

SYLLABUS FOR ENTRANCE EXAMINATION FOR THE POST OF
SYSTEMS ANALYST & PROGRAMMER
IN
PEPSU ROAD TRANSPORT CORPORATION

TOTAL QUESTIONS: 100

TIME ALLOWED: 2.00 HOURS

SECTION A: GENERAL (40 QUESTIONS)

General Awareness and General Knowledge: General information about the state of Punjab, Economy, Science and Technology, Current Events, History, Geography, Political Awareness/Polity, Persons in News, Places in News, Important Awards & Honours, Sports (08)

Quantitative Aptitude: Numbers, Simplification, HCF & LCM, Percentage, Average, Ratio & Proportion, Profit & Loss, Partnership, Time and Work, Time and Distance, Area and Volumes, Trigonometry, Probability, Permutations & Combinations. (10)

Reasoning Ability: Analogy / Analogous Problems, Classification, Word formation, Series, Ranking / Arrangement, Coding & Decoding, Distance and Direction, Symbol & Notation, Scheduled Day or Date, Mathematical problems, Problem Solving: Data Analysis. (10)

General Punjabi up to Matric standard (05)

General English: Comprehension, Common Errors, Sentence Improvement, Fill in the blanks, Antonyms and Synonyms, Use of Propositions, Nouns, Adverbs and Adjectives, Change of voice, Direct & Indirect speech. (07)

SECTION B: PROFESSIONAL (TOTAL: 60 QUESTIONS)

Engineering Mathematics:

Linear Algebra: Matrices, determinants, system of linear equations, eigenvalues and eigenvectors

Probability: Random variables, Uniform, normal, exponential, poisson and binomial distributions, Mean, median, mode and standard deviation, Conditional probability and Bayes theorem.

Digital Logic: Boolean algebra, Combinational and sequential circuits, Minimization, Number representations and computer arithmetic (fixed and floating point).

Computer Organization and Architecture: Machine instructions and addressing modes, ALU, data-path and control unit, Instruction pipelining, Memory hierarchy: cache, main memory and secondary storage; I/O interface (interrupt and DMA mode).

Programming and Data Structures: Assembly language and high-level language, Multiprogramming and time-sharing operating systems, Programming in C, OOPS Concepts, HTML, Core Java, Recursion, Arrays, stacks, queues, linked lists, trees, binary search trees, binary heaps, graphs.

Algorithms: Searching, sorting, hashing, Asymptotic worst case time and space complexity, Algorithm design techniques: greedy, dynamic programming and divide-and-conquer, Graph search, minimum spanning trees, shortest paths.

Compiler Design: Lexical analysis, parsing, syntax-directed translation, Runtime environments, Intermediate code generation.

Operating System: Processes, threads, inter-process communication, concurrency and synchronization, Deadlock, CPU scheduling, Memory management and virtual memory, File systems.

Databases: ER-model, Relational model: relational algebra, tuple calculus, SQL, Integrity constraints, normal forms.

Data Communication and Computer Networks: Basic concepts of data communication system, Concept of layering, LAN technologies (Ethernet), Flow and error control techniques, switching, IPv4/IPv6, routers and routing algorithms (distance vector, link state), TCP/UDP and sockets, congestion control, Application layer protocols (DNS, SMTP, POP, FTP, HTTP), Basics of Wi-Fi, Network security: authentication, basics of public key and private key cryptography, digital signatures and certificates, firewalls.

Advanced Computing:

Mobile Computing : Wireless Communication Concepts, Mobile Computing Framework, Wireless Delivery Technology & Switching methods: Radio Based Systems, Cellular Communications, Wireless packet Data Network, Satellite Networks, Very Small Aperture Terminals (VSAT), Infrared or Light Based Mobile Computing

Cloud Computing: History of Cloud Computing, Cloud Architecture, Cloud Storage, Why Cloud Computing Matters, Advantages of Cloud Computing, Disadvantages of Cloud Computing, Cloud Services. Web-Based Application, Pros and Cons of Cloud Service Development, Types of Cloud Service Development.

Green Computing: Green computing concepts and its applications.