SULIT

KEMENTERIAN PENDIDIKAN TINGGI
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI

BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI
KEMENTERIAN PENDIDIKAN TINGGI

JABATAN TEKNOLOGI MAKLUMAT DAN KOMUNIKASI

PEPERIKSAAN AKHIR

SESI I : 2025/2026

DFN 30353 : SWITCHING ESSENTIALS

TARIKH : 30 NOVEMBER 2025
MASA : 08.30 PAGI – 10.30 PAGI (2 JAM)

Kertas soalan ini mengandungi **DUA PULUH ENAM (26)** halaman bercetak.
Bahagian A: Objektif (30 soalan)
Bahagian B: Struktur (2 soalan)
Dokumen sokongan yang disertakan : Tiada

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

SULIT

SECTION B: 55 MARKS

BAHAGIAN B: 55 MARKAH

INSTRUCTION:

This section consists of **TWO (2)** structured questions. Answer ALL questions.

ARAHAN:

*Bahagian ini mengandungi **TWO (2)** soalan berstruktur. Jawab SEMUA soalan.*

QUESTION 1

SOALAN 1

CLO1 (a) i. State the purpose of using VLSM in network addressing.

Nyatakan tujuan penggunaan VLSM dalam pengalamatan rangkaian.

[2 marks]

[2 *markah*]

ii. Identify the host and network portion for the 192.168.3.210/24 address.

CLO1

Kenalpasti bahagian hos dan bahagian rangkaian untuk alamat 192.168.3.210/24.

[3 marks]

[*3 markah*]

CLO1

iii. Given a network address 192.168.70.0/27, find:

Diberi alamat rangkaian 192.168.70.0/27, cari:

- Subnet mask.

  Subnet mask
- Total IP address persubnet

  *Jumlah alamat IP per*subnet
- Total available host IP address

  Jumlah alamat IP hos tersedia
- The first available host IP address

  Alamat IP hos tersedia yang pertama
- The last available host IP address

  Alamat IP hos tersedia yang terakhir
- Network address

  Alamat rangkaian
- Broadcast address

  Alamat broadcast

[7 marks]

[7 *markah*]

CLO1 (b) i. Give the example of basic configuration command for the following situations.

Berikan contoh arahan konfigurasi asas untuk situasi berikut.

- Remove VLAN 20 from the VLAN database.
  Buang VLAN 20 *daripada pangkalan data* VLAN.

- Display VLAN name, status, and its ports, one VLAN per line.
  Paparkan nama, status VLAN *dan* port VLAN *dalam satu baris.*

[2 marks]

[2 *markah*]

CLO1

ii. Construct configurations to create a VLAN named "JPPKK-Staff" with its VLAN ID 42

Bina konfigurasi untuk menciptakan VLAN *bernama "JPPKK-Staff" dengan* VLAN ID *42.*

[4 marks]

[4 *markah*]

CLO1

iii. Table B1(b)(iii) displays the current MAC Address Table of a switch along with an incoming frame from port Fa0/9. Analyze and identify **TWO (2)** actions the switch will take upon receiving this frame.

Jadual B1(b)(iii) memaparkan MAC Address Table *semasa sebuah* switch *bersama-sama dengan* frame *masuk dari* port Fa0/9. *Analisis dan kenal pasti* ***DUA (2)*** *tindakan yang akan diambil oleh* switch *apabila menerima* frame *ini.*

Table B1b(iii) / *Jadual B1b(iii)*

Current MAC Address Table				
Ports		**MAC Address**		
Fa0/11		d0-d0-10-c0-fe-3e		
Fa0/24		2c-47-1e-da-33-f3		
Incoming Frame from Fa0/9				
Preamble	d0-d0-10-c0-fe-3e	20-d0-ac-de-fa-1a	IP Packet Data	FCS

[4 marks]

[4 *markah*]

QUESTION 2

SOALAN 2

CLO1 (a) i. List **THREE (3)** ways to implement Inter-VLAN routing.

*Senaraikan **TIGA (3)** cara untuk melaksanakan* Inter-VLAN routing.

[3 marks]

[3 *markah*]

CLO1 ii. Illustrate a suitable topology to show a correct Legacy Inter-VLAN routing for **THREE (3)** VLAN

Lukiskan topologi yang sesuai untuk menunjukkan Legacy Inter-VLAN routing *yang betul bagi **TIGA (3)*** VLAN.

[4 marks]

[4 *markah*]

CLO1 iii. Based on the topology and configuration snippets given on Figure B2(a)(iii) propose a correction command to be taken so every PC able to communicate.

Berdasarkan topologi dan coretan konfigurasi yang diberikan pada Rajah B2(a)(iii), cadangkan arahan pembetulan yang perlu diambil supaya setiap PC boleh berkomunikasi.

```
S1#show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/2, Fa0/3, Fa0/4, Fa0/5
                                                Fa0/7, Fa0/8, Fa0/9, Fa0/10
                                                Fa0/11, Fa0/12, Fa0/13, Fa0/14
                                                Fa0/15, Fa0/16, Fa0/17, Fa0/18
                                                Fa0/19, Fa0/20, Fa0/21, Fa0/22
                                                Fa0/23, Fa0/24, Gig0/1
22   Mgt                              active    Fa0/1
33   Finance                          active    Fa0/6
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
S1#show interface trunk
Port        Mode         Encapsulation  Status        Native vl
Gig0/2      on           802.1q         trunking      1

Port        Vlans allowed on trunk
Gig0/2      22,33
```

```
S2#show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/2, Fa0/3, Fa0/4, Fa0/5
                                                Fa0/7, Fa0/8, Fa0/9, Fa0/10
                                                Fa0/11, Fa0/12, Fa0/13, Fa0/14
                                                Fa0/15, Fa0/16, Fa0/17, Fa0/18
                                                Fa0/19, Fa0/20, Fa0/21, Fa0/22
                                                Fa0/23, Fa0/24, Gig0/1
22   Mgt                              active    Fa0/1
33   Finance                          active    Fa0/6
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
S2#show interface trunk
Port        Mode         Encapsulation  Status        Native vlan
Gig0/2      on           802.1q         trunking      1

Port        Vlans allowed on trunk
Gig0/2      22
```

```
R1#show run | section GigabitEthernet0/0/0
interface GigabitEthernet0/0/0
 no ip address
 duplex auto
 speed auto
interface GigabitEthernet0/0/0.22
 encapsulation dot1Q 23
 ip address 192.168.22.1 255.255.255.0
interface GigabitEthernet0/0/0.33
 encapsulation dot1Q 33
 ip address 192.168.33.1 255.255.255.0
```

Figure B2(a)(iii) / *Rajah B2(a)(iii)*

[4 marks]

[4 *markah*]

CLO1 (b) i. Figure B2(b)(i) shows a topology of three switches along with its BID and interface ID. Identify the Root Bridge and every port role for all switches.

Rajah B2(b)(i) menunjukkan topologi tiga switch *bersama dengan* BID *dan* ID *antara mukanya. Kenal pasti* Root Bridge *dan setiap peranan antara muka untuk semua* switch.

Figure B2(b)(i) / *Rajah B2(b)(i)*

[5 marks]

[5 *markah*]

CLO1 ii. Based on Figure B2(b)(ii), construct a configuration for EtherChannel with a valid LACP mode on switch SW2, if switch SW1 is configured using passive mode.

Berdasarkan Rajah B2(b)(ii), bina konfigurasi untuk EtherChannel *dengan mod* LACP *yang sah pada* switch *SW2, jika* switch *SW1 dikonfigurasikan menggunakan mod* passive.

Figure B2(b)(ii) / *Rajah B2(b)(ii)*

[5 marks]

[5 *markah*]

CLO1

iii. Refer to Figure B2(b)(iii). Interface Fa0/1 until Fa0/4 on Switch S3 already configured using EtherChannel with PAgP mode auto. Propose a valid EtherChannel configuration on S2 for to make sure the channel number 2 can be established.

Rujuk Rajah B2(b)(iii). Antara muka Fa0/1 *sehingga* Fa0/4 *pada* Switch S3 *sudah dikonfigurasikan menggunakan* EtherChannel *dengan mod* PAgP auto. *Cadangkan konfigurasi* EtherChannel *yang sah pada* S2 *untuk memastikan nombor saluran 2 boleh diwujudkan.*

```
interface FastEthernet0/2
  channel-group 4 mode active
!
interface FastEthernet0/3
  channel-group 4 mode active
```

Figure B2(b)(iii) / *Rajah B2(b)(iii)*

[4 marks]

[4 *markah*]

CLO1

(c) i. List **TWO (2)** supported Port Security Aging on an interface.

*Senaraikan **DUA (2)*** Port Security Aging *yang disokong pada antara muka.*

[2 marks]

[2 *markah*]

CLO1

ii. Explain how DHCP Snooping can be used to prevent DHCP Spoofing attacks.

Terangkan bagaimana DHCP Snooping *boleh digunakan untuk mencegah serangan* DHCP Spoofing.

[4 marks]

[4 *markah*]

CLO1

iii. In STP attack, attackers can manipulate the Spanning Tree Protocol (STP) to conduct an attack by spoofing the root bridge and changing the topology of a network. Based on Figure B2(c)(iii), construct a BPDU guard configurations on all 24 FastEthernet interfaces at S1 to mitigate this attack.

Dalam serangan STP, *penyerang boleh memanipulasi* Spanning Tree Protocol (STP) *untuk menjalankan serangan dengan memalsukan* root bridge *dan menukar topologi rangkaian. Berdasarkan Rajah B2(c)(iii), bina konfigurasi* BPDU guard *pada kesemua 24 antara muka* FastEthernet *di S1 untuk mengurangkan serangan ini.*

Figure B2(c)(iii) / *Rajah B2(c)(iii)*

[5 marks]

[5 *markah*]

SOALAN TAMAT