

(e) Causes of failure of foundation.

Question No.3 :- Differentiate between following (Any four) (12)

(a) Indirect & Direct project cost.

(b) Self cleaning velocity & non scouring velocity.

(c) Aerated lagoon & oxidation pond.

(d) PERT & CPM Network.

(e) Sullage & Sewage.

(f) Initial & Final setting time.

Question No.4 :- Explain in Brief (any three) (12)

(a) Purpose of plaster.

(b) Methods of measurements.

(c) Properties of cement concrete.

(d) Mixing of concrete.

Question No.5 :- Write detailed specifications of (Any three) (12)

(a) Excavation in hard & soft soil.

(b) Fixing of air valve , Sluice valve, Scour valve.

(c) Lowering, Laying & Jointing of BWSC pipes.

(d) Lowering, Laying & Jointing of HDPE pipes.

(e) Fixing of electromagnetic & ultrasonic meters.

Question No.6 :- Give the rate analysis for following (any three) (12)

(a) Cement concrete 1:5:10 in foundation floor with brick ballast 40 mm thick gauge unit 1 cum.

(b) Cement concrete 1:2:4 unit 1 cum.

(c) Earth work in excavation in foundation including filling in trenches upto 30 m & lead 1.5 m unit 100 cum.

(d) Excavation in hard rock by drilling blasting etc in hilly areas including lead of 30 m & lift 1.5 m unit 100 cum.

Question No.7 :-

(A) Explain the term 24 x 7 water supply system and its advantages over intermittent water supply system. (6)

(B) Draw flow diagram of W.T.P. showing units & direction of flow with approximate dimensions & slope for 5 MLD capacity. (6)

Question No.8 :- Describe the procedure of preparation of DSR (12)

OR

Describe the procedure of preparation of tender document of any water supply scheme. (12)

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MAHARASHTRA ENVIRONMENTAL ENGINEERING
TRAINING & RESEARCH ACADEMY, NASHIK
Professional Examination of Sub Divisional Officers / Engineers / Assistant Engineer Grade- I
October 2012

Roll No..... .....

Subject :- General Civil Engineering (Oral)

Date :- 9/10/2012

Time :- 14.00 to 14.30
Marks :- 75

Note :-
(1) Solve Any five Questions.
(2) Figure on RHS indicates marks.
(3) Use of Calculator & logtable are allowed.
(4) Mobile, laptop & tablets are not allowed.

Question No	1	2	3	4	5	6	7	Total
Marks obtained								

Signature of Supervisor . . . . . Signature of Examiner. . . . . .

Question No.1 :-		(A) Write full form of following.	(10)
	(a)	COD	
	(2)	D.O.	
	(3)	UIDSSMT	
	(4)	S.F.	
	(5)	JTU	
	(6)	L.L.	
	(7)	M.N.P.	
	(8)	DWF	
	(9)	emf	
	(10)	P.F.	
		(B) Convert the following	(5)
	(a)	1 gallon . . . . . .lit.	
	(b)	1 hectore . . . . . .acre.	
	(c)	1 HP . . . . . watts.	

	(d)	1 cum . . . . . gallon.	
	(e)	1 Revolution . . . . . .degrees.	
Question No.2 :-		(A) Fill in the blanks	(10)
	(a)	For cities provided with sewerage system, the per capita water supply should be . . . . . .lpcd.	
	(b)	Value of 'C' for design of M.S. pipe is	
	(c)	As per I.S. 456 , 1978 modular ratio for M- 20G concrete is	
	(d)	The difference in levels of outer & inner adges of a road along the curves is called	
	(e)	The specific weight of water is	
	(f)	The sewer which transports the sewage to the point of treatment is called as	
	(g)	In hilly area DSR Rates of completed items are increased by	
	(h)	For hydraulic testing of pipe line . . . . . % cost of pipe material is kept withheld.	
	(i)	The dia of air valves for rising main / gravity main is from D / . . . to D /	
	(j)	Recommended design flow for primary & secondary treatment units is . . . . . .in sewerage system.	
		(B) State the basic rates of following materials with their units as per DSR 2011	(5)
	(a)	Cement	
	(b)	Murum	
	(c)	Structural steel	
	(d)	Sand	
	(e)	Rubble	
Question No.3 :-		State in short	(15)
	(a)	Hooks law	
	(b)	Name the various conditions for the stability of dam ?	
	(c)	Water Cement ratio	
	(d)	Pre-chlorination	
	(e)	Advantages of Bar chart	

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Question No.4 :-		(A) State true or false	(10)
	(a)	For designing purpose, safe bearing capacity of black cotton soil is taken as 20 MT/m^2	
	(b)	As per MJP practice usually 85% payment is released after supply of pipes	
	(c)	While designing pumping machinery 10% increase in HP is considered for temperature & altitude variation.	
	(d)	As per conditions of contract, in clause 36 all quarry fees, royalties if any should be paid by MJP.	
	(e)	pH value of B.C. soil is 8.5	
	(f)	The rise of the centre of the pavement above its edges along the straight portion of the road is called camber.	
	(g)	The defect liability period for W.T.P. & S.T.P. on contractor's own design is 3 years.	
	(h)	Cavity walls are constructed for heat & sound insulation.	
	(i)	In lap joints, the members to be connected are made to overlap each other & are then connected by means of rivets.	
	(j)	The residue of ordinary Portland cement when sieved through IS sieve No.9 should not exceed 10%	
		(B) State the cover required in mm for following R.C.C. members	(5)
	(a)	Slab	
	(b)	Beam	
	(c)	Coloumn	
	(d)	Footing	
	(e)	Thrust block	
Question No.5 :-		(A) State How many cement bags required for	(10)
	(a)	R.C.C. M- 250 (Grade) with finishing (1:3)	
	(b)	B.B. Masonary (1:6) for superstructure	
	(c)	20 mm thick cement plaster (1:3)	
	(d)	U.C.R. masonary (1:4)	
	(e)	R.C.C. M-200 Grade with finishing (1:3)	

		(B) Give unit weights of following		(5)
	(a)	R.C.C.		
	(b)	Bricks masonary		
	(c)	Dry sand		
	(d)	Water		
	(e)	Rainforcement bars		
Question No.6		(A) Match the following pairs		(10)
		A	**B**	
		(i) B.B.masonary --------	(a) 20 mm thick	
		(ii) Earth Quake ----------	(b) 23 cm thick	
		(iii) Plaster in C.M.----------	(c) At highest spot	
		(iv) U.C.R. masonary--------	(d) Every hump portion	
		(v) Bearing capacity of B.C. soil ----------	(e) Lead joint	
		(vi) Position of E.S.R. in villages----------	(f) Water Treatment Plant	
		(vii) Air valve position--------	(g) Sunction upto 6 m	
		(viii) Centrifugal pumps------	(h) Seismic zone	
		(ix) Leakages in C.I. Pipes------	(i) Header stone	
		(x) Turbidity----------	(j) 5 M.T./m^2	
		(B) State the five types of cements commonly used		(5)
		.. . . . .		
		.. . . . .		
		.. . . . .		
		.. . . . .		
		.. . . . .		

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MAHARASHTRA JEEVAN PRADHIKARAN

Examination conducted by

Maharashtra Environmental Engineering Training & Research Academy (MEETRA), Nashik.

Professional Examination of Asstt. E.E. /A.E.-I/SDE/SDO (Civil)

October 2013

Subject :- General Engineering (Civil) (Written)

Date :- 22/10/2013 **Time :- 10.00 to 13.00**

Marks :- 75

Note :- (1) Question No. 1 is compulsory & write any five Questions from the remaining.
(2) Use of Calculator, Log table are allowed.
(3) Figure in bracket on right hand side indicate total marks.
(4) Mobile, Laptop, Tablets are not allowed.
(5) Make suitable assumption if required. Assume suitable data wherever necessary & state them clearly.

Que. No.1. Design R.C.C. slab required to carry L.L. of 250 kg/m^2. The size of slab 4.0mx4.0m clear inside with walls for support on all sides with corner held down. Make suitable assumptions as per I.S. code concrete grade M15 & steel grade Fe415 & draw sketches showing details of reinforcement. (15)

(OR)

Que. No.1. Design footing for circular column 45 cm dia to support load of 27 MT inclusive of self wt.

Bearing capacity : 20 MT/M^2

Make suitable assumption as per I.S. Code as above.

Draw sketches showing details of reinforcement.

Que. No.2. Write short note on (Any Three) (12)

i)Curing of concrete.

ii) Balance section in reinforced concrete.

iii) Grouting.

iv) Slump test

v)Shoring & Strutting.

Que. No. 3. Differentiate between (Any Four) (12)

(A) R.C.C. & P.C.C.

(B) E.S.R. & G.S.R.

(C) Ground water source & Surface source.
(D) Short column & long column.
(E) C.R. Masonry & U.C.R. Masonry.

Que. No. 4. (A) Write about Maharashtra Ground water act 1993 & its implementation (6)

(B) Describe different types of ground water sources used in designing Rural Water Supply scheme. (6)

Que. No.5. (A) Draw flow diagram of W.T.P. showing T.P. units and direction of flow with appropriate dimensions for 10 mld capacity. (6)

(B) Attempt any Three. (6)

i) Where we can use M-10 grade concrete?
ii) What is meant by water cement ratio? State its importance.
iii) Define segregation and bleeding in relation with wet concrete.
iv) Concrete cubes of same grade of concrete tested for compressive strength after 3 days & 7 days from casting which cube will have more strength? Why?
v) What is workability of concrete? State any one method to measure it.

Que. No. 6. Explain in brief (Any Three) (12)

1) Well sinking.
2) Water hammer pressure.
3) Hydraulic testing of pipeline.
4) Uplift pressure.
5) Ready mix concrete.

Que. No. 7. Write detailed specification. (Any Three) (12)

1) Lowering, laying, jointing & testing CI/DI pipe.
2) Providing & laying P.C.C. 1:2:4.
3) Excavation in hard strata by chiseling.
4) B.B. Masonry in C.M. (1:6)
5) Murum bedding.

Que. No. 8. Describe the procedure of preparation of tender document of any water supply scheme. (From invitation of tender to issuing work order.) (12)

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MAHARASHTRA ENVIRONMENTAL ENGINEERING TRAINING & RESEARCH ACADEMY (MEETRA), NASHIK.

Professional Examination of Asstt. E.E. /A.E.-I/SDE/SDO (Civil)

October 2013

Roll No.

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Question No.	1	2	3	4	5	6	7	Total
Marks obtained								

Que. No. 1. (A)Define the following terms. (Any Five) (10)

a) Proof tress _____

b) ~~Aqveduct~~ Aquduct _____

c) Slenderness Ratio _____

d) Seasoning _____

e) Ductility _____

f) Bench Mark _____

g) Admixture in concrete _____

_____

_____

h) Negative super elevation _____

_____

_____

(B) State True or False. (5)

1) Connecting main is laid below score depth. .....

2) Confined reinforcement is provided for water tank column as per IS 456

.....

3) Normal velocity in the rising main is in the range of 0.6m/sec to 1.2m/sec.

.....

4) 53 grade cement is having coarser grain size thn that of 43 grade cement.

.....

5) Test pressure of CI'A' Class pipe is 18 kg/cm^2

.....

Que. No. 2. (A) What is the average weight per cum of the following. (5)

i) RCC. _____

ii) Sand[dry clean] _____

iii) Portland cement ~~bags~~ _____

iv) BB Masonary _____

v) Teak wood _____

(B) What is the safe bearing capacity of the following. (5)

(a) Hard rock _____

(b) Soft rock _____

(c) Aluvial soil _____

(d) Black cotton Soil _____

(e) Hard murum _____

(C) How many cement bags are required for following? (5)

(a) Cement concrete (1:1.5:3) _____

(b) P.C.C. in M.100 Grade _____

(c) 25mm trick cement plaster ~~(1:4 propositino)~~ (1 : 4 proportion) _____

(d) B.B. Masonary in cm (1:6 proportion) _____

(e) UCR Masonary in CM (1:6 Proportion) _____
Cement mortor

Que. No. 3. Fill in the blanks (Any Ten) (15)

(a) Water cement ratio for m-25 concrete is _____.

(b) Effective size & uniformity coefficient of filter sand is _____ &

_____

(c) Slump test is carried out on concrete for _____.

(d) Low cost sanitation Technology is based on _____ digestion.

(e) Connecting pipe line is designed for _____ Volume flow in water supply scheme.

(f) The initial settling time of ordinary Portland cement is _____.

(g) A minimum velocity of _____ m/sec and a maximum velocity of _____ m/sec is generally taken for design of sewer.

(h) Design period is considered as _____ for designing distribution system.

(i) Recuperation test of supply ~~hell~~ well is taken for ascertaining _____ ~~for designing distribution system~~. of supply well.

~~(j) Recuperation test of supply well is taken for ascertaining of supply well.~~

(k) Minimum width of trench for the pipe dia of 350 mm is _____.

(l) Aggregate having size less than _____ is ~~as~~ called fine aggregate.

(m) The defect liability period for ESR is _____.

Que. No. 4. Give long form of the following terms: (Any Ten) (15)

1) JTU :- _____

2) PF :- _____

3) Emf :-

4) MSL :-

5) GIS :-

6) VIDSSSMT :- VIDSSMT

7) ISMB :-

8) BIS :-

9) CPHEEO :-

10) MLSS :-

11) RSJ :-

12) MCFT :-

Que. No.5. Answer in short : (15)

a) Give main constituents of cement with their approximate percentage.

b) Give any four methods of population forcasting.

c) Give any two methods of increasing bearing capacity of unit. Soil

d) What is the use of admixture of concrete and name any two admixture?

e) Why expansion joints are provided in construction of bridge.?

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Professional Examination of Asstt. EE/A.E.-I/SDE/SDO(Civil)
November 2014

Subject :- General Engineering (Civil) (Written)
Date :- 11/11/2014 **Time** :- 10.00 to 13.00
Marks :- 75

Note :- (1) Question No. 1 is compulsory & write any five Questions from the remaining.
(2) Use of Calculator, Log table are allowed.
(3) Figure in bracket on right hand side indicate total marks.
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(5) Make suitable assumption if required. Assume suitable data wherever necessary & state them clearly.

Que. No. 1. Design a rectangular reinforced concrete beam simply supported on masonry wall 300 mm thick and 6m apart (Center to Center) to support a distributed live load of 10 KN/m and a dead load of 5 KN/m in addition to its own weight. Make suitable assumptions as per I.S. code (Assume m 20 grade concrete and FE 415 HYSD bars). (15)

OR

Que. No. 1. Design a simply supported slab to suit the following data.

- Clear span = 3 m
- Slab supported on load bearing brick walls having 230 mm thick.
- Loading : Roof load (accessible) = 1.5 KN/m^2
- Material : M-20 grade concrete FE-415 HYSD bars.
- Make suitable assumption as per I.S. Code.

Que. No. 2. Write short Note on (Any Three) (12)

i) Parameters considered for design mix concrete.
ii) Minimum & Maximum reinforcement specified for R.C.C. column design as per I.S. Code.
iii) William Hazen's formula for designing pipes for water supply scheme.
iv) Foundation on B.C. soil.
v) Loads considered for foundation design.

Que. No. 3. Differentiate between following (Any Four) (12)

a) Slow sand and rapid sand filtration.
b) One way slab and two way slab.
c) Temporary and permanent hardness of water.
d) Self cleaning velocity and non scouring velocity.
e) Short and Long column.

Que. No. 4. Explain in brief. (Any Four) (12)

a) Physical properties of cement concrete.
b) Curing of concrete.
c) Bulking of sand.
d) Water audit in water supply scheme.
e) Different types of steel and its uses.
f) Admixture in concrete.

Que. No. 5. Write detail specifications, mode of measurement and payment (Any Two) (12)

a) Excavation of soft and hard strata for pipe trenches.
b) Fixing of sluice valve.
c) Constructing brick masonry chamber for sluice valve.
d) Hydraulic testing (Water tightness test) of E.S.R.

Que. No. 6. Give rate analysis for following. (Any Two) (12)

a) P.C.C. M 150 for foundation (Excluding reinforcement)
b) Cement plaster 20 mm thick in C.M. (1:2)
c) Excavation for pipe line trenches in hard murum lift 0 to 1.5 m.
d) Random rubble stone masonry in C.M. (1:6) in superstructure.

Que. No. 7. A) Draw flow diagram of W.T.P. showing all units, directions of flow with appropriate dimensions for 5 MLD capacity. (6)

B) What are the various types of tenders used. Explain each one in short. (6)

Que. No. 8. A) Drawn neat sketch of the following (Any Two) (6)

i) 1.2 m wide catiliver slab (Sectional Elevation)
ii) Coffer dam 5 m depth (Assume other sizes)
iii) B.M. diagram of a continuous beam having three span of 5 m each.

B) Explain different types of pipes used in water supply scheme with their merits & demerits. (6)

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November 2014

Roll No.	

Subject :- General Engineering (Civil) (Oral)
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Time :- 14.00 to 14.30
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Note :- (1) Solve all questions.
(2) Use of Calculator, Log table are allowed.
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(5) Make suitable assumption if required. Assume suitable data wherever necessary & state them clearly.

Question No	1	2	3	4	5	6	7	Total
Marks obtained								

Signature of Supervisor …….. Signature of Examiner…….

Que. No.1. Fill in the blanks. (Solve any Ten) (15)

i) For cities provided with sewerage system, the per capita water supply is …….. LPCD.

ii) The size of air valve for rising/gravity main is from D/…… to D/……

iii) The foundation in which a cantiliver beam is provided to join two footing is known as ……. footing.

iv)The formwork from the underside of slab can be removed only after …….days.

v) ……. Type of cement is used for construction of a massive dam.

vi)The rate of accumulation of sludge in septic tank is recommended as …… liter/per person/per year.

vii) The presence of fluoride in water greater than permissible level of 1.5 mg/l causes ……. disease.

viii) When a retaining wall moves away from the backfill, the pressure exerted on the wall is termed as …… earth pressure.

ix) Standard 5 day BOD of a waste water sample is nearly ..... Percentage of the ultimate BOD.

x) The temporary hardness of water is caused by ..... of calcium & magnesium.

xi) The minimum grade of concrete for RCC structure constructed along a sea coast is .....

xii) The microbial quality of treated pipe water supply is monitored by ..... test.

Que. No.2. Give long form of following abbreviation. (15)

a) B.O.D. :- _____

b) B.I.S. :- _____

c) C.P.H.E.E.O. :- _____

d) OMC :- _____

e) DO :- _____

f) NABARD :- _____

g) HUDCO :- _____

h) P.F. :- _____

i) GIS :- _____

j) NRW :- _____

k) NRDWP :- _____

l) MSNA :- _____

m) NRAP :- _____

n) STP :- _____

o) DWF :- _____

Que.No. 3. A) Give the weight per meter length of following bars. (5)

i) 6 mm dia M.S. bar :- _____

ii) 8 mm dia M.S. tor bar :- _____

iii) 10 mm dia M.S. tor bar:- _____

iv)12 mm dia M.S. tor bar :- _____

v) 16 mm dia M.S. tor bar :- _____

B) How many cement bags are required for the following (with their units) (10)

i) R.C.C. M-30 with finishing in C.M.(1:3) proportion. :- _____

ii) R.C.C. M-20 without finising. :- _____

iii)12 mm thick plaster in C.M. (1:3) proportion. :- _____

iv)B.B. masonry in cement morter (1:6) :- _____

v) P.C.C. (1:2:4) :- _____

Que.No.4. State True or False. (Solve any Ten) (15)

i) Capacitor are provided to improve power factor. :- _____

ii) The strength of brick masonry in 1:6 C.M. is 20 ton/sqm :- _____

iii) Permissible compressive strength of M-200 concrete grade is 30 Kg/sqm

:- _____

iv) M 150 grade of concrete approximates 1:1:2 mix. :- _____

v) Raft foundation are generally preferred to when the area required for individual footing is more than 50% of total area. :- _____

vi) Cement provides strength durability and water tightness to the concrete.

:- _____

vii) Slump test of concrete is used to measure tensile strength of concrete.

:- _____

viii) Separation of water or water, sand, cement from a freshly concrete is known as bleeding. :- _____

ix) Closed contours of decreasing value towards their centre represent a depression. :- _____

x) Removal of Oil and grease from sewage is known as skimming.

:- _____

xi) MPN index is a measure of dissolved oxygen content.

:- _____

xii) Sewage treatment in an oxidation pond is accomplished primarily by algal photosynthesis. :- _____

xiii) C.O.D. of a sample is always greater than B.O.D.

:- _____

Que.No.5. A)Match the following. (5)

a) Tubidity	1) Conservation of water
b) Mix design	2) M.S. Pipe
c) Beam	3) Seismic Zone
d) Rain water harvesting	4) At highest spot
e) Gunetting	5) Deflection
f) Earth Quake	6) Concrete
g) Air valve position	7) N.T.U.
h) Bearing capacity of B.C. Soil	8) Floculation
i) Alum	9) Disinfection
j) Bleaching powder	10) 5 t/sqm

B) State basic current rate with their units. (5)

i) Cement :- _____

ii) Brick :- _____

iii) Sand :- _____

iv) Aggregate :- _____

v) Alum :- _____

C) (5)

i) Various types of cements used in concretes for water retaining structures.

_____

_____

_____

ii) Various types of appertenses used to arrest water hammer pressure.

_____

_____

_____

MAHARASHTRA JEEVAN PRADHIKARAN

EXAMINATION CONDUCTED BY
MAHARASHTRA ENVIRONMENTAL ENGINEERING TRAINING & REASERCH ACADEMY (MEETRA) NASHIK

PROFESSIONAL EXAMINATAION OF A.E.E./A.E.-I/ S.D.E./S.D.O.(CIVIL)
OCTOBER 2015

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SUBJECT:- GENERAL ENGINEERING (CIVIL) WRITTEN **TIME : 10.00 to 13.00 pm**
DATE: 27/10/2015 **MARKS : 75**

==========

NOTE:- 1) Question No.1 is compulsory and write any five question from the remaining
2) Use of Calculator , Log Table are allowed
3) Figure in bracket on right hand side indicate total marks
4) Mobile , Laptop , Tablets are not allowed
5) Make suitable assumption if required. Assume suitable data wherever necessary and state them clearly.

Question No.1:- **(15)**

Design a simply supported slab supported on masonary wall to suit following data

* Size of slab = 14 m x 3.0 m
* Thickness of masonary wall = 230mm
* Live load = 2 KN/M^2
* Material : M -20 grade concrete and FE - 415 HYSD bars
* Make suitable assumption as per I.S. code

Also draw sketches showing details of reinforcement

OR

Question No.1 :-

A rectangular reinforced concrete beam is simply supported on two Brick walls of 230mm thick and 6 m apart (centre to centre). The beam has to carry a distributed live load of 15 KN/m in addition to its own weight. Design the beam section (Assume M 20 grade concrete and steel fe 415) make suitable assumption as per I.S. code. Draw sketches showing details of reinforcement.

Question No.2:-

Write short Note on (Any three) **(12)**

i) Effect of water content in cement concrete

ii) Compaction of concrete

iii) Energy Audit

iv) Curing of Concrete

v) Ready mix concrete

Question No.3:-

Differentiate between following (Any four) **(12)**

i) PERT & CPM Network analysis

ii) Sullage & Sewage

iii) Working Stress & Limit State design

iv) Schedule 'A' & Schedule 'B' tender

v) One way & two way slab

vi) Pressure reducing & flow central valve

Question 4:-

Explain in brief **(12)**

i) Water hammer pressure

ii) Well Foundation

iii) Necessity of curing of concrete

iv) Purpose of guniting of MS pipe

Question No.5:-

Write detail specification , mode of measurement and payment proposed (Any two) **(12)**

i) Construction of Coffer dam

ii) Construction of B.B. Masonary chamber

iii) Lowering, laying & Jointing of HDPE pipe

iv) Excavation of soft and hard soil for pipe trenches

Question No.6:-

Give analysis for following (Any two) **(12)**

a) 12mm cement plaster of mix (1:4)

b) PCC (1:3:6) in foundation

c) Random Rubble stone masonary in CM (1:6) in superstructure

d) Excavation in hard rock by blasting

Question No.7:-

A) Attempt any two **(6)**

i) Type of cement and its suitability

ii) What is workability of concrete? State any two methods to measure it

iii) What is meant by water cement ratio? State its importance

B) Write about documents required for land acquisition proposal of private land and describe the land acquisition process **(6)**

Question No.8:- **(12)**

Describe the procedure of preparation of tender document of any water supply scheme as per the latest available circular (From invitation of tender to issuing work order)

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MAHARASHTRA JEEVAN PRADHIKARAN

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MAHARASHTRA ENVIRONMENTAL ENGINEERING TRAINING & REASERCH ACADEMY (MEETRA) NASHIK

PROFESSIONAL EXAMINATAION OF A.E.E./A.E.-I/ S.D.E./S.D.O.(CIVIL)

OCTOBER 2015

Roll No	

==========

SUBJECT:- GENERAL ENGINEERING (CIVIL) ORAL **TIME : 14.00 to 14.30 pm**

DATE: 27/10/2015 **MARKS : 75**

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NOTE:- 1) Solve all Questions
2) Use of Calculator , Log Table are allowed
3) Figure in bracket on right hand side indicate total marks
4) Mobile , Laptop , Tablets are not allowed
5) Make suitable assumption if required. Assume suitable data wherever necessary and state them clearly.

Question No	1	2	3	4	5	Total
Marks obtained						

Signature of Supervisor ---------- Signature of Examiner----------

==========

Question 1:- Fill in the blanks (Solve any Ten) **(15)**

i) The minimum dissolved oxygen for survival of fish in a river stream is----------ppm.

ii) Maximum permissible nitrite in public water supply is----------.

iii) B.O.D. of treated water should be ----------.

iv) An imaginary line Joining the points of equal elevation on the surface of earth represent----------.

v) If shear force along a section of a beam is zero, the B.M. at the Section is ----------.

vi) The initial setting time of O.P.C. is ---------- minutes.

vii) Specific weight of water is ---------- .

viii) Preferably grade of concrete used for RCC water retaining structure is---------- grade

ix) 25 MLD is equal to ---------- Liter/ hour.

x) The thickness of micron is ---------- meter.

xi) The minimum number of main steel bar provided in R.C.C. circular column is ------ Nos.

xii) The foundation in which a cantilever beam is provided to join footing is known as ---------- footing.

Question 2:- Give long form of following abbreviation (15)

a) C A D :

b) C C T V :

c) Kwh :

d) I S O :

e) B I S :

f) M O U :

g) N G O :

h) I E C :

i) D W S S :

j) N R D W P :

k) W S S O :

l) A M R U T :

m) N I C :

n) W H O :

o) G I S :

Question 3:- State True or False (Solve any Ten) (15)

i) In distribution pipe, drain valves are provided at higher point --------

ii) If P. H. value of water is less than 7, it is said to be alkaline ----------

iii) Surge Tank are used to store water ----------

iv) Closed contours of decreasing value towards their centre represent depression----------

v) Graded aggregate are used for ensuring good quality of concrete

---

vi) M 10 grade of concrete approximate 1:3:6 mix----------

vii) After casting, an ordinary cement concrete on drying expands

---

viii) The shape of bending moment diagram over the length of a beam , having no external load in parabolic----------

ix) The thickness of C I class A pipes is more than C I class L A pipes

---

x) Insufficient Quantity of water makes the concrete unworkable

---

xi) Rapid hardening cement is used to construct a massive dam

---

xii) First reading from a level station is called foresight (F.S.) ----------

Question 4:- A) Match the following **(5)**

Type of Soil / Rock	SBC (KN/M2)
a) Soft rock	i) 50
b) Medium Sand (Compact & Dry)	ii) 130
c) Hard Rock shale	iii) 440
d) Block Cotton Soil	iv) 880
e) Very soft Clay	v) 245

B) How many cement bags are required for following? **(5)**

i) 1 M^3 of cement concrete (1:2:4)

ii) 1 M^3 of B.B. Masonary (1:6)

iii) 1 M^3 of U.C.R.Masonary (1:6)

iv) 1 M^3 of R.C.C. M 25 grade

v) 1 M^3 of R.C.C. M 30 grade

C) Convert the following **(5)**

i) 1Kw = ---------- H.P.

ii) 2 hectare = ---------- Acre

iii) 1 liter/ second = ---------- M^3 /second

iv) 1 revolution = ---------- degrees.

v) 10 cubic feet/ sec. = ---------- cubic meter/ sec

Question 5: State in short (Any Five) (15)

i) If a contractor proposes to increase concrete cover beyond contractor specification (i.e. 40mm to 70mm) , shall engineer accept the proposed state reason also

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ii) Which type of bar reinforcement is more corrosion resistant, epoxy coated bars, stainless steel bars or galvanized bars?

---

iii) What is the purpose of skin reinforcement in deep beam?

---

iv) Give any four method of population forecasting

---

v) What is use of admixture of concrete. Name any two admixture

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vi) Write in one sentence main function of different component of paints namely primer coat, under coat and finishing coat

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vii) Give any two methods of increasing bearing capacity of soil

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