Government of India
Ministry of Communications,
Department of Telecommunications,
National Telecommunications Institute for Policy Research Innovation & Training
ALTTC Campus, Ghaziabad-201002
(Examination Cell)

No.1-4/2019-NTI.EC
Dated: 12.03.2019

To,

DG, DoT HQ New Delhi
All Advisors/ Sr. DDGs/DDGs of DoT Headquarter,
All Advisor/Sr.DDG/DDG, Head of LSA.
Sr.DDG, TEC, New Delhi

Subject: Professional Examination for ADEsT (2014 Batch) and Hindi Test of ADEsT 2016 Batch –regarding.

Sir,

I am directed to inform that the above mentioned examination(s) is scheduled to be held at NTIPRIT Ghaziabad as under:

Paper	Subject	Schedule		Eligible Officers
		Date	Time	
I	Technical Subject (Without books)	Tuesday June 11, 2019	10.00 a.m. to 1.00 p.m.	ADEsT of ITS-2014 Batch
II	Administrative Subject (with Codebooks)	Wednesday June 12, 2019	10.00 a.m. to 1.00 p.m.	ADEsT of ITS 2014 Batch
III	Hindi Test Written	Thursday June 13, 2019	10.00 a.m. to 12.00 Noon	ADEsT of ITS 2016 Batch
IV	Hindi Test Oral	Thursday June 13, 2019	2.00 P.M. onwards	ADEsT of ITS 2016 Batch

2. You are requested to apprise all concerned of this advance notification and schedule of the examination and call for applications immediately from the eligible candidates as per application proforma given in Annexure-A. Syllabus and other conditions are laid down in the Annexure-B of this letter.

3. ADEsT (2014 Batch), who have successfully completed their probation, duly certified by the competent authority, only will be allowed to appear in the Professional Examination.

4. The following criteria may also be brought the notice of the candidate(s):

a. There shall be maximum three numbers of attempts to qualify the Professional Examination/Hindi Test.

b. Minimum qualifying marks in each paper in Professional Examination for Schedule Caste/Schedule Tribe category officers will be 33% and for officers of other categories, it will be 50% in each paper.

c. The minimum qualifying in Hindi Test will be 40% in the aggregate irrespective of the category of the officers.

5. The duly filled applications along with Hall Permit (in duplicate) must reach through proper channel by 11.04.2019 to

Assistant Director General
Examination Cell,
Room No.706B, NTIPRIT,
7th Floor, Admin Building,
ALTTC Campus, Ghaziabad-201002.

6. Kindly acknowledge the receipt.

Yours faithfully,

(Omvir Singh) 12/3/2019
ADG (Exam)

Copy to:

1. Deputy Director General (Estt.), Department of Telecommunications, Sanchar Bhavan, 20, Ashoka Road, New Delhi-110001.
2. Deputy Director General (Training), Department of Telecommunications, 20, Ashoka Road, New Delhi-110001 with a request that the letter may be uploaded on DoT website.
3. DDG (Pers.), TEC, K.L. Bhavan, New Delhi with a request to circulate this notification to all officers concerned.
4. All DDG's NTIPRIT.
5. Director (Training), NTIPRIT with a request to kindly communicate this notice to the concerned ADEsT under his control and upload the letter on NTIPRIT website.

Copy for kind information to:-

1. PS to Sr. DDG, NTIPRIT, Ghaziabad.
2. All DDGs, NTIPRIT, Ghaziabad.

Annexure-A

Application Form for admission to the Professional Examination and Hindi Test for Asstt. Divisional Engineers Telecom to be held on .....

Affix recent passport sized photograph attested by Controlling Authority (Director level)

1. Name (in BLOCK Letters) .....

2. Designation .....

3. Staff No. .....

3. Contact Details Tel..... Mobile.....email.....

4. Year of Recruitment .....

5. Year of Appointment .....

6. Date of Completion of Probation Period .....

7. Name of Controlling Officer .....
   Designation .....
   Office Address .....
   .....
   .....
   Tel..... Fax..... Mobile.....

8. Whether applying for Professional Examination or Hindi Test or both .....

9. Whether exempted from appearing in any paper. If so, give Exam Roll No., month and year of the examination:

Paper	Roll No.	Month and year of the examination
(i)	.....	.....
(ii)	.....	.....

10. Whether belongs to SC/ ST .....

11. Signature of the applicant .....
    Date:..... Place:.....

Signature and photograph of the officer has been attested and the application is forwarded.

Signature of Controlling Authority (minimum Director level) with stamp and date

Format of Hall Permit (to be filled in duplicate)

Professional Examination and Hindi Test for Asstt. Divisional Engineers Telecom to be held on .....

For Office use only:

Eligible for Professional Examination (Yes/ No) .....

Eligible for Hindi Test (Yes/ No) .....

Exemption from any examination: .....

Roll Number Allotted: .....

Examination Centre: .....

Candidate to affix recent passport sized photograph. Not to be attested.

S.N.	Date	Timings	Paper/ Session	Subject	Signature of the Candidate (during the examination)	Signature of the Invigilator

Sl. No. 1 to 4 to be filled by the Candidate as per details given in the application form

1. Name (in BLOCK Letters) .....

2. Designation .....

3. Staff No. .....

4. Name of Controlling Officer .....
   Designation .....
   Office Address .....
   .....
   .....
   Tel..... Fax..... Mobile.....

Note: The Hall Permit shall be collected from the candidate by the Invigilator after the completion of the last examination.

Format of Hall Permit (to be filled in duplicate)

Professional Examination and Hindi Test for Asstt. Divisional Engineers Telecom to be held on .....

For Office use only:	Candidate to affix recent passport sized photograph. Not to be attested.
Eligible for Professional Examination (Yes/ No)	
Eligible for Hindi Test (Yes/ No)	
Exemption from any examination:	
Roll Number Allotted:	
Examination Centre:	

S.N.	Date	Timings	Paper/ Session	Subject	Signature of the Candidate (during the examination)	Signature of the Invigilator

Sl. No. 1 to 4 to be filled by the Candidate as per details given in the application form

1. Name (in BLOCK Letters) .....

2. Designation .....

3. Staff No. .....

4. Name of Controlling Officer .....
   Designation .....
   Office Address .....
   .....
   .....
   Tel..... Fax..... Mobile.....

Note: The Hall Permit shall be collected from the candidate by the Invigilator after the completion of the last examination.

Annexure- B

Syllabus for Paper-I: Administrative Subject under Professional Examination for ADEsT

1. ADMINISTRATION & ESTABLISHMENT

- Office Administration and Office Procedures
- Material Management and Procurement
- Tendering
- Work Estimates, Expenditure and Accounting
- Arbitration
- Delegation of Financial Powers Rules
- General Financial Rules
- P&T Financial Handbooks- Rules
- Control of Expenditure
- DGS&D Procedure
- Right to Information Act
- General rules and regulations reg. establishment
- Staff establishment, Appointment and Training
- Promotions, DPC
- Office Inspections and Audit
- Role & Function of CAT
- Rules relating to Unions & Associations
- Fundamental Rules and Supplementary Rules (FR & SR)
- Pay and Allowances
- Leave Rules
- LTC Rules
- Terminal Benefits and Pension Rules
- CGHS and CS(MA) Rules
- Annual Performance Appraisal Reports
- Income Tax

2. VIGILANCE & DISCIPLINARY PROCEEDINGS

- CCS (Conduct) Rules 1964
- CCS (CCA) Rules 1965
- Constitutional provisions
- Principles of Natural Justice
- Disciplinary Proceedings
- Suspension
- Prevention of Corruption Act 1988
- Role of CVC and CBI

3. DoT FUNCTIONS

3.1 TERM Cell Functions

- Vigilance Functions
- Monitoring Functions
- Security Functions
- Service Testing of various Licensed Service Providers in the License area
- Roll-out obligation testing as per license conditions.
- Registration of OSPs
- Compliance Testing of Electro Magnetic Field (EMF) radiation norms.

3.2 Licensing Functions

- Indian Telegraph Act, 1885 and amendments
- Other Telecom Acts and Rules
- Concept of License, drafting and approval procedure
- Existing Licenses (Access services, Data services, Carrier services and others)
- Unified License Regime
- Policy and procedure for grant of licenses

3.3 Wireless Planning & Spectrum Management

- Role and Functions of Wireless Planning Cell (WPC)
- Indian Wireless Telegraphy Act, 1933
- Coordination and standardisation interface with ITU
- Standing Advisory Committee on Radio Frequency Allocation (SACFA)
- Wireless Monitoring Organisation

3.4 Universal Service Obligation Fund (USOF)

- Background of USO fund: Need and international scenario
- USO Act and Rules
- USO Fund organisational setup
- Activities of USO (Streams) and achievements thereof
- USO subsidy model for Net Cost, Capital Recovery, Operating Expenses and Revenue
- Role of CCAs

3.5 Telecom Engineering Centre (TEC) Functions

- Preparation of Generic Requirements (GRs), Interface Requirements (IRs), Service Requirements (SRs), and Standards (SD)
- Study paper and White paper
- System for providing Technical advice to DoT
- Testing & certification of Telecom Equipment
- Type Approval
- Validation testing of telecom equipment
- Concept of National Working Group (NWG)
- Functioning of ITU and ITU study groups

- Conformity Assessment Body (CAB)
- Mutual Recognition Assessment (MRA)

4. REGULATION AND DISPUTE SETTLEMENT

- TRAI Act
- Regulations
- Directions to Telecom service providers
- Tariff Orders
- Quality of Service Audit/Survey
- Performance Indicator reports
- Process of consultation
- Objectives of TDSAT and its Functioning

List of Codebooks and reference documents/manuals to be used for answering the questions in the Administrative subject paper

- CCS (CCA) Rules 1965
- CCS (Conduct) Rules 1964
- CCS (Pension) Rules
- CCS (LTC) Rules 1988
- CCS (RSA) Rules 1993
- CGHS Rules and CS (MA) Rules
- FR & SR- All parts
- Guidelines and Rulings on APAR of Govt. employees
- General Financial Rules
- Delegation of Financial Power Rules
- P&T Financial Handbook Vol. I & III
- RTI Act 2005
- Prevention of Corruption Act 1988
- Administrative Tribunals Act 1985
- Telecom/Telegraph – Acts and Rules including Amendments, Licenses and Guidelines to TERM Cells

Note:

i. The examinees shall have to arrange and bring the codebooks and reference documents/manuals with them, as they will not be supplied by the Department in the examination hall.

ii. The printed copies of online-available prescribed codebooks and reference documents/manuals, as well as their photocopies, are also allowed to be used during the examination.

iii. Handwritten notes and/or browsing of the reference material on mobiles/tablets/laptops shall not be allowed.

iv. The codebooks and reference documents/manuals should not contain any handwritten or typed notes.

Syllabus for Paper-II: Technical Subject under Professional Examination for ADEsT

(Corresponding to revised syllabus for ITS-2012 & onward batches)

1. SWITCHING

(i) PSTN SWITCHING

- Speech Signal Processing & PCM principles
- PSTN: Overview and Architecture
- PSTN: Access Network, components and management
- Digital Switching Concepts
- Digital Signalling Concepts - CAS, CCS#7
- Traffic Theory and Traffic Engineering
- IN, ISDN Concepts, Services and Applications
- Supplementary Services in PSTN
- NMS & Billing System for PSTN
- National Numbering Plan, International Routing concepts
- Introduction to PSTN NT Switches –OCB-283 and EWSD
- EWSD/OCB switch- Functional Architecture & Units
- Junction Management in the POI scenario
- Traffic reports & analysis

(ii) TELECOM INFRASTRUCTURE

- **Power supply arrangements for Telecom Systems:**
  - Power plant systems - Conventional and SMPS
  - Indoor / Outdoor Power plants in Wireless networks
  - Storage batteries and VRLA Battery
  - UPS and Inverters
- **Electrical installations:**
  - General Introduction to electrical infrastructure in Telecom Exchange buildings (E/A, Lighting, Lifts, Electrical installations etc)
  - Air conditioning -requirements and different systems
  - Earthing Types and Methodologies and Lightning Protection
  - Fire detection and Fire-fighting
  - BEE Standards for Electrical Installations, Energy conservation and Energy auditing
- **Green technologies**
  - TRAI guidelines, Alternative energy sources etc.
- **Civil Construction and Maintenance aspects in Telecom Buildings:**
  - Telecom buildings- types of buildings- Norms
  - Civil infrastructure in Telephone Exchange buildings
  - Towers- GTT, RTT, RTP, Wall Mounted etc.
  - Smart buildings – concepts
  - Water conservation and water harvesting

2. TRANSMISSION

(i) OPTICAL COMMUNICATION

- Introduction to Fibre Optics
- Types of Optical Fibre Cables & constructions
- OF Cable splicing theory and techniques
- Survey & Link Engineering
- OF Cable laying techniques & practices
- Testing and Measuring Instruments
- Concepts of PDH
- Introduction to SDH
- SDH multiplexing
- SDH Network Elements and Topologies
- Protection in SDH
- SDH Networks Management System
- SDH Measurements and Performance Parameters
- Synchronization and Timing Principles
- Synchronization of SDH Networks
- SDH over Radio
- Next-Generation SDH
- MSPP
- Overview of DWDM
- DWDM Components and EDFA
- DWDM System Engineering and Planning
- Optical Transport Network/All Optical Network
- Digital Cross-Connect (DXC)
- Fibre in Local loop, FTTH
- Passive Optical Networks- GPON, GEPON
- Free-Space Optics
- Submarine cable system

(ii) RADIO COMMUNICATION

- Overview of Microwave and microwave system configuration
- Microwave Antennas and wave-guides
- Site Selection criteria and guidelines
- Installation of Antenna & waveguides, Equipment Installation
- Link engineering and performance objectives
- Frequency plans of Digital Microwave systems.
- Digital Microwave measurements.
- IP-based Microwave systems
- Digital Modulation schemes
- 6 GHz, 7GHz, 13 GHz Systems
- Mini-links for BTS Sites
- PMRTS
- SACFA Clearance
- EMF Radiation: Theory and measurement aspects

- Measuring Instruments and Field Measurements
- SAR

(iii) SATELLITE COMMUNICATIONS

- Overview of Satellite Communications.
- Equipment configuration of a Satellite Earth Station.
- Installation of Earth Station Antennas viz. 11 M antenna (Azimuth, Elevation, Mount), 7.5 M antenna (x-y mount) and 4.5 M antenna (x-y mount).
- High Power Amplifier and RF multiplexers.
- Principles of Low Noise Amplifier
- Principle of Echo Suppressor and Echo Cancellers.
- Up/Down converters and Modulator/ Demodulator
- Inter-Satellite Interference /Freq. coordination.
- NOCC and Earth station Mandatory Tests.
- Antenna Tracking and control equipment
- FDM-FM & MCPC/ IDR Link Engineering.
- Procedures of site selection of Satellite Earth Stations.
- Space segment, features of INSAT III Satellites.
- Meteorological services of INSAT.
- Earth Station Maintenance and Planning
- Time Division Multiple Access Techniques, Digital Speech Interpolation Techniques.
- Code Division Multiple Access Techniques and its application to Very Small Aperture Terminal (VSATs).
- Power Plant for Satellite Earth Station.
- Digital Satellite Phone
- GMPCS

3. MOBILE COMMUNICATIONS

GSM

- GSM/GPRS Network Architecture
- Circuit Switched Core Network of GSM: MSC, HLR, EIR etc.
- Packet Switched Core Network of GSM: SGSN, GGSN etc.
- Mobile Number Portability
- Radio Network of GSM: BSC, BTS, OMC-R etc.
- Planning, engineering, designing principles of GSM RF Network
- Antenna systems, In-building solution etc.
- Applications/ Value Added Services in GSM/ GPRS: IN, SMSC USSD, IN, LBS, LBA, MMSC, Instant Messaging, Presence Service, Push to Talk, CRBT, OTA, GSM PBX etc.
- Advancements in GSM Technology: Evolved EDGE, VAMOS, Abis over IP, disaster Recovery for HLR, IN,
- SIM: Comp-128, H/w, File structure, Applications, ME-SIM Interface, PKI related aspects,
- GSM Mobile end user devices: Components, H/w, S/w, CODEC, Encryption, Modem, MSC, UART, Battery etc.
- Lawful Interception in GSM Mobile networks

- Coverage testing for Roll out Obligation
- Drive Test tools, Planning tools, Post Processing tools
- Billing Support System: CDR generation & Collection nodes, CDR Processing & Analysis
- Operation Support System: Traffic report Analysis
- SACFA related issues: Measurement of BTS Power, Antenna Height measurement, Lat-Long measurement
- Infrastructure Sharing issues
- IMEI and related issues

CDMA Technologies

(CDMA family of technologies- CDMA2000 1x, CDMA 2000 EVDO etc.)

- CDMA Network Architecture
- Circuit Switched Core Network of CDMA: MSC, MSC, HLR etc.
- Packet Switched Core Network of CDMA: PDSN, Home Agent, Foreign Agent
- Radio Network of CDMA: BSC, BTS, Coverage, OMC-R
- Planning, engineering, designing principles of CDMA RF Network
- Applications/ Value Added Services in CDMA: SMSC, IN, LBS, LBA, MMSC, CRBT, PTT, OTAP
- CSIM: Security Algorithm, Applications, H/w etc.
- Evolution of CDMA: EVDO etc.
- Lawful Interception in CDMA Networks
- Mobile Number Portability

UMTS

- UMTS Network Architecture
- Circuit Switched Core Network of UMTS: MSC-S, Media Gateway, HSS, MSC-Server, IMS etc.
- Fixed Mobile Convergence
- Packet Switched Core Network of UMTS: 3G SGSN, GGSN
- Radio Network of UMTS- RAN, Node-B, RNC
- UMTS-HSPA, evolved HSPA, VoIP over HSPA
- RF Network planning, designing, engineering, optimization principles
- Applications/ Value Added Services in UMTS: Video Telephony, Video Streaming, Mobile to PSTN Multi-Media Call
- UMTS Security: Security algorithms, Authentication, Encryption, UICC, USAT, USIM, ISIM
- Lawful Interception in UMTS Networks
- Mobile Numbering Portability Process
- Coverage testing for Roll out Obligation

Wi-Fi and WiMAX Technologies

(IEEE standards based technologies such as 802.11b, 802.11g and 802.11n, WiMAX 802.16e and WiMAX 802.16m (4G) etc.)

- WiMAX Network Architecture with functions of each node
- Applications/ Services in WiMAX
- Wi-MAX Core Network 802.16e based
- Wi-MAX Radio Network 802.16e based
- Security Aspects in WiMAX networks
- Wi-MAX Core Network 802.16m based
- Wi-MAX Radio Network 802.16m based
- Wi-Fi IEEE 802.11 b,g
- Security Aspects in Wi-Fi
- Wi-Fi Hotspot 2.0
- Coverage testing for Roll out Obligation

LTE & LTE Advanced Technologies

- LTE Network Architecture
- Core Network of LTE: SAE/ EPC, MME, Serving Gateway, PDN Gateway, PCRF, IMS etc.
- Radio Network of LTE,: E-UTRAN, eNodeB, Air Interface, Relays, Inter-RAT working etc.
- Self Organized Network
- Applications/ Services in LTE: VoIP, IP based conferencing, VPN, Emergency Call on IP, eMBMS
- LTE and Wireless Sensor Networks, SUN
- LTE-Advanced, Developments in Release 11 & 12 of 3GPP
- End-User Devices in Wireless Networks: Mobile Handset, Dongle, OS, Applications
- Lawful Interception in Mobile Networks
- Future Networks, SDN, Network Function Virtualization
- Coverage testing for Roll out Obligation
- Drive Test tools, Planning tools, Post Processing tools
- Infrastructure Sharing issues

4. DATA COMMUNICATIONS

- Basic concepts of Data Communication
- OSI Layer
- Physical Layer
- Modems in Data Circuits
- Error Detection and Correction Techniques
- Data Link Control (DLC)
- HDLC & LAP-B
- Packet Switching & Message Switching Concepts
- Frame relay
- ATM Technology
- TCP/IP Protocol Suite: An Overview
- TCP/UDP header Analysis
- Ipv4 and IPv6 Addressing
- Ipv4 and IPv6 Header analysis

- Introduction to LAN & internetworking devices
- WAN
- ARP & RARP along with header analysis
- Point to Point Protocol (PPP)
- Asynchronous PPP Analysis using Protocol Analyser
- IP Routing Principles (Static & Dynamic)
- Routing information Protocol (RIP)
- Open Shortest Path First (OSPF)
- Border Gateway Protocol (BGP)
- Elements of Internet Node (BSNL-NIB)
- NIB Server Features
- Router, RAS & LAN switch Architecture
- Internet services: HTTP/ PROXY
- Internet services: E-mail, SMTP & POP3
- Internet services: FTP/TFTP
- Internet services: DNS, DNS64, DNS6
- IP Multicasting: Layer 2 & 3 Protocols
- Access control list
- DHCP & DHCP6
- Wireless sensor network
- Broadband components
- ICMP, IGMP Protocols
- VLAN

5. NEXT GENERATION NETWORKS

- NGN Overview and Architecture
- Convergence through NGN
- NGN Services
- NGN Protocols: SIP, Megaco/H.248, Sigtran, RTP/RTCP, H.323 etc.
- NGN Soft switch: ZTE, CDOT etc.
- Interconnect, operational and security issues in NGN
- IP TAX project of BSNL
- Migration to NGN - issues & techniques.

6. LAWFUL INTERCEPTION AND MONITORING

- Licensing provisions
- TEC GRs on LIM & LIS for mobile, Fixed, ISP, IPLC, ILD
- Centralized Monitoring System
- Concept of LEAs and coordination mechanism
- Introduction to Deep Packet Inspection technologies
- Various types of mobile handsets and features

7. Structure of Networks, interconnection & service provisioning

- Overview of PoI & IUC
- Role of Regulator

- PoI provisioning & billing
- NLD/ILD Traffic engineering
- Leased Circuits and SLAs
- NIXI
- IRINN and APNIC
- International Roaming- Implementation & Issues
- Telecom Order Management System (OSS/BSS)
- Commercial conditions of retail service
- Customer care system- Call centre network
- E-top-up system

8. CYBER SECURITY

- Network Security/ Cyber Security/ Computer security and its attributes
- Encryption
- OS and security
- Application security, SQL Injection & Cross Scripting
- INTRUDER
- IDS & IPS
- Phishing and Identity Theft
- Virus, Worm, Malware, BOTNET and recent vulnerabilities
- Cyber space and different kinds of vulnerabilities
- Cyber crime : Mobile & Wireless Security
- Cyber crime & Cloud Computing
- Tools & methods used in cyber crime: Keyloggers
- Role of ITU, DoT and CERT-IN
- TCP Finite State Machine (FSM): States, Events and Transitions

9. DISASTER MANAGEMENT

- Types of Disasters
- Fundamentals of Disaster Management
- Role of Communication Technologies
- DM framework in India
- Role of DoT

Hindi Test

Hindi test will comprise the following six parts:

Sl. No.	Part	Full marks
i.	Dictation	15
ii.	Reading	15
iii.	Conversation	20
iv.	Translation from Hindi to English	15
v.	Translation from English to Hindi	15
vi.	Composition	20
Total		**100**

Oral assessment of the candidates will be carried out through Part No. i, ii and iii, And the written test will comprise of Part No. iv, v and vi as per the above table.

The probationers are expected to attain a reasonable proficiency under all the above heads. They should give stress on acquainting themselves with Hindi-terms in daily use to enable them to converse with the man-in-the-street, particularly villagers. They are also expected to know the technical and other terms which would be helpful to them in their future official work.

The minimum qualifying marks in the Hindi test ***will be 40 % in the aggregate irrespective of the category of the officer.***