PEPERIKSAAN AKHIR
FINAL EXAMINATION
SEMESTER II SESI AKADEMIK 2022 - 2023
SEMESTER II ACADEMIC SESSION 2022 - 2023
IJAZAH SARJANA MUDA DENGAN KEPUJIAN
BACHELORS DEGREE WITH HONOURS

JULAI/OGOS 2023 *JULY/AUGUST 2023*	MASA : 2 JAM *TIME : 2 HOURS*

KOD KURSUS *COURSE CODE*	: TTTN2423 *TTTN2423*
TAJUK KURSUS *COURSE TITLE*	: KEPERLUAN PENSUISAN, PENGHALAAN DAN TANPA WAYAR *SWITCHING, ROUTING AND WIRELESS ESSENTIALS*
ARAHAN *INSTRUCTION*	: 1. Kertas ini mempunyai satu bahagian sahaja. *This paper has one section only.*

2. Jawab SEMUA soalan dalam buku jawapan yang diedarkan.
   Answer ALL questions in the answer booklet provided.

3. Jumlah markah keseluruhan kertas ini 70 markah.
   Total marks for this paper is 70 marks.

4. Kertas soalan tidak dibenarkan dibawa keluar daripada Dewan Peperiksaan.
   The exam paper is not allowed to be taken out from the Examination Hall.

No. Pendaftaran :
Matric No.

Set : _____

_____
(dengan perkataan)/*in words*

Kertas soalan ini mengandungi 6 muka surat bercetak, tidak termasuk muka surat ini.
This question paper consists of 6 printed page(s), excluding this page.

Please answer ALL the questions in the answer booklet.

1. **Figure 1** shows a network of a small company. The output shows the VLAN information of switch SW1. Switch SW2 has the same VLAN configurations. Based on the figure, answer the following questions.
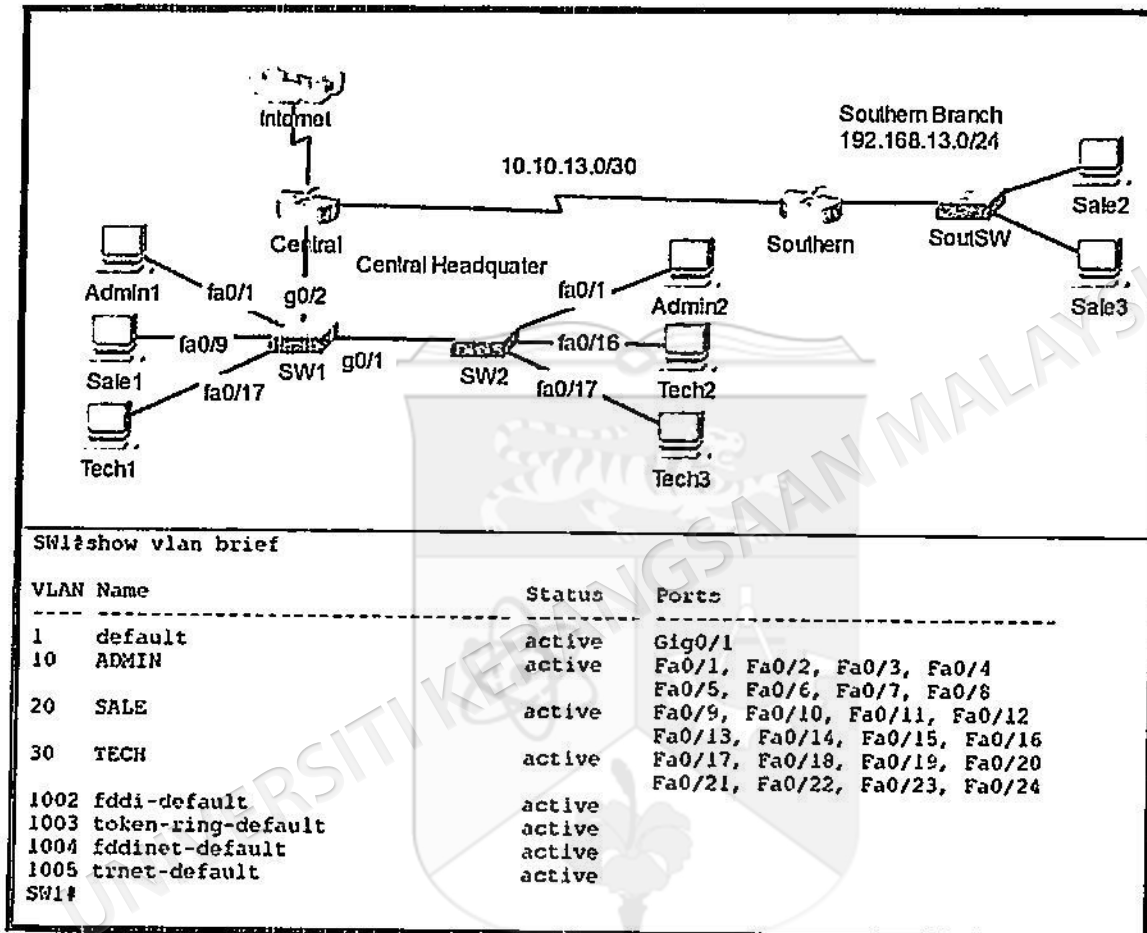


```
SW1#show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Gig0/1
10   ADMIN                            active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                Fa0/5, Fa0/6, Fa0/7, Fa0/8
20   SALE                             active    Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                                Fa0/13, Fa0/14, Fa0/15, Fa0/16
30   TECH                             active    Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                Fa0/21, Fa0/22, Fa0/23, Fa0/24
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
SW1#
```

Figure 1

a. Explain what a broadcast domain is and how it affects network performance.

(2 marks)

b. How many broadcast domains are there in the network shown in Figure 1? Justify your answer.

(2 marks)

c. Identify the VLANs implemented at the Central Headquarter site. Explain how users in one VLAN can interact with users in other VLANs.

(4 marks)

d. All users of Admin2, Tech2 and Tech3 PCs complain that they are unable to communicate with other users. What are the causes of the problem? Justify your answer.

(4 marks)

e. The network administrator has been asked to install a VOIP phone for the Sales staff who uses Sale1 PC at the Central Headquarter. Describe the implementation steps.

(4 marks)

2. Figure 2 shows a network of switches with Spanning Tree Protocol (STP) enabled. Based on the figure, answer the following questions.
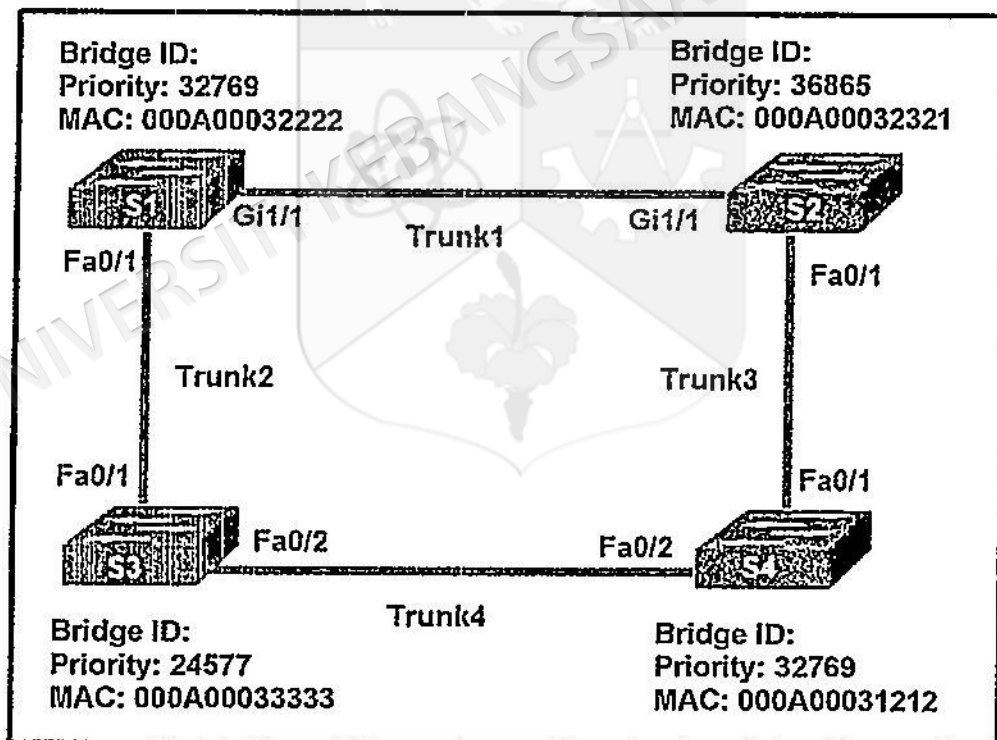

Figure 2

a. Describe redundancy at OSI Layers 1 and 2. Give TWO (2) reasons for implementing redundancy?

(3 marks)

b. Which switch in Figure 2 will be elected as the root bridge? Describe the root bridge election process.

(3 marks)

c. Which switch in Figure 2 will place a port in blocking mode? Justify your answer.

(2 mark)

d. Identify one root port and one designated port from Figure 2. Justify your answer.

(4 marks)

e. The network administrator then implements EtherChannels for the links between S1 and S3, S3 and S4, as well as S2 and S4 to increase the bandwidth. Figure 3 shows the EtherChannel configurations on switches S3 and S4 that are set by the network administrator. Based on the figure, answer the following questions.


```
S3(config)#interface range fa0/1-4
S3(config-if-range)#channel-group 1 mode active
S4(config)#interface range fa0/1-4
S4(config-if-range)#channel-group 1 mode auto
```
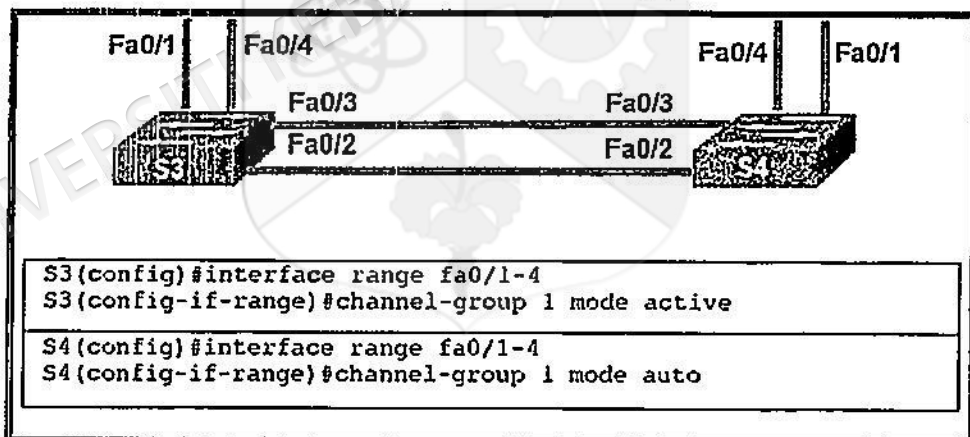
Figure 3

The network administrator discovers that the EtherChannels are not created. Discuss TWO (2) causes of the problem. Suggest how the administrator can solve the problem.

(6 marks)

3. A company has recently implemented an 802.11n wireless network with two separate 2.4GHz and 5GHz band networks.

    a. Compare the advantages and disadvantages of the 802.11n wireless standard in relation to the 802.11a, 802.11g, 802.11ac and 802.11ax wireless standards.

(6 marks)

    b. What are the reasons for splitting the wireless network into these two bands?

(2 marks)

    c. Describe TWO (2) security mechanisms or protocols commonly used in WLANs?

(4 marks)

4. In a recent assessment of the company's LAN security, the network administrator identifies several default settings on the switches including default native VLAN.

    a. Explain what is native VLAN.

(2 marks)

    b. Describe TWO (2) threats or possible LAN attacks that could occur when the native VLAN is left at its default value.

(4 marks)

    c. Give TWO (2) other default switch configurations that should be changed to increase security. Justify your answers.

(4 marks)

5. Figure 4 shows the routing tables of R1 and R2. Based on the figure, answer the following
    questions.

```
R1#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is 209.165.201.2 to network 0.0.0.0

      10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C        10.10.10.0/30 is directly connected, Serial0/0/0
L        10.10.10.1/32 is directly connected, Serial0/0/0
C        10.10.10.4/30 is directly connected, Serial0/0/1
L        10.10.10.5/32 is directly connected, Serial0/0/1
S     192.168.1.0/24 [1/0] via 10.10.10.2
S     192.168.2.0/24 [1/0] via 10.10.10.6
      192.168.10.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.10.0/24 is directly connected, GigabitEthernet0/0.10
L        192.168.10.251/32 is directly connected, GigabitEthernet0/0.10
      192.168.20.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.20.0/30 is directly connected, GigabitEthernet0/1
L        192.168.20.1/32 is directly connected, GigabitEthernet0/1
      192.168.30.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.30.0/24 is directly connected, GigabitEthernet0/0.30
L        192.168.30.251/32 is directly connected, GigabitEthernet0/0.30
      209.165.201.0/24 is variably subnetted, 2 subnets, 2 masks
C        209.165.201.0/30 is directly connected, Serial0/1/0
L        209.165.201.1/32 is directly connected, Serial0/1/0
S*    0.0.0.0/0 [1/0] via 209.165.201.2
```

```
R2#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

      10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C        10.10.10.4/30 is directly connected, Serial0/0/1
L        10.10.10.6/32 is directly connected, Serial0/0/1
S     192.168.1.0/24 is directly connected, Serial0/0/1
      192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.2.0/24 is directly connected, GigabitEthernet0/0
L        192.168.2.251/32 is directly connected, GigabitEthernet0/0
S     192.168.10.0/24 is directly connected, Serial0/0/1
      192.168.20.0/30 is subnetted, 1 subnets
S        192.168.20.0/30 is directly connected, Serial0/0/1
S     192.168.30.0/24 is directly connected, Serial0/0/1
```

Figure 4

a. Explain what R1 does when it receives a packet that has the following destination IP address:

   i.   209.165.201.1

   ii. 192.168.2.15

   iii. 61.10.90.145

(6 marks)

b. Identify the types of static routes implemented on R1 and R2? Justify your answer.

(6 marks)

c. What problem might users connected via R2 encounter, considering its current routing table?

(2 marks)

'GOOD LUCK'