Bharat Sanchar Nigam Limited
Recruitment Section
Janpath, New Delhi -110001

No. 1-4/2011-R-II **Dated: 2nd November, 2011**

To

All CGMT

.....Circle BSNL.

Sub: Holding of Special Recruitment Drive (SRD) for filling up backlog vacancies of Junior Telecom Officer (Telecom/Civil/Electrical) for Persons with Disabilities (PWD) -JTO (SRD) 2011.

Sir,

I am directed to refer to U.O. Note No. 5-1/2010 Pers-IV dated 29.09.2011 from Estt. Branch, letter No. 15-49/2011-Elect. dated 13.10.2011 from Electrical Wing, BSNL CO and letter No. JTOC/AD(BW-II)Pt/2011 dated 20.10.2011 from Civil Wing, BSNL CO to recruit Junior Telecom Officer (JTOs) in Telecom, Electrical and Civil streams through Special Recruitment Drive (SRD) to fill up backlog vacancies reserved for Persons with Disabilities (PWD). The SRD has been re-launched in pursuance with DoPT OM No. 36038/1/2008-Estt.(Res) dated 26.07.2011 and O.M. No. 36038/2/2008-Estt.(Res) dated 28.07.2011.

2. Approval of the competent authority is hereby conveyed to conduct SRD for filling up backlog vacancies reserved for PWDs in the cadre of JTO in Telecom, Electrical and Civil streams under Direct Recruitment quota. The numbers of backlog vacancies which may be filled up by conducting SRD Exam as intimated by the circles are given in the Annexure.

3. **As per 16 (c) of DoPT OM No. 36035/3/2004-Estt (Res) dated 29.12.2005, the vacancies are interchangeable i.e., if vacancy of one category of disability remains unfilled, it may be filled by person of other category of disability.**

4. The date of JTO SRD Exam-2011 has been fixed as 19-2-2012. The examination shall be conducted in accordance with the terms and conditions viz. educational qualification, age, scheme and syllabus of the competitive examination etc. as adopted in JTO SRD Exam 2010 held on 19-12-2010.

5. In the cadre of JTO (Telecom/Civil/Electrical) the physically handicapped persons having the following disability have been permitted:

i) Hearing Impairment-Partially Deaf

ii) Locomotors Impairment-One arm or one leg or both legs affected.

(As per Central Govt. Guidelines, the minimum degree of disability is 40% in order for a person to be eligible for any concession/benefits).

6. It has been decided with the approval of competent authority that:-

a) All recruiting circles will issue the advertisements separately for their respective circle similar to the advertisement issued for the earlier JTO SRD-2010 exam. **In the advertisement, it may be indicated that Exam is to be conducted on 19th February, 2012.**

b) The paper setting and printing will be arranged by Recruitment Cell of BSNL CO in order to have same standard through out India.

c) The Examination will be OMR based as in the past and OMR sheets shall also be arranged by Recruitment Cell, BSNL CO.

d) After the examination is conducted, the Provisional Answer Keys of JTO SRD Exam of all three streams will be uploaded on the BSNL website (www.bsnl.co.in) in order to bring transparency and invite comments, if any, from the candidates by e-mail at E-mail Id recttcell@bsnl.co.in within a period of 10 days after uploading of Answer keys. The Provisional Answer Key will be finalised after considering the representation/feedback received. Final answer key will then be provided to the circles for evaluation of OMR Answer sheets.

e) Evaluation of OMR sheets will be got done by the respective circle as per the instructions issued vide our letter no. 1-5/2010/R-II dated 1-12-2010.

f) Respective Recruiting circle will prepare and declare the results.

7. The Circle-wise distribution of vacancies shall be done by the respective Recruiting Circle after taking into account the demands of Non-recruiting circles like projects, Maintenance Regions etc. The corporate Office may be kept informed about the No. of candidates who join as JTO through SRD Exam.

Regarding educational qualifications in various streams (Telecom/Civil/Elect), it may be mentioned in the advertisement that applicant must possess as on 31-12-2011 the required degree in the respective discipline.

10. Respective circle may explore the possibility of online registration of applications, e-admit card, declaration of result through website etc. as was done in case of JAO (DR) and SDE LDCE for the post of SDE(T) exams.

11 **The broad activities involved in conducting JTO SRD Exam 2011 are detailed below alongwith the time schedule:-**

S No.	Activities	To be completed by
1	Circle to release Advertisement	21-11-2011
2	Closing date of receipt of application	12-12-2011
3	Date of conduct of Exam.	19-02-2012
4	Date of declaration of Result	19-03-2012

The above time schedule should be strictly adhered to by the circles.

(Bindu Roy)
AGM (Rectt)
Tele No.23708041

Copy to: 1. GM (Estt), BSNL, CO.
2. CLO (SCT Cell), BSNL, CO.

Annexure-A

Circle-wise and Category-wise vacancies of JTOs(Telecom)

S.No.	Name of Circle	Loco-motor Impairment Category	Hearing Impairment Category
1.	AP	00	08
2.	A&N	01	00
3.	Assam	02	05
4.	Bihar	03	03
5.	Kolkatta TD	04	06
6.	Chhattisgarh	01	01
7.	Gujarat	11	14
8.	Haryana	02	04
9.	HP	02	03
10.	Chennai TD	00	01
11.	J&K	01	04
12.	Jharkhand	00	01
13.	Karnataka	09	15
14.	Kerala	01	05
15.	MP	01	04
16.	Maharashtra	12	17
17.	NTR	00	01
18.	NE-I	01	03
19.	NE-II	00	01
20.	Orissa	01	03
21.	Punjab	05	08
22.	Rajasthan	00	03
23.	Tamilnadu	01	07
24.	Uttaranchal	00	01
25.	UP(E)	00	01
26.	UP(W)	00	03
27.	West Bengal	07	07
Total		65	129

Annexure-B

Circle-wise and Category-wise vacancies of JTOs(Civil)

S.No.	Circle	Civil	
		Loco-motor Impairment(LI)	Hearing Impairment(HI)
1.	MP	00	01
2.	NTR (Delhi)	00	01
3.	Punjab	01	00
4.	West Bengal	00	01
Total		**01**	**03**

Annexure-C

Circle-wise vacancies of JTOs(Electrical)

S.No.	Name of Circle	Vacancies
1.	AP	1
2.	Kerala	2
3.	WB	1
4.	KTK	1
5.	MH	2
6.	RAJ	1
7.	UP(E)	1
8.	TN	1
Total		**10**

Scheme and Syllabus for the Recruitment of Junior Telecom Officers(Telecom)

For Direct Recruitment of Junior Telecom Officers, an objective type Examination of 3 hours duration consisting of following sectional papers will be conducted:

SCHEME

A. Engineering Stream Section - I

B. Engineering Stream Section - II

C. General Ability Test Section - III

1. The standard of paper in Engineering subjects will be that of Engineering Degree Examination of an Indian University.

2. In the general ability test, special attention will be paid to assess the candidate's capacity for general awareness. The standard of paper in general ability test will be such as may be expected of an Engineering Graduate.

3. The syllabus for engineering stream papers will be as given below.

SYLLABUS

SECTION - I

1. **Materials and components**

Structure and properties of Electronic Engineering materials, Conductors, Semiconductors and Insulators, Magnetic, Ferroelectric, Piezoelectric, Ceramic, Optical and Superconducting materials. Passive components and characteristics, Resistors, Capacitors and Inductors; Ferrites, Quartz crystal, Ceramic resonators, Electromagnetic and Electromechanical components.

2. **Physical Electronics, Electronic Devices and ICs**

Electrons and holes in semiconductors, Carrier Statistics, Mechanics of current flow in a semi-conductor, Hall effect; Junction theory; Different types of diodes and their characteristics; Bipolar Junction transistor; Field effect transistors; Power switching devices like SCRs, CTOs, power MOSFETs; Basics of ICs-bipolar, MOS and CMOS types; Basics of Opto Electronics.

3. **Network theory**

Network analysis techniques: Network theorem, transcient and steady state sinusoidal response, Transmission criteria: delay and rise time Elmore's and other definition, effect of cascading. Elements of network synthesis.

4. **Electromagnetic Theory**

Transmission lines: basic theory, standing waves, matching applications, microstrip lines; Basics of waveguides and resonators; Elements of antenna theory.

5. **Electronic Measurements and instrumentation**

Basic concepts, standards and error analysis; Measurements of basic electrical quantities and parameters; Electronic measuring instruments and their principles of working: analog and digital, comparison, characteristics, applications. Transducers; Electronic measurements of non-electrical quantities like temperature, pressure, humidity etc. Basics of telemetry for industrial use.

6. **Power Electronics**

Power Semiconductor devices, Thyristor, Power transistor, MOSFETs, Characteristics and operation. AC to DC convertors; 1-Phase and 3-phase DC to DC Convertors.

AC regulators. Thyristor controlled reactors, switched capacitor networks.

Inverters: Single-phase and 3-phase. Pulse width modulation. Sinusoidal modulation with uniform sampling. Switched mode power supplies.

SECTION-II

1. **Analog Electronic Circuits**

Transistor biasing and stabilization, Small Signal analysis. Power amplifiers. Frequency response, Wide band techniques, Feedback amplifiers. Tuned amplifiers. Oscillators. Rectifiers and power supplies. Operational Amplifier, other linear integrated circuits and applications. Pulse shaping circuits and waveform generators.

2. Digital Electronic Circuits

Transistor as a switching element; Boolean algebra, simplification of Boolean functions, Karnaugh Map and applications; IC Logic gates and their characteristics; IC logic families: DTL, TTL, ECL, NMOS, PMOS and CMOS gates and their comparison; Combinational logic circuits; Half adder, full adder; Digital Compartor; Multiplexer Demultiplexer; ROM and their applications. Flip-flops, R-S, J-K, D and T flip-flops; Different types of counters and registers; waveform generators. A/D and D/A convertors. Semiconductor memories.

3. Control Systems

Transient and steady state response of control systems; Effect of feedback on stability and sensitivity, Root locus techniques; Frequency response analysis. Concepts of gain and phase margins; Constant-M and Constant-N Nichol's Chart; Approximation of transient response from Constant-N Nichol's Chart; Approximation of transient response from closed loop frequency response; Design of Control Systems, Compensators; Industrial controllers.

4. Communication systems

Basic information theory: Modulation and detection in analogue and digital systems; Sampling and data reconstruction. Quantization & Coding; Time division and frequency division multiplexing; Equalisation; Optical Communication: in free space & fibre optic; Propagation of signals at HF, VHF, UHF and microwave frequency; Satellite communication.

5. Microwave Engineering

Microwave Tubes and solid state devices, Microwave generation and amplifiers, Waveguides and other Microwave Components and Circuits, Microstrip circuits, Microwave antennas, Microwave Measurements, MASERS LASERS; Microwave Propogation. Microwave Communication Systems-terrestrial and satellite based.

6. Computer Engineering

Number Systems; Data representation; Programming; Elements of a high level programming language PASCAL/C; use of basic data structures; Fundamentals of

computer architecture processor design; Control unit design; Memory organization. I/O System Organization. Personal computers and their typical uses.

7. **Microprocessors**

Microprocessor architecture - Instruction set and simple assembly language programming. Interfacing for memory and I/O. Applications of Microprocessors in Telecommunications and power system.

SECTION-III

General ability test

The candidate's comprehension and understanding of General English shall be tested through simple exercises. Questions on knowledge of current events and of such matter of everyday observation and experience in their scientific aspects as may be expected of an educated person. Questions will also be included on events and developments in Telecommunications, History of India and Geography. These will be of a nature, which can be answered without special study by an educated person.

Scheme and Syllabus for the Recruitment of Junior Telecom Officers(Civil)

For Direct Recruitment of Junior Telecom Officer(Civil), an objective type Examination of 3 hours duration consisting of following sectional papers will be conducted:

SCHEME

A. Civil Engineering Stream Section - I : 50 questions

B. Civil Engineering Stream Section - II : 50 questions

C. General Ability Test Section - III : 20 questions

1. The standard of paper in Engineering subjects will be that of Engineering Degree Examination of Indian University.

2. In the general ability test, special attention will be paid to assess the candidate's capacity for general awareness. The standard of paper in general ability test will be such as may be expected of an Engineering Graduate.

3. The syllabus for Civil Engineering stream paper will be as given below.

SYLLABUS:

SECTION-I - CIVIL ENGINEERING STREAM

1. BUILDING MATERIAL:

Timber: Different types and species of structural timber, density-moisture relationship, strength in different directions, defects, influence of defects on permissible stress, preservation, dry and wet rots, plywood, codal provision for design.

Bricks: Types, Indian standard classification, absorption, saturation factor, strength in masonry, influence of mortar strength and masonary strength.

Cement: Compounds, different types, setting times, strength.

Cement Mortar: Ingredients, proportions, water demands, mortar for plastering and masonry.

Concrete: Importance of W/C ratio, strength, ingredients including admixtures, workability, testing, elasticity, non-destructive testing mix design method.

2. SOLID MECHANICS

Elastic constants, stress, plane stress, Mohr's circle of stress, strains, plain strain, Mohr's circle of strain, combined stress. Elastic theories of Failure, simple and shear bending, Torsion of circular and rectangular section and simple members.

3. STRUCTURAL ANALYSIS

Analysis of determinate structures- different methods including graphical methods. Analysis of indeterminate skeletal frames- moment distribution, slope deflection, stiffness and force methods, energy methods. Muller-Breslau principal and application. Plastic analysis of indeterminate beams and simple frames-shape factors.

4. DESIGN OF STEEL STRUCTURES

Principle of working stress method. Design of connections of simple members. Built up sections and frames. Design of Industrial roofs. Principles of ultimate load design. Design of members and frames.

5. DESIGN OF CONCRETE AND MASONRY STRUCTURES.

Limit state design for bending, shear, axial compression and combined forces, Codal provisions for slabs, beams, walls and footings. Working stress method of design of R.C. members.

Principles of prestressed concrete design, material, method of prestressing losses. Design of simple members and determinates structures. Introductions to prestressing of indeterminate structures.

Design of brick masonary as per I.S. codes.

6. CONSTRUCTION PRACTICE, PLANNING AND MANAGEMENT.

Concreting Equipment:

Weight batcher, Mixer, vibrator, batching plant, concrete pump.

Cranes, hoists, lifting equipment.

Earthwork Equipment:

Power shovel, hoe, dozer, dumper, trailers and tractors, rollers, sheep foot rollers, pumps.

Construction, planning and Management:

Bar chart, linked bar chart, work break down structures, Activity-on-arrow diagrams. Critical path, probabilistic activity durations; Event-based networks. PERT network: Time-cost study, crashing; Resource allocation.

SECTION- II - CIVIL ENGINEERING STREAM

1. **(a) FLUID MECHANICS, OPEN CHANNEL, PIPE FLOW:**

Fluid properties, pressure, thrust, Buoyancy, Flow Kinematics, integration, of flow equation, Flow measurement, Relative motion, Moment of momentum, Viscosity, Boundary layer and control, Drag, Lift, Dimensional analysis, Modeling, Cavitations, Flow oscillations, Momentum and Energy principles, in open cannel flow, Flow control, Hydraulic jump, Flow section and properties, Normal flow, Gradually varied flow, Flow development and losses in pipe flows, Measurements, Siphons, Surges and Water hammer, Delivery of Power Pipe networks.

(b) HYDRAULIC MACHINES AND HYDROPOWER

Centrifugal pumps, performance parameters, scaling, pumps in parallel, Reciprocating pumps, air vessels, performance parameters;

2. **(a) HYDROLOGY**:

Hydrological cycle, precipitation and related data analysis, PMP, unit and synthetic hydrographs, Evaporation and transpiration, floods and their management, PMG, Streams and their gauging, .River morphology. Rooting of floods, Capacity of reservoirs.

(b) WATER RESOURCES ENGINEERING:

Water resources of the globe: Multipurpose uses of Water, Soil Plant water relationships, irrigation systems, water demand assessment, Storage and their yields, ground water yield and well Hydraulics, Water logging, drainage design, Irrigation revenue, Design of rigid boundary canals, Lacey' and Tractive force concepts in canal design, lining of canals; Sediment transport in canals; Non-Overflow and overflow sections of gravity dams and their design,

Energy dissipaters and tail water rating, Design of head works, distribution work, falls, cross-drainage work, outlets, River training.

ENVIRONMENT ENGINEERING

3. **(a)WATER SUPPLY ENGINEERING.**

Sources of supply, yield, design of intakes and conductors, Estimation of demand, Water quality standards, Control of water born diseases. Primary and secondary treatment, detailing and maintenance of treatment units. Conveyance and distribution systems of treated water, leakage and control, Rural water supply, Institutional and Industrial water supply.

(b) **WASTE WATER ENGINEERING**

Urban rain water disposal, system of sewage collection and disposal, Design of sewers and sewerages systems, pumping, Characteristic of sewage and its treatment, Disposal of products of sewage treatment, stream flow rejuvenation, Institutional and industrial sewage management, plumbing system, Rural and semi-urban sanitation.

(c) SOLID WASTE MANAGEMENT

Sources, classification, collection and disposal, Design and Management of landfills.

(d) AIR AND NOISE POLLUTION AND ECOLOGY.

Sources and effects of air pollution, monitoring of Air pollution, Noise-pollution and standards; Ecological Chain and balance, Environmental assessment.

4. **(a)SOIL MECHANICS**

Properties of soils, classification and interrelationship, Compaction behavior, method of compaction and their choice, Permeability and seepage, flow nets, Inverter filters, Compressibility and consolidation ,shearing resistance, stresses and failure, SO testing in laboratory and in-situ, Stress path and applications, Earth pressure theories, stress distribution in soil, soil exploration, samplers, load tests ,penetration tests.

(b) FOUNDATION ENGINEERING

Type of foundations, Selection criteria, bearing capacity, settlement, laboratory and field test, Types of piles and their design and layout, Foundations on expansive soils, swelling and it prevention , foundation on swelling soils.

5. **(a) SURVEYING**

Classification of surveys, scales, accuracy, Measurement of distances-direct and indirect methods, optical and electronic devices, Measurement of directions, prismatic compass, local attraction, Theodolites-types Measurment of elevations, Spirit and trigonometric leveling, Relief representation,Contours,Digital elevation modeling concept, Establishment of control by triangulations and traversing measurements and adjustment of observations, computation of coordinates, Field astronomy, concept of global positioning system, Map preparation by plane tabling and by photogrammetry, Remote sensing concepts, map substitutes.

(b) TRANSPORTATION ENGINEERING

Planning of highway systems, alignment and geometric design, horizontal and vertical curves, grade separation, Materials and construction methods for different surfaces and maintenance, Principles of pavement design, Drainage.

Traffic surveys, intersections, signalling, Mass transit systems, accessibility, networking.

Planning of railway systems, terminology and designs, relating to gauge, track controls, transits, rolling stock, tractive power and track modernization, Maintenance Appurtenant works, Containerisation.

SECTION-III - GENERAL ABILITY TEST

The candidate's comprehension and understanding of general English shall be tested through simple exercises. Questions on knowledge of current events and of such matter of everyday observation and experience in their scientific aspects as may be expected of an educated person. Questions will also be included on events and developments in Tele Communications, History of India and Geography. These will be of a nature, which can be answered without special study by an educated person.

SCHEME AND SYLLABUS FOR DIRECT RECRUITMENT OF JUNIOR TELECOM OFFICERS (ELECTRICAL) THROUGH OPEN COMPETITIVE EXAMINATION IN BSNL

For direct recruitment of JTO (Electrical) , an objective type examination of one paper of three hours duration consisting of following sections will be conducted:-

Section-I:	Electrical Engineering:	50 Questions (2 Marks Each)
Section-II:	Electrical Engineering:	50 Questions (2 Marks each)
Section-III:	General Awareness:	20 Questions (2 Marks Each)

1. The standard of paper in engineering subject will be that of Engineering Degree Examination of Indian University.
2. In the general ability test, special attention will be paid to assess the candidate's capacity for general awareness. The standard of paper in general ability test will be such as may be expected of an Engineering Graduate.
3. The syllabus for engineering stream paper will be given below.

SYLLABUS

SECTION –I ELECTRICAL ENGINEERING

1. EM Theory

Electric and magnetic field. Gauss's Law and Amperes Law. Fields in dielectrics, conductors and magnetic materials. Maxwell's equations, Time varying fields, Plane-Wave propagating in dielectric and conducting media. Transmission lines.

2. Electrical Materials

Band Theory, Conductors, Semi-conductors and Insulators. Super-conductivity. Insulators for electrical and electronic applications. Magnetic materials. Ferro and ferri magnetism, Ceramics, Properties and applications. Hall effect and its applications. Special semi conductors.

3. Electrical Circuits

Circuits elements Kirchoff's Laws. Mesh and nodal analysis. Network Theorems and applications. Natural response and forced response. Transient response and steady state response for arbitrary inputs. Properties of networks in terms of poles and zeros. Transfer function. Resonant circuits. Three phase circuits.

4. **Measurements and Instrumentation**

Units and Standard. Error analysis, measurement of current, Voltage, Power, Power-factor and energy. Indicating instruments. Measurement of resistance, inductance, Capacitance and frequency. Bridge measurements. Electronic measuring instruments. Digital Voltmeter and frequency counter Transducers and their applications to the measurement of non-electrical quantities like temperature, pressure, flow-rate displacement, acceleration, noise level etc.

5. **Control System**

Transient and steady state response of control system; Effect of feedback on stability and sensitivity, Root locus techniques; Frequency response analysis. Concept of gain and phase margins; Constant-M and Constant-N Nichol's Chart; Approximation of transient response from constant N Nichol's chart; Approximation of transient response from closed loop frequency response; Design of Control system, Compensators; Industrial controllers.

SECTION-II ELECTRICAL ENGINEERING

1. **Electrical Machines and Power Transformers**

Magnetic Circuits – Analysis and Design of Power transformers Construction and testing. Equivalent circuits. Losses and efficiency. Regulation, Auto-transformer, 3-phase transformer. Parallel operation.

D.C. Machines, Construction, Excitation methods. Circuit models. Armature reaction and commutation. Characteristics and performance analysis. Generators and motors. Starting and speed control. Testing, Losses and efficiency.

Synchronous Machines. Construction. Circuit model. Operating characteristics and performance analysis. Induction Machines: Construction. Principle of operation. Rotating fields. Characteristics and performance analysis. Starting and speed control.

Fractional KW moters. Single-phase synchronous and induction motors.

2. **Power systems**

Types of Power Stations, Hydro, Thermal and Nuclear Stations. Power transmission lines. Optimal power system/ transmission lines operation. Power system Transients. Power system protection circuit breakers. Relays .

3. **Analog and Digital Electronics and Circuits**

Semiconductor device physics, PN junctions and transistors, circuit models and parameters FET, Zener, tunnel, Schottky, photodiodes and their application, rectifier circuits, voltage regulators and multipliers, switching behavior of diodes and transistors.

Small signal amplifiers, biasing circuits, frequency response and improvement, multistage amplifiers and feed-back amplifiers. Operational amplifiers wave shaping circuits. Multivibrators and flip-flops and their applications. Digital logic gate families, universal gates-combination circuits for arithmetic and logic operational, sequential logic circuits. Counters, registers, RAM and ROMs.

4. **Microprocessor.**
Microprocessor architecture-instruction set and simple assembly language programming. Interfacing for memory and I/O. application of Micro-processor in power system.

5. **Communication Systems**
Type of modulation; AM, FM and PM. Demodulations. Noise and bandwidth considerations. Digital communication system. Pulse code modulation and demodulation. Carrier communication. Frequency division and time division multiplexing.

6. **Power Electronics**
Power Semiconductor devices. Thyristors, Power transistor, GTO's and MOSFETS. Characteristic and operation. AC to DC Convertors; Single phase and three phase DC to DC Convertors; AC Regulators. Thyristors controlled reactors; switched capacitor network. Invertors; single phase and three phase. Pulse width modulation. Sinusoidal modulation with uniform sampling. Switched mode power supplies.

SECTION –III GENERAL ABILITY.

The candidate's comprehension and understanding of general English shall be tested through simple exercises. Questions on knowledge of current events and of such matter of everyday observation and experience in their scientific aspects as may be expected of an educated person. Question will also be included on events and developments in Tele Communications, History of India and Geography. These will be of a nature, which can be answered with out special study by an educated person.