

TNPSC CTS (Non-Interview) Post

Agricultural Engineering

DAILY ONLINE TEST Series Tentative Schedule

Units to be covered

Every month, the FIRST week of Sunday Subject paper (10.00 am – 1.00 pm)

Every month, the SECOND week of Sunday GS paper (10.00 am – 1.00 pm)

ONLINE TEST format, either as a Google form or as a PDF

Week order	Subject	GS
May 4 th	Unit III: Soil Erosion and Conservation	Indian National Movement
June 1 st	Unit VIII: Unit Operations in Food and Agricultural Processing + Unit I: General Engineering	UNIT I: General Science + Aptitude and Mental Ability
June 2 nd	Unit IV: Watershed Development and Management + Unit I: General Engineering	UNIT III: History, Culture of India + Aptitude and Mental Ability
June 3 rd	Unit V: Farm Irrigation, Structures and Drainage	UNIT II: Geography of India + Aptitude and Mental Ability
June 4 th	Unit VI: Farm Power	UNIT IV: Indian Polity+ Aptitude and Mental Ability
July 1 st	Unit VII: Farm Machinery	UNIT V: Indian Economy + Aptitude and Mental Ability
July 2 nd	Unit IX: Process Engineering of Agricultural and Horticultural Crops + Unit I: General Engineering	Development Administration in Tamil Nadu + Aptitude and Mental Ability
July 3 rd	Unit X: Renewable and Bioenergy	UNIT VI: History, Culture, Heritage, and Socio-Political Movements in Tamil Nadu Aptitude and Mental Ability
July 4 th	Unit II: Surveying and Hydrology + Unit I: General Engineering	Tamil Eligibility Test

Every week, 25–30 online test series will be provided to you via Google Classroom. The answer key will be released daily to enhance your preparation.

Best wishes for your success

AE FIRST WEEK SCHEDULE

Unit III: Soil Erosion and Conservation

Topic No.	Major Topic Title	Sub-Topics Covered
Topic 1	Introduction & Classification of Soil Erosion	Types of soil erosion (water & wind); Stages of water erosion
Topic 2	Factors Affecting Soil Erosion	Factors affecting erosion by water; Factors affecting erosion by wind
Topic 3	Biological / Agronomic Control Measures for Soil Erosion	Biological control measures and their suitability; Contour farming; Strip cropping; Mixed cropping & intercropping; Mulching
Topic 4	Mechanical / Engineering Control Measures (Overview & Suitability)	Mechanical control measures and their suitability
Topic 5	Design & Construction of Water Erosion Control Structures (Part 1)	Contour bunds; Graded bunds; Terraces
Topic 6	Design & Construction of Water Erosion Control Structures (Part 2)	Contour stone walls; Contour trenches; Staggered trenches; Diversion drains
Topic 7	Gully Control Structures	Drop spillway; Chute spillway; Pipe inlet spillway; Check dams
Topic 8	Wind Erosion & Control Measures	Wind erosion: types and control; Wind breaks; Shelter belts
Topic 9	Dry Farming Techniques	Dry farming techniques for improving crop production
Topic 10	Soil Loss Estimation	Estimation of soil erosion; Universal Soil Loss Equation (USLE)

AE SECOND WEEK SCHEDULE

Unit VIII: Unit Operations in Food and Agricultural Processing

Topic No.	Major Topic Title	Sub-Topics Covered
Topic 1	Heat Transfer Principles & Heat Exchangers	Conduction, convection, radiation; Types of heat exchangers
Topic 2	Evaporation & Evaporators	Unit operations; Evaporators – Types and applications
Topic 3	Mechanical Separation – Filtration, Sedimentation & Settling	Filtration; Sedimentation; Settling
Topic 4	Centrifugal & Cyclone Separation	Centrifugal separation; Cyclone separation
Topic 5	Size Reduction, Mixing, Blending & Emulsification	Size reduction; Mixing; Blending; Emulsification
Topic 6	Food Processing Operations – Pasteurization, Sterilization, Canning, Retort & Extrusion	Pasteurization; Sterilization; Canning; Retort processing; Extrusion processing of foods
Topic 7	Drying of Foods & Preservation by Irradiation	Methods of drying of foods; Preservation of food by irradiation; Microwave and dielectric heating
Topic 8	Fats & Oil Processing – Extraction Methods & Equipment	Fats and oil processing; Extraction methods and equipment
Topic 9	Food Packaging – Materials, Characteristics & Suitability	Food packaging; Materials and characteristics; Suitability
Topic 10	Milk Processing, Refrigeration & Cold Storage Design	Processing of milk and milk products; Packaging of milk; Principles of refrigeration and applications in food industries; Cold

		storage of fruits and vegetables; Design aspects
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Unit I: General Engineering

Topic No.	Major Topic Title	Sub-Topics Covered
Topic 1	Statics & Dynamics of Particles	Statics of particles; Equilibrium of rigid bodies; Dynamics of particles
Topic 2	Properties of Surfaces & Solids – Centroid & Centre of Gravity	Properties of surfaces and solids; Centroid; Centre of gravity
Topic 3	Friction, Stress, Strain & Deformation of Solids	Friction in machine elements; Stress, strain and deformation of solids; Theories of failures

AE THIRD WEEK SCHEDULE

Unit IV: Watershed Development and Management

Topic No.	Major Topic Title	Sub-Topics Covered
Topic 1	Watershed – Concept, Types and Delineation	Watershed concept; Types of watersheds; Watershed delineation methods
Topic 2	Land Capability Classification	Land capability classes: Land use planning based on capability
Topic 3	Participatory Rural Appraisal (PRA) Technique	PRA tools and methods; Participatory planning in watershed development
Topic 4	Watershed Development Plan – Cost & Benefit Estimation	Watershed development planning components: Estimation of costs and benefits

Topic 5	Gully and Ravine Reclamation	Gully erosion; Ravine reclamation techniques
Topic 6	Water Harvesting – In-situ, Ex-situ & Micro Catchments	In-situ water harvesting; Ex-situ water harvesting; Micro catchments
Topic 7	Groundwater Recharge – Artificial Recharge Techniques	Groundwater recharge principles; Artificial recharge techniques and methods; Farm pond; Percolation pond
Topic 8	Soil & Water Conservation Practices and Afforestation	Selection of suitable soil and water conservation practices; Afforestation
Topic 9	Holistic Planning & Watershed-Based Rural Development	Holistic planning approach; Watershed based rural development
Topic 10	Remote Sensing & GIS in Watershed Management	Use of aerial photography and remote sensing; Applications of Remote Sensing and GIS in planning and development of watersheds including forest cover and water resources

Unit I: General Engineering

Topic No.	Major Topic Title	Sub-Topics Covered
Topic 4	Design of Shafts & Couplings	Design of shafts; Design of couplings
Topic 5	Fluid Mechanics – Statics, Dynamics & Pipe Flow	Fluid statics; Equations of continuity and momentum; Bernoulli's equation; Flow through pipes; Head losses in pipes, bends
Topic 6	Pumps, Valves & Applications	Pumps and their applications; Valves and types

AE FOURTH WEEK SCHEDULE

Unit V: Farm Irrigation, Structures and Drainage

Topic No.	Major Topic Title	Sub-Topics Covered
Topic 1	Irrigation – Sources, Soil-Water-Plant Relationship & Water Requirement	Irrigation sources; Soil-water-plant relationship; Water requirement of crops
Topic 2	Measurement of Irrigation Water – Weirs & Flumes	Measurement of irrigation water; Weirs and flumes
Topic 3	Methods of Irrigation – Surface & Sprinkler	Surface irrigation methods; Sprinkler irrigation; Rain gun irrigation
Topic 4	Drip Irrigation – Components, Design & Wetting Pattern	Drip irrigation – Components and design; Wetting pattern; Filters; Fertigation tanks; Pump capacity; Operation and maintenance
Topic 5	Sprinkler Irrigation – Components, Performance & Hydraulic Design	Sprinkler irrigation components; Sprinkler performance; Hydraulic design of sprinkler systems
Topic 6	Irrigation Automation	Irrigation automation
Topic 7	Duty & Delta Relationship, Irrigation Scheduling & Efficiencies	Duty and delta relationship; Irrigation scheduling; Irrigation efficiencies and their estimation
Topic 8	Pumps – Types, Selection & Installation	Pumps – Types, selection and installation
Topic 9	Design & Construction of Farm Structures	Design and construction of farm structures; Site selection; Quality; RCC; Foundation, basement and superstructure; Types of roofs; Building plan and estimation; Requirements of farm house, threshing floor,

		drying floor, poultry house, dairy farm, rat proof godown and farm roads
Topic 10	Dams & Water Conveyance Structures	Design features of earthen dams and gravity dams; Water conveyance structures; Earthen channels and lined channels; Advantages of lining; Materials of lining; Design of channel cross section
Topic 11	Crossing Control Structures	Crossing control structures; Road crossing structures; Culvert; Inverted siphon; Aqueduct; Their uses; Underground pipeline system – Components and their functions
Topic 12	Protected Cultivation Structures	Structures for plant environment; Green houses; Poly houses; Shade nets; Construction and utilization; Soilless culture
Topic 13	Drainage – Causes of Water Logging & Salt Problems	Drainage; Causes of water logging and salt problems
Topic 14	Methods of Drainage – Surface, Sub-surface & Vertical	Methods of drainage; Design of surface, sub-surface and vertical drainage systems
Topic 15	Poor Quality Water Management & Reclamation of Saline/Alkali Soils	Improvement and utilization of poor quality water; Reclamation of saline and alkali soils

AE FIFTH WEEK SCHEDULE

Unit VI: Farm Power

Topic No.	Major Topic Title	Sub-Topics Covered
Topic 1	Sources of Farm Power & IC Engine Fundamentals	Sources of farm power; Construction and working of SI and CI engines; Thermodynamic principles of SI and CI engines
Topic 2	Engine Cycles – Two Stroke & Four Stroke Engines	Two stroke and four stroke engines; Comparison of 2-stroke and 4-stroke; Turbo charging
Topic 3	Engine Systems – Fuel Injection, Ignition, Lubrication & Cooling	Fuel injection systems; Ignition systems; Lubrication systems; Cooling systems; Speed governors; Electrical systems of IC engines
Topic 4	Farm Machinery – Tractors, Bulldozers & Power Tillers	Different types of tractors; Bulldozers; Power tillers
Topic 5	Power Transmission Systems – Clutch & Gearbox	Power transmission systems; Types of clutches; Gearboxes – types, constructional details and operation
Topic 6	Final Drive, Differential, Braking & Steering Systems	Differential; Final drive system; Braking system – types, constructional details and operation; Steering system – types, constructional details and operation
Topic 7	Suspension, Hydraulic System & Hitching	Suspension system – types, constructional details; Uses of hydraulic system in tractors; Hitching system; Three point linkage; Tractor power outlets
Topic 8	Vehicle Mechanics – Resistance, Performance, Bulldozer Operations	Resistances to vehicle motion; Vehicle performance characteristics; Operations using bulldozer
Topic 9	Wheels, Tyres, Battery & Tractor Stability	Types of wheels and tyres; Battery – types, constructional details and working principle; Tractor stability; Mechanics of tractor implement combination; Weight transfer
Topic 10	Ergonomics, Safety & Maintenance of Tractors	Ergonomic considerations in operation of tractors; Safety devices in tractors; Maintenance of tractors

Topic 11	Electrical Motors & Power Measurement	Single phase induction motor; Three phase power measurement methods; Power factor; Electrical pump sets
Topic 12	DC Machines & Power Supplies	Regulated DC power supply; DC machine; DC generator; DC motor; Starter; Torque and efficiency
Topic 13	Electronics in Agriculture – Semiconductors, Digital Electronics & Converters	Electronics in agriculture; Semiconductors; Transistors; Operational amplifiers; Digital electronics; Counters; Encoders; Decoders; Digital to Analog and Analog to Digital converters
Topic 14	Instrumentation – Transducers & Measurements	Instrumentation; Transducers; Strain gauges – types and gauge factor; Force measurement using strain gauges; Torque measurement; Pressure measurement; Flow measurement; Temperature measurement; Thermocouples; Speed measurement
Topic 15	Microprocessors, Controllers & Electric Vehicles in Agriculture	Microprocessors; Microcontrollers; PID controllers; PLC; Electric vehicles in agriculture

AE SIXTH WEEK SCHEDULE

Unit VII: Farm Machinery

Topic No.	Major Topic Title	Sub-Topics Covered
Topic 1	Earth Moving Equipment	Backhoe with front-end loader; Crawler excavator; Bulldozer – bladeshoes; Soil digging machines
Topic 2	Primary Tillage Implements	Indigenous plough; Mould board plough; Disc plough; Chisel plough; Subsoiler; Methods of ploughing
Topic 3	Secondary Tillage & Land Shaping Machinery	Cultivators; Harrows; Rotary tillers; Rotavator; Land shaping machinery – Laser leveller, Ridger, Bund former, Raised bed former, Puddler

Topic 4	Field Capacity & Field Efficiency	Calculation of field capacity; Field efficiency – theoretical and practical concepts
Topic 5	Sowing & Transplanting Equipment	Seed drills – types; Metering mechanisms; Planters; Broadcasters; Rice transplanters; Pneumatic planters
Topic 6	Intercultural Implements	Dryland weeders; Wetland weeders; Manual and power operated weeders
Topic 7	Plant Protection Equipment – Sprayers	Sprayers – types of sprayers; Drone sprayer; Calibration of sprayer; Types of nozzles; Drift
Topic 8	Harvesting Equipment – Part I (Cereal Crops)	Sickle; Mower; Cutter bar; Reaper; Binders; Windrowers
Topic 9	Threshers & Combines	Threshers – principle of threshing, types of threshers, threshing drums; Calculation of output capacity; Combines – working principles, components of combine
Topic 10	Harvesting Equipment – Part II (Specialty Crops)	Root crop harvesters; Cotton harvesters; Cotton strippers; Sugarcane harvester; Maize harvesters; Vegetable and fruit harvesters
Topic 11	Crop Residue Management Machinery	Crop residue management machinery – straw reapers, mulchers, balers, stubble shavers
Topic 12	Cost Estimation of Farm Machinery	Cost estimation of farm machinery – fixed costs, variable costs, depreciation methods, breakeven analysis

AE SEVENTH WEEK SCHEDULE

Unit IX: Process Engineering of Agricultural and Horticultural Crops

Topic No.	Major Topic Title	Sub-Topics Covered
Topic 1	Engineering Properties & Moisture Content of Food Materials	Engineering properties of food materials; Moisture content – Methods of determination
Topic 2	Psychrometry & Drying Principles	Psychrometry; Drying – Thin layer and deep bed drying; Types of heat sources and types of dryers
Topic 3	Cleaning, Grading & Separation	Cleaning and grading – Principles; Separators – Efficiency; Performance index
Topic 4	Shelling, Decortication & Seed Processing	Shelling and decortication; Seed processing and layout of seed processing units
Topic 5	Rice Processing – Parboiling, Dehusking & Milling	Rice processing – Parboiling and dehusking of paddy; Machines used; Milling of corn, pulses and millets
Topic 6	Material Handling Equipment – Conveyors & Elevators	Material handling equipment – Conveyors and elevators
Topic 7	Storage of Agricultural Produce	Storage – Conditions for safe storage; Bag and bulk storage; Silo storage – Design aspects; Modified atmosphere storage; Storage structures
Topic 8	Processing of Horticultural Crops – Preservation, Drying & Dehydration	Equipment used for processing of horticultural crops; Preservation of fresh fruits and vegetables; Drying and dehydration
Topic 9	Processing of Plantation Crops – Coffee, Tea, Rubber & Cashew	Processing of coffee, tea, rubber, cashew nut
Topic 10	Processing of Coconut, Oil Palm, Aromatic Plants, Flowers & Spices	Processing of coconut, oil palm, aromatic plants, flowers and spices

Unit I: General Engineering

Topic No.	Major Topic Title	Sub-Topics Covered
Topic 7	Iron Carbide Phase Diagram & Ferrous/Non-Ferrous Alloys	Iron carbide phase diagram; Ferrous and non-ferrous alloys
Topic 8	Heat Treatment of Metals	Heat treatment of ferrous metals; Heat treatment of non-ferrous metals
Topic 9	Engineering Materials – Polymers, Composites & Nano-materials	Engineering and commodity polymers; Composites; Nano-materials

AE EIGHTH WEEK SCHEDULE

Unit X: Renewable and Bioenergy

Topic No.	Major Topic Title	Sub-Topics Covered
Topic 1	Solar Energy – Thermal Collectors & Applications	Solar energy; Solar collectors – Air heaters, Solar dryers, Water heaters, Solar cold storage
Topic 2	Solar Photovoltaic (PV) Systems	Solar photovoltaic systems and applications; Solar PV pump; Solar fencing
Topic 3	Wind Energy – Resources, Wind Mills & Applications	Wind energy; Suitable sites; Types of wind mills; Wind mill components; Applications; Performance of wind mills
Topic 4	Biomass Resources & Characteristics	Biomass resources; Agro residues; Characteristics of biomass
Topic 5	Biochemical Conversion – Biogas Plants	Conversion technologies; Biochemical conversion; Biogas plant – Types and selection, construction, operation and maintenance; Slurry handling
Topic 6	Thermochemical Conversion – Stoves, Pyrolysis & Gasification	Thermochemical conversion; Stoves – Types, Improved stoves; Pyrolysis; Charcoal production; Gasification; Briquetting

Topic 7	Alternate Renewable Energy Systems	Alternate renewable energy systems – Hydro power, Geothermal, Ocean and Hydrogen energy
Topic 8	Energy Storage Systems & Energy Conservation	Energy storage systems; Energy conservation; Cogeneration
Topic 9	Energy Plantation, Environmental Impact & Global Warming	Energy plantation and environmental impact; Global warming; Clean Development Mechanism (CDM); Role of afforestation
Topic 10	Biofuels – Biodiesel	Biofuels; Biodiesel – Feedstock, production and by-product utilization
Topic 11	Biofuels – Ethanol	Ethanol – Production and utilization
Topic 12	Emission Standards & Control	Emission – Standards and control

AE NINETH WEEK SCHEDULE

Unit II: Surveying and Hydrology

Topic No.	Major Topic Title	Sub-Topics Covered
Topic 1	Surveying – Instruments & Methods of Linear Measurement	Surveying – Instruments; Methods of surveying; Linear measurements; Computation of area
Topic 2	Triangulation, Traversing, Intersection & Cross Staff Survey	Triangulation; Intersection; Traversing; Cross staff survey
Topic 3	Plane Table Survey & Earth Work Computation	Plane table survey; Earth work computation – Simpson's and trapezoidal rule
Topic 4	Levelling – Benchmarks, Instruments & Methods	Levelling – Definition; Types of benchmarks; Different types of levels; Reduced level by rise and fall method and height of collimation method

Topic 5	Contouring, Profile Survey & Cross Section Survey	Contouring; Profile surveying; Cross section survey; Use of minor instruments
Topic 6	Theodolite, Total Station & GPS Survey	Theodolite survey; Total station; GPS survey
Topic 7	Hydrology – Measurement of Rainfall, Evaporation & Infiltration	Hydrology; Measurement of rainfall, evaporation and infiltration
Topic 8	Runoff Estimation – Factors, Volume & Peak Flow	Estimation of runoff; Factors affecting runoff; Computation of volume of runoff and peak flow; Unit hydrograph
Topic 9	Groundwater Occurrence, Exploration & Hydraulics of Wells	Occurrence and movement of groundwater; Groundwater exploration techniques; Hydraulics of wells; Types of wells and their construction
Topic 10	Well Drilling, Screens, Development & Yield Testing	Well drilling – Methods and machinery; Techniques for different formations; Well logging; Types of well screen; Design of well screens; Well development; Yield testing

Unit I: General Engineering

Topic No.	Major Topic Title	Sub-Topics Covered
Topic 10	Manufacturing Processes – Foundry, Forming & Joining	Foundry technology; Metal forming processes; Metal joining processes; Manufacturing of thermosetting and thermoplastic products
Topic 11	Inventory Control & Operations Research	Inventory control – Economic Order Quantity (EOQ); Quantity discounts; ABC Analysis; Operations Research; Assignment Model
Topic 12	Project Management (CPM/PERT) & Industrial Safety	Critical Path Method (CPM); Program Evaluation Review Technique (PERT); Queuing Models; Industrial Safety