कार्मिक शाखा/Personnel Branch
बीएसएनएल निगम कार्या./BSNL Corporate Office
चौथा तल, भारत संचार भवन
4th Floor, Bharat Sanchar Bhawan,
जनपथ, नई दिल्ली-10001/Janpath , New Delhi-110001.

भारत संचार निगम लिमिटेड
(भारत सरकार का उद्यम)
BHARAT SANCHAR NIGAM LIMITED
(A Govt. Of India Enterprise)

No. BSNLCO-PERS/15(17)/2/2023-PERS1(Civil) **Dated: 16-05-2024**

Subject: **Scheme and Syllabus for Direct Recruitment to the post of Senior Executive Trainee (DR) of Civil Stream.**

...

The undersigned is directed to enclose herewith Scheme and Syllabus for direct recruitment to the post of Senior Executive Trainee (DR) [SET(DR)] of Civil Stream for wide publicity. The Scheme and Syllabus shall be applicable w.e.f the date of notification.

This issues with the approval of competent authority.

16.05.2024

Encl.: As above.

[जी.पी. विश्नोई/ G.P. Vishnoi]
उप महाप्रबंधक (कार्मिक-II)
Dy. General Manager (Pers. II)

To

1. PPS to CMD, BSNL.
2. PPS to functional Directors of BSNL Board.
3. PPS to CVO, BSNL.
4. All Heads of Telecom Circles/Administrative Units, BSNL.
5. CGM(BW)/PGM(Pers)/PGM(Estt.)/GM(Rectt.), BSNL CO.
6. General Secretary, SNEA/AIGETOA/SEWA.
7. OL Section for Hindi version.
8. BSNL Intranet portal.

16/05/2024

[मूल चंद/ Mool Chand]
सहायक महाप्रबंधक (कार्मिक नीति)
Assistant General Manager (Pers. Policy)

Scheme and Syllabus for Direct Recruitment to the post of Senior Executive Trainee [SET (DR)] of Civil Stream

1. Scheme of Examination:

The examination (Computer based-Multiple choice-Objective type test) will consist of one paper as given below:

Paper	Particulars	Maximum Marks	Duration
Part-I (Common)	Written Test (Aptitude)	40 Marks (40 Questions)	180 Minutes
Part-II (Core)	Written Test (Technical)	160 Marks (160 Questions)	
	Total	200 Marks (200 Questions)	

Note:

(a) The examination will be conducted in one shift comprising of Part-I (Common) - Written Test (Aptitude) and Part-II (Core) - Written Test (Technical) for 180 Minutes duration.

(b) The examination will be objective type with negative marking. For each correct answer 01 Mark will be awarded and for each wrong answer (-)0.25 Marks will be awarded.

1.1 **Minimum qualifying Marks**: Minimum qualifying Marks in Part-I (Common) & Part-II (Core) shall be 40% in each Part and overall minimum qualifying Marks in both Part-I & Part-II combined shall be 50%. For SC/ST, OBC, PwBD and EWS candidates, there shall be relaxation in Qualifying Marks and the minimum Qualifying Marks in each Part shall be 35% and overall minimum Qualifying Marks in both the Parts combined shall be 45%.

1.2 **Determination of Final Merit List**: Final merit list will be prepared based on Total Marks obtained in Part-I (Common) & Part-II (Core), provided the candidate has secured minimum qualifying Marks as prescribed above.

2. Syllabus for Part-I (Common) – Written Test (Aptitude):

(40 Marks)

Part-I (Common)	Aptitude Test	1. Quantitative ability and data sufficiency 2. Reasoning (e.g. analytical, logical and critical reasoning) 3. Verbal ability, reading comprehension and analysis

3. Syllabus for Part-II (Core) – Written Test (Technical) - Civil Stream:

As given in Annexure.

16.05.2024

Annexure

Syllabus of SET(DR) for written Test (Technical) – Civil Stream

(160 Marks)

Sl. No.	Topic Heading	Topic Sub heading	Weightage (in %)
1.	**Building Materials**	Stone, Lime, Glass, Plastics, Steel, FRP, Ceramics, Aluminum, Fly Ash, Basic Admixtures, Timber, Bricks and Aggregates: Classification, properties and selection criteria; Cement: Types, Composition, Properties, Uses, Specifications and various Tests; Lime & Cement Mortars and Concrete: Properties and various Tests; Design of Concrete Mixes: Proportioning of aggregates and methods of mix design.	8
2.	**Solid Mechanics**	Elastic constants, Stress, plane stress, Strains, plane strain, Mohr's circle of stress and strain, Elastic theories of failure, Principal Stresses, Bending, Shear and Torsion.	3
3.	**Structural Analysis**	Basics of strength of materials, Types of stresses and strains, Bending moments and shear force, concept of bending and shear stresses; Analysis of determinate and indeterminate structures; Trusses, beams, plane frames; Rolling loads, Influence Lines, Unit load method & other methods; Free and Forced vibrations of single degree and multi degree freedom system; Suspended Cables; Concepts and use of Computer Aided Design.	10
4.	**Design of Steel Structures**	Principles of Working Stress methods, Design of tension and compression members, Design of beams and beam column connections, built-up sections, Girders, Industrial roofs, Principles of Ultimate load design.	10
5.	**Design of Concrete and Masonry structures**	Limit state design for bending, shear, axial compression and combined forces; Design of Beams, Slabs, Lintels, Foundations, Retaining walls, Tanks, Staircases; Principles of pre-stressed concrete design including materials and methods; Earthquake resistant design of structures; Design of Masonry Structure.	12

16.05.2024

Sl. No.	Topic Heading	Topic Sub heading	Weightage (in %)
6.	**Construction Practice, Planning and Management**	Construction - Planning, Equipment, Site investigation and Management including Estimation with latest project management tool and network analysis for different types of works; Analysis of Rates of various types of works; Tendering Process and Contract Management; Quality Control, Productivity, Operation Cost; Land acquisition; Labour safety and Welfare.	6
7.	**Fluid Mechanics, Open Channel Flow, Pipe Flow**	Fluid properties; Dimensional Analysis and Modeling; Fluid dynamics including flow kinematics and measurements; Flow net; Viscosity, Boundary layer and control, Drag, Lift, Principles in open channel flow, Flow controls. Hydraulic jump; Surges; Pipe networks.	4
8.	**Hydrology and Water Resources Engineering**	Hydrological cycle, Ground water hydrology, Well hydrology and related data analysis; Streams and their gauging; River morphology; Flood, drought and their management; Capacity of Reservoirs. Water Resources Engineering: Multipurpose uses of Water, River basins and their potential; Irrigation systems, water demand assessment; Resources - storages and their yields; Water logging, canal and drainage design, Gravity dams, falls, weirs, Energy dissipaters, barrage Distribution works, Cross drainage works and head-works and their design; Concepts in canal design, construction & maintenance; River training, measurement and analysis of rainfall.	4
9.	**Environmental Engineering**		
	(a) Water Supply Engineering	Sources, Estimation, quality standards and testing of water and their treatment; Rural, Institutional and industrial water supply; Physical, chemical and biological characteristics and sources of water, Pollutants in water and its effects; Estimation of water demand; Drinking water Standards, Water Treatment Plants, Water distribution networks.	6
	(b) Waste Water Engineering	Planning & design of domestic waste water, sewage collection and disposal; Plumbing Systems. Components and layout of sewerage system; Planning & design of Domestic Waste-water disposal system; Sludge management including treatment, disposal and re-use of treated effluents; Industrial waste waters and Effluent Treatment Plants including institutional and industrial sewage management.	6

16.05.2024

Sl. No.	Topic Heading	Topic Sub heading	Weightage (in %)
	(c) Solid Waste Management	Sources & classification of solid wastes along with planning & design of its management system; Disposal system. Beneficial aspects of wastes and Utilization by Civil Engineers.	3
10.	**Geo-technical Engineering and Foundation Engineering**		
	(a) Geo-technical Engineering	Soil exploration - planning & methods, Properties of soil, classification, various tests and inter-relationships; Permeability & Seepage, Compressibility, consolidation and Shearing resistance, Earth pressure theories and stress distribution in soil; Properties and uses of geo-synthetics.	6
	(b) Foundation Engineering	Types of foundations & selection criteria, bearing capacity, settlement analysis, design and testing of shallow & deep foundations; Slope stability analysis, Earthen embankments, Dams and Earth retaining structures: types, analysis and design, Principles of ground modifications.	6
11.	**Surveying and Geology**		
	(a) Surveying	Classification of surveys, various methodologies, instruments & analysis of measurement of distances, elevation and directions; Field astronomy, Global Positioning System; Map preparation; Photogrammetry; Remote sensing concepts; Survey Layout for culverts, canals, bridges, road/railway alignment and buildings, Setting out of Curves.	6
	(b) Geology	Basic knowledge of Engineering geology & its application in projects.	2
12.	**Transportation Engineering**	Highways - Planning & construction methodology, Alignment and geometric design; Traffic Surveys and Controls; Principles of Flexible and Rigid pavements design.	5
13.	**Green Buildings**	Green Buildings Constructions, Green Rating Integrated Habitat Assessment (GRIHA) green building rating system	3

.....

16-05-2024