Name :	Group :	Mark :

IP ROUTING Exam

Multiple-Choice Questions (10 points, -0.5 points for each incorrect answer): choose the correct answer(s)

1- **From what location can a router load the Cisco IOS during the boot process?**

☐ RAM ☐ TFTP server ☐ NVRAM ☐ setup routine ☐ Flash memory

2- **Which are functions of a router? (Choose three.)**

☐ packet switching ☐ selection of best path based on logical addressing

☐ extension of network segments ☐ segmentation of broadcast domains

☐ selection of best path based on physical addressing

3- **What is the main difference between a routing protocol and a routed protocol?**

☐ A routing protocol is used to forward user traffic, while a routed protocol is used to exchange routing information.

☐ A routing protocol is used to exchange routing information, while a routed protocol is used to forward user traffic.

☐ A routing protocol operates at Layer 2, while a routed protocol operates at Layer 3.

☐ A routing protocol is used to configure IP addresses, while a routed protocol is used for managing switches.

4- **What is a disadvantage of dynamic routing?**

☐ It requires manual intervention to change routes.

☐ It may consume more network bandwidth and resources due to frequent route updates.

☐ It doesn't support large networks. ☐ It is only useful in small-scale networks.

5- **Which statement best describes a router's role in dynamic routing?** The router

☐ creates static routes to the destination networks. ☐ only uses a default route for all destinations.

☐ exchanges routing information with other routers to dynamically build its routing table.

☐ manually configures routes for all possible destinations.

6- **Which of the following is an example of an Interior Gateway Protocol (IGP)?**

☐ BGP (Border Gateway Protocol) ☐ OSPF (Open Shortest Path First)
☐ EIGRP (Enhanced Interior Gateway Routing Protocol) ☐ None of the above

7- **In which scenario is VLSM most beneficial?**

- ☐ When a network needs to be divided into a large number of equally sized subnets.
- ☐ When each subnet needs to accommodate a different number of hosts.
- ☐ When a single subnet is used for the entire network.
- ☐ When there are no restrictions on IP address usage.

8- **How does VLSM help in reducing IP address wastage?**

- ☐ By using only a single subnet mask for the entire network.
- ☐ By allowing different subnet masks for each subnet according to their size.
- ☐ By restricting the number of subnets available in a network.
- ☐ By making subnets larger than necessary.

9- **What is Inter-VLAN Routing?**

- ☐ The process of routing traffic between two VLANs on the same switch.
- ☐ The process of allowing communication between devices in different VLANs.
- ☐ The process of configuring VLANs on a router.
- ☐ The process of segmenting traffic on a single VLAN.

10- **In Router-on-a-stick Inter-VLAN Routing, what type of connection is typically used between the router and the switch?**

☐ A trunk link   ☐ An access link   ☐ A crossover link   ☐ A fiber-optic link

Exercise 2 (4 points): Compare the protocols RIP, OSPF, EIGRP and BGP by addressing the following aspects: Type of protocol, Abbreviation and Administrative Distance, Maximum number of routers supported, Metric used for route selection, and the used Algorithm.

Protocol	RIP	OSPF	EIGRP	BGP
AD	120	110	90 (internal), 170 (external)	20 (external), 200 (internal)
maximum routers in the network.	15	unlimited	255	unlimited
metric	Hop Count	bandwidth	(Bandwidth, Delay, Reliability, Load)	Path Attributes (e.g., AS Path, Weight)
Algorithm	RIP works on Bellman Ford algorithm.	OSPF works on DIJKSTRA Algorithm.	Dual (Diffusing Update Algorithm)	Path vector algorithm
Protocol type	Distance vector	Link State	Distance vector	Path Vector

Exercise 3 (6 points)
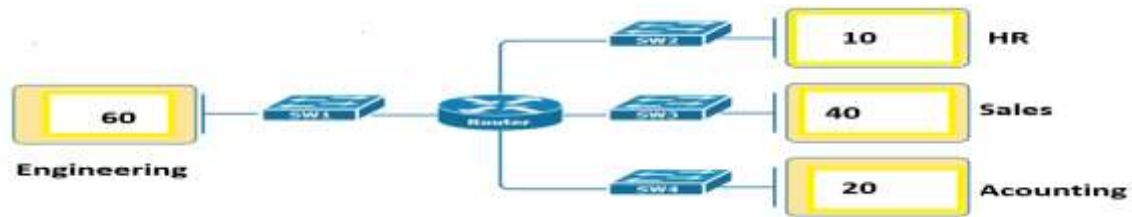
1. How many networks in the figure?
   4 networks
2. Using the address **192.168.1.0/24**. determine the class of this network
   Class C

Using subnet masks with variable length (**VLSM**) propose an addressing plan for the networks using the table bellow (starting from the biggest network to the smallest).

Network	Net@	Mask	Broadcast @	Number of hosts per subnet	Hosts @ range
Engineering	192.168.1.0	/26 255.255.255.192	192.168.1.63	62	192.168.1.1 to 192.168.1.62
Sales	192.168.1.64	/26 255.255.255.192	192.168.1.127	62	192.168.1.65 to 192.168.1.126
Accounting	192.168.1.128	/27 255.255.255.224	192.168.1.159	30	192.168.1.129 To 192.168.1.158
HR	192.168.1.160	/28 255.255.255.240	192.168.1.175	14	192.168.1.161 To 192.168.1.174

3. Determine the number of the used ip addresses and the free (unused) ones.

   Used ip addresses: **192.168.1.0-192.168.1.175 (176 @)**

   Free ip addresses: **192.168.1.176-192.168.1.255 (80@)**