

Key to Paper-I - Advanced Technical Paper - General (Objective type)

**A. DIGITAL SWITCHING**

30 marks

A.1 ( Attempt any two of a , b , c , d)

( 10 marks)

( 5 marks each)

**a. Intelligent Network (IN) and Services**

Each question (sub-part) carries one mark

- i) Which one of the following is not an IN service?  
c) Calling Line Identification
- ii) Access codes for various IN services in BSNL network are in Level  
c) Both "1" and "0"
- iii) In IN architecture , IP stands for  
a) Intelligent Peripheral
- iv) Which one of the following handles the function of "switching" a call in IN service?  
a) SSP
- v) In seven layer OSI structure, Intelligent Network application Part (INAP) is above  
b) TCAP

**b. Signaling System including Number 7**

Each question(sub-part) carries one mark

- i) STP in a CCS7 network stands for  
a) Signaling Transfer Point
- ii) Error detection and correction in CCS7 is the responsibility of  
b) Level 2
- iii) The number of Point Codes for a particular " Network Indicator" are  
d) More than 16000
- iv) Signaling Link Test Message (SLTM) belongs to  
b) MTP3
- v) Dialed digits in an ISUP message are conveyed from Exchange "A" and exchange "B" using  
d) IAM

**c. ISDN**

Each question (sub-part) carries one mark

- i) Primary Rate Interface in BSNL network is  
b) 30B +D
- ii) Which one of the following is not an ISDN supplementary service?  
c) TCP
- iii) Which one of the following is not an ISDN Customer Premises equipment?  
c) IPTV
- iv) Maximum number of terminals that can be supported in ISDN BRI?  
d) 8

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v) Choose from the following the maximum data transfer rate between two PC's using ISDN BRA?

c) 64 Kbps

**d. Long distance switching**

*Each question ( sub-part ) carries one mark*

i) For basic services, numbering plan is based on

a) SDCA

ii) In modified "R2" signaling, "A4" is a

b) backward signal

iii) Synchronization method used in BSNL network is

c) Master Slave Synchronization

iv) Charge determination Point for a long distance call in BSNL N/W is

a) Leading TAX

v) Which one of the following is not a parameter in transmission plan objective?

a) Erlang

**A:2 ( Attempt any one of a , b , c , d , e , f )**

**( 20 marks )**

**a) E10-B switching system**

*Each question (sub-part) carries two marks*

i) Software version of E10-B exchange is

b) 2L+

ii) Subscriber line card in E10-B exchange is

a) XCJ8

iii) Switching involved in E10-B exchange is

b) Time switching only

iv) Number of charge meters with each subscriber is

d) 1

v) Which of the following is not feasible in E10-B exchange?

c) E10B exchange connected to CDOT ANRAX

vi) Internal transfer of CDRs from TX to DCMA in E10 B is dependent on

c) When the block size has reached 2K and time

vii) Which of the following is not supported by E10 B ?

d) None of the above

viii) Frequency adjustment in E10-B exchange is possible with

a) ETA .

ix) The value of "CAT" parameter for Call Waiting feature is

b) CAA2

x) GPXCR command in E 10 B can be used for

d) creating PBX hunting group

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**b) CDOT Digital switching system (MAX)**

*Each question (sub-part) carries two marks*

- i) Software version of CDOT MAX exchange is
  - a) 2\_2\_1\_6
- ii) Subscriber line card in CDOT MAX exchange is equipped in
  - d) BM
- iii) Switching involved in CDOT MAX for inter-BM call is
  - d) Both time and Space switching
- iv) Number of charge meters with each subscriber is
  - c) 4
- v) CCS7 link is implemented by using which card in CDOT MAX
  - b) PHC
- vi) CDRs are stored in
  - a) IOP
- vii) Which of the following is not supported by CDOT MAX at present?
  - a) Centrex
- viii) Synchronization is a function of
  - a) CM
- ix) What is the maximum termination capacity of CDOT MAX-XL?
  - d) 40000 lines
- x) Which of the following is correct syntax in CDOT MAX exchange for subscriber creation ?
  - b) CRE-SUB

**c) EWSD switching system**

*Each question (sub-part) carries two marks*

- i) Software version of EWSD exchange is
  - d) Ver 16
- ii) Subscriber line card in EWSD exchange is equipped in
  - a) DLU
- iii) Among the following, Switching involved in EWSD can be
  - d) Both time and Space switching
- iv) Number of charge meters with each subscriber is
  - b) 5
- v) Which one of the following is the latest hardware in LTG?
  - c) LTG P
- vi) IP interface is implemented in which hardware
  - b) SSNC
- vii) EWSD is not being used as
  - c) Standalone STP
- viii) Synchronization is a function of
  - c) CCGE
- ix) Which parameter will be given in MODSUB command to enable call transfer

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unconditionally?

- a) DIV=DIVI & DIVIMOD
- x) The feature "IACHASTA" can be used for
- d) Bulk billing on junctions

**d) 5ESS switching system**

*Each question (sub-part) carries two marks*

- i) Current Software version of 5ESS exchange is
  - a) Ver 16
- ii) Subscriber line card in 5ESS exchange is equipped in
  - c) SM
- iii) Generally, Switching involved in 5ESS will be
  - d) Both time and Space switching
- iv) Number of charge meters with each subscriber is
  - a) 4
- v) CCS7 signaling is handled by using which card in 5ESS
  - c) PSU
- vi) Which one of the following is not a bus in SM?
  - b) TSIU
- vii) 5ESS is not being used as
  - c) Standalone STP
- viii) Transmission test of line and trunk is the function of module
  - a) GDSU
- ix) ) Which parameter will be given in subscriber related commands to indicate Subscriber number?
  - c) dirnr
- x) Which one of the following features in 5ESS has been implemented the last among the four listed below?
  - b) Centrex

**c) OCB switching system**

*Each question (sub-part) carries two marks*

- i) Current Software version of OCB-283 exchange is
  - b) R25
- ii) Subscriber line card in OCB -283 exchange is
  - c) TABA S
- iii) Among the following, Switching involved in OCB-283 will be
  - a) Time switching only
- iv) Number of charge meters with each subscriber is
  - a) 4
- v) CCS7 link is implemented by using which unit in OCB-283
  - b) PU/PE
- vi) Which of the following is not to be dimensioned while planning OCB-283 exchange

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- c) Number of subscribers to which an announcement can be fed
- vii) OCB-283 is not being used as
  - c) Standalone STP
- viii) Which one of the following is not a logical machine in SMC?
  - b) MLAN
- ix) Which parameter is used to indicate maximum number of users in the group while creating CENTREX?
  - b) TRL
- x) Which one of the following features in OCB -283 has been implemented the last among the four listed below?
  - b) Centrex

**f) AXE switching system**

*Each question ( sub-part) carries two marks*

- i) Software version of AXE-10 TAX exchange is
  - a) IN73
- ii) ISDN BRA Subscriber line card in AXE-10 exchange is
  - c) LIBA
- iii) Among the following, Switching involved in AXE-10 will be
  - d) Both time and Space switching
- iv) Number of charge meters with each subscriber is.
  - a) 4
- v) EI is implemented by using which card in AXE-10
  - b) ETC
- vi) CDRs storage is implemented in which hardware
  - d) IOG
- vii) AXE-10 is not being used as
  - c) Standalone STP
- viii) Clock is implemented by which module
  - d) CLM.
- ix) Which parameter will be given in subscriber related commands to indicate Subscriber number?
  - a) SNB
- x) Which one of the following features in AXE-10 TAX has been implemented the last among the four listed below?
  - b) STM-1 termination

**B. OPTICAL FIBRE CABLE AND SYSTEMS, MICROWAVE AND SATELLITE**

**25 marks**

**B.1 Optical Fibre cable and systems:**

**( 15 marks)**

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*Each question (sub-part) carries one mark*

- i) A fibre having core with refractive index highest at the centre and decreasing gradually until it matches that of the cladding is called
  - c) Graded index fibre
- ii) The variation of refractive index with the wavelength results in which type of dispersion
  - a) Material dispersion
- iii) In fibre optic systems, for data rate  $R$ , total rise-time allowed is
  - c)  $0.35/R$  for RZ signal and  $0.7/R$  for NRZ signal
- iv) Hydroxyl ion presence in fibre will result in
  - d) Losses due to absorption
- v) For detecting low power, preferred detector is
  - b) APD photodiode
- vi) Number of fibres per ribbon in 96F cable is
  - a) 12
- vii) OTDR is based on the principle of
  - e) back-scatter
- viii) Frame length of 34 Mb/s PDH system is
  - d) 1536 bit
- ix) In 140 Mb/s system, alarm indication for far end terminal is indicated by
  - c) 13<sup>th</sup> bit
- x) Second order MUX in PDH hierarchy will have a bit rate of
  - a) 8Mb/s
- xi) Which one of the following is not an advantage of migrating from PDH systems to SDH systems?
  - d) Network Synchronization
- xii) Which of the following overhead byte in STM-1 format is used for Transmission Error Acknowledgement?
  - b) M1
- xiii) In SDH systems, a special container provided for each PDH tributary signal is indicated as
  - a) C-n
- xiv) In terms of bytes, STM-N frame structure is
  - c) N times the STM-1 structure
- xv) DWDM systems, in terms of input interface rates are
  - d) bit rate as well as format independent

## **B.2 Microwave and satellite:**

*Each question (sub-part) carries one mark*

- i) Low Earth Orbit (LEO) designated for Satellite communications is
  - c) 500 to 2000 Km above the earth
- ii) Ku band is indicated by
  - a) 12 to 16 GHz



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- iii) One way propagation delay for earth- geostationary satellite- earth will be of the order of
  - b) 250 msec
- iv) HVNET is a
  - b) VSAT based network
- v) The specification of DCME is based on
  - c) Q.50
- vi) Noise figure is related to
  - a) Noise factor expressed in db
- vii) Which one of the following is a short haul microwave system?
  - d) 15 GHz
- viii) Which one of the following is not suitable for mounting Microwave Antenna?
  - a) 15 meter tower
- ix) Range of VSWR is between
  - b) 1 & infinity
- x) Which one of the following is not based on Microwave?
  - d) none of the above

**C. GSM, WLL ( CDMA and CorDECT )**

**25 marks**

**C.1 GSM:**

**15 marks**

*Each question (sub-part) carries one mark*

- i) Which of the following algorithms is not used in GSM for ciphering and authentication?
  - a) A1
- ii) Which of the following is valid GSM downlink frequency band?
  - b) 935-960 MHz
- iii) If "D" is frequency reuse distance, "R" is the cell radius, "K" is reuse factor, then choose the correct equation.
  - d) None of these
- iv) A-bis interface is between
  - c) BTS-BSC
- v) Which of the following is not a part of IMSI ?
  - b) MSRN
- vi) Which one of the following protocol is used in present GSM network?
  - b) CAP
- vii) Re-allocation of frequencies is a function of
  - d) BSC
- viii) Location registration is a function of
  - c) MSC
- ix) The information about subscriber services is stored in
  - d) HLR

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- x) Which one of the following is not characterized as "Broadcast Channel"?
  - a) SACCH
- xi) SMS is based on principal of
  - b) store and forward
- xii) Which one of the following is not a function of SGSN in GPRS architecture?
  - b) Interface to external data networks
- xiii) The peak data rate possible in GPRS is
  - a) 115 kbps
- xiv) Which one of the following is not a location based service?
  - d) Push to talk
- xv) C-TOPUP SIMs can be used for
  - d) All of these

**C.2 WLL (CDMA and CorDECT)**

**(10 marks)**

*Each question (sub-part) carries one mark*

- i) During quiet periods in a conversation, vocoder
  - a) drops to a lower bit rate
- ii) In CDMA, RF channel bandwidth is
  - c) 1.25 Mhz
- iii) Maximum number of Walsh codes in CDMA IS95A technology is
  - b) 64
- iv) In BSNL network Interface between BSC and PSTN can be
  - d) All of the above
- v) CDMA system deployed in BSNL network, in general does not support
  - ii) Roaming
- vi) Reverse Link Power control is achieved by
  - c) Both a) and b)
- vii) Power control step size in CDMA IS95A is
  - a) 1 db
- viii) In spread- spectrum technology, relation between transmission bandwidth and information bandwidth is
  - b) Transmission bandwidth is greater than information bandwidth
- ix) The designated frequency band for corDECT is
  - c) 1880-1900Mhz
- x) Compact Base Station, in corDECT, supports
  - a) Upto 12 simultaneous voice calls



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**D. INTERNET AND BROADBAND, COMPUTERS, COMPUTER NETWORKS AND APPLICATION PACKAGES**

**25 marks**

**D.1 Internet and Broadband**

**( 15 marks)**

*Each question (sub-part) carries one mark*

- i) Which one of the following is not a broadband wireless access technology?
  - c) PLC
- ii) Which DSL technology is equivalent to a PCM stream?
  - a) HDSL
  - iii) Which channel is used for Upstream data and control in DMF technique?
    - c) Channel 6
  - iv) WiFi is referred by IEEE standard
    - d) 802.11
  - v) Which is/are key feature/features of WiMAX technology?
    - d) Both a) and b)
  - vi) In ADSL technology, Splitter consists of
    - c) Both low pass and high pass filters
  - vii) Distance between Tier 2 LAN switch Aggregator and any of the connected DSLAM assuming that optical to electrical converters are not available, can be less than
    - b) 10 Km
  - viii) Which one of the following is a function of BRAS performed along with RADIUS ?
    - c) Billing
  - ix) In OSI Model, Layer 5 represents
    - a) Session
  - x) What is the port number used by BGP-4 for sending and receiving messages reliably between Peer routers ?
    - c) Port 179
  - xi) "Sender Hardware Address" and "Target Hardware Address" are fields in the header structure of which protocol?
    - d) ARP
  - xii) Which of the following is not a "state" in PPP?
    - a) Synchronize
  - xiii) In VoIP, protocol used to carry voice is
    - b) RTP
  - xiv) Term "DTE" is associated with
    - b) Physical Layer
  - xv) SNMP uses which protocol for Transport ?
    - d) UDP

**D.2 COMPUTERS, COMPUTER NETWORKS AND APPLICATION PACKAGES**

**( 10 marks )**

*Each question (sub-part) carries one mark*



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- i) A Class A IP address consists of
  - c) 24-bit local host and 8-bit network address
- ii) Which one of the following is not a correct private IP address?
  - a) 192.16.x.x
- iii) IP address 127.0.0.1 is used for
  - d) Local loop back
- iv) In subnet masking, which logical operation is performed between the IP address and subnet mask to get Network address
  - b) AND
- v) 4 bits Subnet Net mask 192.168.255.240 will provide
  - b) 16 subnets each with 14 hosts
- vi) The software application "IOBAS" is related to
  - c) Interconnect Billing
- vii) In SQL, which one of the following is not a Numeric function?
  - a) LENGTH
- viii) In MS POWERPOINT, an electronic page in a presentation is called
  - b) slide
- ix) In MS EXCEL, Cell address A\$4 in a formula means it is a
  - d) Mixed cell reference
- x) In HTML, "Marquee" tag is used for which action on the text
  - c) Strolling

**E. ACCESS NETWORKS**

**20 marks**

*Each question (sub-part) carries one mark*

- i) Resistance per kilometer per conductor at 20 degree centigrade for a conductor of nominal diameter 0.40 mm in Polythene Insulated Jelly Filled Polythene Sheathed Under Ground cable is
  - b) 135
- ii) Which one of the following is not a characteristic of PIJF cables?
  - c) Jointing is cumbersome
- iii) Which one of the following is not a DP size?
  - a) 100 pair
- iv) Which is the most important requirement for implementing Pole less scheme?
  - d) 5 pair cable
- v) MEGGAR used for cable maintenance works on the principle of
  - c) Whetstone bridge
- vi) In 30 channel PCM system, time available per channel is
  - a) 3.9 microsecond
- vii) In 30 channel PCM system, Time Slot 0 can be used for
  - d) Both a) and b)
- viii) In DLC based on V5.2, V5.2 interface will be
  - c) Between COT and switch

*10*

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- ix) Which one of the following is not a function of Splitter in ADSL technology?  
d) Traffic multiplexing
- x) In BSNL, which type of secondary cell technology is used in conventional power plants.  
a) Lead-lead-acid type
- xi) The Float Mode voltage in 100A SMPS rectifier module is  
d) -54 plus minus 0.5 V
- xii) Nominal voltage per cell of fully charged VLRA 1000AH battery is  
a) 2.0 V
- xiii) Switching Time in off-line UPS will be  
b) less than 5 msec
- xiv) Which earth electrode system shall be used in case adequate space is not available?  
c) Earth plate
- xv) Which one of the following is not a correct type of Fire Extinguisher in telecom building?  
a) CO type
- xvi) In BSNL, Air-conditioner of 7 TR will be of  
c) Package Type
- xvii) Which one of the following is not a 'stroke' of Diesel engine cycle?  
d) Expansion stroke
- xviii) Which type of call booking is not possible by Trunk IVRS?  
a) Intra SDCA
- xix) Which one of the following is not a component of MLLN?  
b) Analog cross connect
- xx) Which one of the following does not represent a correct ADSL technology version?  
c) ADSL 1+

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