



Office order No. 85 Year 2017

Sub: Professional Examination of Assistant Engineer / Additional Assistant Engineer to be held by Gujarat Jalseva Training Institute, Gandhinagar for the year 2017

- Ref.: (1) Narmada and Water Resources Department Resolution No. PER/2685/23127/G(i) dtd 24.10.1990
(2) Government in GAD, Sachivalaya Gandhinagar Resolution No.KHTP/1004/1473 – K dtd 17.02.2006

Professional Examination of AE/AAE will be held from 11.04.2017 to 13.04.2017 for which detailed programme is appended herewith.

Proposed general rules and procedure of professional examination with syllabus is attached herewith.

The general rules, Syllabus and schedule can be downloaded from GWSSB'S official website.

- D.A. (1) Programme Detail
(2) Proposed rules
(3) Syllabus

Barnes
(B.A.Mistry)
Chairman
Professional Examination Committee
For AE/AAE
Joint Director
GJTI,Gandhinagar

Letter No.GJTI/PE/AE-AAE/ 609 /2017
Office of Chief Engineer and Director
Gujarat Jalsewa Training Institute
Sector 15, Gandhinagar
Date 9/3/17

Copy submitted with respect to

- (1) C.E. Moni.& Planning, G.W.S.& S. B. Gandhinagar for information and necessary action please.
- (2) C.E. (Mech), G.W.S.& S. B. Gandhinagar for information. and necessary action please.
- (3) Chief General Manager, G.W.I.L. ,Gandhinagar for information. and necessary action please.

(P.T.O.)

- (4) C.E.O. WASMO, Gandhinagar for information. and necessary action please.
- (5) Chief Administrative Officer, G.W.S.& S. B. Gandhinagar for information. and necessary action please.
- (6) P.A. to Member Secretary, G.W.S.& S. B. Gandhinagar for information.
- (7) P.A. to Chairman , G.W.S.& S. B. Gandhinagar for information.
- (8) C.E. Zone I / II / III / IV / V for information and necessary action please.
- (9) System Analyst, G.W.S.& S. B. Gandhinagar for information and to upload given information.
- (10) All Superintending Engineer, P. H. Circle for information and necessary action please.

Copy F.W.Cs. to

- (1) All Executive Engineer, P H W Div. for information and necessary action please.
- (2) All Deputy Executive Engineer, P H Sani. Sub Div. for information and necessary action please.

Programme for Professional Examination of AE/AEE (Civil/Mech.) of Gujarat Water Supply & Sewerage Board, Gujarat to be conducted by GJTI, Sector- 15, Gandhinagar at Staff Training College, Sector-17, Near Ch-5 Gandhinagar, from 11/04/2017 to 13/04/2017

Date	Time	Subject	Marks
11.04.17 Tuesday	10.30 to 13.30	General Engineering (Civil) OR General Engineering (Mech)	75
	14.30 to 17.30	Sub-Divisional Works Account	75
12.04.17 Wednesday	10.30 to 13.30	Special Subject (A) Water Supply and Sanitary Engineering OR (B) Mechanical Engineering and Bore drilling Technology	75
	14.30 to 15.45	Practical Drawing (Civil) OR Practical Drawing (Mech.)	25
13.04.17 Thursday	9.00 to 17.00	Practical Test (Civil) OR Practical Test (Mech)	25
		General Engineering (Civil-Oral) OR General Engineering (Mech.-Oral)	75
		Special Subject (Oral) (Civil/Mechanical)	75
		Sub-Divisional Works Account (Oral) (Civil/Mechanical)	75

B. A. Mistry
(B A Mistry)
Chairman

Professional Examination Committee
for AE/AEE & J.D.(GJTI)
GWSSB, Gandhinagar

General Rules and procedure of professional Examination of AE/AEE

Extract of some important general rules for professional examination of AE/AEE (Civil/Mech). These rules are as per GOG, Gandhinagar Resolution No. KHTP-1004-1473-K dtd 17-02-2006 and as per Narmada and Water Resources Department Resolution No. PER/2685/23127/G(i) dtd 24-10-1990

1. Every Assistant Engineer / Additional Assistant Engineer / Overseer shall be required to pass the subordinate exam within two chances during the period of two years (Three chances during the period of three years in the case of SC & ST candidates) after completion of one year / four year / Eight years services respectively in Gujarat water Supply & Sewerage Board **from the date of his regular appointment.**
2. **Minimum marks required to pass the departmental examination.** A minimum of 50 % of the total marks in each subject required to pass the departmental examination.
3. **Regarding exemption in one or more than one subject in which more than 60 % marks are scored.**
Candidate who does not pass the departmental examination overall, but secures more than 60% marks in one or more subjects is not required to appear again in those subjects, the candidate gets exemption in such subjects.
4. Examination is compulsory, there is no exemption for anyone.
5. Grace marks will not be given to unsuccessful candidates in departmental examination.
6. If any Overseer, Additional Assistant Engineer, Assistant Engineer fails to pass the relevant examination within period and chances specified under these rules, he/she shall not earn any increment till he/she passes relevant examination.
Provided that, if in case of any such person (i.e. person failing to pass relevant examination at the last chance specified under these rules), the GWSSB head office is satisfied the person could not pass the relevant examination due to reason/reason beyond his/her control, the GWSSB head office may, by recording such reason/reasons, allow him/her one or more chance/chances to pass the relevant examination.
Provided further that, in such case, if period of probation (i.e. person failing to pass relevant examination at the last chance specified under these rules, and in case of directly recruited person) is less than three years, the probation period shall be extended by a period not exceeding three years. However, in such case (i.e. person failing to pass relevant examination at the last chance specified under these rules, and in case of directly recruited person) if a person belongs to Schedule caste or Schedule Tribe, the probation period shall be extended by a period not exceeding to four years. The person shall not earn any increment (in addition of extension of this probation period) till he/she passes relevant examination .
Any increment withheld under these rules shall become payable after the person passes the relevant examination from the date of declaration of result of relevant examination and further increment shall accrue to him as if no increment has been withheld under these rules. However, the person shall not be entitled to any arrears of pay that were lost for not passing the examination within specified period and chances..
7. Any engineering officer or engineering subordinate desiring to appear at relevant examination shall follow the procedure and instruction as above.
8. The candidates who have applied for the professional examination shall not be prevented from appearing by their superior officers on plea of heavy or urgent or emergency work. However, the Board may, after considering and recording appropriate reason may relax a candidate from appearing in relevant examination. Provided that, period and chances thus lost shall not be considered towards specified period and chances. However, illness or any inability on part of candidate shall not be considered reason for not appearing at the relevant examination and period and chances specified under these rules shall remain applicable in such cases.
Earned leave for preparation for examination may be granted as far as possible. However, this may not be a matter of right.

9. The candidate shall be allowed to keep following Manuals with them at the time of professional examination. For this purpose only manuals published by Government of Gujarat /Government of India shall be allowed. There shall not be any marking flagging/annotation or any other writing in these publication. Any other publication like guide or explanatory notes etc. shall not be allowed. Papers of candidates found in possession of such banned material shall not be examined and he/she shall have to appear in the next examination. Such candidate shall also loose one chance for appearing in relevant examination. Only following manuals shall be allowed for this purpose. The arrangements of Manual shall be made by candidates.
- A. Gujarat PWD Manual volume I & II
 - B. CPHEEO Manual
 - C. Gujarat civil service rules
 - D. Gujarat Treasury Rules
 - E. Gujarat Financial Rules
 - F. Arbitration Act (Only bare act without cases, comments etc.)
 - G. Land Acquisition Act (Only bare act without cases, comments etc.)
 - H. Labour Laws (Only bare act without cases, comments etc.), includes Workman's Compensation Act, Industrial dispute Act, minimum wages Act, Building and other Construction workers (Regulation) Act.
 - I. IS Codes.

Bama
(B A Mistry)
Chairman
Professional Examination Committee
For AE/AEE
and Joint Director
GJTI, Sector 15
Gandhinagar

Syllabus for Professional Examination for AE & AAE (Civil)

PAPER-I

General (Civil Engineering)

(A) Cement:

Cements: Composition and manufacture-storing, varieties and uses. Normal and rapid hardening cements, Properties and I.S.S.tests.

(B) Cement Mortar: Composition, preparation and uses, properties, strength and tests. Gauged mortars - proportioning of materials in mortars.
Effect of water content

(C) Cement Concrete: Aggregates (coarse and fine)

Cement and water. Proportioning and mixing. Real, nominal and field mixes, bulking of sand. Grading of aggregates, water cement ratio, placing and curing. Strength of various mixes and uses. Ready mix concrete and Admixturing. Dam proofing / water proofing

(D) General principles of designing foundations, types of soils and safe bearing pressure on the various types of soils. Various types of foundations suitable for various circumstances e.g. open foundations, black soil foundations, raft foundations, pile foundations, well foundations, grillage foundation etc.

(E) Masonry (various types): Brick masonry/Stone masonry.

(F) Scaffolding, centering and form works different types, steel and wooden moving forms - Design for centering for arches and domes tunnel lining and reservoir etc., removal of forms, periods and methods.

(G) Drafting specifications for various items in construction. Points to be borne in mind while drafting specifications

- IS-456, IS-3370, P-1,2,3,4
- Underground sump - Forces to be acted on each component
- Steel detailing
- Intake type water tank/circular/conical type water tank (ESR) steel detailing

(H) Analysis of rates and schedule of rates

SYLLABUS FOR PROFESSIONAL EXAMINATION FOR ADDITIONAL
ASSISTANT ENGINEER AND ASSISTANT ENGINEER
PAPER-II

ACCOUNTS: SUB-DIVISIONAL AND WORKS ACCOUNTS

1. Internal records of accounts

- i) B1-B2 Tenders
- ii) Measurement books, taking of measurements, use and maintenance of measurement books
- iii) Schedule of Rate
- iv) Delegation of powers
- v) Various types of Approvals for Projects (WS & Drainage)
- vi) Importance of Action plan & Elements

2. Stores

- 1) Initial records, receipts and issues including issues to contractors
- 2) Stores forms Nos.7,8,9 and 10,13,14 and 15
- 3) Material at site accounts

3. Contractors

- 1) Rules regarding contracts as embodied in the: different forms of agreements
- 2) Contractor's bills
- 3) Piece work and contract work
- 4) Aid and advances to contractors
- 5) B1-B2 Tender
- 6) PPP Models
- 7) Standard Tender Documents
- 8) DTPs

NOTE: The relevant chapters or paragraphs of the Bombay Public Works Department Manual, Volumes I and II, Public Works Accounts Code and Book of Forms should be studied.

Professional Examination for AE & AAE

Syllabus for the subject: Water Supply & Sanitary Engineering

PAPER III

Water Supply Engineering:

Planning:

- Objective of public protected water supply
- Basic Design Considerations:
 - Design Period
 - Population forecast
 - Per capita water supply - Criteria
 - Peak factors.
 - Quality standards considerations.

Project Feasibility Report:

- Background
- The proposed project - Long term plan for water supply
- Project Report
 - Google Earth & Google Map for the Survey Work of RWS
 - Various types of approval for regional water supply & drainage projects
- Institutional and Financial aspects
- Conclusions and recommendations for the project

Measurement of Flow:

- Flow measurement in open channels:
 - Notches
 - Weirs
 - Flumes
 - Drops

Measurement in closed conduits:

- Differential pressure devices:
- Venturi meters.
- Orifice plates and nozzles
- Pilot tubes
- Water meters

Sources of Supply:

- Kinds of Water Sources and their characteristics:
 - Water from precipitation
 - Surface Waters
 - Ground waters
 - Salinity ingress
 - Sanitary survey

Transmission & Distribution of water

free-flow and pressure conduits

Hydraulics of conduits

- Formula
- Coefficient of roughness
- Mannings / Hazen Williams formula.
- Experimental estimation of C value.
- Cost effective design of pipeline (Rising as well as Gravity main) Manual & Software based)
- Resistance due to specials and appurtenances

Types of pipes:

- Specifications for manufacture, supply, laying, jointing, commissioning the following pipes
- CI Pipes
- MS pipes
- AC pipes
- Pre stressed concrete pipes
- PVC pipes
- GRP pipes

Appurtenances:

- Line Valves
 - Sluice valves
 - Butterfly valves
 - Globe Valves
- Scour Valves
- Air valves
- Pressure relief valves

- Check valves
- Surge tanks
- Pressure releasing and sustaining valves
- Ball valves or float valves
- Automatic shut-off valves etc.

Water hammer

- Occurrence
- Control measures - Special devices for controlling water hammer

Water Treatment:

Water Quality parameters

- Physical characteristics
- Chemical properties
- Biological properties.
- **Methods of Treatment and flow designs**
- **Conventional Water treatment**
 - Aeration
 - Flash mixing and alum handling
 - Clariflocculator
 - Filtration (SSF & RSF)
 - Dual media filters
 - Pressure filters
 - Disinfection
 - Chlorination
 - Ozonization
 - UV treatment
 - Application of chlorine, chlorine demand, residual chlorine, chlorine dose, handling chlorinators etc.
- **Specific Treatment processes:**
 - Reverse Osmosis
 - Defluoridation plants
 - Water softening plants
- **Service Reservoir**

- **Pumping stations and pumping machinery - Selection and type of pumping machinery**

WASTE WATER ENGINEERING:

- Aim and Objective of Sewage disposal
- Definitions of common terms used in Waste Water Engineering
- Systems of Sanitation : Conservancy system and Water Carriage system
- Sewer appurtenances
- Pumping of sewage
- Characteristics' of sewage (BOD,COD etc)
- Sewage treatment processes
 - Conventional treatment
 - Biological treatment
 - Activated sludge process
 - Oxidation ponds and ditches
 - Anaerobic processes like UASB etc.
- Tertiary treatment and recycling of sewage
- PPP model

SYLLABUS FOR PROFESSIONAL EXAMINATION OF ADDITIONAL ASSISTANT
ENGINEER AND ASSISTANT ENGINEER (Civil)

PAPER-IV

SUBJECT-Practical and VIVA-VOCE TEST- ONE PAPER

1. Practical and oral test in surveying and setting out

- a) Care and adjustment of levels
- b) Leveling and reduction of levels
- c) Setting out angles
- d) Setting out a plan on the ground

The candidate may be required to carry out any of the above.

2. Practical drawing

A pencil drawing to be made from data or a drawing of any one structure from given dimensions of following structure.

- a) RCC ESR likes (1) Conical (2) Intze (3) Cylindrical on Shaft or column
- b) RCC U/G Sump
- c) Pump Room

3. Use of Google Earth & Google Map for the Survey Work of RWSS

Syllabus for Professional Examination for AEs, AAEs of GWSSB (Mechanical)

PAPER – 1

Sub: General Engineering (Mechanical)

- (1) Standard weights and measurements of engineering materials required in mechanical field with their fundamental properties. Special attention should be given to metric system.
- (2) Types of various drives and their application.
- (3) Lifting equipment like tackles, cranes, pulley blocks, etc
- (4) Welding, brazing and soldering.
- (5) Tool-room and application of tools.
- (6) Use of precision instruments like micrometers, alignment indicators etc.
- (7) Foundation of structures - specially engine foundation and foundation of electric poles transformers.
- (8) Various types of pumps and its use – General 20 HP. selection, Design and layout diagram of large size machineries calculation of BHP, KW
- (9) Fuel oil and lubricants - general knowledge of various types of fuel oils, fundamentals of efficient lubrication. Different types of lubricating oils and their uses - methods of reclaiming used lubricating oils.
- (10) Estimation of works including M&R estimates of machineries.
- (11) General knowledge of the working of workshop. Movement of a job from shop to shop and its accounting etc including mobile workshop van .
- (12) Use of air for machinery - Air compressors and machines run on compressed air.
- (13) Geological survey, Geophysical instruments, Electro loggers.
- (14) Operation M&R of Hand pumps in general.
- (15) Write-off and disposal of machineries and vehicles.
- (16) Transformer and generating set. .
- (17) MS pipes, manufacturing process, specification, laying and jointing.
- (18) Corrosion, control and in devices.
- (19) Remote Sensing

Syllabus for Professional Examination for AEs, AAEs of GWSSB (Mechanical)

PAPER – III

Special Subject : Mechanical Engineering

- (1) Fundamental principles of boring.
- (2) Types of boring machines and their application including various types and rigs etc.
- (3) Types of bores.
- (4) Geological strata.
- (5) How to obtain and record the underground strata.
- (6) What are the method test the yield of bore.
- (7) How to test the vertical of the bore.
- (8) How to prepare the estimate.
- (9) Selection of boring mechanics.
- (10) Developing a bore & hydra fracturing process.
- (11) Various types of pumps used in Water supply & Sewerage projects with design finalization of electrical and mechanical drawing of large size mechanics.
- (12) Hand pump types and its M&R.
- (13) Bore – hole pumps.
- (14) Air Lift pumping.
- (15) Reciprocating pumps.
- (16) Methods used for cleaning the bores etc.
- (17) Mass awareness in drinking water, involvements of uses in water supply.
- (18) Fishing

Syllabus for Professional Examination for AES, AAES of GWSSB (Mechanical)

PAPER – IV

Sub: Practical Drawing (Mechanical)

- (1) Isometric Orthographic, Elevation, Plan, Side-End views of a object of Mechanical Engineering.
- (2) Various types of bolts, nuts, rivets, threads.
- (3) Various types of joints.
- (4) Various types of gauges.
- (5) Sketches of Various parts of mechanical engineering.