

TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2082 Chaitra

Exam.	Regular		
Level	BE	Full Marks	80
Programme	BCT	Pass Marks	32
Year / Part	IV/ II	Time	3 hrs.

Subject: Internet and Intranet (CT 754)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt **All** questions.
- ✓ The figures in the margin indicate **Full Marks**.
- ✓ Assume suitable data if necessary.

1. Why is the IP address distribution designed to be distributed in hierarchy from IANA to ISP level? Discuss the tired ISP network infrastructure with their peering types. [3+5]
2. Discuss the importance of IPv6 in terms of routing and packet fragmentation by comparing it with IPv4. How is SLAAC implemented? Explain with example. [4+6]
3. Why are WYS/WYG tools useful for non-programmers but limited for complex web applications? How does AJAX reduce server load and improve user experience? Why does a browser require different rendering techniques for text, HTML, GIF, and JPEG files? [3+3+2]
4. What is virtual hosting? List the types of virtual hosting. Write down the major steps while implementing name based virtual hosting in the web server. [3+2+5]
5. Suppose you are assigned as an ICT Infrastructure Consultant for Tribhuvan University (TU). TU has acquired an IPv6 address block 2040:7D00::/48 from APNIC for its campus-wide intranet. The campus consists of the blocks are Academic Block, Examination Block, Research Block, Hostel Block. A central server room is established inside the Academic Block. Each block contains 35 wired computers and 14 wireless devices, while the Hostel Block additionally supports student Wi-Fi access for 48 users. The server room hosts the services: DNS Server, Email Server, Web Server, Database Server, FTP Server. You are required to: Design a secure, redundant, and loop-free intranet network, clearly describing the logical and physical network architecture. Perform IPv6 addressing and subnet allocation using the given address block for all blocks and the server room. Recommend appropriate networking devices and tools, including: L1, L2, L3 devices, Firewalls and security appliances, Wireless Access Points (WAP). Specify suitable physical transmission media and inter-block links for the intranet network and prepare a Bill of Quantities (BOQ) covering major networking and security equipment. [12]
6. What is VoIP? Explain its operation with its architectural components for SIP. Explain the need of IP interconnection its effect in digital economy. [6+4]
7. What is internet exchange point (IXP)? Why local IXP is needed for the country? Why are packet clearinghouses important in Internet resource management? Explain. [3+3+4]
8. Write short notes on: (Any Three) [3×4]
 - a) RADIUS
 - b) VPN and IPSec
 - c) Cloud Computing
 - d) Major stakeholders of internet ecosystem and their roles

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Subject: - Internet and Intranet (CT 754)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
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1. Discuss in brief the components of Internet Ecosystem. Explain the importance of Submarine Cable, Teleports applicable for landlocked countries such as Nepal. [4+6]
2. What is SLAAC in IPv6? If MAC address of a computer is 40:1A:25:B2:25:5C, how lowest order 64 bit of unicast address is assigned using EUI-64? Describe different streams of Internet RFC. [3+4+3]
3. HTTP is stateless. Explain. What are different types of FTP? Describe how PGP maintains confidentiality of any messages. [4+4+2]
4. Do AJAX applications always deliver a better experience than traditional Web Application? Justify. Differentiate Authentication and Authorization based on HTTP and Cookies. [8]
5. How can a reverse proxy be configured to work as a load balancer for a group of servers? How does CARP help reduce bandwidth consumption and eliminate duplication compared to the Internet Cache Protocol (ICP)? [4+4]
6. Describe the guidelines for intranet implementation. What are the advantages of using CMS in intranet site development? [8]
7. What are the roles and purpose of PCH? Explain the working of VoIP in terms of SIP and compare it with other related protocol. [3+5]
8. Design a network for a manufacturing company with six departments -Sales, Admin, Production, Supply, ICT and Finance. The departments are in different floors. Admin, Finance and ICT department has 12 computers in their department while Sales, Supply and Production department has 25 computers in their departments. Each department have WAP connected. ICT department has servers like DHCP, FTP and web server. The main internet router will be connected to upstream provider. Propose appropriate equipment (L₁, L₂ and L₃) and physical wires for the network design with BoQ details. [12]
9. Write short notes on: (Any Two) [2×3]
 - a) SMTP agents
 - b) CGI
 - c) xDSL
 - d) HTTP2.0 and comparison with QUIC

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Subject: - Internet and Intranet (CT 754)

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- ✓ Attempt **All** questions.
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1. Why do we need IANA? What are the roles of RIR, NIR and LIR? Explain how IANA manages IPV6. [2+6+2]
2. Provide the comparison of IPv6 header structure with IPv4 header? If a Machine's MAC address is 00:23:12:B2:C1:34, then find the following IPv6 address. [4+6]
 - a) Link local address
 - b) Unique Local Address (ULA)
 - c) Solicited-node Multicast address
 - d) Global unicast address with prefix 2003:D30:111::/48
3. Discuss about the different components used in Email system. How does PGP help for secure email system? Compare between HTTP1.0 and HTTP2.0. [4+4+2]
4. What is Virtual Hosting? List the types of virtual Hosting. Write down the major steps while configuring IP based virtual hosting in an Apache server. [2+6]
5. How does the FTP works? What are the differences between XML and HTML? Why to use AJAX? Explain. [4+2+2]
6. How does CARP technique help for load balancing? Explain with suitable example for non-redundant proxy load balancing. [4+4]
7. Propose a network design architecture which has the following departments with requirement as follows: [12]
 - Head Office:
 - Marketing (20 computers)
 - IT (20 computers)
 - Sales (45 computers)
 - Accounting (30 computers)
 - Server Room

The Server Room contains DNS, DHCP, FTP and web server and a main internet router with firewall which will be connected to upstream provider.

The branch office which is on different location has the same departmental requirements with the same number of computers. However, each department in the head office requires VoIP communication.

Design a redundant/loop free intranet physical and logical network for above requirements. The design should include appropriate tools (L1, L2, L3, Firewalls), physical wires, patch cords, wireless access points, and servers.
8. How does ISPs perform IP interconnection? Explain the legal and economic perspectives of VoIP and IP interconnection. [4+4]
9. Write short notes on:(Any Two) [3+3]
 - a) Grid Computing
 - b) Roles of Packet Clearing House
 - c) Data Center Setup Requirements
 - d) SLAAC

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Exam.	Back	
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Subject: - Internet and Intranet (CT 754)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
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- ✓ Assume suitable data if necessary.

1. Discuss the need and working of Domain Name system (DNS) over the internet. Write down the roles and responsibilities of Internet Registries under IANA. [4+4]
2. Explain IPv6 Global unicast, Link local, Site local and Multicast address with an example and its scope. [10]
3. Write the tasks of each e-Mail agent. Explain PGP services for the e-Mail Security. [4+6]
4. What is CGI? How does CGI works? Explain. What are the pros and cons of AJAX? [2+4+4]
5. What is Content Distribution Network (CDN)? List the issues of redundant proxy load balancing and provide the benefits of non-redundant proxy load balancing with its protocol operation including example. [2+8]
6. A Company in Kathmandu has four sub companies under which each has 24 computers connected to it. IT department is located at Balkhu, one is at Singha Durbar, one in head office and one is 500m away from head office. Each computer has redundant network connection via dual ports CAT6 information outlets connected directly from network server room which is at the head office. Prepare a Bill of Quantity (BOQ) with necessary network resources required in quality for the complete networking. Your BOQ should include estimate of information outlet, CAT6 cables, Patch cords, Patch panel, Routers and Switch. Include logical IP addressing in each computer in each location with address assigned by DHCP Server (in server room) which has one dedicated IP address for this company. Assume IP address of your own. [12]
7. Define and compare Internet and Intranet based on its advantages and drawbacks. How does CMS help in the intranet? [5+6]
8. Write Short Notes on:(Any Three) [3×3]
 - a) Cloud Computing and Data Center Operation
 - b) MPLS Operation
 - c) SLAAC for IPv6
 - d) SIP operation for VoIP

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2080 Chaitra

Exam.	Regular		
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Year / Part	IV / II	Time	3 hrs.

Subject: - Internet and Intranet (CT 754)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Necessary figures is attached herewith.
- ✓ Assume suitable data if necessary.

1. What are the major components/organization of internet ecosystem? Is internet backbone cabling - Submarine Cable applicable for the landlocked country Nepal? [4+4]
2. Draw the IPv6 header structure and compare this header with IPv4 header in terms of Routing and Quality of Service. If a Machine's MAC address is 02:1A:23:B2:45:A4, then Find the following IPv6 address. [4+6]
 - a) 64-bit Interface ID
 - b) Link local
 - c) Unique Local address
 - d) Solicited Node Multicast Address
3. What is ISP tiered architecture? How to implement N-Tier architecture? Explain. Describe PGP services for secure email communication. [4+6]
4. List the virtual hosting approaches for the Web server services. Critically Compare HTTP1.1 Vs HTTP2.0 Vs QUIC protocol for internet communication. [3+3.5+3.5]
5. What are the problems of DNS round robin? How CARP works for load balancing? Describe the use of RADIUS server. [2+5+3]
6. Consider Figure 1 (Floor Planning), perform the following [3+4+5]
 - a) Provide Logical IPv6 Address block to cover all the wired and wireless networking devices and servers/routers etc.
 - b) Develop the Bill of Quantity (BoQ) for all the associated equipment listed in the figure in addition with network rack, cable managers, CAT 6 cable trunk, dual port information outlet etc for complete and secure intranet deployment.
 - c) Draw the logical network deployment diagram showing the connections of server, routers, and firewalls up to wired and wireless stations.
7. Explain the VoIP operation with its types. Critically explain the legal issues and economic aspects of IP interconnection. [5+3+3]
8. Write Short Notes on (Any Three) [3×3]
 - a) Unified Messaging System
 - b) RFC and their types
 - c) Roles Packet of Clearing House and Data Center Setup Requirement
 - d) xDSL

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Exam.	Back		
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Subject: - Internet and Intranet (CT 754)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
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1. Discuss the need of Domain Name System (DNS) in an Internet / Intranet environment. Also explain the services provided by DNS. [4+6]
2. Consider sending a 6000 bytes datagram into a link. How many fragments are generated and how the packets are transferred from source to destination in case of IPV6? Assume MTU between link by yourself and explain your answer appropriate figure. [10]
3. Explain what conditional GET is and also explain the role of conditional GET in web browsing? What are the essential components of 3-tier client/server architecture? [4+4]
4. Explain different type of virtual hosting with an example. Write down the major steps while configuring named based virtual hosting. [3+5]
5. Describe how content distribution network reduces the delay in receiving a requested object. Will content distribution reduces the delay for all objects requested by a user? Explain your answer with appropriate figure. [8+2]
6. Design the redundant network for XYZ Company with 5 departments including ISP which are around 400 m a part from each other. Four departments have 2 labs each with 24 computers in each room. ISP contains server farm with server like DNS, DHCP, Email, FTP, NMS and webserver and the main internet routers which will be connected to upstream provider. Propose appropriate equipment (L1, L2, L3 and L5), physical wires, IPs needed and security devices needed for the network design. [10]
7. Define the terms internet, intranet extranet and explain the role each plays in e-business. [8]
8. How internet should evolve to support better multimedia? Explain different classes of multimedia application with suitable example. [4+6]
9. Write short notes on: [2×3]
 - a) Cookies
 - b) AJAX

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1. Explain with internet hierarchy about how our country possible to access the internet? Provide your clarification that satellite link can be used as Internet backbone? Is it possible that Ethernet cable can be used as internet backbone and why? [3+3+2]
2. List the advanced features of IPV6. How differently IP datagram fragmentation is carried out in IPV4 and IPV6. [2+8]
3. What is n-tier architecture? Explain. Describe about the different headers used in E-mail Message protocol.
4. If you were a system administrator than how do you maintain security in the system? Is the persistent connection reduced the congestion and how? [3+3]
5. Explain the concept of Proxy load balancing. Firewalls and Virtual Private Network in detail along with illustrative diagrams. [4+3+3]
6. Suppose, you are hiring for network consultant by IOE network management in Chitwan Engineering Campus, Rampur. IOE purchased a IP 240:4206::/32 from APNIC for college. Design the redundant/loop free intranet logical and physical network for Chitwan College which has proposed for six programs in bachelor level three head of departments (DoEC, DoCA and DoEM) block and a server room. Server room contains DNS, Email, WEB, and Database servers and each department has 40 computers with wireless devices. Propose appropriate tools (L1,L2,L3, Firewalls, WAP), physical links for intranet network and also make the BOQ. [12]
7. What is VPN and tunneling? How do tunneling works? List out different tunneling protocols and discuss their merits and demerits. [2+4+4]
8. What is VoLP? How has VoLP changed the mechanism of communication in today's context? Discuss. Describe the different types of cloud services with example. [5+5]
9. Write short notes on: (Any Two) [2×2]
 - a) WYSIWYG
 - b) Cookies
 - c) N-Tired client/server architecture

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1. How does the IANA help for internet management in this world? Explain with some example. Compare the optical backbone with marine cables. [4+4]
2. Explain along with a well illustrated diagram the difference between IPV4 and IPV6 header in terms of routing and fragmentation. [8]
3. HTTP is stateless. Justify this statement. What are the features of HTTP 2.0? [4+4]
4. Do Ajax applications always deliver a better experience than traditional Web Applications? Explain in brief. Explain the superior features of Laravel framework. [4+4]
5. How does CARP method help for load balancing? Explain with a suitable example. How can a firewall protect the IT infrastructure inside your organization? [6+4]
6. Differentiate between the internet, intranet and extranet on the basis of benefits and drawbacks. How does CMS help in intranet system development? [5+4]
7. What do you think is the most challenging part of being a VOIP? Explain in brief. Compare H323 with SIP for VOIP communication. [4+4]
8. Suppose Nepal Government purchased an IP 180.5.6.32/16 from APNIC and you have a chance to be an IT consultant for network management in Kathmandu Metropolitan city. Design the redundant/loop free intranet logical and physical network for Kathmandu Metropolitan city which has proposed for six sections with two departments (Administration and Operational) block and a Server room. Server room contains DNS, Email, WEB and Database servers and each department has 10 computers with wireless devices. Propose appropriate tools (L1, L2, L3, Firewalls, WAP), physical links for intranet network and also prepare the BOQ. [12]
9. Write short notes on: (Any Three) [3×3]
 - a) Packet Clearing House
 - b) Browser as a rendering engine
 - c) FTP
 - d) Quic protocol

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Year / Part	IV / II	Time	3 hrs.

Subject: - Internet and Intranet (CT 754)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
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1. How is internet governed? Discuss the role of IANA in regulation of the internet. Explain the IPV6 Address distribution plan of IANA. [5+5]
2. If "We Have Enough Addresses Today". Then, why should we bother implementing Ipv6? Differentiate the fragmentation process among the IPv4 and IPv6 address. Suppose a data packet has 4000 bytes and MTU of 1500 bytes, find the no of fragments and packet size of each fragment for IPv4. [3+3+4]
3. What is PGP? Explain the operation of PGP for authentication and confidentiality with necessary diagrams. [2+8]
4. What is web server? How is web server different to web site? Discuss in brief. What does different HTTP status codes signify? Explain with few common codes. [5+5]
5. To manager server for load balancing, which technique will you use and how? Write down the steps to configure the IP based and Name based virtual hosting in apache server. [4+4]
6. Provide IT infrastructure details for a government school with 4 departments including ISP department which are around 500 meters apart from each other. Three departments have 5 labs each with around 24 computers in each room. ISP contains server farm with server like DNS, DHCP, E-mail, FTP and webserver and the main internet router which will be connected to upstream provider. Propose appropriate equipment (L1, L2 and L3) and physical wires for the network design. [12]
7. What is VoIP and IP interconnection? Explain the features of STP. [2+4+4]
8. How does RFC help in the development and distribution of internet? What are the CDNs based approach on the content cached and refreshed? Explain with clean diagram. [3+3]
9. Write short notes on: (Any Two) [2×2]
 - a) AJAX
 - b) Digital Business vs Internet Commerce
 - c) Group communication

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Subject: - Internet and Intranet (CT 754)

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1. With proper diagram, explain the hierarchy by which IANA manages the internet number resources to ensure global interoperability. [3+7]
2. What are the differences between IPv4 and IPv6 addressing? Write in brief with header structure of both. [4+6]
3. With necessary diagrams, explain in detail how PGP ensures the security of email messages. [10]
4. Explain what conditional GET is and also explain the role of conditional GET in web browsing? What are the essential components of 3-tier client/server architecture? [4+4]
5. Suggest a suitable proxy array load balancing mechanism for the large ISP. With appropriate diagram, describe the functionalities that RADIUS server provides to organizations and ISPs. [4+6]
6. What are the guidelines to design proper network system? Considering these factors, propose a redundant network design architecture in hierarchical form with a proper intranet design for a college having four departments namely Civil (20 PCs), Electronics (20 PCs), Computer (45 PCs) and IT (30 PCs). Each department has managed own DHCP server. IT department has managed FTP server, HTTP server and DNS server as well. Use suitable L1, L2 and L3 devices, physical wires, patch cords, patch panels and wireless access points. Also prepare proper specification sheet. [2+6+2]
7. Explain different type of virtual hosting with example. Write down the major steps while configuring the name based virtual hosting. [4+6]
8. Write short notes on: (Any three) [3×4]
 - a) Cookies
 - b) PHP
 - c) IP interconnection
 - d) xDSL

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Subject: - Internet and Intranet (CT 754)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
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1. Explain ISPs and how they are interconnected and also explain distinguishing feature of a tier 1, tier 2 and tier 3 ISPs. [4+6]
2. Describe the IPV6 header to justify the statement "IPV6 have better header format to support real time applications like: video conferencing". Describe IP datagram fragmentation process in IPV6. [5+5]
3. What do you think are the features that a web browser needs to incorporate? Compare and contrast among HTTP, SMTP and PGP. [8]
4. Explain different type of virtual hosting with an example. Write down the major steps while configuring named based virtual hosting. [3+5]
5. Describe how content distribution network reduces the delay in receiving a requested object. Will content distribution reduces the delay for all objects requested by a user? Explain your answer with appropriate figure. [8+2]
6. Design the redundant network for IOE Pulchowk campus with 4 departments including ISP which are around 300m apart from each other. Three departments have 4 labs each with 24 computers in each room. ISP contains server farm with server like DNS, DHCP, Email, FTP, NMS and webserver and the main internet router which will be connected to upstream provider. Propose appropriate equipment (L1, L2 and L3) and physical wires for the network design. [10]
7. Define the terms internet, intranet and extranet and explain the role each plays in e-business. [8]
8. What is an electronic payment system? What are the advantages of having e-commerce over extranets? What are its types and advantages? [2+2+6]
9. Write short notes on: (Any Two) [2×3]
 - a) WYSIWYG
 - b) DHCP
 - c) AJAX

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Subject: - Internet and Intranet (CT754)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
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1. Discuss the roles of IANA. Explain ISP and how do they interconnect? Show the interconnection of tier1, tier2 and tier3 ISP. [3+2+3]
2. Describe IPv4 header structure with suitable diagram. Describe internet RFC along with its streams. [6+4]
3. With regards to HTTP protocol, write the difference between persistent and Non Persistent connection. Why HTTPS is not used for all web traffic? [5+3]
4. Why do you need AJAX programming? Explain DOM tree and Rendering tree used for the rendering of a web page. [2+8]
5. What is RADIUS server used for? Explain configuration of RADIUS server along with proper network architecture. How CARP works? [5+3]
6. Design the redundant/loop free intranet for a Bank having 5 branches in different locations with a central internet department. Internet department contain DNS, DHCP, Email, FTP, Webserver and Database server. The internet department has been implemented the security mechanisms like firewall and IDS and VPN. Each branches have 50 computers, each is provided internet facility. The Bank has purchased a network of 240A0:4206::/32 from APNIC. Propose appropriate equipment (L1, L2 and L3) and physical links for the intranet design with proper IP addresses allocation. [10]
7. Compare internet, intranet and extranet in terms of their benefits and drawbacks. Briefly explain IPSec components and its features. [6+4]
8. Write short notes on: [2×4]
 - a) Universal Internet Browsing
 - b) Virtual Web Hosting
9. What is VOIP? Describe briefly SaaS, PaaS and IaaS as service models of cloud. [2+6]

Exam.	Regular		
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Subject: - Internet / Intranet Technology (CT754)

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1. ISPs and how they are interconnected and also explain distinguishing feature of a ISP for 3 ISPs. [4+6]
2. List the advanced features of IPv6. Describe IPv6 header format with suitable diagram. Describe internet RFC along with its streams. [10]
3. What is PGP? Explain the operation of PGP for authentication and confidentiality with necessary diagrams. [10]
4. Explain different types of web virtual hosting mechanism with an example. Write down the major steps while configuring named based virtual hosting. [5+5]
5. Explain RADIUS server with its functions. What is cookie? What are the types of cookie? Explain. [5+5]
6. Design the redundant/loop free network for 3 stories XYZ insurance company having 5 departments including Internet department. Internet department contain serve farm with server links DNS, DHCP, Email, FTP, insurance application server and webserver. The main internet routers which will be connected to multiple upstream provider. Beside Internet department, other 4 departments have 20 computers each. Propose appropriate equipment (L1, L2 and L3) and physical wires for the network design. [12]
7. How internet should evolve to support better multimedia? Explain different classes of multimedia application with suitable example? [4+6]
8. Write short notes on: (any two) [4+4]
 - i) WYSIWYG authoring tool
 - ii) HTTP
 - iii) FTP
 - iv) Proxy land balancing

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Subject: - Internet / Intranet Technology (CT754)

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- ✓ Attempt All questions.
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1. What is internet backbone network? Explain the hierarchical structure for management of internet number resources? [2+8]
2. Explain Global Unicast, Link Local, Site local and Multicast address with an examples and its scope. [10]
3. What are the features that a web browser need to incorporate? Compare and contrast among POP, SMTP and IMAP. [5+5]
4. How does CGI work? Compare JSP and ASP. What do you prefer to use AJAX? [10]
5. Explain different types of proxy array load balancing mechanism and also explain in detail which mechanism is appropriate for a big ISP. [4+6]
6. DOECE has four computer labs each having 24 computers. One lab is located as ground floor of library building, one is at ground floor of CIT building, one as first floor of DOECE building and one research lab is at third floor of ICT building. Each computer has redundant network connection via dual ports CAT6 information outlet connected directly from Network Server room which is at first floor of CIT building. Prepare a Bill of Quantity (BOQ) with necessary network resources required in quality for the complete networking. Your BOQ should include estimation of information outlet (faceplate), wireless AP, CAT6 cables, Patch cords, 24 ports patch panel and 24port switches. Include logical IP addressing in each computers in each labs with address assigned by DHCP Server (in Server room) which has one dedicated IP address for DOECE building. Assume IP address as your own. [12]
7. What are VoIP and iP interconnection? Explain the concept of cloud and grid computing in brief. [2+2+6]
8. Write short notes on: (any two) [4+4]
 - i) WYS/WYG
 - ii) Web virtual Hosting
 - iii) PGO

Exam.	Regular		
Level	BE	Full Marks	80
Programme	BCT	Pass Marks	32
Year / Part	IV / II	Time	3 hrs.

Subject: -Internet and Intranet (CT754)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.

1. What is the application of TCP/IP? Compare IPv4 and IPv6 on the basis of routing. [4+4]
2. Define client/server architecture with its benefits and drawbacks. Discuss the FTP client/server operation with its types. [4+6]
3. What are the guidelines to design proper network system? You are asked to design a Network System for the organization which has 2 different buildings at less than 500 meter distance. The main building is 5-storey building which has Network/Server room in third floor. There are 3 computer training labs in 1st, 2nd and 3rd floor consisting of 20 computers at each lab. You need to provide internet to all lab computers as well as office computers for staffs. Connect two buildings from Fiber network. You can suggest multiple numbers of Wireless AP and/or Wired Network systems for your requirement. Prepare the required technical documents and suggest a network for the organization. [2+10]
4. How are the ISPS interconnected? Explain distinguishing feature of a tier-1, tier 2 and tier 3 ISPs. [4+6]
5. Explain different type of virtual hosting with an example. Write down the major steps while configuring named based virtual hosting. [4+6]
6. Describe how content distribution network reduces the delay in receiving a requested object. Will content distribution reduce the delay for all objects requested by a user? Explain your answer with appropriate figure. [8+2]
7. What is VOIP and IP Interconnection? Discuss basic operation of VOIP. [8]
8. Write short notes on: (any three) [3×4]
 - a) Content Filtering
 - b) AJAX
 - c) HTTP
 - d) Cookies

Exam.	New Batch (2066 & Later Batch)		
Level	BE	Full Marks	80
Programme	BCT	Pass Marks	32
Year / Part	IV / II	Time	3 hrs.

Subject: - Internet and Intranet (CT754)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.

1. Define and compare Internet and Intranet. Discuss the need and use of Domain Name system (DNS) over the internet. [4+4]
2. Compare the IP datagram fragmentation process in IPv4 and IPv6 with an example. [10]
3. Explain the role of conditional GET in web browsing? What are the essential components of 3-tier client/server architecture? [4+4]
4. How HTTP works? Explain different methods of HTTP. Write the concept of virtual hosting. [3+3+4]
5. What is intranet implementation? Explain the procedure to follow for intranet implementation. Write the concept of Virtual Private Network (VPN). [2+4+4]
6. Design the redundant network for IOE Pulchowk campus with 4 departments including ISP department which are around 400m apart from each other. Three departments have 5 labs each with around 24 computers in each room. ISP contains server farm with server like DNS, DHCP, Email, FTP and webserver and the main internet router which will be connected to upstream provider. Propose appropriate equipment (L1, L2 and L3) and physical wires for the network design. [12]
7. Explain the Inter-relationship of e-commerce with internet. Explain the concept of cloud and grid computing in brief. [5+5]
8. Write short notes on: (Any three) [3×4]
 - a) Proxy load balancing
 - b) xDSL
 - c) Internet ecosystem
 - d) E-mail agents and third functions

Exam.	Regular		
Level	BE	Full Marks	80
Programme	BCT	Pass Marks	32
Year / Part	IV / II	Time	3 hrs.

Subject: - Internet and Intranet (CT754)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
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- ✓ Assume suitable data if necessary.

1. What is internet backbone network? Explain the major components/organization of internet ecosystem. [2+8]
2. Define internet RFC. How differently IP datagram fragmentation is carried out in IPv4 and IPv6? Explain each with example. [2+8]
3. What do you mean by SMTP? Explain the types of FTP and its working principle. [2+8]
4. How are XML and JAVA SCRIPTS used together to develop client-side web applications? [2+8]
5. NITC building had 4 research labs each having 24 computers. All labs are located at the 1st floor. Each computer is to be connected in the network from NCR located at 2nd floor. Prepare a bill of quality (BoQ) with necessary network resources required for complete networking. The BoQ must include estimation of all network resources required. [12]
6. Compare intranet and internet in terms of benefits and drawbacks. Discuss in detail about firewall and content filtering. [4+6]
7. What do you mean by IRC and FoIP? Discuss in detail about the building blocks of e-commerce. [4+6]
8. Write short notes on: [4+4]
 - a) AJAX
 - b) Virtual web hosting

Exam.	New Back (2066 & Later Batch)		
Level	BE	Full Marks	80
Programme	BCT	Pass Marks	32
Year / Part	IV / II	Time	3 hrs.

Subject: - Internet and Intranet (CT754)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
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1. What are teleports? Explain the hierarchical structure for management of internet number resources. [2+8]
2. How has RFC helped in the development and distribution of internet? Write about IPV6 addressing in detail. [4+6]
3. What do you think are the features that a web browser need to incorporate? Compare and contrast among POP, SMTP and IMAP. [5+5]
4. What is WWW? Define HTTP header with its connection type. [2+8]
5. What are the factors to be considered for a well designed network? Considering these factors, propose a redundant network design architecture in hierarchical form for a bank having four departments namely Human Resources (20 PCs), Marketing (20 PCs), Finance (45 PCs) and IT (30PCs). Each department has managed own DHCP server. IT department has managed FTP server, HTTP server and DNS server as well. Use suitable L1, L2 and L3 devices, physical wires, patch cords, patch panels and wireless access points. [12]
6. What is RADIUS? Describe proxy load balancing with respect to CARP. [2+8]
7. Discuss the different XDSL technologies. [10]
8. Write short notes on: [4+4]
 - i) XML
 - ii) DHCP

Exam.	New Back (2066 & Later Batch)		
Level	BE	Full Marks	80
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Subject: - Internet and Intranet (CT754)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.

1. What are the internet resources? Which organization is responsible for distributing internet resources? Explain with their hierarchies and necessary diagrams. [2+8]
2. How do you verify that IPv6 has simplified header format? Explain by comparing with IPv4. [4+6]
3. How e-mail works? Discuss with the functions of different e-mail agents involved. [10]
4. What is HTTP? Explain how this protocol works? [2+8]
5. What is CDN? How Proxy CDN works? Explain with example. [2+8]
6. The IOE CIT has 4 labs each having 24 computers. All labs are located at ground floor. Each computer is to be connected in the network from Network Control Room (NCR) located at first floor. Redundant network connection is provided to each computer in the labs. The 48 ports gigabit switches and 24 ports patch panels are to be mounted at a 42 U server rack at NCR with necessary cable managers to provide CAT6 connection to each computer. Design the network with structured cabling and prepare Bill of Quantity (BoQ) with summary specifications for CAT6 cables, network faceplate, patch cords, patch panels, switches and wireless AP. [12]
7. What is an electronic payment system? What are the advantages of having e-commerce over extranets? What are its types and advantages? [2+2+6]
8. Write short notes on: [4+4]
 - a) Role of helper applications in web programming
 - b) Types of firewalls

Exam.	Regular / Back		
Level	BE	Full Marks	80
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Year / Part	IV / II	Time	3 hrs.

Subject: - Internet and Intranet (CT754)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.

1. What are the functionalities of IANA and ICANN? Explain the role of IP address for internet access. [10]
2. Compare the IP datagram fragmentation process in IPv4 and IPv6 with an example. [10]
3. What do you mean by multiprotocol support? Explain how MPLS works? [2+8]
4. What is virtual hosting? Explain the HTTP connections with respect to web access. [2+8]
5. Define content and content filtering. How do you perform content filtering? Discuss the differences between packet filtering and content filtering. [2+4+4]
6. IOE ICT building has six computer labs each having 30 computers. Two labs are located at 2nd floor and four labs are located at 3rd floor. Each computer has redundant network connection via dual ports CAT6 information outlet connected directly from Network Control Room (NCR) located at ground floor. Prepare the Bill of Quantity (BoQ) with necessary network resources required in quantity for the complete networking. Your BoQ should include estimation of information outlet (faceplate), wireless AP, CAT6 cables, Patch Cords, 24 ports Patch Panels and 48-ports Switches. [12]
7. What are VoIP and IP Interconnection? Discuss the economic, administrative and legal issues of VoIP and IP interconnection in Nepal. [2+2+6]
8. Write short notes on: [4+4]
 - a) WYSIWYG
 - b) Proxy CDN

Exam.	Regular		
Level	BE	Full Marks	80
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Subject: - Internet and Intranet (CT754)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
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- [1] What are the major components/organizations of internet ecosystem? Write down the roles and responsibilities of Internet Registries under IANA. [4+6]
- [2] Why the world has decided to migrate to new internet addressing scheme IPv6? Compare IP4 and IPv6 router with their packet structure. [4+6]
- [3] What are the challenges of N-Tiered client/server Network architecture? Explain the architectural aspect of internet backbone with respect to tiered ISP Network for the internet access. [3+7]
- [4] Explain the request methods of HTTP? Write the major steps while configuring web server and the types of web hosting (Virtual Hosting) from your web server. [4+7]
- [5] What are the benefits of proxy load balancing? Discuss non-redundant proxy array load balancing technique with its features. [5+6]
- [6] Compare Intranet, Internet and Extranet with their benefits and drawbacks. Discuss the necessary resources required to design medium size intranet system. [5+5]
- [7] What is IRC? How IRC is useful in group communication? List the DSL access technologies with their types. [3+3+4]
- [8] Write short notes on [4+4]
 - [a] AJAX
 - [b] Cookies

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INSTITUTE OF ENGINEERING
Examination Control Division
2070 Magh

Exam.	New Back (2066 & Later Batch)		
Level	BE	Full Marks	80
Programme	BCT	Pass Marks	32
Year / Part	IV / II	Time	3 hrs.

Subject: - Internet and Intranet (CT754)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.

1. Write down the history of Internet . Explain how is it developed to this stage. [10]
2. What is RFC? How RFCs are managed based on its streams and status? Explain. [2+8]
3. Discuss the e-mail system components with its functions and the path of e-mail messages to be delivered from source domain to destination domain. [10]
4. What are the features of AJAX programming? How the helper applications like CGI, PEARL, and JAVA Scripts help to develop better internet and intranet system? Explain. [4+7]
5. What are the major design issues with its design criteria to be considered for a medium size network? Also discuss how proxy servers are managed for this network. [3+8]
6. What do you mean by Content Management System (CMS)? An organization has more than six departments each of which has more than fifty internet users. Present your guideline for its internet and intranet system development with respect to the resources required. [2+8]
7. Write down the principle feature(s) of Unified Messaging System (UMS). Explain with its importance, how VoIP is the part of UMS? Write the purpose and benefits of Internet Packet Clearing House. [2+4+4]
8. Write Short Notes on. [4+4]
 - a) WYSIWYG Authoring Tools
 - b) Types of Firewall and Roles of Bastion Host.
