

**SYLLABUS FOR LIMITED COMPETITIVE DEPARTMENTAL  
EXAMINATION AGAINST 25% QUOTA FOR PROMOTION TO  
SDE(T) GRADE**

**Paper-I: Advanced Technical Paper(General) Maximum Marks 100  
(Objective Type)**

**A. DIGITAL SWITCHING**

30 marks

**Section A:** (Attempt any <sup>two</sup> ~~one~~ section)

(10 marks)

**1. Intelligent Network and Services**

Overview of Intelligent Network architecture and functions of SSP, SCP, SMP, IP etc., Various types of IN services, Access codes for various IN services etc.

(5 mark each)

**OR**

**2. Signalling Systems including CCS#7**

Various signaling systems being used in the department for local and trunk network such as E/M, R2 modified, CCS#7 etc.

**OR**

**3. ISDN**

Overview of OSI layer, ISDN introduction and services, Customer premises equipment etc.

**OR**

**4. Long Distance Switching**

Overview of national switching / numbering / charging/ transmission and signaling/synchronization plans

**Section B:** (Attempt any <sup>one</sup> of the subsection under section B)

(20 marks)

**1. E-10B Switching System**

Introduction to E-10B system, Description of links, connection units, time base, switching network, control units etc., Call set up procedures, OMC hardware/software, OMC restart/system regeneration/system saving, Periodic tasks, LOCAVARs, Subscriber features, Exchange maintenance

**OR**

**2. CDOT Digital Switching System (MAX)**

Overview of CDOT (MAX) Switching System, Hardware architecture, Functional description of various subsystems, Call set up procedures, Subscriber facilities, Maintenance procedures

**OR**

**3. EWSD Switching System**

Overview of system architecture, Description of various functional units like DLU, LTG, SN, CP, MB, CCG, SYP, CCNC etc., Call Set up procedures, CCS#7, EWSD Operations, EWSD Maintenance Philosophy, Emergency Concepts

OR

**4. 5ESS - 2000 Switching System**

Basic characteristics & functions of 5ESS switch, Description of SM, SM2000, CM & AM, RSM, Access Interface Unit (AIU), Call set up procedures, Implementation of CCS#7 and ISDN in 5ESS, Routine maintenance

OR

**5. OCB-283 Switching System**

OCB-283 system overview, Description of various units viz. SMC, SMA, SMT, STS, SMX, SMM, token ring and CSN, Call set up procedures, OCB-283 operations, OCB-283 maintenance procedures

OR

**6. AXE-10 Switching System**

AXE-10 system overview, Description of various subsystems viz. Central Processor Subsystem (CPS), Regional Processor Subsystem (RPS), Input-Output Group (IOG-11B), Subscriber Switching Subsystem (SSS), Group Switching Subsystem (GSS), Trunk and Signaling Subsystem (TSS), Common Channel Signaling Subsystem (CCS), SUS, TCS, CHS & OMS, Call handling, System maintenance philosophy

**(Attempt any two sections from B, C & D)**

**B 1. OPTICAL FIBRE CABLES AND SYSTEMS**

**15 marks**

Basic Concepts of optical communication, Optical fiber cable characteristics and Design features like multimode and single mode fibers, Dispersion, attenuation, optical fibre design (96 fibre cable), various types of optical sources and detectors, Survey and cable laying, Route index diagram, Tests and measurements on Optical Fibre Cable like OTDR, DTA, Power meter etc., Basic Concepts of PDH (2, 8, 34, 140 MB Systems), SDH (STM-1/4/16 systems), DWDM Systems.

**B 2. MICROWAVE AND SATELLITE**

**10 marks**

Microwave Line of sight propagation, Path Loss, Frequency Band and capacities of Digital Microwave systems, Hop distance, Noise Figure. Overview of Satellite Communication, History and Evolution, Frequency bands used for Satellite Communication, C and Ku bands, Geostationary satellites and satellite orbits. G/T Ratio, Antenna characteristics, VSATs, IDRs and DCME Data Rates.

OR

**C1. GSM:**

15 marks

Brief History of GSM, GSM Architecture containing the nodes like BTS, BSC, MSC, VLR, HLR, and OMC etc. Cellular Concept, Radio Frequency Management, Mobile Handsets, GPRS and its Network Elements.

**C2. WLL (CDMA and CordECT)**

10 marks

CDMA: Multiple Access Methods, Spreading Techniques, Frequency Spectrum of CDMA, Channel Architecture of CDMA, Application of CDMA Technology in BSNL network.

CordECT: DECT standard, DIU and CBS system capacities, Frequency band, coverage range, Internet bit rates.

OR

**D1. INTERNET AND BROADBAND**

15 marks

Basics of the following topics:

Data communication concepts-Packet switching & Circuit Switching; OSI Layered Model; Physical layer - Physical layer Interfaces and standards-V.35, V.24, G703, HSSI etc. ; Datalink Layer -Datalink Layer protocols, DLC, HDLC, PPP, LAN & Ethernet Technologies; Network Layer Protocols-IP, ARP, RARP, ICMP & IGMP; IP Addressing; Transport Layer Protocols-Connection oriented and connection less protocol, TCP, UDP; Internet routing Protocols-RIP, OSPF, BGP; Internet Applications-HTTP, DNS, Telnet, FTP, SMTP etc; Subscriber access Mechanisms-Modem Theory, HDSL Modems, Leased Line and Dialup Access etc

Broadband Access technologies-xDSL Technologies, DSLAM & ADSL Modems, BRAS, Tier I & Tier II switch, DMT Modulation technique, PPPoE  
Basics of WiFi & WiMAX

**D2. COMPUTERS, COMPUTER NETWORKS AND APPLICATION PACKAGES**

10 MARKS

**COMPUTER FUNDAMENTALS**

Fundamentals of Personal Computers use of Windows Operating System & Introduction to software packages like MS Word, MS Excel and MS Powerpoint. Use of Internet for office work like e-mail, web browsing etc.

The features of Linux Operating System, Linux file system, Basic and Advanced Commands, Graphical User Interface (KDE & GNOME), Open Office.

**WEB TECHNOLOGIES**

Creation of Static Web Page, which includes the designing, and developing of Static Web pages using HTML coding and FrontPage.

**NETWORKING**

Internet Protocols, Network Components and Architecture, IP Addressing and Sub-netting, Network Operating System, Active Directory, DHCP, DNS, Client configuration

**RDBMS**

RDBMS Concepts, SQL, SQL\*Plus and PL/SQL.

**BSNL Software Applications**

Familiarization with various departmental applications like DOTSOFT, BRMS, HR package etc.

**E. ACCESS NETWORKS**

**20 marks**

Basics of Jelly Filled Cables and fault location in copper cable network, construction and maintenance of DP and DP dressing, installation of drop-wire, pole-less external plant network, PCM principles, and overview of DLC and overview of MLLN.

Broadband access – copper based access, ADSL Technologies, DSLAM.

Earthing of Telecom Systems, Maintenance of Battery, Power Plants and UPS, Fire Protection Systems, Types, Use & Mtce. Schedule. Basic Mtce. Of EA Sets and Airconditioning Units.