

Syllabus for Professional Examination for AE, AAE& overseer (civil) - 2018

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 Admixtureing. Damp 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 - 2018

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 Of AE, AAE and Overseers

Syllabus for the subject: Water Supply & Sanitary Engineering - 2018

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 specialsand 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) - 2018

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) Levelling and reduction of levels
- (C) Setting out angles
- (D) Setting out a plan on the ground
- (E) Google Earth & Google Map for the Survey Work of RWSS
- (F) MIS Software
- (G) Application of Branch & Excel
- (H) Survey & leveling

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) Intake (3) Cylindrical on Shaft or column
- b) RCC U/G Sump
- c) Pump Room

Banerji

(B A Mistry)

Chairman

Professional Examination Committee

for AE/AAE & J.D.(GJI)

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