

# SYLLABUS FOR JTO(2008) BATCHES-PHASE-I

(Approved vide BSNL CO New Delhi letter No. 4-1/08/Trg dated:27-11-2009)

## I. GENERAL ADMINISTRATION

| Sl.No.   | Topics  | Duration in hrs.  |                   |
|----------|---|-------------------|-------------------|
|          |   | Theory            | Practical         |
| <b>1</b> | <b>Orientation Programme</b>  |                   |                   |
|          | Address by senior BSNL officer(s) and achievers in different field<br>Visit of Institute and different Labs<br>Visit to different Telecom Installation and other Historical/tourist interest site of city | In two days time  |                   |
|          | <b>Total</b>  | <b>13.0 Hours</b> |                   |
| <b>2</b> | <b>Administration</b>   |                   |                   |
| a)       | Telecom Scenario in India   | 1.5               |                   |
| b)       | Project Shikhar   | 1.5               |                   |
| c)       | Organizational Set up of BSNL   | 1.5               |                   |
| d)       | File keeping and Office Procedure   | 6.0               |                   |
| e)       | BSNL CDA Rules  | 3.0               |                   |
| f)       | RTI Act 2005  | 1.5               |                   |
| g)       | Management of Telecom Equipment   | 4.5               |                   |
| h)       | Asset Management  | 1.5               |                   |
| i)       | Material & Inventory Management   | 4.5               |                   |
| j)       | Corporate Practice  | 6.0               |                   |
| k)       | Corporate Finance   | 3.0               |                   |
| l)       | Project Management  | 1.5               |                   |
| m)       | The Indian Telegraph Act, 1885  | 1.5               |                   |
| n)       | TRAI, TDSAT, USO  | 3.0               |                   |
|          | Criterion Test 1 (OPEN BOOK SYSTEM)   | 1.5               |                   |
|          | <b>Total</b>  | <b>42.0 hrs</b>   |                   |
| <b>3</b> | <b>Managerial Soft Skills</b>   |                   |                   |
| a)       | Time Management (with film)   | 1.5               |                   |
| b)       | Communication Skills  | 1.5               |                   |
| c)       | Transactional Analysis  | 1.5               |                   |
| d)       | Motivation  | 1.5               |                   |
| e)       | Leadership & Team Building  | 3.0               |                   |
| f)       | Change Management   | 1.5               |                   |
| g)       | Crisis Management   | 1.5               |                   |
| h)       | Stress Management   | 1.5               |                   |
| i)       | Emotional Intelligence  | 1.5               |                   |
| j)       | Group Presentation  | 6.5               |                   |
|          | Criterion Test 2  | 1.5               |                   |
|          | <b>Total</b>  | <b>23.0 hrs</b>   |                   |
|          | <b>Grand total</b>  | <b>78.0 hrs</b>   | <b>(02 weeks)</b> |

## II. BASIC TELECOM TECHNOLOGY

| Sl.No.       | Topics   | Duration in hrs. |           |
|--------------|--|------------------|-----------|
|              |  | Theory           | Practical |
| 2.1          | Evolution of Telecom   | 1.5              |           |
| 2.2          | <b>Overhead Lines &amp; Telephony</b>  |                  |           |
| a)           | Erection of Subscriber loop from DP point to Subscriber Premises. Protective Arrangements & termination of Exchange line at subscriber premises. | 1.5              |           |
| b)           | Telephone Instruments  | 1.0              |           |
| <b>Total</b> |  | <b>4.0</b>       |           |

### 2.3 Underground Cables

| Sl.No.       | Topics   | Duration in hrs. |            |
|--------------|--|------------------|------------|
|              |  | Theory           | Practical  |
| a)           | Introduction to Underground Cables<br>Cable Laying, Cable Jointing, Cable Termination                    | 2.5              |            |
| b)           | Power Telecommunication Co-ordination Committee & Electricity Act and Protective Devices for Cable Works | 1.5              |            |
| c)           | Cable Records and Computerization of Cable Records   | 1.5              |            |
| d)           | Preventive Maintenance & Fault Repair Service, TRAI Parameters   | 1.5              |            |
| e)           | Up-gradation & Rehabilitation of External Plant, Pole-less Scheme  | 1.5              |            |
| f)           | Inspection of External plant   | 1.5              |            |
| g)           | Testing of Cables, Cable Faults & Localization (Practical)   | 0                | 2.0        |
| h)           | Cable Jointing Demonstration   | 0                | 1.0        |
| <b>Total</b> |  | <b>10</b>        | <b>3.0</b> |

### 2.4 POWER PLANT & AIR-CONDITIONING

| Sl.No.             | Topics  | Duration in hrs.          |            |
|--------------------|---|---------------------------|------------|
|                    |   | Theory                    | Practical  |
| a)                 | Basic Types of Power Plants and specification                           | 1.0                       |            |
| b)                 | Working Principle of SMPS   | 1.0                       |            |
| c)                 | Installation & Maintenance of SMPS                                      | 1.0                       |            |
| d)                 | Working Principle of VRLA Battery                                       | 1.5                       |            |
| e)                 | Method of Battery working   | 1.5                       |            |
| f)                 | Installation and Maintenance of VRLA Batteries                          | 1.5                       |            |
| g)                 | Defects & remedies in cells   | 1.0                       |            |
| h)                 | Working Principle of UPS/Inverter                                       | 1.5                       |            |
| i)                 | AC Plant and Engine Alternators-Operation and Maintenance               | 3.0                       |            |
| j)                 | Earthing & Measurements   | 1.0                       |            |
| k)                 | Fire Fighting   | 1.0                       |            |
| l)                 | Practicals on Earth Measurements  | 0                         | 3.0        |
| m)                 | Visit on distribution system from HT & LT to battery & Power Plant room | 0                         | 3.0        |
|                    | Criterion Test  | 1.0                       |            |
|                    | <b>Total</b>  | <b>16.0</b>               | <b>6.0</b> |
|                    | <b>Module Total</b>   | <b>30.0</b>               | <b>9.0</b> |
| <b>Grand Total</b> |   | <b>39 Hours (01 week)</b> |            |

### III. FUNDAMENTALS OF TRANSMISSION

| Sl.No.  | Topics   | Duration in hrs.             |             |
|---------|--|------------------------------|-------------|
|         |  | Theory                       | Practical   |
| 3.1 a)  | Transmission Units   | 1.5                          | -           |
| b)      | PCM principles   | 1.5                          | -           |
| 3.2 a)  | Fundamentals of Digital Transmission                         | 1.5                          | -           |
| b)      | Principle of higher order multiplexing                       | 1.5                          | -           |
| c)      | Line Coding  | 1.5                          | -           |
| 3.3. a) | Electromagnetic Wave theory, Antenna Radiation               | 1.0                          | -           |
| b)      | Introduction of UHF, Microwave, Satellite and V-SAT          | 4.0                          | -           |
| 3.4 a)  | Optical Fibre Cable, construction characteristics & splicing | 6.0                          | -           |
| b)      | Over view of PDH systems & SDH                               | 3.0                          | -           |
| 3.5 a)  | NGSDH  | 3.0                          |             |
| b)      | MSPP & RPR   | 1.5                          | -           |
| c)      | Principles of DWDM   | 2.0                          | -           |
| d)      | Synchronization  | 1.0                          | -           |
| e)      | FTTH   | 2.0                          | -           |
| 3.6     | MLLN   | 2.0                          | -           |
|         | Practical & Demonstrations                                   | 0                            | 18.0        |
|         | Group Presentation   | 3.0                          |             |
|         | Criterion Test   | 1.5                          | --          |
|         | Mastery Test   | 0                            | 3.0         |
|         | <b>Total</b>   | <b>37.5</b>                  | <b>21.0</b> |
|         | <b>Grand Total</b>   | <b>58.5 Hours(1.5 weeks)</b> |             |

#### IV. FUNDAMENTALS OF SWITCHING

| Sl.No.             | Topics  | Duration in hrs.             |            |
|--------------------|---|------------------------------|------------|
|                    |   | Theory                       | Practical  |
| <b>4.1</b>         | <b>Fundamentals of Electronic Exchanges</b>   |                              |            |
| a)                 | Basic Principles of Electronic Exchanges  | 1.0                          | -          |
| b)                 | Basic concept of Telephone traffic, Quantitative Indicators for quality of service.   | 1.5                          |            |
| c)                 | Digital Switching   | 2.0                          | -          |
| d)                 | Signaling in Telecommunication  | 4.5                          | -          |
| e)                 | SSTP  | 1.5                          |            |
| f)                 | Billing Process & CDR based billing   | 1.5                          | -          |
| g)                 | VAS- Landline   | 3.0                          | -          |
| h)                 | NGN   | 3.0                          |            |
|                    | <b>Total</b>  | <b>18.0</b>                  |            |
| <b>4.2(a)</b>      | <b>Basic Switching System(C-DOT AN RAX)</b>   |                              |            |
|                    | Introduction to AN-RAX<br>Specifications of AN-RAX<br>System Architecture<br>Hardware Architecture<br>Software Architecture<br>Data creation in LE  | 3.0                          |            |
|                    | <b>Total</b>  | <b>3.0</b>                   |            |
| <b>4.2(b)</b>      | <b>Basic Switching System(C-DOT MAX-XL)</b>   |                              |            |
|                    | To list out and explain the basic growth modules<br>To describe the general system features<br>To explain the termination capacities for different configuration.<br>To explain the traffic capacities for different configuration.<br>To explain the various subscriber feature.<br>To explain the different functions of basic modules and enumerate the hardware units for these functions.<br>To describe briefly the function of CM & AM | 4.5                          |            |
|                    | <b>Total</b>  | <b>4.5</b>                   |            |
|                    | <b>Practicals</b><br>P1 – Practical on C-DOT ANRAX<br>P2-Practicals on C DOT MAX-XL.  |                              | 3.0<br>6.0 |
|                    | Criterion Test on Fundamentals of Switching   | 1.0                          |            |
|                    | Group Presentation  | 3.0                          |            |
|                    | <b>Total</b>  | <b>29.5</b>                  | <b>9.0</b> |
| <b>Grand Total</b> |   | <b>38.5 Hours ( 01 week)</b> |            |

## V. DATA COMMUNICATION

| Sl.No.             | Topics   | Duration in hrs.            |             |
|--------------------|--|-----------------------------|-------------|
|                    |  | Theory                      | Practical   |
| a)                 | Introduction to Data Communication, Basic Concepts                         | 2.0                         |             |
| b)                 | OSI Reference model  | 1.5                         |             |
| c)                 | Transmission of digital data Interfaces & Modems                           | 3.0                         |             |
| d)                 | Error detection and correction   | 2.0                         |             |
| e)                 | Data Link Control  | 1.5                         |             |
| f)                 | Data link protocol   | 1.5                         |             |
| g)                 | Network Essential-Fundamentals of Networking                               | 2.0                         |             |
| h)                 | Data switching techniques & Packet switching                               | 2.0                         |             |
| i)                 | IP Addressing, sub-netting, super-netting, CIDR, TCP/IP, Routing Protocols | 3.0                         |             |
| j)                 | Practical on Network Components and server based LAN Networking.           | 0                           | 7.5         |
|                    | Criterion Test-I   | 1.0                         |             |
| k)                 | Overview of Internet and Intranet  | 1.5                         | 0           |
| l)                 | Types of Internet Accounts & tariff, Modem & Proxy Server                  | 2.0                         |             |
| m)                 | E-Mail, DNS,RAS  | 2.0                         | 0           |
| n)                 | Security, Fire wall  | 1.5                         | -           |
| o)                 | Over view of NIB-project   | 2.0                         | -           |
| p)                 | Packages used in BSNL  | 2.0                         | -           |
| q)                 | ATM  | 1.5                         | -           |
| r)                 | MPLS & MPLS based VPN  | 3.0                         | -           |
| s)                 | Broadband & Multiplay, Rural broadband                                     | 3.0                         |             |
| t)                 | Broadband access (wired & wireless)  | 3.0                         |             |
| u)                 | Internet practical   | 0                           | 1.5         |
| v)                 | Configuration of CPE for broadband   | 0                           | 3.0         |
| w)                 | Visit to ISP node  | 0                           | 2.0         |
| x)                 | Group Presentation on projects   | 3.0                         |             |
| y)                 | Criterion Test-II  | 1.0                         |             |
| <b>Total</b>       |  | <b>45.0</b>                 | <b>14.0</b> |
| <b>Grand Total</b> |  | <b>59 Hours (1.5 weeks)</b> |             |

## VI. MOBILE COMMUNICATION

| Sl.No.             | Topics   | Duration in hrs.            |             |
|--------------------|--|-----------------------------|-------------|
|                    |  | Theory                      | Practical   |
|                    | <b>GSM &amp; WLL</b>                               |                             |             |
| a)                 | Modulation Techniques                              | 1.5                         |             |
| b)                 | Cellular Concept                                   | 1.5                         |             |
| c)                 | GSM architecture                                   | 2.0                         |             |
| d)                 | RF Interfaces                                      | 1.5                         |             |
| e)                 | GSM Services                                       | 1.5                         |             |
| f)                 | VAS  | 1.5                         | 3.0         |
| g)                 | CCS#7 Signaling                                    | 1.5                         |             |
| h)                 | GSM Protocol                                       | 1.5                         |             |
| i)                 | Call Processing                                    | 3.0                         |             |
| j)                 | Call & Mobility Management                         | 1.5                         |             |
| k)                 | Billing & Customer care system                     | 3.0                         |             |
| l)                 | Visit to GSM Lab                                   |                             | 3.0         |
| m)                 | Core Equipment in GSM                              | 3.0                         |             |
| n)                 | GPRS/EDGE/IMT 2000/3G                              | 3.0                         |             |
| o)                 | GSM RF Planning & Engineering Aspects & Drive Test | 3.0                         |             |
| p)                 | Overview of WLL & CDMA                             | 3.0                         |             |
| q)                 | Overview of WCDMA / 3G GSM                         | 3.0                         |             |
| r)                 | Hardware Architecture of MSC based system          | 1.5                         |             |
| s)                 | FWT/HHT Configuration & Programming                | 1.5                         |             |
| t)                 | CDMA 2000 1X AND 1X EVDO                           | 1.5                         |             |
| u)                 | Core Equipment in CDMA                             | 1.5                         |             |
| v)                 | BSNL Plans   | 1.5                         |             |
| w)                 | Visit to CDMA Lab                                  |                             | 3.0         |
| x)                 | Field Visit  |                             | 3.0         |
| y)                 | Criterion Test                                     | 1.5                         |             |
| z)                 | Group Presentation                                 | 3.0                         |             |
|                    | <b>Total</b>                                       | <b>47.0</b>                 | <b>12.0</b> |
| <b>Grand Total</b> |  | <b>59 Hours (1.5 weeks)</b> |             |

## VII. MARKETING

| Sl.No.             | Topics  | Duration in hrs.         |           |
|--------------------|---|--------------------------|-----------|
|                    |   | Theory                   | Practical |
| a)                 | Public Relations & Image Building                     | 1.5 Hours                |           |
| b)                 | Marketing of services – An Overview                   | 2.0 Hours                |           |
| c)                 | Market Research, Customer Behavior & Customer Care.   | 3.0 Hours                |           |
| d)                 | Marketing Strategies                                  | 1.5 Hours                |           |
| e)                 | Service Quality                                       | 1.5 Hours                |           |
| f)                 | Service Pricing                                       | 1.5 Hours                |           |
| g)                 | Franchisees networks                                  | 1.5 Hours                |           |
| h)                 | E-Marketing & Sales                                   | 1.5 Hours                |           |
| i)                 | Internal Marketing                                    | 1.5 Hours                |           |
| j)                 | Business Development & Corporate Marketing            | 1.5 Hours                |           |
| k)                 | Managing Advertising Agencies & Media Relations       | 2.0 Hours                |           |
| l)                 | Marketing strategies of BSNL                          | 1.5 Hours                |           |
| m)                 | Consumer Protection Act                               | 1.5 Hours                |           |
| n)                 | Commercial & Tariff aspects of services               | 2.0 Hours                |           |
| o)                 | Sale of BSNL services (Projects Udaan, Dosti & Vijay) | 3.0 Hours                |           |
| p)                 | IUC   | 1.5 Hours                |           |
| q)                 | WPC- Spectrum Monitoring                              | 1.0 Hours                |           |
| r)                 | Syndicate Presentation by Trainees                    | 4.0 Hours                |           |
| s)                 | Case Study  | 4.5 Hours                |           |
|                    | Theory Test (Criterion Test)                          | 1.0 Hour                 |           |
| <b>Grand Total</b> |   | <b>39 Hours (1 Week)</b> |           |

## VIII. MISCELLANEOUS

| Sl.No. | Topic   | Duration |  |
|--------|---|----------|--|
|        | Registration/Evaluation/Missed Test/Feed back/Holidays etc. | 0.5 Week |  |

## ALLOCATION OF MARKS

### JTO PHASE-I

| Sl.No. | Module   | Marks      |           |       |
|--------|--|------------|-----------|-------|
|        |  | Theory     | Practical | Total |
| 1.     | General Administration<br>(i) Criterion Test-I<br>(ii) Criterion Test-II   | 75<br>75   | --<br>--  | 150   |
| 2.     | Basic Telecom Technology<br>(i) Criterion Test-I                           | 100        | --        | 100   |
| 3.     | Fundamental of Transmission<br>(i) Criterion Test-I<br>(ii) Mastery Test-I | 100<br>--  | --<br>50  | 150   |
| 4.     | Fundamental of Switching<br>(i) Criterion Test-I                           | 100        | --        | 100   |
| 5.     | Data Communication<br>(i) Criterion Test-I<br>(ii) Criterion Test-II       | 100<br>100 | --        | 200   |
| 6.     | Mobile Communication<br>(i) Criterion Test-I                               | 100        | --        | 100   |
| 7.     | Marketing<br>(i) Criterion Test-I  | 100        | --        | 100   |

|  |              |
|--|--------------|
| <b>Total Marks for Modules</b>                 | <b>- 900</b> |
| <b>Discipline</b>                              | <b>- 25</b>  |
| <b>Extra Curricular Activities/ Leadership</b> | <b>- 25</b>  |
| <b>Presentation</b>                            | <b>- 25</b>  |
| <b>Learner's Diary</b>                         | <b>- 25</b>  |

|                    |  |
|--------------------|--|
| <b>Grand Total</b> | <b>1000</b><br><hr style="border-top: 1px dashed black;"/> |
|--------------------|--|