RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER

SYLLABUS FOR SCREENING TEST FOR THE POST OF

ASSISTANT SOIL CONSERVATION OFFICER (ENGINEERING),

FOREST DEPARTMENT

HYDROLOGY

Introduction; hydrologic cycle; precipitation - forms, rainfall measurement, mass curve, hydrograph, mean rainfall depth, frequency analysis of point rainfall.

Interception; Infiltration; evaporation; Evapotranspiration-estimation and measurement; geomorphology of watersheds - stream number, stream length, stream area, stream slope; Runoff - factors affecting, measurement; Stage and Velocity, Rating curve, Extension of rating curve; Estimation of peak runoff rate and runoff yield; Rational method, Cook's method, Curve number method, Strange's table, Barlow's table.

Hydrograph; components, base flow separation, Unit hydrograph theory - Unit hydrograph of different durations, uses and limitations of unit hydrograph.

Head water flood control - methods, Retards and their location; Flood routing - graphical methods of reservoir flood routing; hydrology of dry land areas - drought and its classification.

SOIL AND WATER CONSERVATION ENGINEERING

Land use capability classification ,

Introduction; Soil erosion *:* Causes, types and agents of soil erosion; water erosion - forms of water erosion, mechanics of erosion; gullies and their classification, stages of gully development; gully and ravine reclamation. Soil loss estimation - Universal soil loss equation and modified soil loss equation, determination of their various parameters.

Erosion control measures*:* Agronomical and Vegetative measures - Contour cropping, Strip cropping, Mulching; Contour vegetative hedge.

Mechanical measures - terraces - level and graded broad base terraces, PRT, SWT, bench terraces and their design, layout procedure, terrace planning.

Drainage line treatment measures, Grassed water ways and their design; introduction to water harvesting techniques; introduction to stream water quality and pollution. Temporary and Permanent gully control structures.

Insitu conservation measures for non-arable lands. Conservation measures for arable lands- Bunds - contour bunds, graded bunds and their design;

Wind erosion *:* Factors affecting wind erosion, Mechanics of wind erosion, Soil loss estimation, wind erosion control measures - Vegetative, Mechanical measures, Wind breaks & Shelter belts, Sand dunes stabilization.

WATERSHED PLANNING AND MANAGEMENT

Watershed management - Problems and prospects; watershed based land use planning, watershed characteristics, factors affecting watershed management, hydrologic data for watershed planning, watershed delineation, delineation of priority watershed.

Water yield assessment and measurement from a watershed; hydrologic and hydraulic design of earthen embankments and diversion structures; sediment yield estimation and measurement from a watershed and sediment yield models, sediment delivery ratio, trap efficiency.

Rainwater conservation technologies - in-situ and storage, design of water harvesting tanks and ponds; water budgeting in a watershed; effect of cropping system, land management and cultural practices on watershed hydrology.

Evaluation and monitoring of watershed programmes; people's participation in watershed management programmes; planning and formulation of project proposal; cost benefit analysis of watershed projects.

SURVEYING AND LEVELLING

Introduction to various surveying and leveling instruments e.g. Chain survey, Plane table survey, Dumpy level, Abney level, hand level, etc.

Description, construction and use of Theodolite, Temporary adjustments of Theodeolite, Fixing, Centering, leveling and elimination of parallax. various axes and their relationship. Principles of Tacheometric survey and its field application. Constants of Tachometer. Calculation of R.L. Use of stadia cross wires.

Contours, contouring and their characteristics. Contour Drawing by different methods.

Area calculation of regular boundaries by mathematical formulas. Use of Trapezoidal and Simpson's formula, their limitation. Planimeter: Its construction, use and theory, Area calculations, Use of zero circle and solution of numerical Problems.

Computation of volumes, Earth work calculations. Calculation of volume by the use of contour and their use in computing the reservoir capacity.

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Pattern of Question Papers:

1. Objective Type Paper
2. Maximum Marks : 100
3. Number of Questions : 100
4. Duration of Paper : Two Hours
5. All Questions carry equal marks
6. There will be Negative Marking

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