

**MAHARASHTRA JEEVAN PRADHIKARAN  
RESEARCH AND TRAINING CENTRE, NASHIKROAD**

**Professional Examination of Asstt.Engineer- II / Sectional Engineer  
/ Jr.Engineer  
October 2011**

**Subject :- General Engineering (Written)**

Date :- 11/10/2011

Time :- 10.00 to 13.00

Marks :- 100

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- Instructions :
- 1) Question No.1 is Compulsory & Solve any five questions from remaining.
  - 2) Marks are reserved in each question for clear sketches, good handwriting, neatness in general.
  - 3) Make suitable assumptions where ever necessary and state them clearly.
  - 4) Figures in bracket on right hand side indicate full marks.
  - 5) Use of calculator, log tables is allowed
- 

**Q.1(a) Prepare an Estimate for Providing, Lowering laying, Jointing & testing 90mm dia P.V.C. 6Kg/cm<sup>2</sup> pipeline from M.B.R. to E.S.R. using following data. (12)**

Length of pipe line is 1000 m. Assume suitable number of Air Valve, Scour Valve, Isolation Valve and other required data as per M.J.P.'s Practice and clearly mention them

S.N.	Particulars	Rate	Unit
a)	90 mm P.V.C. 6Kg/cm <sup>2</sup> pipe	113.00	Rmt
b)	80 mm Sluice valve PN-1	4737.00	No
c)	25 mm Single ball Air valve	946.00	No
d)	80 mm CI Mech. Tail Piece	1206	No
e)	80 mm CID Joint CI-10	276.00	No

S.N.	Particulars	Rate	Unit
g)	Excavation in soft strata	107.00	Cum
h)	Excavation Boulders	134.00	Cum
i)	Excavation hard rock	500.00	Cum
j)	Providing, Laying sand bedding	730.00	Cum
k)	Lowering, laying Jointing		
	90 mm PVC 6Kg/cm <sup>2</sup> Pipe	28.50	Rmt
l)	Fixing 80 mm Sluice Valve	1309.00	No
m)	Fixing 25 mm Air Valve	163.00	No
n)	P.C.C. M-100	3314.00	Cum
o)	Internal Mortar lining	269.00	Sqm
p)	Refilling the trenches	50.00	Cum

**Q-1(b)** :- Explain the term Gunitting & Why it is necessary ? (4)

**Q-1(c)** :- Explain the term Internal Mortar lining, Where it is done & Why ? (4)

**Q.No.-2(a):-** Design a simply supported R.C.C. Slab (one way) with effective span of 4.00 m.

The Live Load on slab may be taken as 1000 Kg/m<sup>2</sup>.

Tensile Strength  $t = 1400 \text{ Kg/m}^2$ , Compressive Strength  $c = 50 \text{ Kg/m}^2$ , Modular ratio  $m=18$ , Moment of Resistance  $MR = 8.5 \text{ bd}^2$  lever arm  $jd = 0.8696$ .

Find – Depth of Slab, Reinforcement and draw a neat sketch showing details of reinforcement. (10)

Assume distribution Steel as 0.15 % of Gross Area of slab.

Q.2 b) :- Explain following (any 3) (6)

A) Ribbed tor steel.

b) Singly reinforced & doubly reinforced beams.

c) Properties of Good bricks.

d) Modular ratio.

Q.3 :- Write Short Notes on (any 4) (16)

a) Retaining Wall.

b) Water Cement Ratio.

c) Seasoning of Timber & its Methods

d) Vibration of concrete.

e) Controlled blasting with electric detonator.

Q.4 :- Distinguish between. (any 4) (16)

a) Super elevation and Camber.

b) G.T.S.B.M. and T.B.M.

c) Friction piles and Bearing Piles.

d) Weight batching and volume batching.

e) Earnest money and security deposit.

Q.5. :- (I) What are Various types of Foundation, list out them. (6)

(II) Explain each type of Foundation. With neat sketch & where they are used.10)

Q.6. :- Give reasons in brief. (any 4) (16)

(I) Filters are backwashed in W.T.P.

(II) Curing is done after casting.

(III) Main Reinforcement is provided on top in chhajjas.

(IV) Shrouding material is filled around supply wells.

(V) Foundation of structure is wide at Bottom.

**Q.7. :- Explain in brief. (any 4)**

(16)

- (a) Standard Measurement Book.
- (b) Unstamped Receipt & Red unstamped Receipt.
- (c) Write specification for 1:2:4 concrete.
- (d) Dado and skirting.
- (e) Prepare a rate analysis for 1:2:4 concrete for foundation.

**Q.8. :- Draw neat sketch of following (not to scale) & assume suitable dimensions & mention them on the drawing. (any 2)**

(16)

- (a) Intz / Simple E.S.R. for 1.00 lakh Li.cap.
- (b) Cross sectional view for village Road.
- (c) King post truss with its accessories.

**MAHARASHTRA JEEVAN PRADHIKARAN  
RESEARCH AND TRAINING CENTRE, NASHIKROAD**

**Professional Examination of Asstt.Engineer- II / Sectional Engineer  
/ Jr.Engineer  
October 2011**

**Subject :- General Engineering (Oral)**

**ROLL NO :-**

Date :- 12/10/2011

Time :- 15.00 to 15.30

Marks :- 50

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- Note :-
- (1) All Questions are compulsory.
  - (2) Use of Calculator, Log table is allowed.
  - (3) Figure in bracket on right hand side indicate total marks.
- 

**Question No.1** Write full form of the following (10)

- |                    |                |
|--------------------|----------------|
| (1) P.E.R.T.       | (6) M.B.R.     |
| (2) L.A.Q.         | (7) S.B.       |
| (3) U.I.D.S.S.M.T. | (8) N.G.O.     |
| (4) R.F.L. A.C.T.  | (9) D.I. PIPES |
| (5) B.O.D.         | (10) POP       |

**Question No.2** Fill in the blanks (10)

- (1) A power driven inclined continuous stair way used for raising or lowering passengers is called.....
- (2) Initial setting time of ordinary Portland cement is.....
- (3) The cement bags should be ..... cm away from the wall
- (4) The centering removed in respect of vertical sides of 3 m long column in.....hrs.
- (5) The total area of window opening should normally vary from ..... to ..... % of the floor area of the room.
- (6) For residential buildings, the size of steps commonly adopted tread..... & rise.....
- (7) The weight of R.C.C. item in  $\text{kg/m}^3$  is .....

- (8) Super elevation should not be ..... than the camber
- (9) The S.B.C. of the murrum ..... Considered for the design purpose.
- (10) The standard cement consumption of the R.C.C. 1:2:4 is .....

**Question No.3 (A)** Mention unit of measurement as per MJP DSR (5)

- (1) M.S. Specials
- (2) RCC ESR
- (3) Barbed wire fencing
- (4) Excavation in Hard rock
- (5) Cement sand guniting

**Question No.3 (B)** Answer the following (5)

- (1) Design years of village water supply scheme.....
- (2) .....LPCD in 'C' class municipal council
- (3) Long form of P.V. Claim
- (4) Bearing capacity of the B.C. Soil is .....
- (5) Long form of P.C.C. is .....

**Question No.4** Indicate whether following statement are (True or False) (10)

- (1) The force of resistance offered by a body against the deformation is called strain
- (2) When 1 cm on a map represents 10 M. on the ground, the representative fraction of the scale is 1:100.
- (3) Minimum distance at which the air valves may be provided on the Rising Main/ Gravity Main is 800 M
- (4) The standard size of a masonry brick is 20 cm x 10 cm x 10 cm
- (5) The amount of precipitation is measured by rain gauge
- (6) The water bearing strata is called an aquifer.

- (7) The most commonly used disinfectant for drinking water throughout the world is alum
- (8) Raft foundation may be provided for the R.C.C. E.S.R. in the B.C. soil strata
- (9) In the water cement ratio is low, the strength of the mix is high
- (10) The water from kitchens, bathrooms, wash basins is called sewage

**Question No.5**      Answer in one sentences (10)

(1) Stress

(2) Grouting

(3) Balancing Tank

(4) Scour valve

(5) Non return valve

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

Signature of Supervisor-----

Signature of Examiner-----

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

**Professional Examination of Asstt.Engineer- II /**  
**Sectional Engineer / Jr.Engineer**  
**October 2012**

**Subject :- General Engineering (Civil) (Written)**

**Date :- 3/10/2012**

**Time :- 10.00 to 13.00**

**Marks :- 100**

- 
- Note :-**
- (1) Question No.1 is compulsory. Solve any five question out of remaining.
  - (2) Marks are reserved in each question for clear sketches, good hand writing and neatness in general.
  - (3) Make suitable assumption where necessary and state them clearly.
  - (4) Figure in bracket on right hand side indicate total marks.
  - (5) Use of calculator, Log table are allowed.
  - (6) Mobile, Laptop, Tablets are not allowed.
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**Question No.1 :-**

- (a) Define the term foundation (4)
- (b) What are the purpose of foundation (4)
- (c) Causes of failure of foundation (4)
- (d) Describe under-reamed pile & its method of construction with sketch. (8)

**Question No.2 :- Write a short note (any four) (16)**

- (a) Shoring
- (b) Hollow concrete blocks
- (c) Water cement ratio.
- (d) Pre-chlorination.
- (e) Score depth.
- (f) Admixture of concrete.

**Question No.3 :-**

- (A) Find the thickness & reinforcement for a R.C.C. floor slab required to carry a superimposed load of  $480 \text{ kg/m}^2$ , the span being 2.5 m, Simply supported. The flooring is to be finished with 20 mm thick terrazzo topping. Assume-  $m = 18$ ,  $c = 50 \text{ kg/cm}^2$ ,  $t = 1400 \text{ kg/cm}^2$  & weight of 20 mm thick terrazzo topping =  $60 \text{ kg/m}^2$ . Draw the dimensional sketch of the slab. (10)
- (B) Explain Advantages of Reinforcement concrete. (6)



Question No.4 :- Explain in short (Any four)

(16)

- (a) English Bond & Flemish Bond.
- (b) Oneway slab & Twoway slab.
- (c) Load bearing wall & Retaining wall.
- (d) Traditional Bricks & Modular Bricks.
- (e) G.T.S. Bench mark & Temporary Bench mark.
- (f) Task work.

Question No.5 :-

- (a) Draw a cross section of Earthen Balancing Tank showing proper slopes of Embankment & its components. Considering Av.GL-105, Bedlevel- 103, FSL- 108. (8)
- (b) Define the stair & Draw the sketch showing its various components. (8)

Question No.6 :-

- (A) List out the items to be included in the estimate of any two of following. (8)
  - (i) R.C.C. production well.
  - (ii) Rising main with D.I. pipes
  - (iii) Pure water pumping machinery (centrifugal pumps)
- (B) State standard cement consumption for (Any two) (4)
  - (i) P.C.C. M 150 (1:2:4)
  - (ii) R.C.C. M 150 (1:2:4)
  - (iii) IInd class BB masonry in cm (1:5) (30% mortar assumed)
  - (iv) 12 mm thick cement plaster in single coat in cm (1:3)
- (C) State unit weight of following Building Materials. (Any two) (4)
  - (i) Bricks
  - (ii) Cement
  - (iii) Steel
  - (iv) Water

Question No.7 :-

- (A) Give Reason (any two) (8)
- (i) Steel Rods are used as Reinforcement.
  - (ii) Curing is necessary for concrete.
  - (iii) Chlorination is invariably used as treatment for disinfection on large scale.
- (B) Write Advantages & Disadvantages of Welding. (4)
- (C) Write function of Air valves & its location on pipeline. (4)

Question No.8 :-

- (A) - Write functions of Junior Engineer & Sectional Engineer. (8)
- (B) Methods of population forecast usually used in MJP. (4)
- (C) Difference Between Regional Rural water supply scheme & Individual rural W.S.S. (4)

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

**Professional Examination of Asstt.Engineer- II /  
Sectional Engineer / Jr.Engineer**

**October 2012**

**Subject :- General Engineering (Oral)**

Date :- 4/10/2012

Time :- 15.00 to 15.30

Marks :- 50

- Note :-
- (1) All Questions are compulsory.
  - (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.

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

Question No.1	Write the full form of following generally used in MJP	(10)
	(1) CPM.....	
	(2) DPC.....	
	(3) ESR.....	
	(4) BPT.....	
	(5) STP.....	
	(6) BWSC Pipes.....	
	(7) WBM.....	
	(8) NRV.....	
	(9) NRDWP.....	
	(10) SBC.....	
Question No.2	Fill in the blanks	(10)
	(1) 28 days strength of concrete M20 is .....N/mm <sup>2</sup>	
	(2) Weight of water per cubic meter is .....Kg/m <sup>3</sup>	

	(3)	Weight of 10 mm dia MS bar is .....Kg/m	
	(4)	Percentage of Annual depreciation for RCC ESR is ..... %	
	(5)	Safe permissible load on Brick masonry with CM 1:3 is ..... Tonne/m <sup>2</sup> .	
	(6)	Design period of pumping machinery is .....year.	
	(7)	Clarifloculator is a unit of .....type of WTP.	
	(8)	Minimum dia of pipe is used for Rising main is ..... mm	
	(9)	A water supply scheme for two of more than two villages known as .....	
	(10)	Standard size of Hollow concrete block is .....	
Question No.3		(A) Mention unit of measurement as per MJP DSR	(5)
	(1)	G.I. Pipe railing. ....	
	(2)	Trial Bore. ....	
	(3)	Pressure Grouting. ....	
	(4)	Cross connection to Existing Distribution system. .... .....	
	(5)	Inner cement mortar lining. .... .....	
		(B) Answer the following	(5)
	(1)	In Water treatment plant Chlorine is used as. ....	
	(2)	Life of RCC ESR is .....	
	(3)	Percentage of Annual depreciation for Earthen Dam. ....	
	(4)	In water supply scheme Dam used as .....	
	(5)	Weight of Portland cement bag is .....	
Question No.4		Indicate whether following statement are (True or False)	(10)
	(1)	Rise upto 160 mm is admissible in the case of staircase .....	
	(2)	Alum is used as coagulant .....	
	(3)	Percolation well is used as surface source in water supply scheme .. .....	

	(4)	For Lowering, laying & jointing D.I. K-7/K-9 pipe, rate shall be adopted as per CI 'LA' class pipe .....	
	(5)	Roof Rain Water Harvesting should be compulsory to every construction of Roof .....	
	(6)	Concrete used for prestressed work should have a cube strength of 350 kg/cm <sup>2</sup> for post-tensioned system. ....	
	(7)	Rate of filtration for slow sand filter is 3000 to 6000 Lit/Hrs/sqm .. .....	
	(8)	R.C.C. NP2 pipes are used for Rising main .....	
	(9)	A water supply scheme supplying water at least 16 days in a month known as functioning scheme .....	
	(10)	For major concrete work machine mixer is compulsory .....	
Question No.5			
	(A)	Which types of pipes used in water supply scheme with their C value (Five type only)	(5)
	(i)	.....	
	(ii)	.....	
	(iii)	.....	
	(iv)	.....	
	(v)	.....	
	(B)	Answer in one sentence for the following	(5)
	(i)	The Recommended height of pump house for V.T. Pump of 50 HP & above. ....	
	(ii)	Lifting equipment for centrifugal & submersible pump of 151 HP to 300 HP. ....	
	(iii)	Self cleaning velocity for sewers for Design peak flow .....	
	(iv)	Maximum permissible velocity for sewer of concrete Drain. ....	
	(v)	Maximum permissible depth of flow for sewer upto 400 mm dia. ... .....	

# MAHARASHTRA JEEVAN PRADHIKARAN

Examination conducted by

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

Professional Examination of Asstt. Engineer-II / Sectional Engineer / Jr. Engineer

October 2013

Subject :- General Engineering (Civil) Paper-I (WRITTEN)

Date :- 22/10/2013

Time :- 10.00 to 13.00

Marks :- 100

Note :- (1) Question No. 1 compulsory & Solve Any Four From the remaining.

(2) Use of Calculator, Log table are allowed.

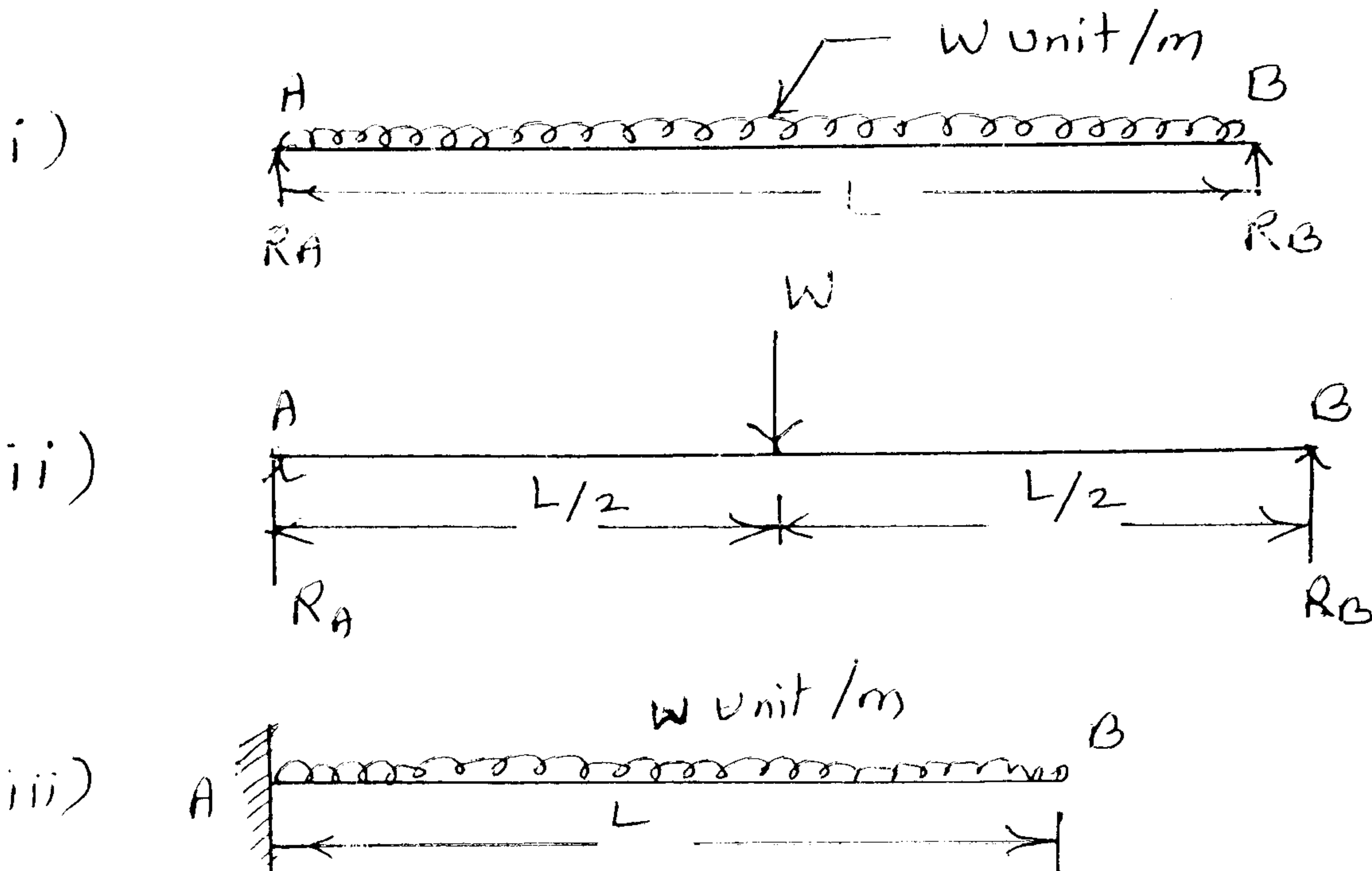
(3) Figure in bracket on right hand side indicate total marks.

(4) Mobile, Laptop, Tablets are not allowed.

(5) Make suitable assumptions where necessary & state them.

Que. No. 1. A] Design a simply supported beam having a effective span is 5.00m with U.D.L. of 500kg/m, m-150 grade concrete  
 $f = 1400 \text{ kg/cm}^2$ ,  $C = 50 \text{ kg/cm}^2$ ,  $m = 18$  (8)

B] Calculate the reactions ( $R_A$  &  $R_B$ ) shear force and maximum bending moment (BM) for the following loading. Also drawn SF & BM diagram (Any Two). (8)



C) What are the factors which governs the RCC design?

(4)

Que. No. 2. A) Calculate the missing values by H.I. method from given data & also apply necessary check.

(12)

Chainage	B.S. Back Sight	I.S. Intermediate Sight	F.S. Fore Sight	H. I. Height of Instrument	R.L. Reduced Level	Remark
	2.925	-	-	?	209.510	B.M.
0	-	1.675	-	-	?	
30	-	?	-	-	210.425	
60	-	3.355	-	-	209.080	
90	0.840	-	?	209.520	?	C.P.
120	-	?	-	-	208.275	
150	-	?	-	-	210.635	
180	?	-	2.630	207.815	?	C.P.
210	-	?	-	-	206.04	
240	-	1.920	-	-	205.895	
270	-	-	?	-	205.69	

Check :- B.M. :- Bench Mark, C.P. :- Change Point

B) Solve all Questions.

(8)

- i) What is the short column.
- ii) What is form work.
- iii) What is the curing.
- iv) Properties of Good bricks.

Que. No. 3. Write a short Note (Any Five)

(20)

- i) Water cement ratio.
- ii) Seasoning of Timber & its methods.
- iii) Admixture of concrete.
- iv) Pre-chlorination.
- v) Score Depth
- vi) NRDWP Programme.

**Que. No. 4.** Distinguish between (Any Five) (20)

- i) Weight batching & volume batching.
- ii) G.T.S. Bench Mark & Temporary Bench Mark.
- iii) Super elevation and Camber.
- iv) Singly reinforced & doubly reinforced beam.
- v) Guniting & mortar lining.
- vi) Earnest money & Security Deposit.

**Que. No. 5.** Explain in brief (Any Five) (20)

- i) Write specification for 1:2:4 concrete.
- ii) Causes of failure of foundation.
- iii) Write function of Air Valve & its location on pipeline.
- iv) Why filters are backwashed in water treatment plant.
- v) List out the methods of population forecast usually used in MJP & Explain in details any one method.
- vi) Write short note on lightening conductor.

**Que. No. 6. A]** List out the vertical wings formed for strengthening of the M.J.P. & Give two functions of each wing. (8)

**B]** Draw a neat sketch of E.S.R. for cap 2.00 lakhs lit. (not to scale) assume suitable dimensions. Mention the name of each components on drawing. (8)

**C]** State Unit Weight of following Building material. (4)

- 1) Cement
- 2) Steel
- 3) Water
- 4) Bricks.





# MAHARASHTRA JEEVAN PRADHIKARAN

Examination conducted by

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

Professional Examination of Asstt. Engineer-II / Sectional Engineer / Jr. Engineer

October 2013

Roll No.

Subject :- General Civil Engineering (ORAL)

Date :- 23/10/2013

Time :- 15.00 to 15.30

Marks :- 50

- Note :- (1) All Questions are compulsory.  
(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.

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

Que. No. 1. Write the full form of the following :

(10)

- 1) RTI Act :- \_\_\_\_\_
- 2) LAQ :- \_\_\_\_\_
- 3) HDPE pipes :- \_\_\_\_\_
- 4) GSR :- \_\_\_\_\_
- 5) RA Bill :- \_\_\_\_\_
- 6) PMCS Division :- \_\_\_\_\_
- 7) FD Work :- \_\_\_\_\_
- 8) PFR :- \_\_\_\_\_
- 9) MSNA :- \_\_\_\_\_
- 10) GSR :- \_\_\_\_\_

Que. No. 2. Fill in the blanks (Any Ten)

(10)

- i) The SBC of B.C. soil \_\_\_\_\_ considered for the design purpose.
- ii) The standard cement consumption of the R.C.C. m250 is \_\_\_\_\_ bags per m<sup>3</sup>.
- iii) The design year of Urban Water Supply Scheme is assumed as \_\_\_\_\_ year.
- iv) For the design of underground drainage scheme the minimum water supply should be \_\_\_\_\_ LPCD.
- v) The long form of HFL is \_\_\_\_\_.
- vi) Generally \_\_\_\_\_ water treatment plant is used for the demand less than 5 mld.
- vii) In chlorination treatment for disinfection, the \_\_\_\_\_ is used as disinfecting material.
- viii) In the orthotolidine test, the formation of \_\_\_\_\_ color indicated the presence of residual chlorine.
- ix) The long form of WBM is \_\_\_\_\_.
- x) The permissible turbidity for drinking water is \_\_\_\_\_ to \_\_\_\_\_ ppm.
- xi) A natural water has PH value of \_\_\_\_\_.

Que. No. 3. Indicate whether following statements are True or False.

(10)

- 1) The Rising main pipe line used to flow water without pumping.

Ans :- \_\_\_\_\_

- 2) The standard size of masonry brick is 20cm x 10cm x 10cm.

Ans :- \_\_\_\_\_

3) The compressive strength of ordinary Portland cement concrete at 28 day is 100 %.

Ans :- \_\_\_\_\_

4) The permission for National Highway road crossing has to be taken state PWD.

Ans :- \_\_\_\_\_

5) The Ampere is a unit of electric current.

Ans :- \_\_\_\_\_

6) The average 500 Nos. of bricks required for one cubic meter of brickwork.

Ans :- \_\_\_\_\_

7) The turpentine solvent is commonly used in oil paint.

Ans :- \_\_\_\_\_

8) A land is said to be water logged when it is submerged in Flood.

Ans :- \_\_\_\_\_

9) The highest point on road surface is called camber.

Ans :- \_\_\_\_\_

10) The width of landing should be greater than the width of stair.

Ans :- \_\_\_\_\_

**Que. No. 4. Write in short (Any Five).**

**(10)**

i) Define rain gauges?

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ii) State two types of rapid sand filters?

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iii) What is water-cement ratio?

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iv) What is meant by batching?

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v) State any two types of piles?

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vi) Define super elevation in the highway?

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**Que. No. 5. Write the following (Any Five).**

**(10)**

A) Name any two methods of population forecast which are generally used?

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B) Write a long form of D.W.F. & U.G.D.

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C) Define Reflux valve

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D) Define Sullage.

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E) What is slump test?

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F) Write long form of PERT & CPM

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G) Define the term tread & flight in the stairs.

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**Examination conducted by**  
**Maharashtra Environmental Engineering Training & Research Academy**  
**(MEETRA), Nashik**  
**Professional Examination of Asstt. Engineer-II/Sectional Engineer/**  
**Jr. Engineer/Technical Assistant (Civil)**  
**November 2014**

**Subject** :- General Engineering (Civil) (Written)

**Date** :- 11/11/2014

**Time** :- 10.00 to 13.00

**Marks** :- 100

- 
- Note :-** 1) Question No.1 Compulsory & solve any five from the remaining.  
2) Use of calculator, Log, table are allowed.  
3) Figure in bracket on right hand side indicate total marks.  
4) Make suitable assumptions where necessary & state them.  
5) Use of mobile, laptop & tab are not allowed.
- 

**Que.No.1.** A) Design a short R.C. column required to carry an axial load of 1500 KN: Use M-20 grade of concrete & mild steel reinforcement. Assume suitable data whenever required as per IS code & Draw all required labeled diagram showing details of reinforcement. (12)

B) Describe under reamed piles & its method of construction with sketches (8)

**Que.No.2.** Write short notes on (Any four) (16)  
1) Initial setting time & final setting time of cement  
2) Camber & Super elevation.  
3) Scour depth  
4) Water cement ratio.  
5) Function of air valves & its location on pipeline.

**Que.No.3.** Explain in brief (Any four) (16)  
i) Why filter are backwashed in water treatment plant.  
ii) G.T.S. benchmark & Temporary Benchmark  
iii) Standard measurement Book  
iv) Gunitting & why it is necessary.  
v) Cut of trench.

**Que.No.4.** Answer the following (Any Four) (16)  
i) What are weep holes & its use in retaining wall.  
ii) Explain term "Lightening Conductor"  
iii) Seasoning of timber.  
iv) List out the various method of population forecast.  
v) Why curring is necessary?

- Que.No.5. Distinguish between (Any Four) (16)
- i) Earnest Money & Security Deposit
  - ii) Short column & Long column
  - iii) Weight batching & Volume batching
  - iv) Dado & Skirting
  - v) Evaporation losses & percolation losses
- Que.No.6. Draw neat sketch of following (not to scale) (16)  
Assume suitable dimension & mention them on the drawing (Any Two)
- i) Septic tank for small family.
  - ii) R.C.C. ESR of 1.00 Lakh capacity.
  - iii) Flow diagram of small village water supply scheme.
- Que.No.7. A) List out the items in short to be included in the estimate of any two (8)  
of following.
- i) Raw water rising main with 300 mm D.I. pipes.
  - ii) Switch control Room
  - iii) Jack well
- B) i) Write short note on NRDWP program (4)  
ii) List out the vertical wings formed for structuring of MJP. (4)

**MAHARASHTRA JEEVAN PRADHIKARAN**  
Examination conducted by  
Maharashtra Environmental Engineering Training & Research Academy  
(MEETRA), Nashik  
Professional Examination of Asstt. Engineer-I/Sectional Engineer/Jr. Engineer /  
Technical Assistant (Civil)  
November 2014

Roll No.	
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Subject :- General Engineering (Civil) (Oral)

Date :- 11/11/2014

Time :- 14.00 to 14.30

Marks :- 50

- 
- Note :- 1) All question. Compulsory.  
2) Use of calculator, Log, table are allowed.  
3) Figure in bracket on right hand side indicate total marks.  
4) Make suitable assumptions where necessary & state them.  
5) Use of mobile, laptop & tab are not allowed.
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Que.No.1. Fill in the blanks. (10)

- i) Minimum dia of vertical bar reinforcement of ESR column is ..... mm.  
ii) The standard size of concrete cube is .....  
iii) The minimum diameter of rising main is .....mm used in rural water supply scheme.  
iv) Bearing capacity of black cotton soil is 20.8.....MT/sqm.  
v) Super elevation is provided to reduce the effect of centrifugal force on a moving vehicle.  
vi) Trial pits are necessary to as certain .....  
vii) Slump test is carried out on concrete for control of workability of concrete  
viii) For circular column, minimum bars required are .....Nos.  
ix) The design period is considered while designing pumping machinery is .....1.5..... years.  
x) The highest point on road surface is called ....Crown.

Que.No.2. Indicate whether following statements are True or False. (10)

- i) The average 500 Nos. of bricks required for one cubic meter of brick work :- True  
ii) The standard size of brick is 20cm X 10cm X 10cm. :- false  
iii) Air valves are fixed at lower elevation in pipe line :- false  
iv) The Ampear is a unit of electric current :- Yes  
v) Alum is used as coagulant for treatment of water :- Yes



- vi) R.C.C. NP2 pipes are used in rising main :- \_\_\_\_\_
- vii) For major concrete work machine mixer is compulsory. :- Yes
- viii) Raft foundation may be provided for the R.C.C. ESR in the B.C. soil strata. :- Yes
- ix) Silt content of sand for concrete work should not exceed more than 10%. :- Yes
- x) Funding from NRDWP program is use for urban water supply scheme. :- 50%

Que.No.3. Write down the correct wording & Values. (10)

- A) Various test of concrete.
  - i) Comp strength ii) Tensile strength iii) Density iv) Modulus of rupture
  - shrinkage creep Modulus of elasticity Absorption
- B) Various test for cement
  - i) fineness ii) soundness iii) consistency iv) Initial & final setting time
  - compressive strength
- C) Design period as per C.P.H.E.E.O. manual.
  - i) Distribution system ..... 30 ..... years. ✓
  - ii) Water treatment plant ..... 15 ..... years.
  - iii) Head works ..... 15 ..... years. ✓
  - iv) Pumping machinery ..... 15 ..... years. ✓
- D) List out the items involved in pipeline work chronologically.
  - i) Grit channels screening
  - ii) Primary sedimentation
  - iii) Trickling filter
  - iv) Anaerobic digestion
  - sec clarifier
- E) Frame any four components of primary sewage plant.
  - i) \_\_\_\_\_
  - ii) \_\_\_\_\_
  - iii) \_\_\_\_\_
  - iv) \_\_\_\_\_

Que.No.4. Write full form of the following (10)

- i) NRDWP :- \_\_\_\_\_
- ii) NRV :- Non-return valve
- iii) BWSC :- Bar wrapped steel cylinder pipe
- iv) MBR :- Master balancing reservoir
- v) COD :- chemical oxygen demand
- BOD :- Biological oxygen demand

for cement 1440 kg of bags.

- vi) OPC :- Ordinary portland cement
- vii) MSNA :- Muzammasa tea signa Normal Abhiyan
- viii) DSR :- District schedule of rates
- ix) SBC :- safe bearing capacity
- x) TBM :- Temporary bench mark

Que.No.5. A) Which types of pipes used in water supply scheme with their 'C' Value? (Five type only). (5)

- i) \_\_\_\_\_
- ii) \_\_\_\_\_
- iii) - \_\_\_\_\_
- iv) \_\_\_\_\_
- v) \_\_\_\_\_

B) Answer the following. (5)

i) Write the value of safe bearing capacity of murum.

22 to 44 T/m<sup>2</sup>

ii) What is the unit in D.S.R. for wire fencing?

Running meter

iii) Cement consumption for R.C.C. 1:2:4 mix.

$1:2:4 = 7$ ,  $\therefore 1.52/7 = 0.217 \text{ m}^3$ ,  $0.217 \times 1440 = 312.68 \text{ bags}$

iv) What is the weight per cubic meter of mild steel?

7850 kg/cum

v) What is the current DSR rate for cement per bag?

\_\_\_\_\_

**MAHARASHTRA JEEVAN PRADHIKARAN**  
**Examination Conducted by**  
**MAHARASHTRA ENVIRONMENTAL ENGINEERING TRAINING &**  
**RESEARCH ACADEMY (MEETRA) NASHIK**

Professional Examination of AE-II / Sect.Engr. / Jr.Engr. / Technical Assistant  
(Civil) October 2015

Subject- General Civil Engineering Paper - I (Written)

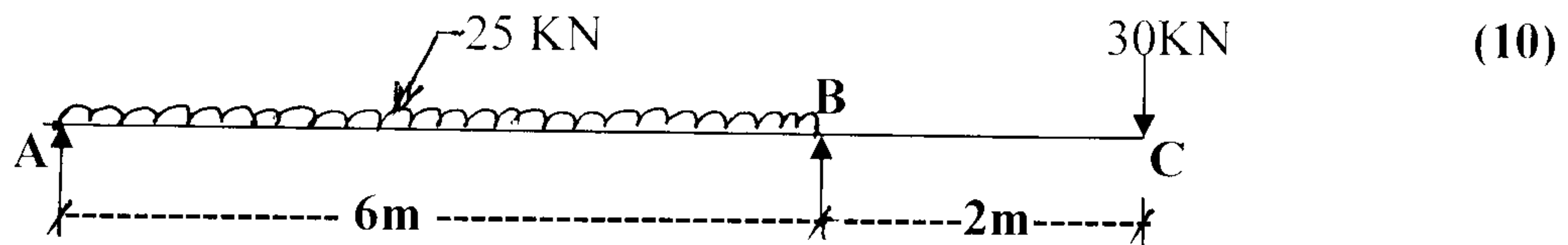
Date- 27/10/2015

Time- 10.00 to 13.00  
Marks-100

- Note-**
- 1) Question No.1 is compulsory & solve any five from the remaining.
  - 2) Use of calculator, log table are allowed.
  - 3) Figure in bracket on the right hand side indicates total marks.
  - 4) Make suitable assumptions where necessary & state them.
  - 5) Use of Mobile, laptop & tablets are not allowed.

**Question No.1**

- (A) A beam ABC, supported at A & B, BC being overhang. AB carries a udl of 25 KN/m & point load of 30 KN at C acting vertically down. AB=6m, BC=2m draw SF & BM diagram. (10)



- (B) i) What do you mean by perfect frame and imperfect frame. (5)  
ii) A circular steel bar of diameter 20mm is subjected to a tensile load of 90KN. Calculate stress, strain and change in length. (5)  
Take  $E=200$  GPA, length of bar 2.8m.

**Question No.2**

**Attempt any Eight (16)**

- 1) Define contour and state methods of interpolation.
- 2) State various types of estimates.
- 3) State principals of surveying.
- 4) State mode of measurement for following
  - i) Brick work
  - ii) Cement
- 5) State the rule of deduction for opening as per IS:1200 for brick work and plastering.
- 6) State the various factors affecting per capita demand of water.
- 7) State difference between fore bearing and back bearing.
- 8) State various sources of water.

- 9) State different grades of cement.
- 10) What do you mean by concrete mix design.

**Question No.3**

(12)

- 1) Following are the consecutive reading taken in straight line on a continuously sloping ground at a common interval of 30m with level & 4m levelling staff 0.980, 1.375, 2.325, 3.205, 0.770, 1.460, 2.835, 3.675, 0.790, 1.290, 2.815, 3.335. The first reading was taken on BM of RL -751.00m. Rule out page of level field book. Enter the readings using height of instrument method. Calculate reduced levels & gradient of line & apply check.
- 2) Draw stress, Strain curve & show its importance points.

**Question No.4 Attempt any two**

(16)

- (A) Prepare an approximate estimate of a public building having plinth area=1800 sqm.
  - i) Plinth area rate as 3500/sqm
  - ii) Special architectural treatment = 3% of cost of building.
  - iii) Miscellaneous installations = 20% of cost of building.
  - iv) Contingencies = 5% of overall cost of building.
  - v) Supervision charges = 5% of overall cost of building.
- (B) Draw cross section and structural plan of simply supported one-way slab as per IS 456-2000.
- (C) Prepare approximate estimate of ESR 200000 lit capacity. Use following data.
  - i) Cost of construction = Rs. 12/- per lit.
  - ii) Contingency & establishment charges = 10% of total cost.
  - iii) Supervision charges = 5% of cost of construction.
  - iv) Other charges = 10% of cost of construction.

**Question No. 5 Attempt any two**

(16)

- 1) The following is the population data for a town. Water supply Scheme is to be designed for this town with a design period 30 yrs find the population at the end of the year 2020 by Arithmetical method.

Year	1950	1960	1970	1980	1990
Population	35,000	37,500	43,500	52,000	57,500

- 2) Plan lamina of size 2m X 3m is immersed in water at a depth of 4m. Calculate total hydrostatic pressure if lamina is lying horizontally.
- 3) Write short note on workability of concrete. State its different methods.

**Question No. 6 Attempt any two**

(16)

- 1) State objectives of concrete mix design.
- 2) State different methods of NDT. Explain its importance.
- 3) Following are the result of sieve analysis of fine aggregates. Determine fineness modulus of fine aggregates.

Sieve Size	4.75	2.36	1.18	0.9	0.3	0.15	R.pan
Wt. Retained(gm)	10	110	223	227	340	90	10

**Question No. 7, Write a short note (Any Four)**

**(16)**

- 1) Liquid limit & plastic limit
- 2) Define the term
  - i) Water content
  - ii) Density of soil
- 3) Define the term
  - i) Unit wt. of soil mass
  - ii) Void ratio
- 4) Define the term
  - i) Topographical Survey
  - ii) Astronomical Survey
- 5) What are intakes? Where are these used?

**Question No. 8**

**(8)**

- 1) Draw plan & elevation of ground storage reservoir of capacity 1.5 lakh lit.  
Ground level is 110.00m, Lowest water level 107.00m, Full supply level- 111.00 m ,  
free board 0.5m ,base slab-200mm tk., PCC-150mm tk., Roof slab 150mm  
thick, wall thickness is 200mm.  
From given data calculate height of water and dia. of GSR.
- 2) Draw homogenous embankment type Earthen dam & explain its various parts. **(4)**
- 3) Define & Explain slump test of concrete. **(4)**

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**MAHARASHTRA JEEVAN PRADHIKARAN**  
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Professional Examination of AE-II / Sect.Engr. / Jr.Engr. / Technical Assistant  
(Civil) October 2015  
Subject- General Civil Engineering Paper - I ( Oral )

<b>Roll No</b>	
----------------	--

Date- 27/10/2015

Time- 14.00 - 14.30  
Marks-50

- Note-**
- 1) All questions are compulsory.
  - 2) Use of calculator, log table are allowed.
  - 3) Figure in bracket on the right hand side indicates total marks.
  - 4) Use of mobile, laptop & tab are not allowed.

Question No	1	2	3	4	5	Total
Marks obtained						

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

**Question No.1 - Write the full form of the following (10)**

- (1) RTI Act
- (2) MSNA
- (3) NRDWP
- (4) AMRUT
- (5) BWSC PIPES
- (6) BOD
- (7) RA Bill
- (8) NRV
- (9) CBR
- (10) MBR

**Question No.2 - Fill in the blanks**

**(10)**

- (1) The standard size of concrete cube is -----.
- (2) Super elevation is provided to reduce the effect of ----- on a moving vehicle.
- (3) Slump test is carried out on concrete for control of -----.
- (4) The standard size of bricks is -----.
- (5) Application of chlorine after all the treatments of purification of water are complete is called as -----.
- (6) Weight of water per cubic meter is -----kg/m<sup>3</sup>.
- (7) Weight of 12 mm dia. MS bar is ----- kg/m.
- (8) Weight of portland cement bag is -----Kg.
- (9) A water supply scheme for two or more than two villages known as -----.
- (10) Design period of pumping machinery is ----- years.

**Question No.3 Indicate whether following Statement are True or False**

**(10)**

- (1) Alum is used as coagulant for treatment of water.
- (2) Air valves are fixed at lower elevation in pipe line.
- (3) Silt content of sand for concrete work should not exceed more than 10%.
- (4) The compressive strength of ordinary portland cement concrete at 28 days is 100%.
- (5) The width of landing should be greater than the width of stair.
- (6) The permissible PH value for public water supply is 6.5 to 8.5.
- (7) Aeration is done for removal of colour.
- (8) Weight of water per cubic meter is 1000 kg.
- (9) The permission for National Highway road crossing has to be taken state PWD.
- (10) A land is said to be water logged when it is submerged in flood.

**Question No.4 - State answers the following**

**(10)**

- (A) Various test for cement.
- (B) Methods of population forecast.
- (C) State various types of piles in foundation work.
- (D) State various methods of water distribution system.
- (E) List the various units of water treatment plant.

**Question No.5 -**

(A) Write WTP process units and their functions.

**(5)**

(B) Answer the following

**(5)**

- 1) What is the safe bearing capacity of murum?
- 2) What is the weight per cubic meter of mild steel?
- 3) What is self cleaning velocity normally adopted for sewers?
- 4) What is called for an imaginary line connecting the points of equal elevation on the ground surface?
- 5) What is the crushing strength of first class bricks?

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