

PAPUR ARHOLIAD / EXAMINATION PAPER

LLEOLIAD / LOCATION:	ABERTAWE / SWANSEA
CYFNOD ARHOLIADAU / EXAMINATION PERIOD:	IONAWR 2026 / JANUARY 2026
LEFEL / LEVEL:	6

MODIWL / MODULE: ACC6022
SWITCHING,ROUTING AND WIRELESS ESSENTIALS

AMSER / TIME:	2 HOURS
CYFARWYDDIADAU / INSTRUCTIONS:	ANSWER <u>ALL</u> QUESTIONS

Adnoddau neu ddefnyddiau sydd eu hangen / Equipment or materials required:
Dewiswch o'r canlynol os gwelwch yn dda / Please select from the following:

Cyfrifiannell / Calculator ☐

Llyfr Agored / Open Book ☒

Llyfr Fformiwla / Formula Book ☐

Arall nodwch os gwelwch yn dda / Other please specify. **Use one page of typed A4 notes**

STUDENT NAME: _____

STUDENT ID: _____

Office Use Only:			
Author:		Semester:	one
Internal Verifier:		R Y/N?	Yes / No (Please delete as applicable)
Contribution to Overall Module Assessment (%):			

THIS IS AN INDIVIDUAL PRACTICAL LAB-TEST, HELD UNDER EXAMINATION CONDITIONS. YOU WILL BE ASSIGNED THREE ROUTERS, TWO SWITCHES AND TWO PCS. CONFIGURE THESE DEVICES BASED ON THE FOLLOWING SPECIFICATIONS.

THE ROUTERS ARE R1, R2 AND R3. THE SWITCHES ARE S1 AND S2. AND THE PCS ARE PC1 AND PC2.

THIS PAPER CONTRIBUTES 75 % TO OVERALL MODULE ASSESSMENT.

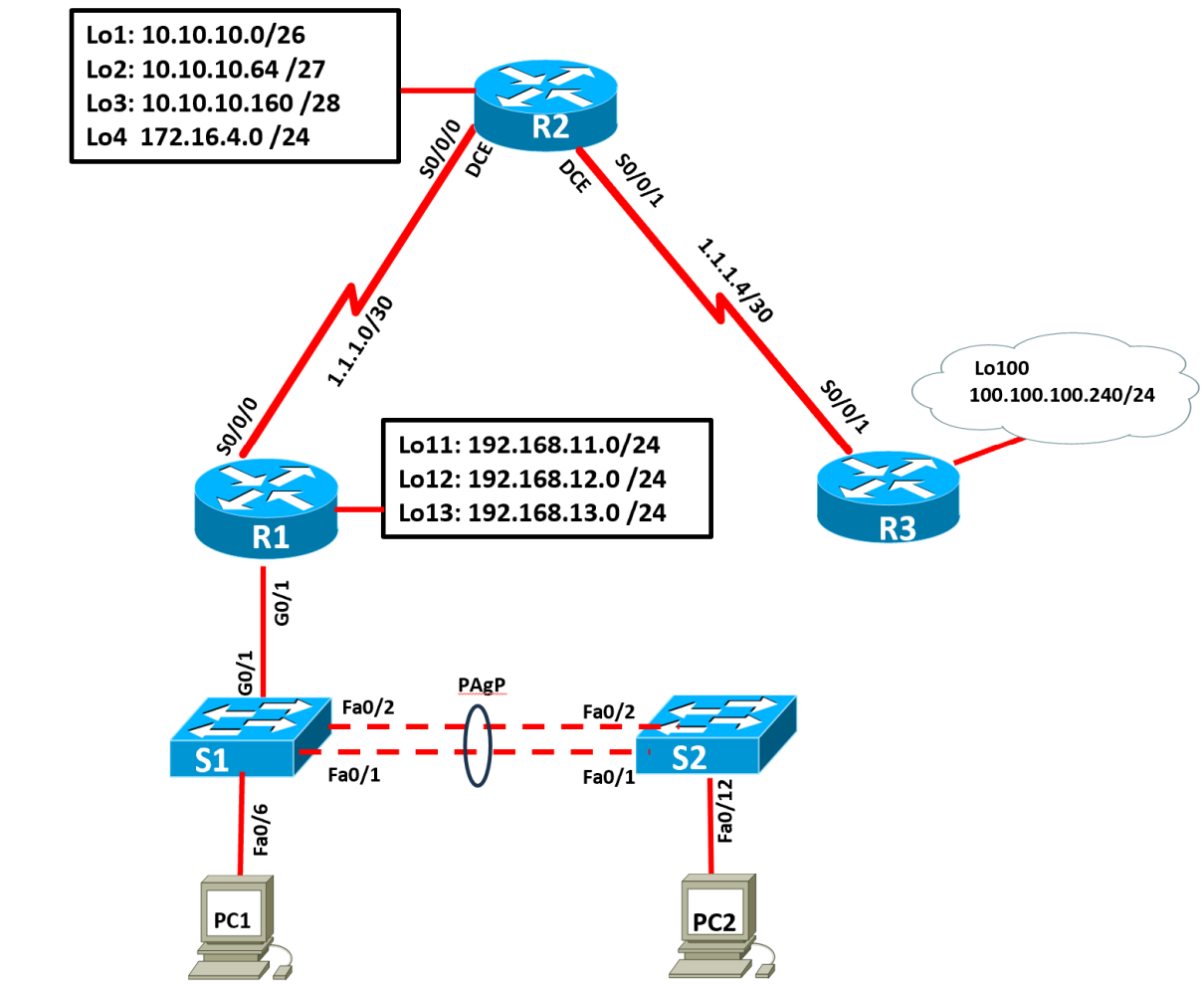
Task 1: In class activities (15 %)

1. Layer 3 config and Inter-Vlan Routing Challenge (5%) complete by (done)
2. Implementing Ether-Channel (5%) complete by (done)
3. HSRP ACTIVITY (5%) complete by (done)

Task 2: Network Configuration (85 %)

NB : Exam paper interfaces may not match actual device interfaces. Run a “*show ip interface brief*” on routers and switches before starting. Router interfaces may vary (e.g., Gi0/0 & Gi0/1 or Gi0/0/0 & Gi0/0/1), and switch interfaces can also differ based on the model.

TOPOLOGY DIAGRAM



VLAN table

VLAN	NAME	PORTS	NETWORK
99	Management & Native	SVI	172.16.99.0/24
10	Academics	Fa0/3 to Fa0/11	172.16.10.0/24
20	Students	Fa0/12 to Fa0/18	172.16.20.0/24
30	Guest	Fa0/19 to Fa0/24	172.16.30.0/24

2.1 IP Addressing table

Using the topology diagram, complete the IP Address table below. For the LAN, assign the first usable address to the router interface. PCs will receive IP addresses from the DHCP server. For VLAN 99, assign the second and third usable addresses to S1 and S2, respectively.

Device	Interface	IP Address	Subnet mask	Default Gateway
R1	Gi0/1.10			
	Gi0/1.20			
	Gi0/1.30			
	Gi0/1.99			
	S0/0/0			
	Lo11			
	Lo12			
	Lo13			
R2	S0/0/0			
	S0/0/1			
	Lo1			
	Lo2			
	Lo3			
	L04			
R3	S0/0/1			
	Lo100			
S1	VLAN99			
S2	VLAN99			
PC1	NIC	DHCP	DHCP	DHCP
PC2	NIC	DHCP	DHCP	DHCP

2.2: Initial Setup (5 Marks)

- Setup the above topology using Routers, Switches and PC's assigned to you.

Examiner Comments and Signature:

Note: After completing the cabling ask the invigilator to check and sign it off.

If not signed off by the invigilator, marks will not be awarded for this step.

Cabling Verification:
Signature:

2.2 Basic configuration (5 marks)

- i. On all devices configure host name and disable domain name lookup.
- ii. On both routers configure all interfaces with appropriate ip addresses.
- iii. Set the bandwidth on serial links to 1024kbps.
- iv. Set the clock rate on DCE to be 64000

2.3 Switch configuration (25 marks)

- v. On both S1 and S2, enable VLANs as per the VLAN table
- vi. On both switches, set VLAN 99 for management and native VLAN.
- vii. Configure PVST as spanning tree mode.
- viii. Configure Etherchannel using PAgP as per network topology and set up trunks to allow only VLANs 10, 20, 30 and 99.
- ix. Enable 802.1q trunking
- x. Disable DTP negotiations on Etherchannel link
- xi. On ports connected to PCs , configure port security with mac address sticky and max of 3 mac addresses per port, violation type: restrict, aging time: 60mins and aging type: inactivity.
- xii. Configure PortFast and BPDU Guard on the ports connected to PCs. Shutdown all unused ports.

2.4 Router configuration (20 marks)

- xiii. Enable Router-on-Stick Inter-VLAN routing as per topology
- xiv. Configure EIGRP 100 on all routers. Disable automatic summarization. Advertise all connected networks with appropriate mask. Do not advertise Lo100 as part of EIGRP.
- xv. On all routers set LAN and Loopback interfaces to Passive
- xvi. On R3 router, configure ipv4 default static route towards Lo100 and advertise the default route on to EIGRP networks .

2.5 DHCP configuration (10 marks)

- xvii. At R1 router configure DHCP server for VLAN 10 and 20. Set PC1 and PC2 to obtain ip address via DHCP server.

DHCP Pool Name:	Vlan10	Vlan20
Exclude IP Address	1st 10 Usable IP Address	1st 10 Usable IP Address
Network:	172.16.10.0/24	172.16.20.0/24
Default Router:	172.16.10.1	172.16.20.1
DNS Server:	1.1.1.1	1.1.1.1

Note: After completing task **xvii** ask the invigilator to check and sign it off.

If not signed off by the invigilator, marks will not be awarded for this step.

xviii. DHCP Verification

From PC1, and PC2 command prompt, issue ipconfig/all and record following details

	PC1	PC2
IP Address		
Subnet mask		
Default Router:		
DNS Server:		

Examiner Comments and Signature:

DHCP Verification: Issue ipconfig/ release and renew to verify full DHCP operation.

Signature:

Task 3: Network connectivity (15 marks)

Using ping command, verify end-to-end connectivity for all networks:

- i. From R1 & R2 router, ping Lo100. Is it successful? _____
- ii. From PC1, ping PC2 . Is it successful? _____
- iii. From PC1, ping R2 networks. Is it successful? _____
- iv. From PC1, ping Lo100. Is it successful? _____
- v. From PC2, ping to rest of networks. Is it successful? _____

Examiner Comments and Signature:

Note: Ask the invigilator to check and sign off the Task 3. If not signed off by the invigilator, marks will not be awarded for this step.

Network Connectivity Verification:
Signature:

Submission Requirement:

For each device you configured a txt file containing the following outputs must be submitted on Moodle. The file name should be ***StudentID_devicename.txt***

On Routers:

```
show run
show ip int brief
show ip route
```

On Switches:

```
show run
show ip int brief
show etherchannel summary
show vlan brief
show interfaces trunk
```

All documentation for your solution should be submitted electronically on Moodle within the time allocated. It is your responsibility that you copy all the files correctly. Any files submitted after the deadline will be capped at 40%

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