POLITEKNIK
MALAYSIA

BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK
KEMENTERIAN PENDIDIKAN TINGGI

JABATAN KEJURUTERAAN ELEKTRIK

PEPERIKSAAN AKHIR

SESI DISEMBER 2016

EP601 : DATA COMMUNICATION

TARIKH : 12 APRIL 2017
MASA : 8.30 AM - 10.30 AM (2 JAM)

Kertas ini mengandungi **TUJUH (7)** halaman bercetak.

Bahagian A: Struktur (10 soalan)
Bahagian C: Esei (3 soalan)

Dokumen sokongan yang disertakan : ASCII Code Table

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

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 struktur. Jawab SEMUA soalan.

CLO1
C1

QUESTION 1
SOALAN 1

List **FOUR (4)** types of application in data communication.

Senaraikan EMPAT (4) jenis aplikasi yang digunakan dalam komunikasi data.

[4 marks]

[*4 markah*]

CLO1
C3

QUESTION 2
SOALAN 2

Calculate the Shannon's Limit if you were given a bandwidth of 300Hz and signal to noise ratio , S/R is 3dB.

Kirakan 'Shahnon's Limit 'sekiranya kamu diberikan lebarjalur 300Hz dan nisbah isyarat ke hingar, S/R adalah 3 dB.

[4 marks]

[*4markah*]

CLO1
C1

QUESTION 3
SOALAN 3

Identify the voltage level for RS-422 at the transmitting and receiving end.

Kenalpasti paras voltan untuk RS-422 pada bahagian penghantar dan penerima.

[4 marks]

[*4 markah*]

CLO2
C2

QUESTION 4

SOALAN 4

Compress the data below using Run Length Encoding (RLE).

   i.   *BBBBBBBBBAAAAAAAAAAAAAAAAANNMMMMMMMMMM*

  ii.   *00000000000001000000110000000000000*

Mampatkan data di bawah menggunakan kaedah Run Length Encoding (RLE).

   i.   BBBBBBBBBAAAAAAAAAAAAAAAAANNMMMMMMMMMM

  ii.   00000000000001000000110000000000000

[4 marks]

[*4 markah*]

CLO2
C3

QUESTION 5

SOALAN 5

Illustrate Front End Processor (FEP) and Multiplexer as a data efficiency devices.

Ilustrasikan Pemproses Hujung Hadapan dan Multiplexer sebagai peranti kecekapan data.

[4 marks]

[*4 markah*]

CLO2
C2

QUESTION 6

SOALAN 6

There are several types of Media Access Control (MAC) in Local area Network. Explain the concept of Token Passing.

Terdapat beberapa jenis 'Media Access Control' dalam Rangkaian Kawasan Tempatan. Terangkan konsep 'Token Passing'.

[4 marks]

[*4 markah*]

CLO2
C1

QUESTION 7

SOALAN 7

Give **FOUR (4)** differences between MAN and WAN.

*Berikan **EMPAT (4)** perbezaan antara MAN dan WAN.*

[4 marks]

[*4 markah*]

CLO2
C2

QUESTION 8

SOALAN 8

Interfaces R, S, T and U are the interfaces for devices in Integrated Services Digital Network (ISDN). Describe all of these interfaces.

Antaramuka R, S, T dan U merupakan antaramuka bagi peranti pada Perkhidmatan Paduan Rangkaian Digital . Perihalkan kesemua antaramuka tersebut.

[4 marks]

[*4 markah*]

CLO2
C2

QUESTION 9

SOALAN 9

Compare between Public Switched Telephone Network (PSTN) and Integrated Services Digital Network (ISDN).

Bandingkan di antara 'Public Switched Telephone Network (PSTN)' dan 'Integrated Services Digital Network (ISDN)'.

[4 marks]

[*4 markah*]

CLO2
C2

QUESTION 10

SOALAN 10

Describe **TWO (2)** differences between IPv4 and IPv6.

*Perihalkan **DUA (2)** perbezaan antara IPv4 dan IPv6.*

[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 esei. Jawab **SEMUA** soalan.*

QUESTION 1
SOALAN 1

CLO1
C3

a) Coding is a set of symbols to represent message or data before being processed. Employ ASCII code to represent character N and G using ASCII code table given.
Pengkodan merupakan set simbol bagi mewakili mesej atau data sebelum diproses. Gunakan kod ASCII untuk mewakilkan aksara N dan G menggunakan jadual kod ASCII yang diberi .

[4 marks]
[4 markah]

CLO1
C3

b) Refer to the answer in (a) for character 'N' above, show how the character can be transmitted by using Cyclic Redundancy Check (CRC) for error checking at the transmitter and the receiver. Given the CRC generator =1101.
Merujuk jawapan (a) bagi aksara 'N', tunjukkan bagaimana aksara boleh dihantar menggunakan menggunakan kaedah Cyclic Redundancy Check (CRC) sebagai kaedah pengesanan ralat di bahagian penghantar dan penerima. Diberi penjana CRC= 1101

[7 marks]
[7 markah]

CLO1
C3

c) Explain **THREE (3)** types of error in error coding with the aid of a diagram.
*Terangkan **TIGA (3)** jenis ralat dalam pengekodan dengan bantuan gambarajah.*

[9 marks]
[9 markah]

QUESTION 2
SOALAN 2

CLO2
C2

a) Explain **FOUR (4)** characteristics of Caesar Cipher technique for encryption and decryption.
*Terangkan **EMPAT (4)** ciri-ciri teknik 'Caesar Cipher' untuk penyulitan dan nyahsulitan.*

[6 marks]
[6 markah]

CLO2
C3

b) If k = 3, and the message (plain text) = **POLITEKNIK MALAYSIA**, show the detail process of Caesar Cipher technique in encrypting the message.
*Jika k = 3, dan pesanan (plain text) = **POLITEKNIK MALAYSIA**, tunjukkan dengan terperinci proses teknik 'Caesar Cipher' dalam penyulitan mesej.*

[6 marks]
[6 markah]

CLO2
C3

c) Bus Topology, Star Topology, Ring Topology and Mesh Topology are among networking topologies in Local Area Network. Illustrate each of these topologies
Topologi Bus, Topologi Bintang,Topologi Gelang dan Topologi 'Mesh' adalah antara topologi yang digunakan di dalam Rangkaian Kawasan Tempatan. Ilustrasikan kesemua topologi tersebut.

[8 marks]
[8 markah]

QUESTION 3

SOALAN 3

CLO2
C2

a) There are **THREE (3)** types of ISDN access mode which are Basic Rate Interface (BRI), Primary Rate Interface (PRI) and Hybrid Interface (HI). Explain the differences between BRI and PRI.

*Terdapat **TIGA (3)** jenis mode capaian ISDN iaitu 'Basic Rate Interface' (BRI), 'Primary Rate Interface' (PRI) and 'Hybrid Interface' (HI). Terangkan perbezaan antara BRI dan PRI.*

[8 marks]

[*8 markah*]

CLO2
C2

b) Describe **THREE (3)** importance of Integrated Services Digital Network (ISDN) compared to Public Switching telephone network (PSTN)

*Nyatakan **TIGA (3)** kepentingan Perkhidmatan Paduan Rangkaian Digital (ISDN) berbanding Rangkaian Telefon Pensuisan Awam (PSTN).*

[6 marks]

[*6 markah*]

CLO2
C2

c) Explain **THREE (3)** Next Generation Network (NGN) services.

*Terangkan **TIGA (3)** perkhidmatan Rangkaian Generasi Akan Datang (NGN).*

[6 marks]

[*6 markah*]

SOALAN TAMAT

APPENDIX 1 (LAMPIRAN 1).

ASCII TABLE

Dec	Hx	Oct	Char		Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr
0	0	000	NUL	(null)	32	20	040	 	Space	64	40	100	@	@	96	60	140	`	`
1	1	001	SOH	(start of heading)	33	21	041	!	!	65	41	101	A	A	97	61	141	a	a
2	2	002	STX	(start of text)	34	22	042	"	"	66	42	102	B	B	98	62	142	b	b
3	3	003	ETX	(end of text)	35	23	043	#	#	67	43	103	C	C	99	63	143	c	c
4	4	004	EOT	(end of transmission)	36	24	044	$	$	68	44	104	D	D	100	64	144	d	d
5	5	005	ENQ	(enquiry)	37	25	045	%	%	69	45	105	E	E	101	65	145	e	e
6	6	006	ACK	(acknowledge)	38	26	046	&	&	70	46	106	F	F	102	66	146	f	f
7	7	007	BEL	(bell)	39	27	047	'	'	71	47	107	G	G	103	67	147	g	g
8	8	010	BS	(backspace)	40	28	050	(	(	72	48	110	H	H	104	68	150	h	h
9	9	011	TAB	(horizontal tab)	41	29	051	)	)	73	49	111	I	I	105	69	151	i	i
10	A	012	LF	(NL line feed, new line)	42	2A	052	*	*	74	4A	112	J	J	106	6A	152	j	j
11	B	013	VT	(vertical tab)	43	2B	053	+	+	75	4B	113	K	K	107	6B	153	k	k
12	C	014	FF	(NP form feed, new page)	44	2C	054	,	,	76	4C	114	L	L	108	6C	154	l	l
13	D	015	CR	(carriage return)	45	2D	055	-	-	77	4D	115	M	M	109	6D	155	m	m
14	E	016	SO	(shift out)	46	2E	056	.	.	78	4E	116	N	N	110	6E	156	n	n
15	F	017	SI	(shift in)	47	2F	057	/	/	79	4F	117	O	O	111	6F	157	o	o
16	10	020	DLE	(data link escape)	48	30	060	0	0	80	50	120	P	P	112	70	160	p	p
17	11	021	DC1	(device control 1)	49	31	061	1	1	81	51	121	Q	Q	113	71	161	q	q
18	12	022	DC2	(device control 2)	50	32	062	2	2	82	52	122	R	R	114	72	162	r	r
19	13	023	DC3	(device control 3)	51	33	063	3	3	83	53	123	S	S	115	73	163	s	s
20	14	024	DC4	(device control 4)	52	34	064	4	4	84	54	124	T	T	116	74	164	t	t
21	15	025	NAK	(negative acknowledge)	53	35	065	5	5	85	55	125	U	U	117	75	165	u	u
22	16	026	SYN	(synchronous idle)	54	36	066	6	6	86	56	126	V	V	118	76	166	v	v
23	17	027	ETB	(end of trans. block)	55	37	067	7	7	87	57	127	W	W	119	77	167	w	w
24	18	030	CAN	(cancel)	56	38	070	8	8	88	58	130	X	X	120	78	170	x	x
25	19	031	EM	(end of medium)	57	39	071	9	9	89	59	131	Y	Y	121	79	171	y	y
26	1A	032	SUB	(substitute)	58	3A	072	:	:	90	5A	132	Z	Z	122	7A	172	z	z
27	1B	033	ESC	(escape)	59	3B	073	;	;	91	5B	133	[	[	123	7B	173	{	{
28	1C	034	FS	(file separator)	60	3C	074	<	<	92	5C	134	\	\	124	7C	174	|		
29	1D	035	GS	(group separator)	61	3D	075	=	=	93	5D	135	]	]	125	7D	175	}	}
30	1E	036	RS	(record separator)	62	3E	076	>	>	94	5E	136	^	^	126	7E	176	~	~
31	1F	037	US	(unit separator)	63	3F	077	?	?	95	5F	137	_	_	127	7F	177	&#127;	DEL