

GUJARAT WATER SUPPLY & SEWERAGE BOARD

Jaiseva Bhavan, Sector 10-A, Gandhinagar 382 010

PROFESSIONAL EXAMINATION FOR ASSISTANT ENGINEER, ADDITIONAL ASSISTANT ENGINEER AND OVERSEER

PAPER-I GENERAL CIVIL ENGINEERING (100 Marks)

Date : 28-11-2011

Time:10-30 am to 13.30 Noon

- Q.1 Describe different types of cements and write in brief about ordinary Portland cement and rapid hardening cement 10 marks
- Q.2 Write about the field test conducted on cement OR Describe in brief different types of mortars used in masonry works 5 marks
- Q.3 Describe different types of bonds provided in brick masonry. Write a brief note for any one type of bond with neat sketch 10 marks
- Q.4 What is curing ? Write different types of curing adopted in construction 10 marks
- Q.5 Describe different types of foundations suitable for various circumstances (Brief any one in detail). What are the precautions to be taken for foundation on black cotton soil? 10 marks
- Q.6 Write about the different steps duly followed for execution of any water supply schemes. 10 marks
- Q.7 (a) Define Rate Analysis and its importance. Write the factors effecting Rate Analysis. 5 marks
- (b) Work out rate analysis of 1cum brick work (1:6) OR Rate Analysis of 1 cum concrete (M150) grade 5 marks
- Q.8 Write different types of masonry ? Write in brief about any one type of masonry 5 marks
- Q.9 Choose appropriate answers to the questions from the options given 30 Marks
1. In circular sump wall (Free at top and bottom) which steel is main steel
- (a) Vertical (b) Horizontal (c) Stirrups

2. In column, which steel is main steel?
(a) Vertical (b) Horizontal (c) Stirrups
3. What is the proportion of M200 concrete?
(a) 1:2:4 (b) 1:1.1/2:3 (c) 1:1:2 (d) 1:3:6
4. As per IS-456 grade OR concrete for M250 & more than M250 is called
(a) Nominal concrete (b) Design concrete
(c) Standard concrete
5. Give standard size of brick
(a) 18 x 8 x 8 (b) 19 x 9 x 9
(c) 20 x 10 x 10 (d) 21 x 11 x 11
6. The term "Frog" means that
(a) A depression on face of brick (b) An apparatus to lift the stone
(c) Vertical joint in brick (d) Soaking brick in water
7. The number of bricks required for 1 cum brick masonry is ____
(a) 400 (b) 425
(c) 500 (d) 450
8. Slump test for concrete is carried out to determine ..
(a) Strength (b) Durability
(c) Workability (d) Water content
9. Weight in Kg. for 1 meter long 12 mm tor steel is ---
(a) 0.62 (b) 0.89
(c) 0.39 (d) 1.56
10. Least bearing capacity of soil is that of
(a) Hard rock (b) Soft rock (c) Black cotton soil (d) Murrum

- 11. During excavation if water is found in soil then bearing capacity ---
 - (a) Increases
 - (b) Decreases
 - (c) Remains same

- 12. The form work of a slab having span less than 4.5 meter can be removed after --
 - (a) 7 days
 - (b) 14 days
 - (c) 21 days
 - (d) 28 days

- 13. Nominal mix of concrete may be used for concrete grade equal are less than --
 - (a) M25
 - (b) M20
 - (c) M30
 - (d) M15

- 14. The design period of water supply projects in rural areas is --
 - (a) 20 years
 - (b) 30 years
 - (c) 25 years
 - (d) 45 years

- 15. Bulking of sand is caused due to --
 - (a) Surface moisture
 - (b) Air voids
 - (c) Clay content
 - (d) Viscosity

- 16. Good quality cements contain higher percentage of ---
 - (a) Tricalcium Silicate
 - (b) Dicalcium Silicate
 - (c) Dicalcium Aluminate
 - (d) Tricalcium Aluminate

- 17. With storage, strength of cement--
 - (a) Increases
 - (b) Decreases
 - (c) Remains the same
 - (d) None of above

- 18. Pile foundations are suitable for ---
 - (a) Water logged soil
 - (b) Soft rock
 - (c) Compact soil
 - (d) Hard rock

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19. Brick laid with its length parallel to the face of wall is known as
- (a) Header (b) Stretcher
(c) Closer (d) None of above
20. Plaster work is normally measured in --
- (a) Running mtr. (b) Square mtr.
(c) Cubic mtr.
21. A temporary rigid structure having platforms to enable masons to work at different stages of buildings is known as --
- (a) Scaffolding (b) Dead shore
(c) Raking shore (d) Jacking
22. If the various concrete ingredients i.e., cement, sand and aggregates are in the ratio of 1: 3 : 6, then grade of concrete is --
- (a) M100 (b) M150
(c) M200 (d) M250
23. IS Code has specified the full strength of concrete after--
- (a) 7 days (b) 14 days
(c) 21 days (d) 28 days
24. The minimum diameter of main steel for column is--
- (a) 6 mm (b) 8 mm
(c) 10 mm (d) 12 mm
25. If concrete grade is 1: 2: 4 and fine aggregate weight is 50kg, coarse aggregate weight is 100 kg., water/cement ratio is 0.6 than weight of water required for concrete mix is --
- (a) 12 kg. (b) 14 kg.
(c) 10 kg. (d) 15 kg.

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26. If the bearing capacity of soil is less than 10kg/Sq.cm and the structure is heavily loaded, then which type of foundation is preferred?
- (a) Individual footing (b) Raft foundation
(c) Combined footing
27. For M200 Grade concrete, what is the maximum water cement ratio as per IS-456:2000
- (a) 0.4 (b) 0.45
(c) 0.50 (d) 0.55
28. Minimum percentage of steel in slab when top steel is used--
- (a) 0.10 (b) 0.12
(c) 0.15 (d) 0.20
29. Minimum comprehensive strength of 1st Class Bricks should be --
- (a) 75 kg/Sq.cm (b) 90 kg/Sq.cm
(c) 100 kg/Sq.cm (d) 120 kg/Sq.cm
30. The Kiln which may work regularly though out the year is----
- (a) Clamp (b) Bull's kiln
(c) Hoffman's kiln (d) None of above



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GUJARAT WATER SUPPLY AND SEWERAGE BOARD (GWSSB)

DEPARTMENTAL EXAMINATION FOR ASST. ENGINEERS/ ADDITIONAL
ASSISTANT ENGINEERS AND OVERSEERS- 2011

Subject: Water Supply and Sanitary Engineering
MM: 100

Date: 28-11-2011
Time: 3 Hours

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SECTION I

Select the correct alternatives from the ones given below each question. There are 20 questions in this section each carrying 1 mark.

1. The ratio of maximum to average flow of sewage in a sewer is called _____.
 - A. Peak factor
 - B. Mean factor
 - C. Star factor
 - D. Sewer factor

2. If the rainfall is heavy and for a shorter duration a _____ system of sewerage is preferred.
 - A. Separate
 - B. Combined
 - C. Water Conservancy
 - D. None of the above

3. The quantity of oxygen required for the biochemical oxidation of the decomposable matter at specified temperature within the specified time is called _____.
 - A. Chemical oxygen demand
 - B. Biochemical oxygen demand
 - C. Anaerobic demand
 - D. Nitrogen Demand

4. The standard time and temperature for BOD test in India is _____.
 - A. 5 days 20°
 - B. 3 days 30°
 - C. 5 days 37°
 - D. 3 days 40°

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5. The difference between the amount of chlorine added to water and the amount of chlorine remaining at the end of a specified contact period is called _____.
- A. chlorine demand
 - B. residual chlorine
 - C. applied chlorine
 - D. chlorine dose
6. Post chlorination is done after the _____ process.
- A. Sedimentation
 - B. Coagulation
 - C. Filtration
 - D. Alum dosing
7. _____ is used as a coagulant in water supply practice
- A. Bleaching Powder
 - B. Alum
 - C. Ozone
 - D. Potassium permanganate
8. To detect the presence of residual chlorine in water samples, _____ is done.
- A. Jar test
 - B. Orthotoludine test
 - C. Yield test
9. The minimum velocity at which no solids get deposited in the sewer is called _____.
- A. Self cleansing velocity
 - B. Non-scouring velocity
 - C. Zero velocity
 - D. None of the above
10. _____ is fixed at the summits of mains where there is a possibility of some suspended impurities to settle down and cause obstruction to the flow.
- A. Air valve
 - B. Scour valve
 - C. Reflux valve
 - D. None of the above

11. 1 horse-power = _____ watts

- A. 1000
- B. 746
- C. 1250
- D. 7460

12. The main end-product of anaerobic decomposition of organic waste is _____

- A. Methane
- B. Carbon-di-oxide
- C. Hydrogen sulphide
- D. Nitrogen

13. The work of laying Bulk water lines in the state is carried out by _____.

- A. GWSSB
- B. GWIL
- C. WASMO
- D. WALMI

14. The "c" value of _____ pipe is the highest.

- A. CI
- B. AC
- C. MS
- D. PVC

15. Most of the 'colour' of the water is due to _____ impurities.

- A. Dissolved
- B. Suspended
- C. Colloidal
- D. All the above

16. Dissolved impurities in water can be removed by _____ process.

- A. Disinfection
- B. Filtration
- C. Reverse Osmosis
- D. Sedimentation

17. The residual chlorine at each and every consumer tap should be _____ under normal circumstances.

- A. 2 mg/l
- B. 0.2 mg/l
- C. 0.2mg/l
- D. 0.4mg/l

18. Fluoride concentration is usually high in _____.

- A. Surface water
- B. Ground water
- C. Wholesome water
- D. None of the above

19. The full form of GRP is _____.

- A. Glass Reinforced plastic
- B. Gum reinforced Plastic
- C. Granite reinforced plastic
- D. Grass reinforced plastic

20. $1 \text{ m}^3 =$ _____ liters

- A. 100
 - B. 1000
 - C. 10000
 - D. 10
-

Section II

There are 18 Questions in this section. Answer any 16. Each Question carries 5 (five) marks.

1. Explain the terms: Water Bearing Stratum, Water table and porosity.
2. What is meant by wholesome water? Mention four requirements of wholesome water.
3. What are water borne diseases? Give two examples of water borne diseases.
4. Write a note on pH value and its significance. What should be the range of pH of water in case of public water supplies?
5. What do you understand by hardness of water? How can you remove hardness from water?
6. Name any two valves used in water supply practice and state their functions.
7. Explain the term turbidity. What should be the turbidity of water treated by a conventional water treatment plant?
8. Explain the necessity of providing a manhole in sewer lines. Explain the construction of a manhole with a neat sketch.
9. State the quality standards for drinking water (desirable as well as permissible) for the following parameters as per IS 10500; 1991.
 - a. Nitrates
 - b. TDS
 - c. Chlorides
 - d. Hardness
 - e. Fluoride
10. In a regional water supply scheme, tail end villages are not getting sufficient water. What can be the probable reasons and what steps you would suggest to solve them?
11. What do you understand by roof rain water harvesting structures? Where in Gujarat would you propose roof rain water harvesting structures? Why?
12. Give four points of difference between a rapid sand filter and a slow sand filter.
13. Answer the following with respect to Rapid sand filter.
 - a. What is the maximum permissible head loss?
 - b. What is the filtration rate?
 - c. What is backwashing? How frequently a filter bed needs to be washed?
14. Explain in brief the main features of Swajaldhara programme.
15. Mention only the data required and points to be considered to design gravity main using software developed by UNDP or any other software. Differentiate – Gravity main and Rising main.
16. Draw a line diagram of a conventional Water Treatment Plant and explain the function of each unit in brief.
17. Explain any two pipes used in water supply practice and their significance and properties.
18. From the census data given below, estimate the population of the city for the year 2041. Use any method of your choice to estimate the population.

1951	1961	1971	1981	1991	2001
21610	29540	42860	61500	90000	112000

GUJARAT WATER SUPPLY & SEWERAGE BOARD

Jalseva Bhavan, Sector 10-A, Gandhinagar 382 010

**PROFESSIONAL EXAMINATION FOR ASSISTANT ENGINEER, ADDITIONAL ASSISTANT ENGINEER AND
OVERSEER****PAPER-III (ACCOUNTS) (100 Marks)**

Date : 29-11-2011

Time : 10.30 am to 13-30 Noon

- Q.1** Explain in details various Forms of Bills for payment to contractors 10 marks
- Q.2** Explain in details how Schedule of Rates are prepared 10 marks
- Q.3** Explain in details the parts of Muster Rolls 10 marks
- Q.4** Differentiate between (any Four) 20 marks
- (1) Piece work and contract work
 - (2) Common M.B. and Standard M.B.
 - (3) Stock Accounts and Tools & Plant Accounts
 - (4) Issue Rate and Storage Rate
 - (5) Part Rate and Reduce Rate
- Q.5** Write short note on any four 20 marks
- (1) Material at site accounts
 - (2) Bin-card
 - (3) Form No.7 & 8 of stores
 - (4) Procedure for verification of stock
 - (5) Work abstracts

OBJECTIVE

Q.6 Choose appropriate answers to the questions from the options given (20 Marks)

- (1) A common measurement book can be destroyed after how many years after written of last measurement?
- (a) 5 years (b) 7 years
(c) 10 years (d) 20 years
- (2) Daily Report is necessary to prepare if the labourers exceed ____
- (a) 15 labourers (b) 16 labourers and above
(c) 17 labourers and above (d) 24 labourers and above
- (3) What are the powers to approve DTPS by the Executive Engineer?
- (a) Rs.15 lacs (b) Rs.20 lacs
(c) Rs.50 lacs (d) Rs.10 lacs
- (4) The Form No.of Measurement Book is ____
- (a) Form No.21 (b) Form No.23
(c) Form No.33 (d) Form No.43
- (5) Payment Refund Deposit is made by preparing the voucher on ____
- (a) F&F Bill (b) C.O.P
(c) Hand Receipt (d) Final bill
- (6) The Additional Asstt.Engineer is competent to pass NMR upto Rs.____
- (a) Rs.3 000 (b) Rs.6000
(c) Any limit (d) Nil
- (7) The Form No.of Hand Receipt is ____
- (a) 24 (b) 25
(c) 28 (d) 27
- (8) As per Delegation of Powers, Executive Engineer has powers to carry out work on Rate List is ____
- (a) Rs.5 ,000 (b) Rs.10,000
(c) Rs.15,000 (d) Rs.20,000
- (9) TPC-2 has powers to approve tender cost upto Rs.____
- (a) Rs.1 crore (b) Rs.2 crore
(c) Rs.20 crore (d) Rs.25 crore
- (10) The Superintendent Engineer has powers to approve _____ Rs.of Draft Tender Papers
- (a) Rs.1.5lacs (b) Rs.15 lacs (c) Rs.75 lacs (d) Full powers

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- (11) Dy.Executive Engineer has powers to carry out workson A-1/A-2 tender is ____
 - (a) Rs.50,000
 - (b) Rs.5,00,000
 - (c) Rs.1,00,000
 - (d) No powers
- (12) SE has Rs.____ powers for procurement of Plant/Machinery/Transport Vehicles and Tools and Plants
 - (a) Rs.50,000(annually)
 - (b) Rs.1,00,000 (annually)
 - (c) Rs.5,00,000
 - (d) Full powers
- (13) As per Delegation of Powers, an authority can accept tender on
 - (a) Tender cost
 - (b) Estimated cost
 - (c) Quoted cost
 - (d) Non of above
- (14) SE can accept late Security Deposit of ____ days
 - (a) 10 days
 - (b) 30 days
 - (c) Full powers
 - (d) 20 days
- (15) A.A.E.whose service is more than 10 years can take final measurement upto Rs.____
 - (a) Rs.40,000
 - (b) Rs.1,00,000
 - (c) Rs.5,000
 - (d) Rs.50,000
- (16) For supply on regular work, Executive Engineer has to check the measurement if the supply exceeds Rs.____
 - (a) Rs.1,00,000
 - (b) Rs.75,000
 - (c) Rs.20,000
 - (d) None of above
- (17) Dy.Executive Engineer has powers to purchase articles of petty stores required for sanctioned work
 - (a) Rs.1,000
 - (b) Upto Rs.2,000
 - (c) Upto Rs.5,000
 - (d) Upto Rs.10,000
- (18) AAE whose service is more than 1 year can record intermediate measurement of upto Rs.____
 - (a) Rs.1,00,000
 - (b) Rs.50,000
 - (c) Rs.25,000
 - (d) Rs.5,000
- (19) Dy.Executive Engineer has powers for acceptance of tenders (on estimated cost) upto Rs.____
 - (a) Rs.1,50,000
 - (b) Rs.15,00,000
 - (c) Rs.5,00,000
 - (d) Rs.2,00,000

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(20) What is the power of Executive engineer to give AA to WS scheme of NC/PC, ARP/MNP/Special component and Board programme?

(a) Rs.10,00,000

(b) Rs.5,00,000

(c) Rs.15,00,000

(d) Rs.25,00,000

Q.7 Write full form or elucidate (any ten) from the following abbreviations

(10 Marks)

(1) DTP

(2) EIRL

(3) USR

(4) CSS Bill

(5) SOR

(6) NMR

(7) TEO

(8) EMD

(9) DR & TR Book

(10) LPC

(11) BOQ

(12) RR

GUJARAT WATER SUPPLY & SEWERAGE BOARD

Jalseva Bhavan, Sector 10-A, Gandhinagar 382 010

PROFESSIONAL EXAMINATION FOR ASSISTANT ENGINEER, ADDITIONAL ASSISTANT ENGINEER AND OVERSEER

PAPER-IV (PRACTICAL DRAWING) (100 Marks)

Date : 29-11-2011

Time : 3-00 pm to 6-00 pm

Q.1 Draw plan, elevation and section of a pump-house 3.0m x 3.0 m size. 50 marks

Q.2 Draw a detailed drawing of an RCC ESR of 2 lac liter capacity having 10 m height including steel sdetails 50 marks

OR

Draw a detailed drawing of an RCC sump of 5 lac liter capacity showing steel details.



**GUJARAT WATER SUPPLY AND SEWERAGE BOARD
GANDHINAGAR**

**Professional Examination of Assistant Engineers, Additional Assistant
Engineers / Overseers**

Sub: Water Supply & Sanitary Engineering (Civil)

Date: 14.10.2003
Time: 11.00 to 14.00

Marks: 100

Center : GJTI, Gandhinagar

- Note:** 1. Question No. 1 is compulsory.
2. Answer any five questions from the rest.
3. Fig,at right indicate full marks.

Q.1 Give the component wise function of each unit of a Regional Water Supply Schemes based on Surface Water. (20)

OR

Give the component with function of each unit of conventional type sewage treatment plant.

Q.2 Write a short note. (Any four) (16)

1. Defluoridation
2. Desalination
3. Water Hammer Devices
4. Corrosion Control Devices
5. Disinfection

Q.3 Calculate the KWH required for vertical turbine pump set with following data. (16)

a.	Urban Population	2,00,000 souls
b.	Rural Population	4,40,000 souls
c.	Rate of W/S for urban area	140 lpcd
d.	Rate of W/S for rural area	70 lpcd
e.	Hours of pumping	22 Hours
f.	Suction R.L	55 mt.
g.	F.S.L. of filtration plant	85 mt.
h.	Free board of filtration plant	0.5 mt.
i.	Friction losses in pumping main	20 mt.
j.	Efficiency of pump	85 %
k.	Over loading	10 %

Assume appropriate data if necessary.

Q.4 (A) Give the quality standards for drinking water for following parameters as per water supply manual. (8)

- a. Fluoride
- b. TDS
- c. Chlorides
- d. Nitrates
- e. Turbidity
- f. pH Value
- g. Magnesium
- h. Sulphates

(B) In a Regional Water Supply Scheme, tail end villages are not getting sufficient water. Give the causes and steps you will propose to solve it. (8)

Q.5 (A) Explain in brief when Low Cost Sanitation system is useful. (7)

(B) Explain with a neat sketch. (Any three) (9)

- (1) Gully trap
- (2) Intercepting trap
- (3) Manhole
- (4) Storm water drain
- (5) Septic tank

Q.6 (A) Give details of Swajal Dhara Yojana. (8)

(B) Explain Rain Water Harvesting with a neat sketch. (8)

Q.7 (A) Give details of Sector Reform Programme. (7)

(B) Differentiate between (Any three) (9)

- a. Screen chamber and Grit chamber
- b. Zero velocity valve and Air valve
- c. Sluice valve and Reflux valve
- d. Self cleansing velocity & Scour velocity
- e. Garbage and Sewage
- f. Aerobic bacteria and Anaerobic bacteria



GUJARAT WATER SUPPLY AND SEWERAGE BOARD GANDHINAGAR

Professional Examination of Assistant Engineers, Additional Assistant Engineers / Overseers

Sub: SUB-DIVISIONAL WORKS ACCOUNTS (written)

Date: 13.10.2003

Time: 15.00 to 18.00

Marks: 100

Center : GJTI, Gandhinagar

- Note:** 1. Answer all questions.
2. Fig. at right indicate full marks.

Q.1 Post the following transactions in the Cash book from given to you and close the cashbook with necessary certificates of cash balance. (16)

Date	Items	Amount Rs.
2.9.03	Opening Balance	
	Cash...	525.00
	Bank...	375000.00
3.9.03	Fund Received from GWSSB Main Office	400000.00
3.9.03	Drawing cheque self order	100000.00
4.9.03	Paid to GEB as Electric Bill	75000.00
5.9.03	Paid to Class III and IVth staff on account of salary for the month August 03 net	100000.00
6.9.03	Order placed for purchase of MS Pipes	200000.00
6.9.03	Paid to Mr. Y on account of RA Bill for work done for RCC ESR.....230000.00	
	Recovery as under:	
	Cement7500.00	
	Security Deposit.....2000.00	
	Income Tax.....4600.00	
	Net Payment to Mr. Y by cheque.....	215900.00
8.9.03	Paid to Petrol Pump for Petrol & Diesel	12000.00
8.9.03	Imprest to Y Sub dn. By Cheque	75000.00
9.9.03	Received from Nagarpalika as a Water charges (Cash)	20000.00
10.9.03	Remitted water charges in Bank	20000.00

Q.2 Write a short note. (Any four) (16)

1. Rate list
2. Schedule contract
3. Earnest Money
4. Schedule of Rates
5. Reduced Estimate
6. D.T.Ps

Q.3 Answer the following (Any three) (16)

- (A) Ordinary measurement books and standard measurement books
- (B) Various types of tenders and the use of each type
- (C) Negotiations for tender
- (D) Utility of Form-7, Form-35-A, Form-21, Form-28

Q.4 Explain the difference between (Any Four) (16)

1. Intermediate payment and advance payment
2. Excess & Extra Item
3. Part rate & Reduced rate
4. Revised estimate & Work slip
5. Piece work & Regular contract
6. Works slip & Work abstract

Q.5 (A) Write full forms of following abbreviation. (Any twelve) (6)

- | | |
|-------------|--------------|
| 1. N.C.B. | 8. D.T.Ps. |
| 2. I.C.B. | 9. E.M.D. |
| 3. C.S.P.O. | 10. E.P.C. |
| 4. C.I.F. | 11. E.I.R.L. |
| 5. F.O.B. | 12. U.S.R. |
| 6. N.I.T. | 13. T.E.O. |
| 7. L.C. | 14. L.O.I. |

(B) Fill up in the blank by selecting correct answer from the bracket. (6)

- (1) Supdt. Engr. can accept the late security deposit up to days. (10, 15, 30)
- (2) Executive Engineer can accept late security deposit..... days (5, 10, 30)
- (3) Symbol for making presence in morning in case of muster roll..... (⊙, \, ⊚)
- (4) Checking of Executive Engineer ^{is} necessary when the amount of bill for the work exceeding to Rs. (75000, 50000, 30000,)
- (5) Standard measurement books are ~~No. numbered~~ (serially, Alphabetically)
- (6) A consolidated account of receipts, issues and balances of T&P is maintained in.....(Form-13, Form-14, Form-15,)

Q.6 Explain the details to be recorded in various parts of muster rolls and state certificates to be recorded on muster rolls (12)

Q.7 What are the latest monetary power deligated to S.E., E.E., D.E.E. in case of different items given below. (Any three) (12)

1. Administrative approval to water supply & sewerage projects to be taken up on As and When basis.
2. Acceptance of tender
3. Technical section to Rural and Urban Water Supply and Sewerage project
4. Approval of D.T.Ps

GUJARAT WATER SUPPLY & SEWERAGE BOARD
Professional Examination of AE/AAE/Overseers of GWSSB

Centre: GJTI, Gandhinagar

Sub: General Civil Engineering

Date: 9.10.2001

Time: 11.00 hrs to 14.00 hrs

Total Marks: 100

Q.1 Describe soil testing procedure for deciding "Safe Bearing Capacity (S.B.C)" of the site for ESR – which is better site for ESR? (10 marks)

OR

Describe bonds of brick masonry and types of stone masonry.

What will you prefer Brick masonry or Stone masonry construction for pump house ? Why ?

Q.2 Describe characteristics of good timber useful for doors and windows of building. (10 marks)

OR

Describe characteristics of good concrete and reinforcing bars used for RC work.

Q.3 Write Short notes. (Any Three) (15 marks)

1. Design of Economical Rising Main.
2. Valves used in WS System.
3. Disaster Management of WS System.
4. Fixing of Capacity of ESR & Sump.
5. Utility of LS of Pipeline work.

Q.4 Differentiate. (Any Five) (15 marks)

1. Command Area & Catchment Area.
2. Gravity main & Pumping main.
3. Man hole and Weep hole.
4. Precast concrete and Prestress concrete.
5. Rainfall and Runoff.
6. Super Elevation and Camber.
7. Long column & Short column.

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Q.5 Explain briefly the procedure of acquiring private land for public work (Govt. work). (15 marks);

OR

Give full form of abbreviated terms given below. (Any Fifteen)

- 1 S.B.C
- 2 T.B.M
- 3 E.S.R
- 4 G.S.R
- 5 H.F.L
- 6 I.P.S.
- 7 B.O.D
- 8 H.P
- 9 L.P.C.D
- 10 O.P.C
- 11 F.S.L
- 12 L.A.Q
- 13 L.S.L
- 14 G.C.A
- 15 C.C.A
- 16 S.S
- 17 C.O.D

Q.6 Fill in the blanks with appropriate word given in the bracket.(Any Ten) (10 marks)

- 1 _____ is hardest stone. (Basalt, Limestone, Sandstone)
- 2 RCC is artificial _____. (Brick, Stone, Rock)
- 3 _____ numbers of bricks (ISI size) are required for 1cum of brick masonry. (500, 5000, 50)
- 4 Commercial cement bag contains _____ kg cement. (50, 55, 60)
- 5 Consumption of cement in CC 1:2:4 (M 15) will be _____ bag per cum. (7.35, 6.35, 8.35)
- 6 12mm dia meter bar will have _____ sq.cm cross section area. (0.95, 1.13, 1.54)
- 7 Scour valve is provided _____ level section of pipeline. (high, low)
- 8 Average value of C for PVC pipe _____. (130, 140, 120)
- 9 Bottom form works of beams are removed after _____ days. (10, 14, 21)
- 10 Air valve is provided _____ level of pipeline. (high, low)
- 11 Unit weight of RCC is _____ t/cum. (2.3, 2.4, 2.5)
- 12 12mm dia bar will have _____ kg per meter run weight. (0.39, 0.62, 0.89)
- 13 Cracked section of RCC ESR & Sumps can be repaired using _____. (Guniting, Grouting)

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Q.7 Explain PERT and CPM as management tools of construction. (10 marks)

OR

Described your experience of execution of Regional Water Supply Scheme.

Q.8(A) Discussed in brief any five.

(10 marks)

1. Water Cement ratio.
2. Vibrators.
3. Rate Analysis.
4. S.O.R
5. Intake well.
6. Reflux Valve.
7. Contour survey.

Q.8(B) Match A with B.

(5 marks)

- | | |
|-------------------|-----------------------------|
| 1. Defluoridation | 1. Chlorinator |
| 2. Disinfection | 2. DF Plant |
| 3. Clarification | 3. Drainage Pumping Station |
| 4. Filter | 4. Clarifloculator |
| 5. Screen Chamber | 5. WS pumping station |
| | 6. Water Treatment Plant |
| | 7. Sewer Line |
- 12
- 13

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GUJARAT WATER SUPPLY & SEWERAGE BOARD

PROFESSIONAL EXAMINATION OF AE/AAE/OVERSEERS OF GWSSB

CENTRE: GJTI, Gandhinagar
Date: 10/10/2001

Marks: 100
Time: 11:00 to 14:00 Hrs.

SUBJECT: WATER SUPPLY & SANITARY ENGINEERING.

Section : I

- 1.0 Question No.1 is compulsory
- 2.0 Attempt any 3 questions from the rest of questions in section.
- 3.0 Figures to the right indicted full marks
- 4.0 Make your assumption wherever necessary.

Q:1 (A) A water supply scheme of a city having population of 1,50,000 souls is to be designed. The various alternative sources are as under. (5)

- (i) The dam is situated at the distance of 10 km.
- (ii) The non-perennial river is flowing 1 km from the city.
- (iii) The under-ground water in the city is 5 mt below G.L. having high Salinity.

Which source you will prefer for the water supply project. Give merits and demerits of each source. Give the line sketch of all the different components for city water supply project (consider – 140 LPCD water demand).

(B) You have visited rural regional water supply scheme of 5 – Vilages, (5) affected by earth quake. Prepare a survey report of 5 villages.

Village	Name of the component damaged					E.S.R. sump	Total cost.
	Sources	Pipe	stand point	cistern	C.T.		
A							
B							
C							

Find out which component are affected. Assume rough cost of each component's repair. Assume your own data find out total cost of re-commissioning R.W.S.S.

(C) Narrate importance of population fore cast in public Health project (4)
Briefly describe any two methods, please mention where these methods are used.

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- 2
- Q:2 (a) Describe the different types of pumps generally used in water supply project. (4)
- (b) What is the importance of chlorination in water supply project describe it briefly. (4)
- (c) You have to prepare a city water supply project. What data you should collect before the preparation of such project. (4)
- Q:3 Write Short Notes (Any four) (12)
- (1) Water Hammer (2) Flash mixer (3) Disinfection (4) Rapid sand filter (5) Sluice valve (6) Scaling of pipes (7) Duties of W.S. Engineer (8) Defloridation of Water.
- Q:4 Differentiate any four : (12)
- (1) Pre-chlorination and Post - chlorination
(2) Temporary hardness and Permanent hardness.
(3) Air- valve and Scour valve
(4) C.I. Pipe and P.V.C. pipe.
(5) Static head and effective head.
(6) Gravity main and Pressure main
(7) Coagulation and flocculation
(8) R.S.F. and S.S.F.
- Q:5 (a) What are the different types of pipes ? Give its merits and demerits and mention where it can be used. (4)
- (b) Describe briefly the various sources of water supply (4)
- (c) Give the details in brief about pipe joints for any two types of pipes used in water supply (4)
- Q:6 (a) Fill in the blank with appropriate figure/word (Any six) (6)
- (1) Potable water supply turbidity is acceptable upto _____ J.T.U. (2.5, 15, 20)
- (2) Potable water PH cause for rejection is (7.0, 8.5, 9.2)
- (3) Average value of C for PVC pipe line is _____ (100, 95, 140)
- (4) Design period for distribution system is _____ years. (50, 40, 30)
- (5) Pipe system should be designed for _____ m minimum residual pressure for the peak demand for single storey building. (7, 20, 30).
- (6) Dis-infection of drinking water is done to remove _____.
(Colour, turbidity, bacteria)
- (7) Working pressure in pipe is generally considered as _____ of test pressure for rising main. ($\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{4}$)
- (8) Efficiency of removing bacteria from raw water by a rapid sand filter is _____ % (70, 99, 90)
- 18A

- (b) State true or false, if false give the correct one (any six) (6)
- (1) Flash mixer is designed for detention time of 1 hour.
 - (2) Individual water requirement for hospital having 200 beds is 450 litres per bed.
 - (3) Slow sand filter has $6 \text{ M}^3/\text{M}^2/\text{hr}$ rate of filtration.
 - (4) Surface water Storage which are well protected having turbidity below 10 JTU and free from odour and colour plain dis-infection by chlorination is adopted before water supply.
 - (5) Accepted range of PH for drinking water is 10 to 15.
 - (6) Aeration is necessary to add oxygen to water expulsion of CO_2 and Volatile substances and to precipitate impurities like iron.
 - (7) In clariflocculator flocculation zone is designed for detention time of $2\frac{1}{2}$ hrs.
 - (8) Water distribution system should be designed for 3 Storey building 17M minimum residual pressures at ferrule points.

Section - II:

- Note :**
- 1.0 Q. No. 1 is compulsory
 - 2.0 Attempt any 3 Questions from rest of the questions in section
 - 3.0 Make your assumptions wherever necessary.
 - 4.0 Figures to the right indicate full marks.

- Q:1 (a) What is an oxidation pond ? (8)
describe its working with merits and demerits draw its sketch.
- (b) Define any six (6)
- (1) PH (2) Storm wter (3) outfall sewer (4) Aerobic bacteria
(5) Sullage (6) B.O.D. (7) D.W.F. (8) self cleansing velocity
- Q:2 Write short notes on (Any four) (12)
- (1) Manholes and Drop Manholes.
 - (2) Imhoff Tank (3) Incineration (4) Aqua Privy (5) Ventilating column (6) Trickling filter (7) self cleansing velocity (8) Crown corrosion.
- Q:3 Differentiate the following (any four) (12)
- (1) Excreta and Night Soil (2) Sewage and Sewerage
 - (3) Sullage and Storm water. (4) Oxidation pond and oxidation ditch
 - (5) Self cleansing velocity and Scouring velocity
 - (6) Oxid method and Anoxic method.
- Q:4 (a) What is drop Manhole ? give the detail with sketch. (6)
- (b) Write hydraulic testing of pipe sewers (1) Water test (2) Air testing.(6)

- Q:5 (a) What are the various methods of low cost treatment of sewage? (6)
describe briefly.
- (b) What are the advantages and disadvantages of separate and combined system of Sewage ? (6)

Q: 6 Fill in the blank with appropriate word (Any six) (6)

- (1) Maximum permissible concentration of toxic elements in irrigation water of Arsenic is _____ mg/l and copper is _____ mg/l. (1, 0, 0.2, 10, 15, 20)
 - (2) As per Manual of Govt. of India minimum dia of public sewer shall be _____ mm. (300, 150, 100, 350)
 - (3) Generally _____ % of the water supply may be expected to reach the sewers. (50, 60, 75, 80)
 - (4) As per the manual Govt. of India Peaks factor upto 20,000 souls is _____ and for population above 75000 souls is _____ (2, 2.5, 3, 4)
 - (5) Sewerlines are designed to run _____ depth and _____ depth for sewer dia. upto 400mm and beyond 900mm dia respectively. (1/4, 1/2, 1/3, 3/4)
 - (6) In a sewer line minimum velocity of _____ m/sec at design peak flow and _____ m/sec. for present peak flow are recommended. (0.4, 0.8, 0.6, 1)
 - (7) Pumping station (Civil Works) designed period is _____ years and pumping machinery designed period is _____ years. (15, 50, 30, 25)
 - (8) Drop manholes are required when inverts between shallow incoming and out going sewer of manhole is more than _____ cm. (30, 40, 50, 60)
-
- (b) State true or false (any six) (6)
- (1) Sewerline of collecting system are designed for a period of 15 years.
 - (2) Aerated lagoon is designed for detention time of 1 day.
 - (3) If diameter of sewer is 150 mm the gradient required to generate self cleansing velocity is 1 in 60.
 - (4) The effect of scouring in sewer is greatest on bottom.
 - (5) Before allowing workers to enter sewers proper tests for the presence of poisonous gases must be carried out..
 - (6) A drop – manhole is provided to insert a lamp to check obstruction.
 - (7) In sewers the gas generally found is Hydrogen Sulphide, Carbon Dioxide and methane.
 - (8) Stone ware pipes are specially suited for pressure pipes.

GUJARAT WATER SUPPLY AND SEWERAGE BOARD GANDHINAGAR

Professional examination of Assistant Engineer, Additional Assistant Engineers / Overseers.

Subject : SUB-DIVISIONAL WORKS ACCOUNTS(written)

Date : 09.10.2001 Time : 15.00 to 18.00 Hrs. Marks : 100
Centre : G.J.T.J. Gandhinagar

Note : 1) Answer all questions. 2) Fig at right indicate full marks.

Q.1 Post the following transactions in the Cash book form given to you and close the cashbook with necessary certificates of cash balance. (Marks 16)

Date	Items	Amount Rs.
2.7.01	Opening Balance	
	Cash..	410.00
	Bank..	101000.00
3.7.01	Advice received from Bank regarding fund received from GWSSB main office	300000.00
3.7.01	Drawing cheque self or order	90000.00
3.7.01	Purchase postal stamp by cash	600.00
4.7.01	Paid to GEB on account of light bill by cheque	5800.00
4.7.01	Paid to Estt. Class III & IVth on account of pay for the month of June - 2001 net.	85000.00
5.7.01	Order placed for purchase of PVC pipes	125000.00
5.7.01	Paid to Mr. 'A' on account of liird RA bill for the work done of laying PVC pipe line... Rs. 175000.00 Recovery as under: 1. Cement recovery..... Rs. 12000.00 2. Security deposit..... Rs. 2000.00 3. Time limit penalty..... Rs. 300.00 4. Income Tax..... Rs. 3500.00 Net payment to Mr. 'A' by cheque....	157200.00
6.7.01	Paid office rent by cheque....	5000.00
6.7.01	Paid by cheque to The Times of India on account of advertisement charges	3500.00
7.7.01	Imprest to 'Y' Sub.Div. by cheque	55000.000
9.7.01	Received tender for by cash.....	2100.00
10.7.01	Remitted tender fee in bank	2100.00

Q:2 Write short notes. (Any four)

(Marks 12)

- 1) Lump sum contract.
- 2) Conveyance contract.
- 3) Security deposit
- 4) Mobilization advance.
- 5) Two cover bid system

Q:3 (A) Write full forms of following abbreviation. (Any twelve)

(Marks 6)

- | | |
|--------------|--------------|
| 1. L.O.I. | 8. E.P.C. |
| 2. T.E.O. | 9. L.C.B. |
| 3. D.G.S.&D. | 10. E.I.R.L. |
| 4. F.O.B. | 11. C.L.R. |
| 5. N.I.T. | 12. I.C.B. |
| 6. D.T.Ps. | 13. N.M.R. |
| 7. E.M.D. | 14. U.S.R. |

P.T.O.

(B) Fill up in the blank by selecting correct answer from the bracket. (Marks 9)

1. Ex. Engr. Can accept the late security deposit up to ----- days. (5, 10, 15)
2. Symbol for making presence in case of muster roll for presence in morning but absence in evening is -----.(\odot , \ominus , \odot)
3. Standard measurement books are numbered ----- (Serially, Alphabetically)
4. The number of Labours to be employed in N.M.R. should be fixed by ----- (A.E., D.E.E., E.E.)
5. The payment for refund of deposit is made by preparing the voucher on ----- (F & F bill, Final bill, H.R., C.O.P.)
6. In case of muster roll containing names of less than -----labourers, submission of daily labour report is not necessary.(14, 15, 16)
7. Checking of Executive Engineer is necessary when the amount of bill for the work exceeding to Rs. -----.(Rs. 30,000/-, Rs. 50,000/-, Rs. 75,000/-)
8. No income Tax is to be recovered from the bill if amount does not exceed Rs.----- (5,000/-, 2,000/-, 10,000/-)
9. Dy. Ex. Engr can approve the Draft Tender papers up to Rs.----- (50,000/-, 1,00,000/-, 1,50,000/-)

Q:4 Answer the following. (Any two)

(Marks 9)

- (a) What are the various types of tenders and the use of each type.
- (b) Ordinary measurement books and standard measurement books.
- (c) Action to be taken in case of muster roll lost before payment.

Q:5 Explain the difference between. (Any three)

(Marks 12)

Piecework and regular contract.

- (1) Administrative approval and technical sanction.
- (2) Supplementary estimate and revised estimate.
- (3) Workslip and work abstract.
- (4) Intermediate payment and Advance payment.

Q:6 (A) Match the following.

(Marks 6)

- | A | B |
|--|---------------------------------|
| 1. First and Final bill Paid on | a. Material at site Account |
| 2. Standard measurement book based for | b. After every four years |
| 3. L.T.C. is admissible | c. Form-24 |
| 4. D.R. book is the Record of | d. Form-28 |
| 5. Hard receipt | e. Divisional office |
| 6. Form 35 A | f. Maintenance of Dept.building |

(B) What is the utility of following forms.
Form-7, Form-15, Form-21, Form-26

(Marks 6)

Q:7 (A) What are the latest norms of G.I.A. for water supply and Drainage scheme for different categories of cities/towns/villages.

(Marks 12)

(B) What are the latest norms of L.I.C. loan for water supply scheme, Drainage scheme and Rural Regional water supply scheme.

Q:8 What are the latest monetary powers delegated to the S.E., Ex. Engr., Dy. Ex. Engr. in case of different items given below.(Attempt any four)

(Marks 12)

1. Approval of Draft tender papers.
2. Approval of excess in Tender.
3. Acceptance of Tender.
4. Extension of time limit.
5. Administrative approval to the Water Supply schemes of 'No source' / NC / PC / Habitations under ARP/MNP/special component film.

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GUJARAT WATER SUPPLY & SEWERAGE BOARD

PROFESSION EXAMINATION OF AE/AAE/OVERSEERS OF GWSSB

CENTRE:GJIT,GADHINAGER

MARKS: 100

Date:10.10.2001

TIME:15:00 TO 18.00 HOURS

SUBJECT:PRATICAL DRAWING (CIVIL)

Q.1 400mm dia. C.I.pipe line of RWSS is passing 800 mt. away from the village. The present population of the village is 2500 souls. It has been proposed to supply water to this Village from pipe line of RWSS scheme as per prevailing rules and with following data. (30)

1. G.L. at junction point of 400 mm dia C.I. pipe-----R.L. 115.00mt.
2. G.L. at highest point in the village-----R.L. 108.00mt.
3. G.L. at proposed head works site-----R.L. 105.00mt
4. Head available at junction point of RWSS pipeline----- 10.00mt.

Assume remaining data suitably where required for the above project.

Draw the layout plan with appropriate dimensions with suitable scale along with stand post ,cattle-trough etc.

OR

Q.1 Draw plan, elevation and one section of 3m X 3m pump house.

Q.2 Draw plan,elevation ,cross section of 5 lacs lit. of U/G sump showing details of reinforcement, grade of concrete, thickness of various components. Assume required necessary data. (70)

OR

Q.2 Draw plan,elevation,cross section of R.C.C. E.S.R. showing reinforcement, grade of concrete, approximate thickness of various components considering the following data:

1. Capacity----- 1,00,000 lit.
2. Height----- 10 mtr.
3. Foundation----- 3.0 mtr. Below G.L (Raft)
4. Container shape----- Any suitable shape
- 5 Staging ----- Shaft /Column-brace



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GUJARAT WATER SUPPLY & SEWERAGE BOARD, GANDHINAGAR

Professional Examination of Assistant Engineers, Addl. Assistant Engineers
and Overseers for the year 1998-99

Date : 27/7/98

Month : July 1998

Place : G.W.S.B. Sector-15

Time : 11-00 to 14-00 hrs.

Gandhinagar

Marks : 100

Subj. - GENERAL CIVIL ENGINEERING (Written)

- Note :
1. Attempt any eight questions.
 2. All questions carry equal marks.
 3. Draw neat sketches wherever necessary.
 4. Four marks are reserved for neat sketches.

Q-1. 1. What are the different type of foundations? What are the causes for failure of foundations? (12)

(b) Describe the type of foundations requires for different type of soils.

(c) What are the methods to improve bearing capacity of the weak soil.

Q-2. Write short notes. (Any three) (12)

- a) Slump in Concrete
- b) Break pressure Tank
- c) Water Hammer
- d) Characteristics of a good brick
- e) Ventilating shaft

Q-3. Define (any four) (12)

- a) Slenderness ratio
- b) High Flood Level (H.F.L.)
- c) Water Content Ratio
- d) Domestic sewage

Q-4. Explain (any four) (12)

- a) Contra-jack and its use
- b) Vibrator is used while concreting
- c) Dampers and strainers are provided in masonry wall
- d) Bricks are soaked in water before use
- e) Dampers are provided in R.C.C. and S.P. having columns as supporting member.