



Qualification Pack

CISCO Certified Network Associate

QP Code: MSME/ELE/Q1601

Version: 1.0

NSQF Level: 4

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Qualification Pack

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Qualification Pack

MSME/ELE/Q1601: CISCO Certified Network Associate

Brief Job Description

The qualification containing different modules, which is required for the job role of CCNA and ultimately helps learner in the following Computer Networks, various protocols used in Communication, Managing and configuring Cisco Switches and Routers and various WAN technologies.

Personal Attributes

The qualification containing different modules, which is required for the job role of CCNA and ultimately helps learner in the following Computer Networks, various protocols used in Communication, Managing and configuring Cisco Switches and Routers and various WAN technologies.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [MSME/ELE/N1608: Switching, Routing, and Wireless Essentials.](#)
2. [MSME/ELE/N1606: Enterprise Networking, Security, and Automation](#)
3. [MSME/ELE/N1605: Enterprise Networking, Security, and Automation](#)
4. [MSME/ELE/N1603: Switching, Routing, and Wireless Essentials.](#)
5. [MSME/ELE/N1602: Introduction to Networks](#)
6. [MSME/ELE/N1601: Introduction to Networks](#)
7. [MSME/ELE/N1607: Employability Skill 09](#)

Qualification Pack (QP) Parameters

Sector	Electronics
Sub-Sector	Strategic Electronics
Occupation	Computer Networking
Country	India
NSQF Level	4



Qualification Pack

Credits	14
Aligned to NCO/ISCO/ISIC Code	(Field Technician- Networking and Storage)
Minimum Educational Qualification & Experience	12th grade Pass with NA of experience OR Pursuing 2nd year of 3-year regular Diploma (after 10th) with NA of experience OR Previous relevant Qualification of NSQF Level (NSQF Level 3.5) with 1.5 years of experience OR Previous relevant Qualification of NSQF Level (NSQF Level 3) with NA of experience
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	17 Years
Last Reviewed On	NA
Next Review Date	30/04/2027
NSQC Approval Date	30/04/2024
Version	1.0
Reference code on NQR	NCVET- QG-04-EH-02389-2024-V1-MSME
NQR Version	1.0



Qualification Pack

MSME/ELE/N1608: Switching, Routing, and Wireless Essentials.

Description

After completion of course Student should be able to Configure Router with IPv4 & IPv6 Addressing.

Scope

The scope covers the following :

- After completion of course Student should be able to Configure Router with IPv4 & IPv6 Addressing.

Elements and Performance Criteria

MSME/CCNA/02 Switching, Routing, and Wireless Essentials

To be competent, the user/individual on the job must be able to:

- PC1.** Configuration of Switch.
- PC2.** Configuration of SSH for Secure Access in Switch.
- PC3.** Configuration VLANs and Trunks.
- PC4.** Configuration of VTP.
- PC5.** Inter-VLAN routing.
- PC6.** Troubleshoot inter-VLAN routing on Layer 3 devices
- PC7.** Understand the working principle of STP.
- PC8.** Understand the STP root configuration and verification
- PC9.** Identify the Root Bridge on the basis of lowest Mac address.
- PC10.** Observe the Blocking and Designated port.
- PC11.** Understand the working process of Per VLAN Spanning Tree (PVSTP).
- PC12.** Observe the occurrence of Rapid Spanning Tree.
- PC13.** Understand the Static routing.
- PC14.** Configuration of Static and Default Routes.
- PC15.** Configuration of CDP and Summary routes.
- PC16.** Configure redundancy on a switched network using STP and Ether Channel
- PC17.** Troubleshoot Ether Channel on switched networks.
- PC18.** Configure IPv4 and IPv6 static routing on routers.
- PC19.** Concept of link aggregation working and load balancing
- PC20.** Understand the basic concept of Ether Channel.
- PC21.** Identify the types of Ether Channel
- PC22.** Configuration of LACP, PAGP protocols in Ether Channel.
- PC23.** Configure WLANs using a WLC and L2 security best practices
- PC24.** Understand the Dynamic Routing Protocols.
- PC25.** Discuss the working principle of Distance Vector Routing.
- PC26.** Understand the concept of RIPv2.



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- PC27.** Understand the Link State Routing.
- PC28.** Introduction to OSPF and OSPF DR/BDR.
- PC29.** Understand the concept of Multi Area OSPF.
- PC30.** Calculation of VLSM and CIDR.
- PC31.** Loading of IOS in Routers.
- PC32.** Resetting of password in Routers and Switches.
- PC33.** Configuration of Access Control List (ACLs).
- PC34.** Understand the types of ACLs (Standard & Extended ACLs).
- PC35.** Identify the requirement of ACLs.
- PC36.** Understand the requirement of DHCP.
- PC37.** Configuration of DHCP on real devices.
- PC38.** Understand the basic and advance concept of NAT.
- PC39.** Configuration of Static NAT.
- PC40.** Dynamic NAT configuration and verification on real device.
- PC41.** PAT configuration and verification on real device.



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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>MSME/CCNA/02 Switching, Routing, and Wireless Essentials</i>	-	100	-	-
PC1. Configuration of Switch.	-	-	-	-
PC2. Configuration of SSH for Secure Access in Switch.	-	-	-	-
PC3. Configuration VLANs and Trunks.	-	-	-	-
PC4. Configuration of VTP.	-	-	-	-
PC5. Inter-VLAN routing.	-	-	-	-
PC6. Troubleshoot inter-VLAN routing on Layer 3 devices	-	-	-	-
PC7. Understand the working principle of STP.	-	-	-	-
PC8. Understand the STP root configuration and verification	-	-	-	-
PC9. Identify the Root Bridge on the basis of lowest Mac address.	-	-	-	-
PC10. Observe the Blocking and Designated port.	-	-	-	-
PC11. Understand the working process of Per VLAN Spanning Tree (PVSTP).	-	-	-	-
PC12. Observe the occurrence of Rapid Spanning Tree.	-	-	-	-
PC13. Understand the Static routing.	-	-	-	-
PC14. Configuration of Static and Default Routes.	-	-	-	-
PC15. Configuration of CDP and Summary routes.	-	-	-	-
PC16. Configure redundancy on a switched network using STP and Ether Channel	-	-	-	-



Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC17. Troubleshoot Ether Channel on switched networks.	-	-	-	-
PC18. Configure IPv4 and IPv6 static routing on routers.	-	-	-	-
PC19. Concept of link aggregation working and load balancing	-	-	-	-
PC20. Understand the basic concept of Ether Channel.	-	-	-	-
PC21. Identify the types of Ether Channel	-	-	-	-
PC22. Configuration of LACP, PAGP protocols in Ether Channel.	-	-	-	-
PC23. Configure WLANs using a WLC and L2 security best practices	-	-	-	-
PC24. Understand the Dynamic Routing Protocols.	-	-	-	-
PC25. Discuss the working principle of Distance Vector Routing.	-	-	-	-
PC26. Understand the concept of RIPv2.	-	-	-	-
PC27. Understand the Link State Routing.	-	-	-	-
PC28. Introduction to OSPF and OSPF DR/BDR.	-	-	-	-
PC29. Understand the concept of Multi Area OSPF.	-	-	-	-
PC30. Calculation of VLSM and CIDR.	-	-	-	-
PC31. Loading of IOS in Routers.	-	-	-	-
PC32. Resetting of password in Routers and Switches.	-	-	-	-
PC33. Configuration of Access Control List (ACLs).	-	-	-	-
PC34. Understand the types of ACLs (Standard & Extended ACLs).	-	-	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC35. Identify the requirement of ACLs.	-	-	-	-
PC36. Understand the requirement of DHCP.	-	-	-	-
PC37. Configuration of DHCP on real devices.	-	-	-	-
PC38. Understand the basic and advance concept of NAT.	-	-	-	-
PC39. Configuration of Static NAT.	-	-	-	-
PC40. Dynamic NAT configuration and verification on real device.	-	-	-	-
PC41. PAT configuration and verification on real device.	-	-	-	-
NOS Total	-	100	-	-



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	MSME/ELE/N1608
NOS Name	Switching, Routing, and Wireless Essentials.
Sector	Electronics
Sub-Sector	
Occupation	Computer Networking
NSQF Level	4
Credits	4
Version	1.0
Last Reviewed Date	30/04/2024
Next Review Date	30/04/2027
NSQF Clearance Date	30/04/2024



Qualification Pack

MSME/ELE/N1606: Enterprise Networking, Security, and Automation

Description

After completion of course Student should be able to Configure single-area OSPFv2 in both point-to-point and multi-access networks.

Scope

The scope covers the following :

- After completion of course Student should be able to Configure single-area OSPFv2 in both point-to-point and multi-access networks.

Elements and Performance Criteria

MSME/CCNA/03 Enterprise Networking, Security, and Automation

To be competent, the user/individual on the job must be able to:

- PC1.** Understand the concept of Virtual Routing
- PC2.** Understand the working principle of Hot Standby Routing Protocol.
- PC3.**
 - How to mitigate threats and enhance network security using access control lists and
 - security best practices.
- PC4.** Basic concept of EIGRP.
- PC5.** Configuration of EIGRP on real devices.
- PC6.** Understand the concept of equal and unequal load balancing in EIGRP
- PC7.** OSPFv3 concept and configuration..
- PC8.** Configuration of Access Control List (ACLs)
- PC9.** Understand the types of ACLs (Standard & Extended ACLs).
- PC10.** Identify the requirement of ACLs.
- PC11.** Understand the requirement of DHCP.
- PC12.** Configuration of DHCP on real devices.
- PC13.** Understand the basic and advance concept of NAT.
- PC14.** Configuration of Static NAT
- PC15.** Dynamic NAT configuration and verification on real device.
- PC16.** PAT configuration and verification on real device.
- PC17.** Understand the WAN encapsulation protocols.
- PC18.** Understand the working process of HDLC protocol.
- PC19.** Understand the Circuit Switched Networks
- PC20.** Understand the concept of Packet Switched Networks.
- PC21.** Identify the different Public Internet Network (DSL, Cable Modems and Wi-max).
- PC22.** Understand the working principle of Point to Point Protocol (PPP).
- PC23.** Configuration of PPP on real devices.
- PC24.** Understand the types of PPP (PAP & CHAP).



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- PC25.** Authentication of PAP over PPP on real devices
- PC26.** Authentication of CHAP over PPP on real devices.
- PC27.** Understand the networking devices implement QoS
- PC28.** Understand the Implement protocols to manage the network
- PC29.** Understand the concept of Lease Line Connections.
- PC30.** Understand the concept and technical detail of Frame Relay switch.
- PC31.** Point to Point configuration of Frame Relay.
- PC32.** Understand the concept of Tunneling.
- PC33.** Configuration of Virtual Private Network (VPN)
- PC34.** Identify the types of VPN.
- PC35.** Configuration of GRE Tunneling.
- PC36.** Understand the concept of IP Sec.
- PC37.** Tunneling of IPv6 over IPv4 Packets
- PC38.** Understand the software defined networking
- PC39.** Understand the automation affect evolving networks.



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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>MSME/CCNA/03 Enterprise Networking, Security, and Automation</i>	-	100	-	-
PC1. Understand the concept of Virtual Routing	-	-	-	-
PC2. Understand the working principle of Hot Standby Routing Protocol.	-	-	-	-
PC3. • How to mitigate threats and enhance network security using access control lists and • security best practices.	-	-	-	-
PC4. Basic concept of EIGRP.	-	-	-	-
PC5. Configuration of EIGRP on real devices.	-	-	-	-
PC6. Understand the concept of equal and unequal load balancing in EIGRP	-	-	-	-
PC7. OSPFv3 concept and configuration..	-	-	-	-
PC8. Configuration of Access Control List (ACLs)	-	-	-	-
PC9. Understand the types of ACLs (Standard & Extended ACLs).	-	-	-	-
PC10. Identify the requirement of ACLs.	-	-	-	-
PC11. Understand the requirement of DHCP.	-	-	-	-
PC12. Configuration of DHCP on real devices.	-	-	-	-
PC13. Understand the basic and advance concept of NAT.	-	-	-	-
PC14. Configuration of Static NAT	-	-	-	-
PC15. Dynamic NAT configuration and verification on real device.	-	-	-	-
PC16. PAT configuration and verification on real device.	-	-	-	-
PC17. Understand the WAN encapsulation protocols.	-	-	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC18. Understand the working process of HDLC protocol.	-	-	-	-
PC19. Understand the Circuit Switched Networks	-	-	-	-
PC20. Understand the concept of Packet Switched Networks.	-	-	-	-
PC21. Identify the different Public Internet Network (DSL, Cable Modems and Wi-max).	-	-	-	-
PC22. Understand the working principle of Point to Point Protocol (PPP).	-	-	-	-
PC23. Configuration of PPP on real devices.	-	-	-	-
PC24. Understand the types of PPP (PAP & CHAP).	-	-	-	-
PC25. Authentication of PAP over PPP on real devices	-	-	-	-
PC26. Authentication of CHAP over PPP on real devices.	-	-	-	-
PC27. Understand the networking devices implement QoS	-	-	-	-
PC28. Understand the Implement protocols to manage the network	-	-	-	-
PC29. Understand the concept of Lease Line Connections.	-	-	-	-
PC30. Understand the concept and technical detail of Frame Relay switch.	-	-	-	-
PC31. Point to Point configuration of Frame Relay.	-	-	-	-
PC32. Understand the concept of Tunneling.	-	-	-	-
PC33. Configuration of Virtual Private Network (VPN)	-	-	-	-
PC34. Identify the types of VPN.	-	-	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC35. Configuration of GRE Tunneling.	-	-	-	-
PC36. Understand the concept of IP Sec.	-	-	-	-
PC37. Tunneling of IPv6 over IPv4 Packets	-	-	-	-
PC38. Understand the software defined networking	-	-	-	-
PC39. Understand the automation affect evolving networks.	-	-	-	-
NOS Total	-	100	-	-



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National Occupational Standards (NOS) Parameters

NOS Code	MSME/ELE/N1606
NOS Name	Enterprise Networking, Security, and Automation
Sector	Electronics
Sub-Sector	
Occupation	Computer Networking
NSQF Level	4
Credits	3
Version	1.0
Last Reviewed Date	30/04/2024
Next Review Date	30/04/2027
NSQF Clearance Date	30/04/2024



Qualification Pack

MSME/ELE/N1605: Enterprise Networking, Security, and Automation

Description

After completion of course Student should be able to Configure single-area OSPFv2 in both point-to-point and multi-access networks.

Scope

The scope covers the following :

- After completion of course Student should be able to Configure single-area OSPFv2 in both point-to-point and multi-access networks.

Elements and Performance Criteria

MSME/CCNA/03 Enterprise Networking, Security, and Automation

To be competent, the user/individual on the job must be able to:

- PC1.** Understand the concept of Virtual Routing
- PC2.** Understand the working principle of Hot Standby Routing Protocol.
- PC3.**
 - How to mitigate threats and enhance network security using access control lists and
 - security best practices.
- PC4.** Basic concept of EIGRP.
- PC5.** Configuration of EIGRP on real devices.
- PC6.** Understand the concept of equal and unequal load balancing in EIGRP
- PC7.** OSPFv3 concept and configuration..
- PC8.** Configuration of Access Control List (ACLs)
- PC9.** Understand the types of ACLs (Standard & Extended ACLs).
- PC10.** Identify the requirement of ACLs.
- PC11.** Understand the requirement of DHCP.
- PC12.** Configuration of DHCP on real devices.
- PC13.** Understand the basic and advance concept of NAT.
- PC14.** Configuration of Static NAT
- PC15.** Dynamic NAT configuration and verification on real device.
- PC16.** PAT configuration and verification on real device.
- PC17.** Understand the WAN encapsulation protocols.
- PC18.** Understand the working process of HDLC protocol.
- PC19.** Understand the Circuit Switched Networks
- PC20.** Understand the concept of Packet Switched Networks.
- PC21.** Identify the different Public Internet Network (DSL, Cable Modems and Wi-max).
- PC22.** Understand the working principle of Point to Point Protocol (PPP).
- PC23.** Configuration of PPP on real devices.
- PC24.** Understand the types of PPP (PAP & CHAP).



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- PC25.** Authentication of PAP over PPP on real devices
- PC26.** Authentication of CHAP over PPP on real devices.
- PC27.** Understand the networking devices implement QoS
- PC28.** Understand the Implement protocols to manage the network
- PC29.** Understand the concept of Lease Line Connections.
- PC30.** Understand the concept and technical detail of Frame Relay switch.
- PC31.** Point to Point configuration of Frame Relay.
- PC32.** Understand the concept of Tunneling.
- PC33.** Configuration of Virtual Private Network (VPN)
- PC34.** Identify the types of VPN.
- PC35.** Configuration of GRE Tunneling.
- PC36.** Understand the concept of IP Sec.
- PC37.** Tunneling of IPv6 over IPv4 Packets
- PC38.** Understand the software defined networking
- PC39.** Understand the automation affect evolving networks.



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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>MSME/CCNA/03 Enterprise Networking, Security, and Automation</i>	100	-	-	-
PC1. Understand the concept of Virtual Routing	-	-	-	-
PC2. Understand the working principle of Hot Standby Routing Protocol.	-	-	-	-
PC3. • How to mitigate threats and enhance network security using access control lists and • security best practices.	-	-	-	-
PC4. Basic concept of EIGRP.	-	-	-	-
PC5. Configuration of EIGRP on real devices.	-	-	-	-
PC6. Understand the concept of equal and unequal load balancing in EIGRP	-	-	-	-
PC7. OSPFv3 concept and configuration..	-	-	-	-
PC8. Configuration of Access Control List (ACLs)	-	-	-	-
PC9. Understand the types of ACLs (Standard & Extended ACLs).	-	-	-	-
PC10. Identify the requirement of ACLs.	-	-	-	-
PC11. Understand the requirement of DHCP.	-	-	-	-
PC12. Configuration of DHCP on real devices.	-	-	-	-
PC13. Understand the basic and advance concept of NAT.	-	-	-	-
PC14. Configuration of Static NAT	-	-	-	-
PC15. Dynamic NAT configuration and verification on real device.	-	-	-	-
PC16. PAT configuration and verification on real device.	-	-	-	-
PC17. Understand the WAN encapsulation protocols.	-	-	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC18. Understand the working process of HDLC protocol.	-	-	-	-
PC19. Understand the Circuit Switched Networks	-	-	-	-
PC20. Understand the concept of Packet Switched Networks.	-	-	-	-
PC21. Identify the different Public Internet Network (DSL, Cable Modems and Wi-max).	-	-	-	-
PC22. Understand the working principle of Point to Point Protocol (PPP).	-	-	-	-
PC23. Configuration of PPP on real devices.	-	-	-	-
PC24. Understand the types of PPP (PAP & CHAP).	-	-	-	-
PC25. Authentication of PAP over PPP on real devices	-	-	-	-
PC26. Authentication of CHAP over PPP on real devices.	-	-	-	-
PC27. Understand the networking devices implement QoS	-	-	-	-
PC28. Understand the Implement protocols to manage the network	-	-	-	-
PC29. Understand the concept of Lease Line Connections.	-	-	-	-
PC30. Understand the concept and technical detail of Frame Relay switch.	-	-	-	-
PC31. Point to Point configuration of Frame Relay.	-	-	-	-
PC32. Understand the concept of Tunneling.	-	-	-	-
PC33. Configuration of Virtual Private Network (VPN)	-	-	-	-
PC34. Identify the types of VPN.	-	-	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC35. Configuration of GRE Tunneling.	-	-	-	-
PC36. Understand the concept of IP Sec.	-	-	-	-
PC37. Tunneling of IPv6 over IPv4 Packets	-	-	-	-
PC38. Understand the software defined networking	-	-	-	-
PC39. Understand the automation affect evolving networks.	-	-	-	-
NOS Total	100	-	-	-



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National Occupational Standards (NOS) Parameters

NOS Code	MSME/ELE/N1605
NOS Name	Enterprise Networking, Security, and Automation
Sector	Electronics
Sub-Sector	
Occupation	Computer Networking
NSQF Level	4
Credits	1
Version	1.0
Last Reviewed Date	30/04/2024
Next Review Date	30/04/2027
NSQF Clearance Date	30/04/2024



Qualification Pack

MSME/ELE/N1603: Switching, Routing, and Wireless Essentials.

Description

After completion of course Student should be able to Configure Router with IPv4 & IPv6 Addressing.

Scope

The scope covers the following :

- After completion of course Student should be able to Configure Router with IPv4 & IPv6 Addressing.

Elements and Performance Criteria

MSME/CCNA/02 Switching, Routing, and Wireless Essentials

To be competent, the user/individual on the job must be able to:

- PC1.** Configuration of Switch.
- PC2.** Configuration of SSH for Secure Access in Switch.
- PC3.** Configuration VLANs and Trunks.
- PC4.** Configuration of VTP.
- PC5.** Inter-VLAN routing.
- PC6.** Troubleshoot inter-VLAN routing on Layer 3 devices
- PC7.** Understand the working principle of STP.
- PC8.** Understand the STP root configuration and verification
- PC9.** Identify the Root Bridge on the basis of lowest Mac address.
- PC10.** Observe the Blocking and Designated port.
- PC11.** Understand the working process of Per VLAN Spanning Tree (PVSTP).
- PC12.** Observe the occurrence of Rapid Spanning Tree.
- PC13.** Understand the Static routing.
- PC14.** Configuration of Static and Default Routes.
- PC15.** Configuration of CDP and Summary routes.
- PC16.** Configure redundancy on a switched network using STP and Ether Channel
- PC17.** Troubleshoot Ether Channel on switched networks.
- PC18.** Configure IPv4 and IPv6 static routing on routers.
- PC19.** Concept of link aggregation working and load balancing
- PC20.** Understand the basic concept of Ether Channel.
- PC21.** Identify the types of Ether Channel
- PC22.** Configuration of LACP, PAGP protocols in Ether Channel.
- PC23.** Configure WLANs using a WLC and L2 security best practices
- PC24.** Understand the Dynamic Routing Protocols.
- PC25.** Discuss the working principle of Distance Vector Routing.
- PC26.** Understand the concept of RIPv2.



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- PC27.** Understand the Link State Routing.
- PC28.** Introduction to OSPF and OSPF DR/BDR.
- PC29.** Understand the concept of Multi Area OSPF.
- PC30.** Calculation of VLSM and CIDR.
- PC31.** Loading of IOS in Routers.
- PC32.** Resetting of password in Routers and Switches.
- PC33.** Configuration of Access Control List (ACLs).
- PC34.** Understand the types of ACLs (Standard & Extended ACLs).
- PC35.** Identify the requirement of ACLs.
- PC36.** Understand the requirement of DHCP.
- PC37.** Configuration of DHCP on real devices.
- PC38.** Understand the basic and advance concept of NAT.
- PC39.** Configuration of Static NAT.
- PC40.** Dynamic NAT configuration and verification on real device.
- PC41.** PAT configuration and verification on real device.



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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>MSME/CCNA/02 Switching, Routing, and Wireless Essentials</i>	100	-	-	-
PC1. Configuration of Switch.	-	-	-	-
PC2. Configuration of SSH for Secure Access in Switch.	-	-	-	-
PC3. Configuration VLANs and Trunks.	-	-	-	-
PC4. Configuration of VTP.	-	-	-	-
PC5. Inter-VLAN routing.	-	-	-	-
PC6. Troubleshoot inter-VLAN routing on Layer 3 devices	-	-	-	-
PC7. Understand the working principle of STP.	-	-	-	-
PC8. Understand the STP root configuration and verification	-	-	-	-
PC9. Identify the Root Bridge on the basis of lowest Mac address.	-	-	-	-
PC10. Observe the Blocking and Designated port.	-	-	-	-
PC11. Understand the working process of Per VLAN Spanning Tree (PVSTP).	-	-	-	-
PC12. Observe the occurrence of Rapid Spanning Tree.	-	-	-	-
PC13. Understand the Static routing.	-	-	-	-
PC14. Configuration of Static and Default Routes.	-	-	-	-
PC15. Configuration of CDP and Summary routes.	-	-	-	-
PC16. Configure redundancy on a switched network using STP and Ether Channel	-	-	-	-



Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC17. Troubleshoot Ether Channel on switched networks.	-	-	-	-
PC18. Configure IPv4 and IPv6 static routing on routers.	-	-	-	-
PC19. Concept of link aggregation working and load balancing	-	-	-	-
PC20. Understand the basic concept of Ether Channel.	-	-	-	-
PC21. Identify the types of Ether Channel	-	-	-	-
PC22. Configuration of LACP, PAGP protocols in Ether Channel.	-	-	-	-
PC23. Configure WLANs using a WLC and L2 security best practices	-	-	-	-
PC24. Understand the Dynamic Routing Protocols.	-	-	-	-
PC25. Discuss the working principle of Distance Vector Routing.	-	-	-	-
PC26. Understand the concept of RIPv2.	-	-	-	-
PC27. Understand the Link State Routing.	-	-	-	-
PC28. Introduction to OSPF and OSPF DR/BDR.	-	-	-	-
PC29. Understand the concept of Multi Area OSPF.	-	-	-	-
PC30. Calculation of VLSM and CIDR.	-	-	-	-
PC31. Loading of IOS in Routers.	-	-	-	-
PC32. Resetting of password in Routers and Switches.	-	-	-	-
PC33. Configuration of Access Control List (ACLs).	-	-	-	-
PC34. Understand the types of ACLs (Standard & Extended ACLs).	-	-	-	-



Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC35. Identify the requirement of ACLs.	-	-	-	-
PC36. Understand the requirement of DHCP.	-	-	-	-
PC37. Configuration of DHCP on real devices.	-	-	-	-
PC38. Understand the basic and advance concept of NAT.	-	-	-	-
PC39. Configuration of Static NAT.	-	-	-	-
PC40. Dynamic NAT configuration and verification on real device.	-	-	-	-
PC41. PAT configuration and verification on real device.	-	-	-	-
NOS Total	100	-	-	-



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	MSME/ELE/N1603
NOS Name	Switching, Routing, and Wireless Essentials.
Sector	Electronics
Sub-Sector	
Occupation	Computer Networking
NSQF Level	4
Credits	1
Version	1.0
Last Reviewed Date	30/04/2024
Next Review Date	30/04/2027
NSQF Clearance Date	30/04/2024



Qualification Pack

MSME/ELE/N1602: Introduction to Networks

Description

After completion of course Student should be able to Understand the concept of Networking.

Scope

The scope covers the following :

- After completion of course Student should be able to Understand the concept of Networking.

Elements and Performance Criteria

MSME/CCNA/01 Introduction to Networks

To be competent, the user/individual on the job must be able to:

- PC1.** Understand the concept of Networking.
- PC2.** Understand the advantages of networking
- PC3.** Working principle of Network Topologies.
- PC4.** Identify various communication Medias and cabling technique.
- PC5.** Crimping of Ethernet Cables.
- PC6.**
 - Configure switches and end devices to provide access to local and remote network
 - resources.
- PC7.**
 - Explain how physical and data link layer protocols support the operation of Ethernet in a
 - switched network.
- PC8.** Configure routers to enable end-to-end connectivity between remote devices.
- PC9.** Understand the responsibilities of each layers of OSI model.
- PC10.** Understand the working principle of Transport layer.
- PC11.** Understand the TCP and UDP protocol.
- PC12.** Calculation of IPV4 Addressing.
- PC13.** Sub netting of IP Address.
- PC14.** Using FLSM & VLSM for Sub netting.
- PC15.** Understand the IPV6 Addressing.
- PC16.** Understand the working process of Router.
- PC17.** Understand the needs and benefits of Router.
- PC18.** Configuration of Router.
- PC19.** Configuration of IPV6 addresses on router.
- PC20.** Assigning Passwords to router.
- PC21.** Configure a small network with security best practices.
- PC22.** Troubleshoot connectivity in a small network.



Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>MSME/CCNA/01 Introduction to Networks</i>	-	100	-	-
PC1. Understand the concept of Networking.	-	-	-	-
PC2. Understand the advantages of networking	-	-	-	-
PC3. Working principle of Network Topologies.	-	-	-	-
PC4. Identify various communication Medias and cabling technique.	-	-	-	-
PC5. Crimping of Ethernet Cables.	-	-	-	-
PC6. <ul style="list-style-type: none">• Configure switches and end devices to provide access to local and remote network• resources.	-	-	-	-
PC7. <ul style="list-style-type: none">• Explain how physical and data link layer protocols support the operation of Ethernet in a• switched network.	-	-	-	-
PC8. Configure routers to enable end-to-end connectivity between remote devices.	-	-	-	-
PC9. Understand the responsibilities of each layers of OSI model.	-	-	-	-
PC10. Understand the working principle of Transport layer.	-	-	-	-
PC11. Understand the TCP and UDP protocol.	-	-	-	-
PC12. Calculation of IPV4 Addressing.	-	-	-	-
PC13. Sub netting of IP Address.	-	-	-	-
PC14. Using FLSM & VLSM for Sub netting.	-	-	-	-
PC15. Understand the IPV6 Addressing.	-	-	-	-
PC16. Understand the working process of Router.	-	-	-	-



Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC17. Understand the needs and benefits of Router.	-	-	-	-
PC18. Configuration of Router.	-	-	-	-
PC19. Configuration of IPv6 addresses on router.	-	-	-	-
PC20. Assigning Passwords to router.	-	-	-	-
PC21. Configure a small network with security best practices.	-	-	-	-
PC22. Troubleshoot connectivity in a small network.	-	-	-	-
NOS Total	-	100	-	-



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	MSME/ELE/N1602
NOS Name	Introduction to Networks
Sector	Electronics
Sub-Sector	
Occupation	Computer Networking
NSQF Level	4
Credits	3
Version	1.0
Last Reviewed Date	30/04/2024
Next Review Date	30/04/2027
NSQF Clearance Date	30/04/2024



Qualification Pack

MSME/ELE/N1601: Introduction to Networks

Description

After completion of course Student should be able to Understand the concept of Networking.

Scope

The scope covers the following :

- After completion of course Student should be able to Understand the concept of Networking.

Elements and Performance Criteria

MSME/CCNA/01 Introduction to Networks

To be competent, the user/individual on the job must be able to:

- PC1.** Understand the concept of Networking.
- PC2.** Understand the advantages of networking
- PC3.** Working principle of Network Topologies.
- PC4.** Identify various communication Medias and cabling technique.
- PC5.** Crimping of Ethernet Cables.
- PC6.**
 - Configure switches and end devices to provide access to local and remote network
 - resources.
- PC7.**
 - Explain how physical and data link layer protocols support the operation of Ethernet in a
 - switched network.
- PC8.** Configure routers to enable end-to-end connectivity between remote devices.
- PC9.** Understand the responsibilities of each layers of OSI model.
- PC10.** Understand the working principle of Transport layer.
- PC11.** Understand the TCP and UDP protocol.
- PC12.** Calculation of IPV4 Addressing.
- PC13.** Sub netting of IP Address.
- PC14.** Using FLSM & VLSM for Sub netting.
- PC15.** Understand the IPV6 Addressing.
- PC16.** Understand the working process of Router.
- PC17.** Understand the needs and benefits of Router.
- PC18.** Configuration of Router.
- PC19.** Configuration of IPv6 addresses on router.
- PC20.** Assigning Passwords to router.
- PC21.** Configure a small network with security best practices.
- PC22.** Troubleshoot connectivity in a small network.



Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>MSME/CCNA/01 Introduction to Networks</i>	100	-	-	-
PC1. Understand the concept of Networking.	-	-	-	-
PC2. Understand the advantages of networking	-	-	-	-
PC3. Working principle of Network Topologies.	-	-	-	-
PC4. Identify various communication Medias and cabling technique.	-	-	-	-
PC5. Crimping of Ethernet Cables.	-	-	-	-
PC6. • Configure switches and end devices to provide access to local and remote network • resources.	-	-	-	-
PC7. • Explain how physical and data link layer protocols support the operation of Ethernet in a • switched network.	-	-	-	-
PC8. Configure routers to enable end-to-end connectivity between remote devices.	-	-	-	-
PC9. Understand the responsibilities of each layers of OSI model.	-	-	-	-
PC10. Understand the working principle of Transport layer.	-	-	-	-
PC11. Understand the TCP and UDP protocol.	-	-	-	-
PC12. Calculation of IPV4 Addressing.	-	-	-	-
PC13. Sub netting of IP Address.	-	-	-	-
PC14. Using FLSM & VLSM for Sub netting.	-	-	-	-
PC15. Understand the IPV6 Addressing.	-	-	-	-
PC16. Understand the working process of Router.	-	-	-	-



Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC17. Understand the needs and benefits of Router.	-	-	-	-
PC18. Configuration of Router.	-	-	-	-
PC19. Configuration of IPv6 addresses on router.	-	-	-	-
PC20. Assigning Passwords to router.	-	-	-	-
PC21. Configure a small network with security best practices.	-	-	-	-
PC22. Troubleshoot connectivity in a small network.	-	-	-	-
NOS Total	100	-	-	-



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	MSME/ELE/N1601
NOS Name	Introduction to Networks
Sector	Electronics
Sub-Sector	
Occupation	Computer Networking
NSQF Level	4
Credits	1
Version	1.0
Last Reviewed Date	30/04/2024
Next Review Date	30/04/2027
NSQC Clearance Date	30/04/2024



Qualification Pack

MSME/ELE/N1607: Employability Skill 09

Description

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and getting ready for jobs and apprenticeship.

Scope

The scope covers the following :

- This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century,
- digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service,
- entrepreneurship, and getting ready for jobs and apprenticeship.

Elements and Performance Criteria

Employability Skill

To be competent, the user/individual on the job must be able to:

- PC1.** Explain the major applications of MS Office
- PC2.** Explain the different types of e-commerce
- PC3.** List the benefits of e-commerce for retailers and customers
- PC4.** Discuss how the Digital India campaign will help boost e-commerce in India
- PC5.** Write applications pertaining to various matters.
- PC6.** Explain power of positive attitude and Importance of commitment
- PC7.** Explain motivation and the Ways to motivate oneself and Personal goal setting
- PC8.** Explain the Effective & Level of Communication
- PC9.** Explain communication and Significance of technical communication?
- PC10.** Explain the methods of listening Skills.
- PC11.** Explain the differences between bio-data, CV and Resume.
- PC12.** Explain verbal and non-verbal Communication
- PC13.** Explain how to face an interview
- PC14.** Explain team work, group work, team formation process
- PC15.** How to Minimize the team conflicts
- PC16.** Explain Ethics & values
- PC17.** Explain the concept of entrepreneurship, and entrepreneurship v/s Management
- PC18.** Explain the process of project report preparation for setting up a new business
- PC19.** • Explain the role of various schemes and institute for self-employment i.e. MSME, DIC,
• NSIC, SIDBI etc.,
- PC20.** Role of financial institution to support startup



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- PC21.** Discuss the importance of saving money
- PC22.** Discuss the main types of bank accounts
- PC23.** Differentiate between fixed and variable costs
- PC24.** Describe the different types of insurance products
- PC25.** Discuss the main types of electronic funds transfers



Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Employability Skill</i>	100	-	-	-
PC1. Explain the major applications of MS Office	-	-	-	-
PC2. Explain the different types of e-commerce	-	-	-	-
PC3. List the benefits of e-commerce for retailers and customers	-	-	-	-
PC4. Discuss how the Digital India campaign will help boost e-commerce in India	-	-	-	-
PC5. Write applications pertaining to various matters.	-	-	-	-
PC6. Explain power of positive attitude and Importance of commitment	-	-	-	-
PC7. Explain motivation and the Ways to motivate oneself and Personal goal setting	-	-	-	-
PC8. Explain the Effective & Level of Communication	-	-	-	-
PC9. Explain communication and Significance of technical communication?	-	-	-	-
PC10. Explain the methods of listening Skills.	-	-	-	-
PC11. Explain the differences between bio-data, CV and Resume.	-	-	-	-
PC12. Explain verbal and non-verbal Communication	-	-	-	-
PC13. Explain how to face an interview	-	-	-	-
PC14. Explain team work, group work, team formation process	-	-	-	-
PC15. How to Minimize the team conflicts	-	-	-	-
PC16. Explain Ethics & values	-	-	-	-
PC17. Explain the concept of entrepreneurship, and entrepreneurship v/s Management	-	-	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC18. Explain the process of project report preparation for setting up a new business	-	-	-	-
PC19. <ul style="list-style-type: none">• Explain the role of various schemes and institute for self- employment i.e. MSME, DIC,• NSIC, SIDBI etc.,	-	-	-	-
PC20. Role of financial institution to support startup	-	-	-	-
PC21. Discuss the importance of saving money	-	-	-	-
PC22. Discuss the main types of bank accounts	-	-	-	-
PC23. Differentiate between fixed and variable costs	-	-	-	-
PC24. Describe the different types of insurance products	-	-	-	-
PC25. Discuss the main types of electronic funds transfers	-	-	-	-
NOS Total	100	-	-	-



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	MSME/ELE/N1607
NOS Name	Employability Skill 09
Sector	Electronics
Sub-Sector	
Occupation	Computer Networking
NSQF Level	4
Credits	1
Version	1.0
Last Reviewed Date	30/04/2024
Next Review Date	30/04/2027
NSQC Clearance Date	30/04/2024

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

As per QP

Minimum Aggregate Passing % at QP Level : 40

(Please note: Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS



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National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
MSME/ELE/N1608.Switching, Routing, and Wireless Essentials.	-	100	-	-	100	10
MSME/ELE/N1606.Enterprise Networking, Security, and Automation	-	100	-	-	100	10
MSME/ELE/N1605.Enterprise Networking, Security, and Automation	100	-	-	-	100	10
MSME/ELE/N1603.Switching, Routing, and Wireless Essentials.	100	-	-	-	100	10
MSME/ELE/N1602.Introduction to Networks	-	100	-	-	100	20
MSME/ELE/N1601.Introduction to Networks	100	-	-	-	100	20
MSME/ELE/N1607.Employability Skill 09	100	-	-	-	100	20
Total	400	300	-	-	700	100



Qualification Pack

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training



Qualification Pack

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.



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Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.