

**JAGAT GURU NANAK DEV**  
**PUNJAB STATE OPEN UNIVERSITY PATIALA**  
(Established by Act No.19 of 2019 of Legislature of the State of Punjab)

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**Duration: 60 minutes**

**Max. Marks: 60**

**Syllabus for the Post of System Administrator**

**Design/Configuration/Installation/Management/Maintenance/Troubleshooting (30 marks)**

- Installation configuration and management of various operating systems, Web servers, database servers, Mail servers, storage hardware technologies (disk, tape, and SAN systems) and backup methodologies including database backups, Data backup and restore procedures. System Security (e.g. intrusion detection systems)
- Troubleshooting Routers, Switches, Firewall, Wireless access points (AP), Wireless manager, Network Access control (NAC) etc., Networking protocols at all layers (Application, Transport, Network, and Link). LAN, MAN & WAN architectures. Concept of WAN subnet. Overview of existing networks. OSI Reference Model Architecture, TCP/IP Model, IP Addressing, Internet Control Protocols.
- Design and deployment of wired/wireless network, SDN, VxLAN, VPN, EVPN, SFlow, LAN and WiFi, Enterprise wifi authentication, Next generation L2, L3 campus network design. Familiarity with current 802.11xx (WiFi) standards
- Setting-up of HA, load balancing, clustering, Virtualized software environments, storage (NAS and SAN). Basic Server Architectures. Network Security: Firewalls and their components; Encryption techniques and examples of encryption standards. Remote Network Management.

**Software/Programming Technologies (15 marks)**

- Introduction to PHP/ASP.NET/C#: Datatypes, Function, Array, Operators, File handling, working with forms, Session and Cookie, Database connectivity, Exception Handling, Basic knowledge of frameworks (CodeIgniter, Laravel, ASP.NET Core MVC). ASP.NET Web Forms
- HTML5, CSS3, Bootstrap, WordPress, jQuery, JSON, AJAX, JavaScript, Static and Dynamic Web Development
- System design, Software design concepts, Security concerns in software development

**Database Management Systems (DBMS):- (15 marks)**

Database- MySQL, SQL Server

Keys, E-R Model, Normalization – 1NF to 5NF; Aggregate functions, Nested Sub queries, Views, Joined Relations, Transaction- ACID properties; Concurrency Control, triggers, stored procedures, Data Models, SQL Commands, Data Sorting, Database Design, SQL Function, Operators, Clauses, Relational Databases and Integrity Constraints.