The Power Of IT Jobs



INDEX OF CONTENTS

Computer System	01-10
Chapter: 1. History of Computing and Binary System	2-9
Introduction	
A Little Bit of History	3
	6
Number Systems	8
Complement Number Systems	9
Network	11-142
Chapter: 2. Computer Networks	12-84
Introductio	12-27
Network, Computer Network, Communication performed,	
Elements, Media, Messages, Protocols, Architecture	13
Internet structure,Cable Connection,Bit,Cable specification	14
Transfer Mode, Bandwidth, Throughput, Goodput, Apple Talk, AUI ConnectorBNC Connector, Bridge, CSMA/CA, CSMA/CD, DIN, Dumb Terminal,	15
E-mail,Ethernet,Expansion SlotFDDI,Fiber Optic Cable,File Server,Gigabit Ethernet,Gigabyte,	16
Hub,Infrared,Intranet,Extranet,Linear Bus,LocalTalk,MAN	17

Modem, Multiplexer, NIC, Network Operating System, Peer-to-Peer,	
Point-to-Point,ping,RAID,Repeater,RJ-45	18
Router, SCSI, Segment, Sneaker-Net, Star Topology, Terminator,	
Thicknet ,Thinnet,Token	19
USB,WAN,IPv4, IPv6	20
Wireless Networks	21-22
IEEE 802.15 ,IEEE 802.16,GSM,802.11a,802.11b,802.11g,	
Wireless Access Point, Wireless NIC, VSAT	21
Types of threats, attacks	22-23
White hat, Hacker, Black hat, Cracker, Phreaker, Spammer, Phisher	22
Computer Crime, Threats to Physical Infrastructure, Network Attacks	23
Encryption algorithms	23-24
DES,3DES,AES,RSA	23-24
Subnetting	25
Variable Length Subnet Masking	27
Questions and Answers	28-64
Network, Link	28
Node,gateway,point-point,Multiple Access, Distributed,Processing,effective	
and efficient network, performance, reliability	29
Protocol, key design, Routing, Dynamic Routing, routing Protocols	30
Routing Protocols Classification, peer-peer, switch congested	30
Semantic gap, Round Trip Time, Multiccasting and Broadcasting,	
OSI layers, OSI Vs TCP/IP	31
Responsibilities OSI layer	32-33
Link types, types of errors, Error Detection, Redundancy, VRC, LRC	33
CRC,Checksum,Error Detection and Error Correction,Data Words,	
Code Words, Cyclic Codes, Encoder	34
Decoder, Framing, Stuffing, Error Control, ARQ, Stop-and-Wait	35
Relaible Transmission, Sliding Window, Piggy Backing, SAP, triple X,	
Beaconing, redirector, passive topology	36
Brouter,point-to-point,MAC,Project 802,Protocol Data Unit	37
ICMP,TCP/IP protocol,classes of internet addresses	38
TFTP and FTP,types of networks,important topologies,5-4-3 rule,	
MAU, routable and non- routable protocols	39
logical link, virtual channel, virtual path, packet filter, traffic shaping,	
multicast routing,multicast protocol	40
Multicasting,region,syndrome,Digrams and Trigrams,IDEA,	
Wide-mouth frog, Mail Gateway, EGP, autonomous system, BGP	41
Gateway-to-Gateway,NVT,Multi-homed Host,Kerberos,OSPF,Proxy ARP,	
SLIP,RIP,source route,MAC Address	42
MAC vs. IP,IP address,Private,Public Address,Static and Dynamic IP,	
Network Address Translation, subnet	43
Subneting,PING,Data encryption,Public Key Encryption,Digital	. •
Signatures. Ethernet technology. IGMP protocol	44
TCP / IP protocol,UDP protocol,TCP windowing,HTTP,NNTP	45
CSMA and CD,NetBIOS,Application layer,different kinds of network,	. •
Ring, Bus and Star topology	46-47

7 Layers of OSI	47
Router, routing, route a packet, Static Routing,	
Default and Dynamic Routing	48
Routing Protocol, classes of routing protocols, internet routing,	
Routing Loops	49
OSPF features, RIPv1 and RIPv2, IGRP and RIP, neighbourship EIGRP	50
Switching Spanning Tree	51
RIP and IGRP same network,MAC address not table	52
Denial of Service, Brute Force Attacks, RSA authentication, encoding,	
encryption and hashing	53
Hash function, Physical and Digital Signature, Authentication Header,	
SSL Protocol, TFTP and FTP	54
Bit and baud rate, NETBIOS and NETBEUI, ARP and RARP, POP3, SNMP	55
Transaction server, Message Oriented Middleware, TP-Lite and	
TP-Heavy,Intranet and the Internet,FTP,DNS	56
DNS,Telnet,SMTP,Spanning-Tree,VPN,types of VPN	
Address Resolution Protocol, structure and use of internet addresses,	07
APN, VPN and APN	58-59
Names translated IP,broadcast domain	
Bridge vs switch,gateway,firewall,Distance Vector Routing	
Trusted and Untrusted Networks, Tunneling, voluntary and	00
Compulsory tunnels, static and dynamic tunnel, RTP,RTP	61
RTP and RTCP,RTP and RTCP packets,RTCP header,socket	62
Datagram vs. stream, stream socket, SSL, TCP Socket classes, race	02
Condition, Symmentric Multiprocessing	63
Objective Questions	64-83
Chapter: 3. Information Security and Control	
Introduction	84-85
Information, Security, Threat, Interception, Modification,	
Fabrication, Encryption, Decryption	84
Plaintext, Cipher text, some cipher, Transposition, Cryptography,	
Symmetric and Asymmetric Key, Public key Encryption	85
Chapter: 4. Data Communication	86-10
Introduction	86-91
Data Communications, Basic Elements, Information	
Transmitter, Channel, Receiver, Transmission, Analog, Digital	
Methods of sending data, ways of transmitting, Digital Communication	
Encoder, Decoder, Data Encoding Techniques, Analog-to-Digital,	00
Digital-to-Analog, Modulation, Amplitude modulation	89
Angle modulation, Fundamental digital modulation methods	
Sampling,FHSS,DSSS	90 91
Questions and Answers	02 10
Transmission, attenuation, distortion, and noise	92
Composite single, types are wireless transmission	93
Random Excess, Channelization, FDMA and TDMA	94

CDMA in wireless, Bandwidth and Latency, types of Multiplexing, Physical	
And Digital Signature, Symmetric and Asymmetric-Key cryptography	95
Design goals of ATM,data communication,data exchange,Simplex,half-duplex	96
Duplex, analog and digital signals, Nyquist Theorem, Aliasing effect	97
Pulse amplitude, sampling, multiplexing, Classify of multiplexing	- 98
FDM,WDM,TDM,Synchronous TDM	- 99
Asynchronous, Synchronous, Transmission media, categories Of Transmission	
media,attenuation	100
Retransmission,communication and transmission,hamming code,CSMA,bit rate	
and baud rate, Bandwidth, baseband, And broadband transmission, Bluetooth	101
Fiber Optics,Optical fibers types,Single and Multi-mode fibers	102
Fiber Optics	102
Optical fiber, multimode fiber, singlemode, AV signal transmitted, light-emitting	
diode, Laser diode, VCSEL, photodetector, wavelengths single & multimode fiber	103
Pure ALOHA and Slotted Aloha	104
Chapter: 5. Mobile Wireless Communications	- 105-129
Introduction	
First Mobile,Cellular Mobile	
First Generation,1G Separate Frequencies,Switching Networks	
Taxonomy of switched, VIRTUAL-CIRCUIT	107-108
Radio Propagation	- 108
Second Generation,2G -TDMA,Typical 2G	109
GSM,GSM 2G Architecture,GSM Evolution	
GPRS 2.5G for GSM,EDGE,2.5G Architecture,2G & 3G-CDMA	
3G Technologies, 3G Vision, International Standardization	
Migration To 3G, IMT-2000 Vision	
3G Network Layout,3GPP, EVDO	114
EVDV,HSPA,HSPA+,SMS	115
3G QoS,3G UMTS,Handoff	
Evolution of Radio,LTE	
OFDM	
FDM vs. OFDM,LTE-Downlink,LTE Uplink	
Evolution of LTE-Advance,LTE Vs LTE-Adv	
LTE vs WiMAX	
Questions and Answers	
1G Vs 2G,cell,frequency reuse,multiple access schemes,co-channel	· 121
Adjacent channel, types of cells, channel allocation, mobility management, cluster,	
Radio resource, planning of a cellular, location, handoff management, splitting	- 122
Trunking, types of Hand over, satellite system, paging, channels used, Units of a	
Cellular	123
Classifications of Wireless, limitations, fading, coherence, wave path	124
Base station, MSC, foot print, Dwell time, handoff, modulation schemes, cross	
section, Reflection, diffraction	125
Scattering, Mobile services, GPRS, SIM, information in SIM, Cellular, Architecture,	
Adaptive equalization,PHP,subsystems of GSM	126
Frequency in GSM,channel GSM,types of handoffs,beacon,Encapsulation And	127

Decapsulation, interfaces GSM, standards 3G, 4G mean, 4G services, 4G vs 3G	
4G voice calls, Wi-Fi router and 4G, HSPA+ or 3.5G	127
Objective Questions	127-129
Chapter: 6. Radio Frequency	130-132
Questions and Answers	130-132
PCB,band,gain,amplifier,Insertion loss,Thermal,relation dB and Signal,	130-132
octave,decade,Skin	130
VSWR,impedance,polarization,amplifier,curve,911point,saturation point,Filters	131
Superheterodyne, VCO, PLLs	132
Chapter : 7. Teletraffic	133-137
Introduction	133-137
Teletraffic,purpose	133
Model	134
Little's formula, classification, Call rates	135
Streams,analysis,Markov process	136
Pure death, Pure birth process	137
Chapter: 8. Emerging Wireless Technologies and Applications	138-142
Introduction	138-142
Ad hoc networks,Problems	138
Mobile ad hoc networks (MANET), Problems, Applications	138-139
Wireless sensor networks (WSN), Application	139-140
Free Space Optics (FSO), Application, Deployment, Challenges	141
Cooperative Communication Wireless, Benefits, Application	141-142
Cognitive Radio,challenges	142
Software	143-284
301twai e	143-20-
Chapter: 9. C programming	144-193
Examples	144-161
Perfect numbers	144
Prime numbers, odd and even numbers	145
Palindrome number, Fibonacci series	146
Factorial number, number reverse	147
Sum of digit, power number	148
Add two numbers without using addition operator	148
Prime factor,NCR factor	149
Swap two numbers in c without using third variable	150
Split number into digits, Count the number of digits	151
LCM two numbers,GCD two numbers	152
Decimal to binary	153
Binary to decimal, decimal to hexadecimal	154
Characters sorting of a string, reverse a string	155

Sum of series 1 + 2 + + n,sum of series 1^3 + 2^3 + + n^3 Find largest and smallest number	
Bubble sort,concatenation two string using pointer	
Linear search,binary search	
Takes password from user,Palindrome without using string function	
Programming Test	
Chapter : 10. Object Oriented ProgrammingIntroduction	
OOP,Encapsulation,Class,Object,Access-specifier	
Constructor,Destructor,Copy constructors,Array of objects	
Inheritance	
Polymorphisms,Overloading,Abstract classes	
Virtual functions overriding, Exceptions, Template	
Multi-threaded programming	
Questions and Answers	
OOPS,basic concepts,class,object,Encapsulation,Polymorphism,	
Inheritance,manipulators,constructor	199
Destructor,Inline,virtual,friend,overloading function,operator overloading	200
Abstract class, finalize method, types of arguments, super keyword, method	
Overriding,interface,exception handling,tokens	201
Overloading and overriding, class vs object, abstraction, access, sealed modifiers	
Base method, new and override, constructors	
Early and late binding, this' pointer, structure Vs class, default access, pure virtua	al,
Dynamic or run time polymorphism, parameter & copy constructor	203
Base,sub,super class,static,dynamic binding,overloading,reuse mechanism,	
Necessary information	
Objective Questions	204
Chapter: 11. Data Structures and Algorithms	
Introduction	_
Data structure, Sorting complexity chart	
Questions and Answers	_
Areas	218
Types of data, linear and non linear, used, prefix and postfix, efficient data,	040
8 Queens, spanning Tree	219
Stack vs Queue, stack pointer, linked lists, Binary Search Tree	220
Merge sort,B-tree,infix expressions	221
Quick sort,heap,Construct B-tree	222
Bubble sort,BST	
Towers of Hanoi,complexity Merge Heap,B-tree level	224
Objective Questions	224
Chapter: 12. Algorithm Analysis and Design	235
onapter: 12. Algorithm Analysis and Design	
Questions and AnswersBubble sort algorithm, find the maximum & minimum in an array	235

Linear search, Inserting & Delete into a Linear Array	236
Algorithm defination,problem types,Efficiency classes,algorithm	
Design, time complexity	237
Recursive call, efficiency, characteristics	238
Pseudocode, flow chart, iterative function to fine sum	239
Divide and conquer, Quick sort, Iterative binary search	240
Knapsack	240
Live node, E – node, dead node, 8–Queens, chromatic number, planar graph, NP-	
hard and Np-Complete, Knapsack problem, traveling salesperson	241
Class P and NP,NP-Hard and NP-Complete	242
Chapter: 13. Database Systems	243-271
Introduction	243-246
Database, Properties, DBMS, Transaction Mechanism	243
DML,Aggregate Functions,DML commands,key,Primary,Unique	244
Foreign, Super, Candidate, Compound, Alternate, Artificial, Natural key	245
View, Normalization 1,2,3,4,5 NF, BCNF, DKNF, Data Dictionary	246
Questions and Answers	246-250
SQL,RDBMS	246
Constraints,E-R model,Object Oriented model,DDL,VDL,SDL,DML,	
Union and Union All operator	247
Group by, types of joins, normalization, denormalization, atomicity and	
Aggregation, Data Warehousing, Data mining, database and data admin	248
Explicit and implicit lock,ACID transaction,database recovere,rollback	
And roll forward	249
SQL Query	249-250
Relational schema for SQL queries	250-260
Objective Questions	260-271
Chapter: 14. Software Engineering	272-274
Introduction	272
Questions and Answers	272-273
Aggregation, Association, Multiple Inheritances, Accidental Multiple	
Inheritances, Metadata, Constraints	272
Software,software engineering,software engineering	
And computer science	272
Software engineering and system engineering, software Process, process	
model,CASE,attributes,Model,Student Syndrome	273
model,CASE,attributes,Model,Student SyndromeObjective Questions	273-274
Chapter: 15. Operating Systems	275-284
Introduction	275-277
OperatingSystem,classified,Multi-user,Multiprocessing,Multitasking,	213-211
	275
Multithreading, Real time, Logical and Physical address, memory types, Processes Kernel, Micro-kernel, Nanokernel, Threads, Kernel Thread, Multithread Model,	270
	274
Paging,CPU SchedulingDispatcher,Deadlocks,File Naming,File system,NTFS,features of NTFS,FAT	276 277
Dispatcher, Deadiocks, inc. Maining, inc. system, MTF3, Teatures of MTF3, FAT	Z11

Questions and Answers	278-28
Basic functions OS,paging used,virtual memory,Throughput,Turnaround,	
Waiting and Response time, multi tasking, multi programming, Multithreading	278
Physical Vs logical address, swapping, DRAM	279
Dispatcher, CPU Scheduler, cache memory, Safe State and deadlock avoidance,	
Semaphore, Coffman's conditions	280
Short-long and medium-term scheduling, turnaround & response time, TLB	
System in safe, busy waiting, rendezvous, latency, transfer and seek time	281
Demand- and pre-paging, mutant	- 282
Redhat Important Directories and Commands	282-28
Hardware	- 285-3
Chapter: 16. Digital Logic Design	
Introduction	
Boolean Algebra, Boolean Postulates, Boolean Theorems	
Simplification of Logic expressions using Boolean Algebra	- 287-28
Demorgan's First & Second Law	- 290
Combinational & Integrated Circuits	291
SOP(Sum of Products)	
POS(Product of Sums)	- 293
Basic Gate, NAND & NOR gates, Universal Gates	294
Half and Full adder, Decoders	- 297
Design 3-to-8 decoder, Encoders, Multiplexers, Demultiplexer	- 298
Programmable logic array, Flip Flop, S-R & D Flip Flop	- 299
J-K & T Flip Flop, Masterslave RS NAND flip-flop	
Masterslave JK & D NAND flip-flop, Registers, 4-bit shift resister,	
4-bit ripple counter	301
Ring counter,Latch,Digital Integrated Circuits	- 302
Chapter: 17. Digital System Design	
Introduction	
Sequential circuits, Registers, Ripple Counter, Mod 10 counter Micro-operations, Vector processing	
Chapter: 18. Embedded System Design	
Introduction	
Embedded System, Importance, Characteristics	
Trends of ES,Category	
ES Architecture, Design Procedure, Coding, Tools, Testing Tools	- 307
uP Vs uC	308
Chapter: 19. Reconfigureable Computing	
	309-31
Reconfigurable computing, Why interesting, Characterizes	
DEVILES	- 510

Configuring FPGA,Uses of reconfigurable	311
Why reconfigure relevant these days, technology overview	
Hardware programming languages (Verilog)	313
Board	313
High-level synthesis languages, Algorithm acceleration	314
(SoC)/ASIC,HDL,C and Verilog	315
Advantage of HDL over Schematic based Design, Examples of HDL	316
Chapter: 20. Microprocessors and Assembly Languages	317-328 317-320
Microprocessor,8086 CPU ARCHITECTURE,BIU	
8259 interrupt diagram, Peripheral, Interfacing, Interrupts	318
8255 diagram,MULTIPROCESSOR SYSTEMS	319
Computer Instructions, Microinstruction, Microcomputer	320
Questions and Answers	
	320-324
Registers 8085,16 bit registers, flags, Stack Pointer, Program counter	320
HLT instruction, Tri-state logic, one address, interrupts, addressing modes, clock	224
frequency,RST for the TRAP,High order / Low order Register	321
Input & output,RC clock source,Quality factor,flags in 8086	
Explain 8085,Explain Internal arch. 8085	323
Machine cycles and Bus Timings	324
Assembly Programs	324-326
Factorial, data transfer to new location, reverse string, multiply 2 numbers	324
Sum of 10 numbers, find Largest No., number of times letter 'e' in string,	
Generate square wave	325
Average of 'n' integers, one's and two's complement, subtract a BCD	326
Objective Questions	327-328
Chapter : 21. Computer Architecture and Organization	329-340
Introduction	329-334
Addressing modes	329
Pipelining	330
Multiple Platters	331
RAID(Redundant Array of Independent Disks)	
DMA definition and operation	333
Virtual memory,RISC architecture	334
Questions and Answers	335-340
Develop a Microprocessor,cache memory,factors of speed CPU	
	335
Virtual address space FIFO LRU	336
Two, One, Zero address instructions	337
Infix notation to RPN, multiply two numbers by repeated	339
Ven Neumann architector, stored program	340
Chapter : 22. VLSI Design	341-34
Questions and Answers	341-348
Intrinsic and Extrinsic, CMOS, four generations IC, PMOS, MOS layers	341
MOS,Enhancement,Depletion,pinched off,manufacturing,	342

Epitaxy,lithography,fabrication,masking,etching	
Ion-Implantation, Silicon wafer, oxidation, types of CMOS, Channel-stop,	
LOCOS,SWAMI,LDD,Twin-tub	343
Insulator,SOI process	344
BiCMOS,interconnect,Silicide,Polycide,Stick diagram,bipolar technologiesThreshold,Body effect,Channel-length,Latch-up,demarcation,	345
Layout design,LVS and DRL tools	346
Instance, flat cell, primitive library, Hierarchy, MOSFETs instead of BJTs	347
Body effect,Cross-sectional of CMOS	348
Artificial Intelligence and Logic	349-353
Chapter: 23. Neural Network and Machine Intelligence	350-353
Artificial Neural Network,Model,Logical Operators	350-353 350
OR,AND,NOT,XOR Operators, Model with Function	350 351
Classification, Architecture/Topology	352
Math problem and solution	353
Chapter: 24. Pattern Recognition and Fuzzy Systems	354-355
Introduction	354-355
Pattern, Pattern recognition, Theories	354
Fuzzy logic, Fuzzy theory related, Applications	355
Chapter: 25. Artificial Intelligence	356-358
Objective Questions	356-358
Chapter: 26. Discrete Mathematics	359-362
Introduction	359
Full, Complete Binary, Extended binary tree	359
Propositional logic,Example	359-362
Chapter: 27. Theory of Computation and Compiler Design Introduction	363-364 363-364
Automata, Regular Expression, Turing Machine, Applications	363
Compiler,Six phases of Compiler	363-364
Chapter: 28. Computer Graphics	365-368
Questions and Answers	365-368
Computer graphics, features, applications, GUI, RGB	365
3D view,scan code,refreshing,Raster,resolution,Plasma panel,Aspect ratio	366
Pixel, Addressability, dot size, frame buffer, controller, output primitive,	2/7
Polygon, aliasing, antialiasing	367
Scaling, shearing, reflection, window port Vs view, Port, clipping, spline, Projection, plane	368
I OI LIGHDDINGSDINGF I OFCHONINDICTORES	500