

**SULIT**



BAHAGIAN PEPERIKSAAN DAN PENILAIAN  
JABATAN PENGAJIAN POLITEKNIK  
KEMENTERIAN PENDIDIKAN MALAYSIA

JABATAN KEJURUTERAAN ELEKTRIK

PEPERIKSAAN AKHIR  
SESI DISEMBER 2013

**EP602: WIRELESS COMMUNICATION**

**TARIKH : 23 APRIL 2014  
TEMPOH : 2.30 PM – 4.30PM (2 JAM)**

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Kertas ini mengandungi **LAPAN (8)** halaman bercetak.

Bahagian A: Struktur (10 soalan)

Bahagian B: Esei (3 soalan)

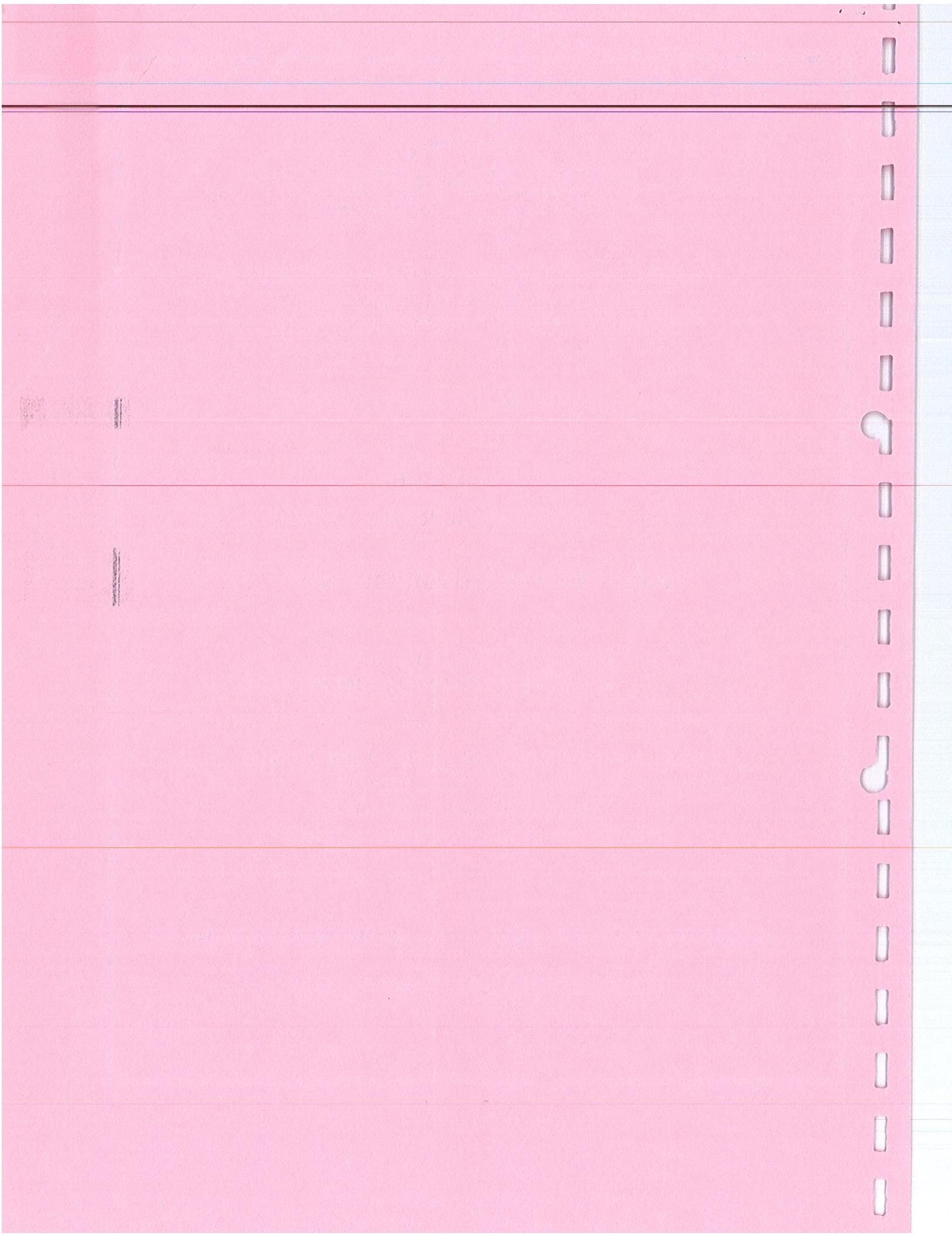
Dokumen sokongan yang disertakan : Tiada

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**JANGAN BUKA KERTAS SOALANINI SEHINGGA DIARAHKAN**

(CLO yang tertera hanya sebagai rujukan)

**SULIT**



**SECTION A : 40 MARKS****BAHAGIAN A : 40 MARKAH****INSTRUCTION:**

This section consists of **TEN (10)** structured questions. Answer **ALL** questions.

**ARAHAN:**

*Bahagian ini mengandungi SEPULUH (10) soalan berstruktur. Jawab semua soalan.*

CLO1  
C1**QUESTION 1**

State **TWO (2)** advantages and disadvantages of wireless communication system.

**SOALAN 1**

*Nyatakan DUA (2) kelebihan dan kelemahan sistem komunikasi tanpa wayar.*

[4 marks]

[4 markah]

CLO1  
C1**QUESTION 2**

Amateur radio is one of the long range communication services. List **FOUR (4)** applications of amateur radio.

**SOALAN 2**

*Radio amatur merupakan salah satu perkhidmatan komunikasi tanpa wayar jarak jauh.*

*Senaraikan EMPAT (4) aplikasi-aplikasi bagi radio amatur.*

[4 marks]

[4 markah]

### QUESTION 3

Describe the characteristics of General Packet Radio Service (GPRS).

CLO1  
C2

#### ***SOALAN 3***

*Jelaskan ciri-ciri 'General Packet Radio Service' (GPRS).*

[4 marks]

[4 markah]

CLO1  
C2

### QUESTION 4

Differentiate between High Speed Downlink Packet Access (HSDPA) and Worldwide Interoperability for Microwave Access (WiMAX) in term of bandwidth and data speed.

#### ***SOALAN 4***

*Bezakan antara High Speed Downlink Packet Access (HSDPA) dan Worldwide Interoperability for Microwave Access (WiMAX) dari segi lebar jalur dan kelajuan data.*

[4 marks]

[4 markah]

CLO1  
C2

### QUESTION 5

Differentiate between CDMA and TDMA.

#### ***SOALAN 5***

*Bezakan antara CDMA dan TDMA.*

[4 marks]

[4 markah]

CLO1  
C1

**QUESTION 6**

List **FOUR (4)** cellular communication system components that are connected to the Mobile Switching Centre (MSC).

**SOALAN 6**

*Senaraikan **EMPAT (4)** komponen-komponen sistem komunikasi selular yang disambungkan kepada ‘Mobile Switching Centre’ (MSC).*

[4 marks]

[4 markah]

CLO1  
C2

**QUESTION 7**

How are sectoring techniques used to improve coverage and capacity in cellular system?

**SOALAN 7**

*Bagaimakah teknik-teknik ‘sectoring’ yang digunakan untuk memperbaiki kawasan liputan dan kapasiti dalam sistem selular?*

[4 marks]

[4 markah]

CLO1  
C2

**QUESTION 8**

Describe hard hand-over.

**SOALAN 8**

*Jelaskan ‘hard hand-over’.*

[4 marks]

[4 markah]

CLO1

C2

**QUESTION 9**

Illustrate TWO (2) types of free space propagation phenomena.

**SOALAN 9**

*Illustrasikan DUA (2) jenis fenomena perambatan ruang bebas.*

[4 marks]

[4 markah]

CLO1

C1

**QUESTION 10**

By using a suitable diagram, distinguish the co-channel and adjacent channel.

**SOALAN 10**

*Dengan menggunakan gambarajah yang sesuai, bezakan 'co-channel' dan 'adjacent channel'.*

[4 marks]

[4 markah]

**SECTION B : 60 MARKS**

**BAHAGIAN B : 60 MARKAH**

**INSTRUCTION:**

This section consists of **THREE (3)** essay questions. Answer **ALL** questions.

**ARAHAN:**

*Bahagian ini mengandungi **TIGA (3)** soalan eseai. Jawab semua soalan.*

**QUESTION 1**

**SOALAN 1**

CLO1  
C2

- (a) Enhanced Data Rates for GSM Evolution (EDGE) is considered as a pre-3G technology and is part of ITU's 3G definition. Explain briefly about EDGE technology.

*Enhanced Data Rates for GSM Evolution (EDGE) adalah dianggap sebagai teknologi pra-3G dan ia merupakan sebahagian daripada definisi 3G ITU. Terangkan secara ringkas mengenai teknologi EDGE.*

[4 marks]

[4 markah]

CLO1  
C1

- (b) Identify **THREE (3)** roles of these organizations for communication standards:

- i. International Telecommunication Union (ITU)
- ii. Malaysian Communication and Multimedia Commission (MCMC)

*Kenalpasti **TIGA (3)** peranan bagi setiap organisasi bagi piawaian komunikasi berikut:*

- i. International Telecommunication Union (ITU)
- ii. Malaysian Communication and Multimedia Commission (MCMC)

[6 marks]

[6 markah]

CLO1  
C2

(c) Explain each of the wireless communication services listed below:

i. Wireless Wide Area Network (WWAN)

ii. Zigbee

*Terangkan setiap perkhidmatan komunikasi tanpa wayar yang disenaraikan di bawah:*i. *Wireless Wide Area Network (WWAN)*ii. *Zigbee*

[10 marks]

[10 markah]

**QUESTION 2****SOALAN 2**

CLO1

(a) i. Draw the architecture for Global System for Mobile communication (GSM) system.

C1

*Lukiskan senibina bagi sistem ‘Global System for Mobile communication’ (GSM).*

[6 marks]

[6 markah]

CLO1

C2

ii. Describe the function of any THREE (3) components in the block diagram.

*Jelaskan fungsi bagi mana-mana TIGA (3) komponen dalam gambarajah blok tersebut.*

[6 marks]

[6 markah]

CLO1

C1

(b) List FOUR (4) characteristics of Frequency Division Multiple Access (FDMA).

*Senaraikan EMPAT (4) ciri-ciri bagi Frequency Division Multiple Access (FDMA).*

[8 marks]

[8 markah]

**QUESTION 3**

CLO1  
C2

- a) Differentiate between soft and softer hand-over in cellular communication system.

*Bezakan di antara ‘soft and softer hand-over’ dalam sistem komunikasi selular.*

[4 marks]

[4 markah]

CLO1  
C2

- b) By using a suitable diagram, describe the cellular call procedures when making a call from a wireline telephone (PSTN) to mobile phone.

*Dengan menggunakan gambarajah yang sesuai, jelaskan prosedur panggilan selular apabila membuat panggilan dari satu telefon berwayar (PSTN) ke telefon mudahalih.*

[8 marks]

[8 markah]

CLO1  
C2

- c) What is the phenomena that occurs when the Base Transceiver Station (BTS) transmit signal to the mobile user where the emission has been obstructed by a hill top. Explain the phenomena by using a suitable diagram.

*Apakah fenomena yang berlaku sekiranya BTS memancarkan isyarat kepada pengguna mudahalih di mana pancarannya telah terhalang oleh puncak bukit.*

*Terangkan fenomena tersebut dengan menggunakan bantuan gambarajah yang bersesuaian.*

[4 marks]

[4 markah]

CLO1  
C2

- d) Compute the values of Cluster Size (N) and Co-channel Reuse Ratio (Q) if the cell have  $i=2$  and  $j=2$ .

*Hitungkan saiz kluster (N) dan nisbah guna-semula sesaluran (Q) jika sel mempunyai  $i=2$  dan  $j=2$ .*

[4 marks]

[4 markah]

