# Practice Exam Questions for Nokia GMPLS-controlled Optical Networks (exam number: 4A0-220)

The following questions will test your knowledge and prepare you for the Nokia GMPLS-controlled Optical Networks exam. Compare your responses with the Answer Key at the end of the document.

1. What is the function of LER and LSR in an MPLS network?A static filter
   a. The LER adds a label to the packet at the input of the network, while the LSR removes the label at the output
   b. The LER adds the label at the input of the network, while the LSR uses the label to switch the packet
   c. The LER forwards packets according to the destination, while the LER is in charge for signaling
   d. The LSR adds the label at the input of the network, while the LER uses the label to switch the packet

2. Which of the following is an advantage of MPLS with respect to IP routing?
   a. MPLS reduces the number of hops during the routing
   b. MPLS provides more security and traffic engineering to the network
   c. MPLS transports all traffic with the same priority
   d. MPLS is connection-oriented and protocol independent

3. What is the meaning of “label swapping”?
   a. The intermediate nodes can remove or add a label
   b. The intermediate nodes can use a dedicated label for signaling
   c. The intermediate nodes replace the top label with another one
   d. The Label Edge Router examines the IP destination address to define the next hop

4. Which of the following sentences is true for the GMPLS technology in a WDM network?
   a. In WDM networks, GMPLS is used by the Managed Plane
   b. In WDM networks, GMPLS is used by the Transport Plane
   c. In WDM networks, GMPLS is used to increase the traffic bit-rate
   d. In WDM networks, GMPLS is used to establish bidirectional LSPs.

5. What is a TE-Link?
   a. The TE-Link is a set of physical connections that share a common cable, whose failure can cause the failure of all related e2e transmissions
   b. The TE-Link represents a way of separating the network into different logical domains.
   c. The TE-Link is an attribute to associate the cost parameter to the physical connections belonging to it
   d. The TE-Link is a logical object, representing a way to group physical resources, seen by GMPLS as equivalent by the routing point of view

6. Which attribute corresponds to this definition: “It defines the cost parameter for the specific connection”?
   a. Shared Risk Group
   b. Metric
   c. Color
   d. Priority

7. What is the purpose of resource coloring in GMPLS networks?
   a. To define the risk of failure of a physical connection; different color means different risks
   b. To associate a forward priority to the LSP; different color means different priority
   c. To define which TE-Links can be used by an LSP and which cannot be used
   d. To specify the signal type (i.e., video, audio, etc.); this way it is possible to treat different kinds of signal in different ways

8. Which links are associated to the NPA in a L1 Control Plane network?
   a. Optical Transport Sections
   b. Optical Channel Trail
   c. Sub Network Connections
   d. Share Risk Link Groups

9. What is the protocol in charge of propagating the topology information to all nodes?
   a. RSVP-TE
   b. OSPF-TE
   c. LMP
   d. LDP

10. What is the Link State Advertisement (LSA) in the OSPF protocol?
    a. The link within the node that carries the highest amount of traffic
    b. The basic communication instrument of the OSPF topology
    c. A 32-bit vector representing a set of color attributes
    d. A mechanism to inform non-adjacent nodes of link failures.

11. What is the protocol in charge of bandwidth allocation requests for downstream nodes?
    a. RSVP-TE
    b. OSPF-TE
    c. LMP
    d. IS-IS

12. What is the scope of the “Traffic Engineering” extension in the GMPLS protocols?
    a. It is in charge of path removal when this is requested by the sender (the head node)
    b. It allows to share parameters such as priority, metric, risk, latency to guarantee Quality of Service
    c. It is in charge of establishing and maintaining a Control Channel between nodes
    d. It is used to group traffic signals when they have the same optical parameters

13. What is the protocol in charge of setting up a Control Channel between pairs of nodes?
    a. RSVP-TE
    b. OSPF-TE
    c. LMP
    d. LDP

14. What is the purpose of the ConfigAck message in the LMP protocol?
    a. It is the response of the receiving node which accepts the parameters included in the config message
    b. It is used to acknowledge that the link is up
    c. It is a request to acknowledge the Control Channel
    d. It is used by one router to acknowledge the information received about a neighbour configuration

15. What different layers are implemented in a GMPLS node?
    a. Management plane, control plane, data plane
    b. Management plane, transport plane, data plane
    c. Control plane, transport plane, signaling plane
    d. Management plane, control plane, routing plane

16. What network supports multiple switching technologies?
    a. Multi-Layer Network (MLN)
    b. Integrated Services networks (IntServ)
    c. Multi-Region Network (MRN)
    d. Multi-Protocol Label Switching (MPLS)

17. What is the “reversion mode” parameter used for?
    a. It reverts the LSP to the Nominal Route and it is manually triggered.
    b. If a failure occurs, the LSP can be set to revert back to the Nominal Route
    c. It reverts the LSP to the Nominal Route, either manually or automatically triggered.
    d. If a failure occurs, SRG diversity is considered before reverting to the Nominal Route

18. Which links are associated to the NPA in a L0 Control Plane network?
    a. Optical Transport Sections
    b. Optical Channel Trail
    c. Sub Network Connections
    d. Share Risk Link Groups

19. What are the restoration mechanisms supported by GMPLS?
    a. WSR, GR, and PRC
    b. SBR, WSR, and PRC
    c. SBR, GR, and PRC
    d. WSR and GR

20. Describe the PRC mechanism.
    a. It waits for the underlying server resources before switching data traffic.
    b. It switches data traffic to another tunnel for fast restoration within 50 milliseconds.
    c. It switches within 50 milliseconds upon failure of a leg and then restores it.
    d. It restores to an SRG diverse path

# Answer Key

1. B
2. D
3. C
4. D
5. D
6. B
7. C
8. B
9. B
10. B
11. A
12. B
13. C
14. A
15. A
16. C
17. C
18. A
19. C
20. C

**About Nokia**

We create the technology to connect the world. Powered by the research and innovation of Nokia Bell Labs, we serve communications service providers, governments, large enterprises and consumers, with the industry's most complete, end-to-end portfolio of products, services and licensing.

From the enabling infrastructure for 5G and the Internet of Things, to emerging applications in digital health, we are shaping the future of technology to transform the human experience. networks.nokia.com



Nokia Oyj
Karaportti 3
FI-02610 Espoo, Finland
Tel. +358 (0) 10 44 88 000

Document code: (July) CID 207337