



Directorate of Agriculture,
Krishi Bhavan,
Tonca, Caranzalem-Goa.

**SYLLABUS FOR WRITTEN TEST FOR THE POST OF JUNIOR
RESEARCH ASSISTANT, LABORATORY ASSISTANT & SAMPLE
COLLECTOR.**

Part A: (60 Marks)

Topic I

- 1) Structure of Atom.
- 2) Classification of elements and periodicity of properties.
- 3) Chemical bonding and molecular structure.
- 4) Thermodynamics.
- 5) Equilibrium
- 6) Redox Reactions
- 7) Hydrogen
- 8) S-Block elements & P block elements.
- 9) Organic chemistry – some basics principles and techniques.
- 10) Environmental Chemistry.

Topic -II

- 1) Solid state, Solutions & Electrochemistry.
- 2) Chemical Kinetics, Surface Chemistry.
- 3) General Principles and process of isolation of elements.
- 4) P,d,f block elements.
- 5) Co-ordination Chemistry, Haloalkanes, Alcohol, Phenols and ethers.
- 6) Aldehydes, Ketones and Carboxylic acids.
- 7) Organic compounds containing Nitrogen & Bio molecules, polymers and chemistry in everyday life.

Part B:(40 Marks)

- a) General Knowledge & Current Affairs.
- b) Logical Reasoning.
- c) General English.
- d) Computer Fundamentals.

Note:

* Duration for Written Test: 60 Minutes.

* Maximum Marks for Written Test: 100 Marks.



Directorate of Agriculture,
Krishi Bhavan,
Tonca, Caranzalem-Goa.

SYLLABUS FOR WRITTEN TEST FOR THE POST OF JUNIOR ENGINEER (CIVIL).

Part A: includes the following topics(60 marks)

1) Building materials

- i) Physical and chemical properties.
- ii) Classification, Standard Tests, Uses and Manufacture/Quarrying of material.

2) Estimating, Costing and Valuation.

- i. Estimate, glossary of technical terms, analysis of rate, methods and unit of measurement, items of work-earthwork, brick work (modular and Traditional Bricks) RCC work, shuttering, Timber work, painting, Flooring and plastering.
- ii. Boundary wall, Brick building, water Tank, Septic tank, Bar bending schedule.
- iii. Cost estimate of septic tank, flexible pavements, Tube well, isolates and combined footings, steel truss, piles and pile-caps.
- iv. Valuation-value and cost, scrap value, salvage value, assessed value, sinking fund, depreciation and obsolescence, methods of valuation.

3) Surveying

- i. Principles of surveying, measurement of distance, chain surveying
- ii. Working of the prismatic compass, compass traversing, bearings, local attraction, place table surveying.
- iii. Theodolite traversing adjustment of theodolite leveling, definition of terms used in leveling contouring, curvature and refraction corrections.
- iv. Temporary and permanent adjustments of dumpy level methods of contouring.
- v. Uses of contour map, tachometric survey, curve setting.
- vi. Earthwork calculation advanced surveying equipment.

4) Soil Mechanics

- i. Origin of soil, phase diagram, definition-void ratio, porosity, degree of saturation, water contents, specific gravity of soil grains, unit weights, density index and interrelationship of different parameters, grain size distribution curves and their used.
- ii. Index properties of soils, ISI soil classification and plasticity chart.
- iii. Permeability of soil, coefficient of permeability.

5) Hydraulics

- i. Fluid properties and hydrostatic, measurements of flow.
- ii. Bernoulli's theorem and its application.
- iii. Flow through pipes.
- iv. Flow in open channels, weirs, flumes, spillways, pumps and turbines.

6) Irrigation Engineering

- i. Definition, necessity, benefits, 211 effects of irrigation, types and methods of irrigation.
- ii. Hydrology – Measurement of rainfall, runoff coefficient, rain gauge.
- iii. Losses from precipitation-evaporation, infiltration, etc. water requirement of crops, duty, delta and base period, Kharif and Rabi crops, command area, Time factor, Crop ratio, overlap allowance, irrigation efficiency.
- iv. Different types of canals, types of canal irrigation, loss of water in canals, canal lining- types and advantages. Shallow and deep to wells, yield from a well

7) Transportation Engineering

- I. Highway Engineering- cross-sectional elements, geometric design, types of pavements, pavement materials.
- II. Components of permanent way-Sleepers, ballast, fixtures and fastening, track geometry, points and crossings, track junction, stations and yards.
- III. Aggregates and bitumen, different tests, Design of flexible and rigid pavements.
- IV. Water Bounds Macadam & Wet Mix Macadam.

8) Environmental Engineering

- i. Quality of water, source of water supply, purification of water, distribution of water, need of sanitation, sewerage systems, circular sewer, oval sewer, sewer appurtenances, sewage treatments.
- ii. Surface water drainage.
- iii. Solid waste management-types, effects, engineered management system.
- iv. Air Pollution-pollutants, causes, effects, control.
- v. Noise pollution-cause, health effects, control.

Part B(40 Marks)

- a) General Knowledge & Current Affairs
- b) Logical Reasoning.
- c) General English.
- d) Computer Fundamentals.

Note:

* Duration for Written Test: 60 Minutes.

* Maximum Marks for Written Test: 100 Marks.



Directorate of Agriculture,
Krishi Bhavan,
Tonca, Caranzalem-Goa.

SYLLABUS FOR WRITTEN TEST FOR THE POST OF TECHNICAL ASSISTANT.

Part A:(Marks 60)

- 1) Elements of farm Machinery and Farm Power (Renewable Energy, Measurement of Engine Power, Governor, Fuel system, Lubrication system, Ignition system, cooling system).
- 2) Farm Tractors and Power tiller (Classification of tractors, Power transmission system, differential unit and final drive, steering system and brake, hydraulic system, hitch and control board, tyre and front axle, traction and traction theory of tractor, maintenance and storage of tractor, Power tiller).
- 3) Tillage Implements (Classification and types of tillage, ploughs, harrows, cultivators & estimation of cost of operation tractor, power tiller).
- 4) Types of harvester and thresher.

Part B:(40 Marks)

- a) General Knowledge & Current Affairs.
- b) Logical Reasoning.
- c) General English.
- d) Computer Fundamentals.

Note:

* Duration for Written Test: 60 Minutes.

* Maximum Marks for Written Test: 100 Marks.



Directorate of Agriculture,
Krishi Bhavan,
Tonca, Caranzalem-Goa.

SYLLABUS FOR WRITTEN TEST FOR THE POST OF TRACTOR DRIVER.

Part A:(60Marks)

- 1) Pre-use safety checks of tractors.
- 2) Use of instruments and controls.
- 3) Knowledge of potential hazards.
- 4) Procedures for safe tractor driving.
- 5) Manoeuvre with different attachments.
- 6) Basic maintenance checks.

Part B:(40 Marks)

- a) General Knowledge & Current Affairs.
- b) Logical Reasoning.
- c) General English.
- d) Computer Fundamentals.

Note:

- * Duration for Written Test: 60 Minutes.
- * Maximum Marks for Written Test: 100 Marks.



Directorate of Agriculture,
Krishi Bhavan,
Tonca, Caranzalem-Goa.

SYLLABUS FOR WRITTEN TEST FOR THE POST OF JUNIOR MECHANIC.

Part A:(60 Marks)

- 1) Various Mechanical Works related to tractor and agricultural implement.
- 2) Working of tractor, parts of tractor, repair techniques, service.
- 3) Maintenance of fuel system, lubrication system, Ignition system, cooling system.
- 4) Power transmission system, differential unit and final drive, steering system and brake hydraulic system.
- 5) Hitch and control board, front axle, tyre replacement.

Part B:(40 Marks)

- a) General Knowledge & Current Affairs.
- b) Logical Reasoning.
- c) General English.
- d) Computer Fundamentals.

Note:

- * Duration for Written Test: 60 Minutes.
- * Maximum Marks for Written Test: 100 Marks.

