REVISED SYLLABUS 2022

DEPARTMENTAL PROMOTION EXAMINATION
FROM SENIOR RESEARCH OFFICER TO SUPERINTENDING RESEARCH OFFICER
(GWH / SWH / WATER CHEMIST / HYDRAULICS)

PAPER-I	**CURRENT AFFAIRS & RULES & REGULATIONS**	**100 marks** (Pass marks 47)
	(Note: Passing in each part is mandatory to clear paper-1)	

Part-I	**Current Affairs**	**33 marks** (Pass marks 40%)

Current Affairs paper will be set from leading issues published in the newspaper for the last 3 months. The following books may be consulted.

- Monthly Current Affairs Digest by Tariq Mahmood Dogar
- Monthly Current Affairs Digest by Dr. Safdar Mahmood
- Any other Current Affairs Digest

Part-II	**Rules and Regulations (Books allowed)**	**67 marks** (Pass marks 50%)

- The Pakistan WAPDA Employees (E&D) Rules, 1978
- The Pakistan WAPDA Employees (Retirement) Rules, 1979
- The Pakistan WAPDA Leave Rules for WAPDA Employees 1982
- The Pakistan WAPDA TA Rules 1982
- WAPDA Act
- Conduct Rules
- Medical Attendance Rules.

Reference Books

- WAPDA Manual of General Rules amended upto 2014 (including addendums)

PAPER-II	**TECHNICAL**	**100 Marks** (Pass marks 50)

Hydrology:

- Design of optimum rain gauge network in a basin.
- Modern instruments of hydro meteorological data observation e.g. digital current meter, ADGP, SVR, automatic weather station etc.
- Methods to collect the data from these modern instruments through laptop/palmtop.
- Introduction about Doppler technology e.g. ADCP etc for discharge an sediment measurement
- Method to use tracer technology in highly turbulent rivers for discharge measurement.
- Forms of precipitation and how it occurs?
- Hydro meteorological characteristics of the basins.
- Use of radars in the study of storm mechanism.
- Meteor burst and GSM data communication system.
- Types of flow (steady, unsteady, uniform & non-uniform)
- Introduction to statistical hydrology.
- Statistical parameters for the analysis of hydrological data (i.e.) mean, medium, mod standard deviation, variance, skewness etc.
- Correlation of data (i) Liner correlation (ii) Multiple correlation.
- Calculation of Design storm, PMP & PMF.
- Water losses and methods to estimate them.

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- Factors affecting run off from a basin.
- Estimation of runoff from rainfall.
- Hydrograph, unit hydrograph and its properties.
- Synthetic unit hydrographs
- Methods of determination of discharges at an station,
  (i) mid section method (ii) mean section method
- Rating of current meters and its necessity.
- Types of ground water aquifers and their yields.
- Hydraulics of open wells.
- Foods and their estimation.
- Routing of floods in reservoirs
- Probability analysis & floods frequency.
- Stream flow flouting.
- Extension of rating curves/extrapolation of rating curves.
- Reservoir mass curve and Storage.
- Flow duration curves.
- Mathematical models in hydrology
  (i) Deterministic models (ii) Stochastic models

Computer (Information Technology): Introduction to Computer System, M.S. Word and M.S. Office: Characteristic of computer, types of computer, computer hardware and software, types of memory and functions, operating systems, input/out and storage devices, main features of utility of MS Word, MS Excel, MS Power Point, Internet and E-mail.

Reference Books

- Groundwater hydrology by David Kaith Tood.
- Guidelines for water well design by Ch. Atta-ur-Rehman – 1979.
- Groundwater Manual by US department of the interior, 1985.
- Applied hydrology by K.N. Mutreja..
- Hand book of applied hydrology by VEN Te Chow.
- Study & Interpretation of chemical characteristics of natural water by John D. Hem.
- Water quality Reports on SCARPS by SMO.
- Laboratory manual for water analysis by SMO.
- Methods of collection and analysis of water samples by F.H./Rain Water.
- Standard Method (ASTM).
- Hydraulic design Handbook by Larry W. Mays
- Open Channel Flow by Dr. M. Hanif Chaudhry
- Open Channel Hydraulic by Ven Te Chow
- Irrigation Engineering and Hydraulic Structure by Santosh Kummar Garg
- Hand book of Applied Hydraulic by C. V. Davis and K.E. Sorensen
- Indian practical civil engineering handbook by PN Khanna
- Hand book of Applied Hydraulic Chief Editor Calvin Victor Davis
- Engineering Hydraulic by Hunter Rouse
- Modeling of Rivers by Hsieh Wedn Sheu
- Microsoft Office 2007/2010, by Gary B. Shelly, Thomas J. Cashman and Misty E. Vermaat.
- Window 7 Step by Step by Joan Lambert and Joyce Cox (Available Online).

NOTE (1) One question from Computer (Information Technology) is **compulsory** to be included in Paper-II (Technical).

NOTE (2): The paper will be 50% objective and 50% subjective.

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