



हेमवती नन्दन बहुगुणा गढ़वाल विश्वविद्यालय (केन्द्रीय विश्वविद्यालय)
HEMVATI NANDAN BAHUGUNA GARHWAL UNIVERSITY (A Central University)

Scheme of examination for direct recruitment to the posts of Senior System Analyst:

M.M. 100

S.N.	Test Components	
1.	Data Structures and Algorithms	Data structures: Linked list, stack, queue, priority queues, Hashing, Binary trees, Tree traversal, BST, AVL trees, Graphs-shortest paths, minimum spanning trees Algorithms: Analysis, space and time complexity, Design-greedy approach, Dynamic programming, divide and conquer, sorting and searching, complexity classes-P, NP,NP-hard, NP-complete.
2.	Theory of Computation	Regular languages and finite automata, Context-free languages and pushdown automata, recursively enumerable sets and Turing machines, Un-decidability.
3.	Operating Systems	CPU Scheduling, Deadlocks, Memory Management, Security, Virtual Memory, Threads
4.	Computer Networks	Layered architecture, LAN technologies, wireless LAN, flow and error control, routing algorithms, congestion control, TCP/UDP and sockets, IPv4, IPv6, ICMP, DNS, SMTP, POP, FTP, HTTP, MIME, Hubs, switches, routers and gateways, public key and private key cryptography, digital signature, firewalls, wireless networks, Bluetooth.
5.	Database Management System	Database Design-ER Model, Relational Model-Relational Algebra. Normalization, Integrity Constraints, SQL, Querying with SQL, PL/SQL, Transaction. Recovery, Concurrency Control
6.	Web Applications	Web Server and Web Applications basics HTML, DHTML, XML, JSON, AJAX, PHP, Java script, Java Servlets, Applets & OOP
7.	Software Engineering	System modeling, system engineering process, life cycle models, design and implementation, validation, evolution, automated, process support-software requirements, SRS, feasibility studies-elicitation and analysis-validation-management-system models, context models, behaviour models, data models, object models, object-oriented design evolution, real time software design, critical system specifications-critical system development, software testing. Software Metric, Software Maintenance.

NOTE:

1. There shall be a single Paper of Examination on OMR Sheet. All questions shall be objective (MCQs) type and carry one (01) mark each without negative marking for wrong answer.
2. Scheme of Examination and Test Components mentioned above are indicative only. Actual scheme/questions may vary.
3. The candidates appeared in the written test shall be shortlisted for appearing in the Interview in order of merit restricting the ratio 1:15 as prescribed in the CRR 2019, however, the marks scored in the written test are only for short-listing the candidates and it will have no weightage in the interview. The selection of the eligible candidate for the post will be solely based on his/her performance in the interview.

**Registrar
HNBGU**



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HEMVATI NANDAN BAHUGUNA GARHWAL UNIVERSITY (A Central University)

Scheme of examination for direct recruitment to the posts of Programmer:

M.M. 100

S.N.	Test Components	
1.	Data structures and Algorithms	Data structures: Linked list, stack, queue, priority queues, Hashing, Binary trees, Tree traversal, BST, AVL trees, Graphs-shortest paths, minimum spanning trees Algorithms: Analysis, space and time complexity, Design-greedy approach, Dynamic programming, divide and conquer, sorting and searching, complexity classes-P, NP, NP-hard, NP-complete.
2.	Set theory and statistics	Sets, relations, functions, groups, partial orders, lattices, algebraic structures, mathematical induction, The principle of inclusion-Exclusion, Probability theory: Sample spaces, Events and probability, Discrete Probability: Union, Intersection and Compliment of events, Conditional probability, Bayer's theorem, Linear correlation coefficient, Linear regression, Non-linear regression, Multiple correlation and Multiple regression, Theory of sampling and population.
3.	Theory of Computation	Regular languages and finite automata, Context-free languages and pushdown automata, recursively enumerable sets and Turing machines, Un-decidability.
4.	Operating Systems	CPU Scheduling, Deadlocks, Memory Management, Security, Virtual Memory, Threads
5.	Computer Networks	Layered architecture, LAN technologies, wireless LAN, flow and error control, routing algorithms, congestion control, TCP/UDP and sockets, IPv4, IPv6, ICMP, DNS, SMTP, POP, FTP, HTTP, MIME, Hubs, switches, routers and gateways, public key and private key cryptography, digital signature, firewalls, wireless networks, Bluetooth.
6.	Database Management System	Database Design – ER Model, Relational Model – Relational Algebra. Normalization, Integrity Constraints, SQL, Querying with SQL, PL/SQL, Transaction. Recovery, Concurrency Control
7.	Programming Concepts in C & C++	Operators and expressions, control statements, storage structures, functions, arrays, strings, structures, pointers and dynamic memory management, file handling, Object Oriented Programming in C++
8.	Web Applications	Web Server and Web Applications basics HTML, DHTML, XML, JSON, AJAX, PHP, Java script, Java Servlets, Applets & OOP

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