

Syllabus for Departmental Examination for DEEs & AEEs (Civil) of GWSSB - 2020

PAPER – I

General (Civil Engineering)

Part: (i) Materials (ii) Construction (iii) CPM/PERT

Part- 1.

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|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (a) Stones & bricks | General characteristics of stones & bricks, Engineering projects, Chief varieties and uses tests |
| (b) Cement | Composition and manufacture-storing. Verities are uses: Normal and rapid Hardening cements, properties and ISS tests. |
| (c) Cement Mortar | Composition, preparation and uses, properties, strength and tests, gauged mortars, proportioning of materials in mortars. Effect of water content. |
| (d) Cement concrete | Aggregate (Coarse and fine) Cement and water Proportioning and mixing Real, nominal and field mixes, grading of aggregates, water cement ratio, placing and curing strength of various mixes and uses. Causes of deterioration of concrete. |
| (e) Steel | Characteristics and uses of mild steel, torque steel. |
| (f) Unit weight of building materials. | |

Part-2

- (1) General principles of designing foundations, types of soils and safe bearing pressures on the various types of soils, various types of foundations suitable for various circumstances e.g. open foundations, black soil foundation, raft foundation, pile foundation, well foundation, grillage foundation etc.
- (2) Masonry: various types, permissible load on masonry structures, lintels, chhajjas & its RCC design, plaster and pointing.
- (3) Scaffolding centering and form works - different types: steel and wooden form works design for centering for arches and domes, removal of forms- periods and methods.
- (4) Uses of explosives and control blasting.

- (5) Drafting specifications for various items in building construction and water supply and sanitary projects. Points to be borne in mind while drafting specifications.
- (6) Analysis of rates and schedule of rates of Building construction.
- (7) Piles and pile driving. Types of piles and methods of pile driving.
- (8) Doors and Windows - types, its fittings.
- (9) Reinforced cement concrete - Types of concrete, mix & its strength. Methods of construction of RCC structure, mixing, placing, curing, causes of deterioration of concrete, guniting construction joints in RCC structures.
- (10) Ready mix concrete and Admixturing damp proof water proofing.

Part-3

Network Analysis

- (1) PERT - CPM : Introduction and history ,
- (2) Difference between PERT-CPM
- (3) Critical path methods: Applications in construction and management of big projects
- (4) Constructions of network-diagram, separation of project activities
- (5) Earliest finishing time, normal time, float time, free float.
- (6) Advantage of network planning.
- (7) Use of network analysis in construction activities.
- (8) Selection of technique.

Part-4

R.O.U. (Right of Use)

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PAPER – II

Sub: Sub Divisional and work accounts

- (1) Initial records of accounts
 - (1) Measurement Books, Types of MB, taking of measurement, use and maintenance of measurement books, various powers for recording measurement, standard MB.
 - (2) Different kinds of bills , cheque receipts books, cash book, imprest and temporary advances, remittances into treasure, work abstracts, requisition, vouchers , hand receipts

- (2) Stores
 - 1) Initial records, receipts and issued including issue to contractor.
 - 2) Stores forms No. 7,8,9 and 10,13,14 and 15 USR
 - 3) Material at site accounts
 - 4) Procedure for procurement of material on Rate contract and at Divisional level.
 - 5) Market rate, SOR and issue Rate.
 - 6) Inspection of stores and verification.
 - 7) Procedure for recovery of material issue to contractors.
 - 8) Disposal of unserviceable stores.

- Contract
 - 1) Types of contract, Tender, Tender clause. B1 & B2 Tender, Standard Tender Documents
 - 2) LCB/NCB tenders. Turnkey contracts, D.G.S.&D. rate contract, C.S.P.O. rate contracts, B.O.I. tender.
 - 3) Liquidity Damage
 - 4) Admin. & Technical Approval
 - 5) Action Plan
 - 6) Security Deposit .Earnest Money, Lapsed deposit.
 - 7) Pre-qualification, Registration, Special registration
 - 8) D.T.Ps. Tender notice

- 9) Advance payment, secured advance. Temp. advance, mobilization advance, machinery advance, L.S. advance
- 10) EPC contract, e-tendering.
- 11) Rules regarding contracts embodied in the different form of agreement.
- 12) Advantage of contract & departmental work
- 13) Contractor's Bills. Refunds and remissions.
- 14) Piece of work, contract work and regular work.
- 15) Aid and advances of contracts.
- 16) Two cover Bid system / Three cover Bid system.
- 17) LCB & ICB tenders.
- 18) Registration of contractors, types of contractors.
- 19) Extra item, excess, time limit, extension, RA & final bill, reduced rate and part rate, liquidated damages.
- 20) Responsibilities of supervisory staff on work.
- 21) Documents and registers to be kept by the supervisory staff on site.
- 22) Revised estimate, reduce estimate, works slip, work abstract, sub head, sub-work, operation & out tern, supplementary and revised estimate, A.A. & T.A.
- 23) Various types of forms for making payment of bill.

Bill Forms & Other Forms

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PAPER – III

Sub: Water Supply and Sanitary Engineering

- 1) Project Report
 - a. Google Earth & Google Map for the Survey Work of RWS
 - b. Various types of approval for regional water supply & drainage projects
- 2) Water quality and standards, importance of various parameters quality criteria and monitoring.
- 3) Water hydraulics - formula
- 4) Mechanism of water purification
 - Chlorination - Pre -Post & Super
 - Sedimentation
 - Coagulation and flocculation
 - Filtration
 - Aeration
 - Defluoridation
 - Desalination
 - Algae control
- 5) Water hammer
- 6) Leak detection and control .
- 7) Operation and maintenance of rural water supply scheme.
- 8) Pipes fittings and appurtenances
 - Different types of pipes and water hammer control devices manufacturing specification, pipe jointing, laying, testing
 - Different type of valves
 - Sluice
 - Scour
 - Air
 - Zero velocity
 - Butter fly
 - Reflux etc.
 - Different type of tees, bends, reducers etc.

- 9) Water demand projection
 - Various methods of population forecasting
 - Water supply rate norms
- 10) Water storage
 - Mass balancing calculations
- 11) Pumping machinery
 - Different types of pumps, their advantages and limitations, Design of large size pumping machine.
 - Calculation of BHP, KW
- 12) Water supply sources
 - Intake work.
 - Tube well development and protection.
 - Water harvesting structures.
- 13) Economical design of rising main
- 14) Importance of waste water parameters like, pH, BOD, COD, TDS, Pathogens, virus. etc.
- 15) Collection system for underground sewerage scheme
 - Pipes and jointing materials
 - Manholes
 - Crown corrosion
 - Sewerage hydraulics
- 16) Feasibility report and detail engineering for and underground Sewerage scheme
- 17) Prevailing Guidelines for RWSS-Technical Scrutiny Committee
- 18) Sewage treatment '
 - Oxidic, anoxic and facultative sewage treatment including
 - Screen chamber
 - Grit chamber.
 - Primary clarifier
 - Trickling filter
 - Activated sludge
 - Oxidation
 - Aerated lagoon
 - Secondary clarifier

- Sludge digestion and sludge drying beds
- Effluent disposal

19) Construction specifications of various items of water supply and sanitary projects.

20) PPP model

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PAPER-IV

SUBJECT- Practical and VIVA-VOCE TEST

1. Practical and oral test

- a) Care and adjustment of levels
- b) Leveling 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 RWS
- f) MIS Software
- g) Application of Branch & Excel
- h) Survey & leveling
- i) Power point presentation skill
- j) WS-WMS Software (Practical Test)

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



(Kusum Sambhwani)

Chairman

Departmental Examination Committee
for DEE & AEE & Director, GJT
GWSSB, Gandhinagar

Syllabus for Departmental Examination for DEEs, AEEs of GWSSB (Mechanical) - 2020

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 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 Departmental Examination for DEEs, AEEs of GWSSB (Mechanical) - 2020

PAPER – III

Special Subject: Mechanical Engineering and bore drilling Technology

- (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 Survey & Strata.
- (5) How to obtain and record the underground strata.
- (6) What are the methods 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.
- (12) Hand pump types and its M&R.
- (13) Borehole 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) Corrosion control
- (19) MS pipe Manufacturing, laying, jointing
- (20) Butterfly valve, GI valves, Air valves
- (21) Water Hammer Control devices
- (22) Water harvesting, conservation and recharging
- (23) Fishing

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PAPER – IV

Sub: Practical Drawing (Mechanical)

- (1) Isometric Orthographic, Elevation, Plan, Side-End views of an 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.
- (6) WS-WMS Software (Practical Test)



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