Part I (15 Marks, 5 each):


Part II 40 marks, 10 each

a. Digital circuits: Boolean algebra, minimization of Boolean functions; logic gates; digital IC families (DTL, TTL, ECL, MOS, CMOS). Combinatorial circuits: arithmetic circuits, code converters, multiplexers, decoders, PROMs and PLAs. Sequential circuits: latches and flip-flops, counters and shift registers. Sample and hold circuits, ADCs, DACs. Semiconductor memories. Microprocessor (8085): architecture, programming, memory and I/O interfacing.

b. Electromagnetic Theory:
Elements of vector calculus: divergence and curl; Gauss' and Stokes' theorems, Maxwell's equations: differential and integral forms. Wave equation, Poynting vector. Plane waves: propagation through various media; reflection and refraction; phase and group velocity, skin depth. Transmission lines: characteristic impedance; impedance transformation; Smith chart; impedance
matching; S parameters, pulse excitation. Waveguides: modes in rectangular waveguides; boundary conditions; cut-off frequencies; dispersion relations. Basics of propagation in dielectric waveguide and optical fibers. Basics of Antennas: Dipole antennas; radiation pattern; antenna gain.

c. Communication Systems:
Amplitude, Frequency and Phase Modulation, Modulation index and power relations in AM, Modulation and detection of AM and FM wave, Sampling and Data Reconstructions, Quantization & Coding, Digital Modulation Techniques: ASK, FSK, PSK and M-ary PSK, Time Division and Frequency Division Multiplexing, Equalization, Propagation of signals at HF, VHF, UHF and Microwave Frequency, Satellite communication.

d. Concepts of Electrical Technology:

Part III (45 Marks, 15 each)

e. Concepts of Optical Fiber Communication Systems:
Interference and Diffraction & Dispersion, principles of LASERS, Photodiodes, principles of fiber communication, step & graded index fiber, single modè and multi-mode optic propagation, Optical sources: LED and Lasers, Optical Receivers: APD and PIN photodiode. Optical Fiber Transmission Technologies and systems,SDH standards, architecture of optical transport networks (OTNs), network topologies, protection schemes SDH, and wavelength routed architectures. Operational principle of WDM, WDM network elements and Architectures, Introduction to DWDM

f. Wireless Communications systems:
Introduction to wireless communication, Frequency Division Multiple access, Time Division Multiple access, Spread Spectrum Multiple access, Space Division Multiple access, and OFDM, Frequency reuse, channel assignment strategies, handoff strategies, interference and system capacity, trunking and grade of service, improving the capacity of cellular systems. and related design problems,
2G Technologies, GSM Network architecture, signaling protocol architecture, GSM evolution in GPRS and EDGE: Architecture and services offered, 3GPP LTE Introduction and system overview, Logical and Physical Channels: Mapping of data onto logical sub-channels physical layer procedures, establishing a connection, retransmission and reliability, power control, Emerging Technologies for 4G, Multi antenna Technologies: MIMO; software defined radio, Adaptive multiple antenna techniques, radio resource management, QOS requirements.

g. Computer Networks:-

Data communications concepts, Network Topologies, Concepts of LAN, Ethernet Protocol, Concepts of WAN, Larger Architecture-OSI and TCP/IP concepts, IP protocols, architecture of a computer network and explain how each device in a network communicates with each other, processes in each layer of the network protocol that enables different networks to share resources, basic network protocols in each layer of a TCP/IP stack and the purpose of each protocol; various services and functionalities of specific mechanisms in each protocol and their usage in a computer network; Network Request for Comment (RFC), compare and contrast each layer in the TCP/IP model with those in the OSI model; socket programming and explain its role in application processing; IP addressing and explain its purpose; packet collisions and how they are corrected in the link layer; CSMA and describe its use in the link layer; application protocols such as VoIP and IPTV; and TCP/IP security related issues.

Concepts of Switching technology, routing technology, WAN technology, DNS and DHCP
SYLLABUS FOR ON-LINE EXAMINATIONS FOR RECEPTION POSTS OF
SENIOR MANAGERS (OSS)

Senior Manager/OSS (NOC Processes & Practices)
- e-TOM framework & functionalities of various verticals/sub verticals
- Telecom NOC functionalities - various functions of NOC
- NOC Practices & Implication on Network health & operational efficiency
- ITIL processes related to Telecom Network Management
- Process KPIs
- Operational efficiency parameters of NOC for benchmarking & improvements
- Critical KPIs of Help desk, NOC process, Network
- ISO 9001:2015
- ISO 27001
- Basics of telecom technologies (SDH, NGN Switches, MPLS, ISP, IT)

Senior Manager/OSS (Service Assurance)
- e-TOM/NGOSS framework & functionalities of various verticals/sub verticals
- Telecom NOC functionalities - various functions of NOC
- Operational efficiency parameters of NOC
- Assurance stack - building blocks, detailed functionalities & inter dependencies
- Operational efficiency parameters of NOC for benchmarking & improvements
- Critical KPIs of Help desk, NOC process, Network
- Basics of telecom technologies (SDH, Switches, MPLS, ISP, IT)
- NBIs protocols: SNMP, ASCII, Syslog, CORBA, XML, REST APIs etc
- Basics of UNIX, SQL, Shell & Perl scripting