KOLEJ UNIVERSITI TEKNOLOGI TUN HUSSEIN ONN

PEPERIKSAAN AKHIR
SEMESTER I
SESI 2006/07

NAMA MATAPELAJARAN	:	EKONOMI KEJURUTERAAN DAN KOS PERAKAUNAN
KOD MATAPELAJARAN	:	BKF 3213
KURSUS	:	4 BKC
TARIKH PEPERIKSAAN	:	NOVEMBER 2006
JANGKA MASA	:	3 JAM
ARAHAN	:	JAWAB **LIMA (5)** SOALAN SAHAJA DARIPADA LAPAN (8) SOALAN

KERTAS SOALAN INI MENGANDUNGI 14 MUKASURAT

S1   Pihak JKR sedang mempertimbangkan cara untuk meningkatkan rekabentuk struktur jalan dengan membina lapisan asas (base course) baru setebal 20 cm menggunakan batu hancur (crushed stone base) yang kemudian akan diturap dengan suatu lapisan haus. Dua (2) alternatif lapisan haus yang dapat digunakan adalah :

Alternatif 1   Penggunaan *sheet-asphalt* dengan tebal 3 cm
Alternatif 2   Penggunaan *slurry seal cold asphalt* dengan tebal 5 cm

Anggaran kos untuk kedua-dua alternatif tersebut adalah seperti berikut :

Perihal	Alternatif 1	Alternatif 2
Kos awal pembinaan struktur jalan (investment)	RM 330,000	RM 440,000
Pelapisan ulang dilakukan setiap	4 tahun	8 tahun
Kos pelapisan ulang	RM 180,000	RM 240,000
Kos penyelenggaraan tahunan	RM 34,000/tahun	RM 18,000/tahun
Kadar faedah	8 % setahun	8 % setahun

Tentukan alternatif yang harus dipilih oleh pihak JKR untuk meningkatkan struktur jalan sedia ada dengan menggunakan kaedah nilai kini.

(20 markah)

S2   Pendidih stim diperlukan dalam merekabentuk janakuasa baru. Pendidih ini boleh dijana samada dengan menggunakan gas semulajadi, minyak bahan bakar atau arang batu. Keputusan mesti dibuat untuk menentukan yang mana satu bahan bakar yang perlu digunakan. Satu analisis kos menunjukkan bahawa kos pemasangan mestilah sekurang-kurangnya RM 30,000 untuk gas semulajadi, untuk minyak bahan bakar sebanyak RM 55,000 dan untuk arang batu pula sebanyak RM 180,000. Jika gas semulajadi dipilih untuk digunakan selain daripada minyak bahan bakar, kos bahan bakar tahunan akan naik sebanyak RM 7,500. Jika arang batu pula digunakan selain daripada minyak bahan bakar, kos bahan bakar tahunan akan dapat dikurangkan sebanyak RM 15,000 satu tahun. Dengan menganggap faedah sebanyak 8%, analisis dalam 20 tahun dan tiada nilai baki, bahan bakar mana yang paling menjimatkan?

(20 markah)

S3 Dua kemungkinan laluan yang boleh digunakan untuk penghantaran kuasa elektrik adalah sedang dikaji. Data dari kedua laluan tersebut adalah sebagai berikut:

Perkara	Alternatif A	Alternatif B
Panjang	15 km	5 km
Kos awal	RM 5,000/km	RM25,000/km
Kos penyelenggaraan	RM 200/km/tahun	RM 400/km/tahun
Jangka hayat	15 tahun	15 tahun
Nilai baki (salvage value)	RM 3,000/km	RM5,000/km
Yearly power loss	RM500/km	RM500/km
Cukai tahunan	2% dari kos awal	2% dari kos awal

Tentukan alternatif yang harus dipilih dengan menggunakan kaedah nilai tahunan (annual cash flow analysis) dan kadar faedah 8% setahun.

(20 markah)

S4 (a) Berikan definisi 'susut nilai dalam pengurusan aset' sesebuah firma.

(5 markah)

(b) Nyatakan dengan ringkas **dua (2)** alasan kepentingan susut nilai didalam ekonomi kejuruteraan.

(5 markah)

(c) Sebuah jentera mengangkut tanah telah dibeli 7 tahun lalu dengan harga RM50,000. Julat hayat penyusutan aset (ADR) adalah 6 tahun. Dianggarkan nilai salvaj aset pada akhir hayat adalah RM3,500. Dengan merujuk **Jadual 2** kirakan susut nilai pada tahun kedua dan nilai buku pada akhir tahun ke empat bagi kaedah-kaedah berikut:

(i) Kaedah garis lurus

(ii) Kaedah baki berkurang dengan peratus tetap ($\bullet$) adalah 1.2/L

(iii) Kaedah baki berkurang dan anggaran nilai salvaj.

(10 markah)

S5   (a)   Jelaskan dengan ringkas konsep nilai wang masa dan kadar faedah di dalam kesetaraan ekonomi.

(5 markah)

(b)   Firma ABC telah membeli sebuah jentera yang mempunyai jangka hayat 5 tahun. Anggaran kos penyenggaraan tahun pertama adalah RM2,000. Kos tersebut meningkat RM300 setiap tahun. Kadar faedah tahunan adalah sebanyak 8%. Dengan merujuk **Jadual 3** kirakan jumlah kos penyenggaraan semasa yang diperlukan oleh firma.

(15 markah)

S6   (a)   Nyatakan **tiga (3)** kategori aliran tunai beserta contoh dalam mengenalpasti samada sesuatu projek itu mempunyai satu atau lebih nilai kadar pulangan dalaman.

(5 markah)

(b)   Berdasarkan **Jadual 4** di bawah, tentukan kadar pulangan dalaman bagi pelaburan yang dibuat. Andaikan kadar minimum pulangan (*MARR*) firma ialah 20% untuk setengah tahun.

Jadual 4 : Butiran dan Nilai pelaburan

Butiran	Nilai
Nilai semasa (P) , RM	-1000
Hasil jualan tahunan (A_1), RM	4,150
Perbelanjaan tahunan (A_2),RM	-5,595
Nilai masa hadapan (F), RM	2,457
Jangka hayat mesin (n), tahun	3

Berdasarkan kiraan ,berikan komen anda.

(15 markah)

4

S7 (a) Nyata dan huraikan pengkosan

(5 markah)

(b) Tujuan utama sistem pengkosan ialah untuk menyediakan makluamat kos. Nyatakan **dua (2)** perkara yang perlu dipertimbangkan sebelum sesuatu sistem digunakan.

(2 markah)

(c) Nyatakan **dua (2)** definisi perakaunan kos.

(2 markah)

(d) Pengkosan ialah lanjutan kepada perakaunan kewangan. Nyatakan **dua (2)** perkara yang perlu dipertimbangkan dalam perakaunan kewangan.

(2 markah)

(e) Nyata dan huraikan **dua (2)** teknik pengkosan.

(4 markah)

(f) Nyatakan definisi perakaunan kos strategic dan huraikan tujuannya.

(5 markah)

S8 (a) Nyatakan **lima (5)** prosedur pembelian efisyen.

(5 markah)

(b) Nyatakan **lima (5)** kebaikan pembelian masa itu (*just in time*)

(5 markah)

(c) Nyata dan huraikan **tiga (3)** kaedah untuk merekod masa buruh.

(6 markah)

(d) Nyatakan **empat (4)** punca yang menyebabkan masa leka.

(4 markah)

PEPERIKSAAN AKHIR

SEMESTER/SESI	:	I / 2006/07	KURSUS	:	4BKC
MATAPELAJARAN	:	EKONOMI KEJURUTERAAN KOS PERAKAUNAN	KOD MATAPELAJARAN	:	BKF 3213

Jadual 1 Faktor Faedah Kompaun – i = 8%

	Single Payment		Uniform Payment Series				Arithmetic Gradient		
	Compound Amount Factor	Present Worth Factor	Sinking Fund Factor	Capital Recovery Factor	Compound Amount Factor	Present Worth Factor	Gradient Uniform Series	Gradient Present Worth	
n	Find F Given P F/P	Find P Given F P/F	Find A Given F A/F	Find A Given P A/P	Find F Given A F/A	Find P Given A P/A	Find A Given G A/G	Find P Given G P/G	n
1	1.080	.9259	1.0000	1.0800	1.000	0.926	0	0	1
2	1.166	.8573	.4808	.5608	2.080	1.783	0.481	0.857	2
3	1.260	.7938	.3080	.3880	3.246	2.577	0.949	2.445	3
4	1.360	.7350	.2219	.3019	4.506	3.312	1.404	4.650	4
5	1.469	.6806	.1705	.2505	5.867	3.993	1.846	7.372	5
6	1.587	.6302	.1363	.2163	7.336	4.623	2.276	10.523	6
7	1.714	.5835	.1121	.1921	8.923	5.206	2.694	14.024	7
8	1.851	.5403	.0940	.1740	10.637	5.747	3.099	17.806	8
9	1.999	.5002	.0801	.1601	12.488	6.247	3.491	21.808	9
10	2.159	.4632	.0690	.1490	14.487	6.710	3.871	25.977	10
11	2.332	.4289	.0601	.1401	16.645	7.139	4.240	30.266	11
12	2.518	.3971	.0527	.1327	18.977	7.536	4.596	34.634	12
13	2.720	.3677	.0465	.1265	21.495	7.904	4.940	39.046	13
14	2.937	.3405	.0413	.1213	24.215	8.244	5.273	43.472	14
15	3.172	.3152	.0368	.1168	27.152	8.559	5.594	47.886	15
16	3.426	.2919	.0330	.1130	30.324	8.851	5.905	52.264	16
17	3.700	.2703	.0296	.1096	33.750	9.122	6.204	56.588	17
18	3.996	.2502	.0267	.1067	37.450	9.372	6.492	60.843	18
19	4.316	.2317	.0241	.1041	41.446	9.604	6.770	65.013	19
20	4.661	.2145	.0219	.1019	45.762	9.818	7.037	69.090	20
21	5.034	.1987	.0198	.0998	50.423	10.017	7.294	73.063	21
22	5.437	.1839	.0180	.0980	55.457	10.201	7.541	76.926	22
23	5.871	.1703	.0164	.0964	60.893	10.371	7.779	80.673	23
24	6.341	.1577	.0150	.0950	66.765	10.529	8.007	84.300	24
25	6.848	.1460	.0137	.0937	73.106	10.675	8.225	87.804	25
26	7.396	.1352	.0125	.0925	79.954	10.810	8.435	91.184	26
27	7.988	.1252	.0114	.0914	87.351	10.935	8.636	94.439	27
28	8.627	.1159	.0105	.0905	95.339	11.051	8.829	97.569	28
29	9.317	.1073	.00962	.0896	103.966	11.158	9.013	100.574	29
30	10.063	.0994	.00883	.0888	113.283	11.258	9.190	103.456	30
31	10.868	.0920	.00811	.0881	123.346	11.350	9.358	106.216	31
32	11.737	.0852	.00745	.0875	134.214	11.435	9.520	108.858	32
33	12.676	.0789	.00685	.0869	145.951	11.514	9.674	111.382	33
34	13.690	.0730	.00630	.0863	158.627	11.587	9.821	113.792	34
35	14.785	.0676	.00580	.0858	172.317	11.655	9.961	116.092	35
40	21.725	.0460	.00386	.0839	259.057	11.925	10.570	126.042	40
45	31.920	.0313	.00259	.0826	386.506	12.108	11.045	133.733	45
50	46.902	.0213	.00174	.0817	573.771	12.233	11.411	139.593	50
55	68.914	.0145	.00118	.0812	848.925	12.319	11.690	144.006	55
60	101.257	.00988	.00080	.0808	1 253.2	12.377	11.902	147.300	60
65	148.780	.00672	.00054	.0805	1 847.3	12.416	12.060	149.739	65
70	218.607	.00457	.00037	.0804	2 720.1	12.443	12.178	151.533	70
75	321.205	.00311	.00025	.0802	4 002.6	12.461	12.266	152.845	75
80	471.956	.00212	.00017	.0802	5 887.0	12.474	12.330	153.800	80
85	693.458	.00144	.00012	.0801	8 655.7	12.482	12.377	154.492	85
90	1 018.9	.00098	.00008	.0801	12 724.0	12.488	12.412	154.993	90
95	1 497.1	.00067	.00005	.0801	18 701.6	12.492	12.437	155.352	95
100	2 199.8	.00045	.00004	.0800	27 484.6	12.494	12.455	155.611	100

PEPERIKSAAN AKHIR

SEMESTER/SESI	:	I / 2006/07	KURSUS	:	4BKC
MATAPELAJARAN	:	EKONOMI KEJURUTERAAN	KOD	:	BKF 3213
		KOS PERAKAUNAN	MATAPELAJARAN		

<u>Jadual 2</u>: Peratus Susut Nilai bagi Kaedah *Accelerated Cost Recovery System*

Tahun Dijual	Kelas Aset (Tahun)			
Kembali	3	5	10	15
1	25	15	8	5
2	38	22	14	10
3	37	21	12	9
4		21	10	8
5		21	10	7
6			10	7
7			9	6
8			9	6
9			9	6
10			9	6
11				6
12				6
13				6
14				6
15				6

<u>Jadual 3</u>: Aliran Tunai Diskret : Kadar Faedah Kompaun , i = 8%

n	Bayaran Tunggal		Siri Bayaran Seragam				Cerun Aritmetik	
	F/P	P/F	A/F	F/A	A/P	P/A	P/G	A/G
1	1.0800	0.9259	1.00000	1.0000	1.08000	0.9259		
2	1.1664	0.8573	0.48077	2.0800	0.56077	1.7833	0.8573	0.4808
3	1.2597	0.7938	0.30803	3.2464	0.38803	2.5771	2.4450	0.9487
4	1.3605	0.7350	0.22192	4.5061	0.30192	3.3121	4.6501	1.4040
5	1.4693	0.6806	0.17046	5.8666	0.25046	3.9927	7.3724	1.8465

KOLEJ UNIVERSITI TEKNOLOGI TUN HUSSEIN ONN

FINAL EXAMINATION
SEMESTER I
SESI 2006/2007

NAME OF SUBJECT : ENGINEERING ECONOMICS AND COST ACCOUNTING

CODE OF SUBJECT : BKF 3213

COURSE : 4BKC

DATE OF EXAMINATION : NOVEMBER 2006

DURATION : 3 HOURS

INSTRUCTION : ANSWER ONLY **FIVE(5)** QUESTIONS FROM EIGHT (8) QUESTIONS

Q1 The Public Work Department (JKR) is considering a method to upgrade a highway structure in Malaysia using a new 20 cm base course of crushed stone base. This new layer will then improved by covering it with a surface layer. There are 2 (two) alternatives of surface layer that can be used.

1st alternative : 3 cm sheet-asphalt
2nd alternative : 5 cm slurry seal cold asphalt
Data on these alternatives are as follows:

	1st alternative	2nd alternative
Capital cost (investment)	RM 330,000	RM 440,000
Re-layering is done every	4 years	8 years
Re-layering cost	RM 180,000	RM 240,000
Maintenance cost	RM 34,000/year	RM 18,000/year
Interest	8 %per year	8 % per year

Determine which alternative should JKR choose to upgrade highway structure using the present worth method?

(20 marks)

Q2 A steam boiler is needed as part of the design of a new plant. The boiler can be generated either by natural gas, fuel oil, or coal. A decision must be made on which fuel needs to be used. An analysis of the costs shows that the installation cost, with all controls, would be least for natural gas at $30,000; for fuel oil it would be RM55, 000; and for coal it would be RM180, 000. If natural gas is used rather than fuel oil, the annual fuel cost will be RM15, 000 per year less. Assuming 8% interest, a twenty-year analysis period, and no salvage value, which is the most economical installation?

(20 marks)

Q3 Two possible routes for a power line are under study. Data on the routes are as follows:

	Around The Lake	Under The Lake
Length	15 km	5 km
First cost	RM 5,000/km	RM25,000/km
Maintenance	RM 200/km/year	RM 400/km/year
Useful life, in years	15	15
Salvage value	RM 3,000/km	RM5,000/km
Yearly power loss	RM500/km	RM500/km
Annual property taxes	2% of first cost	2% of first cost

Using annual cash flow analysis and 8% interest, should the power line be routed around the lake or under the lake?

(20 marks)

Q4 (a) Define the term 'depreciation asset' in a management firm.

(3 marks)

(b) Briefly describe **two (2)** reasons why depreciation is important in economic engineering.

(5 marks)

(c) A forklift truck was purchased 7 years ago for RM50,000. The range life of depreciation asset (ADR) was 6 year. The salvage value is estimated at RM3,500. Based on **Table 2** calculate the depreciation for the third year and the book value at the end of the second year using the following methods.

    (i)   Straight line method
    (ii)   Declining balance method with fixed percentage (•) is 1.2/L
    (iii) Declining balance method with estimated salvage value.

(12 marks)

Q5 (a) Briefly explain the concept of time value of money and interest rate in economic equivalence.

(5 marks)

(b) ABC Firm has just purchased a truck that has useful life of 5 years. It is estimated that the maintenance costs for the truck during the first year will be RM2, 000. Maintenance cost is expected to increase as the truck ages at a rate RM300 per year over the remaining life. Based on **Table 2** determine the present value of maintenance cost if the interest rate is 8% per annum.

(15 marks)

Q6 (a) Explain **three (3)** categories of cash flow by giving examples, in order to determine whether the project has one or more value of Internal Rate of Return.

(5 marks)

(b) Determine the internal rate of return for investment that is made by a firm. Assume that the minimum rate of return is 20% for the half of the year.

Table 3 : Items and investment value

Items	value
Present worth (P) , RM	-1000
Income per annum (A_1), RM	4,150
Expenses per annum (A_2),RM	-5,595
Future worth (F), RM	2,457
Life of asset (n), year	3

Based on the calculation, give your comment.

(15 marks)

Q7 (a) Define and describe costing.

(5 marks)

(b) The main purpose of a costing system is to provide cost information. Before such a system can be installed, state **two (2)** requirements which should be considered.

(2 marks)

(c) State **two (2)** definition of cost accounting.

(2 marks)

(d) Cost is an extension of financial accounting. State **two (2)** considerations in financial accounting.

(2 marks)

(e) State and describe **two (2)** costing techniques.

(4 marks)

(f) State definition strategic cost accounting and describe the aims.

(5 marks)

Q8 (a) Give **five (5)** efficient purchasing procedures.

(5 marks)

(b) State **five (5)** benefits of just in time purchasing.

(5 marks)

(c) State and describe **three (3)** methods for recording labour times.

(6 marks)

(d) Mention **four (4)** reason which can caused idle time.

(4 marks)

FINAL EXAMINATION

Table 1 Interest Compound Factor – i = 8%

n	Compound Amount Factor Find F Given P F/P	Present Worth Factor Find P Given F P/F	Sinking Fund Factor Find A Given F A/F	Capital Recovery Factor Find A Given P A/P	Compound Amount Factor Find, F Given A F/A	Present Worth Factor Find P Given A P/A	Gradient Uniform Series Find A Given G A/G	Gradient Present Worth Find P Given G P/G	n
1	1.080	.9259	1.0000	1.0800	1.000	0.926	0	0	1
2	1.166	.8573	.4808	.5608	2.080	1.783	0.481	0.857	2
3	1.260	.7938	.3080	.3880	3.246	2.577	0.949	2.445	3
4	1.360	.7350	.2219	.3019	4.506	3.312	1.404	4.650	4
5	1.469	.6806	.1705	.2505	5.867	3.993	1.846	7.372	5
6	1.587	.6302	.1363	.2163	7.336	4.623	2.276	10.523	6
7	1.714	.5835	.1121	.1921	8.923	5.206	2.694	14.024	7
8	1.851	.5403	.0940	.1740	10.637	5.747	3.099	17.806	8
9	1.999	.5002	.0801	.1601	12.488	6.247	3.491	21.808	9
10	2.159	.4632	.0690	.1490	14.487	6.710	3.871	25.977	10
11	2.332	.4289	.0601	.1401	16.645	7.139	4.240	30.266	11
12	2.518	.3971	.0527	.1327	18.977	7.536	4.596	34.634	12
13	2.720	.3677	.0465	.1265	21.495	7.904	4.940	39.046	13
14	2.937	.3405	.0413	.1213	24.215	8.244	5.273	43.472	14
15	3.172	.3152	.0368	.1168	27.152	8.559	5.594	47.886	15
16	3.426	.2919	.0330	.1130	30.324	8.851	5.905	52.264	16
17	3.700	.2703	.0296	.1096	33.750	9.122	6.204	56.588	17
18	3.996	.2502	.0267	.1067	37.450	9.372	6.492	60.843	18
19	4.316	.2317	.0241	.1041	41.446	9.604	6.770	65.013	19
20	4.661	.2145	.0219	.1019	45.762	9.818	7.037	69.090	20
21	5.034	.1987	.0198	.0998	50.423	10.017	7.294	73.063	21
22	5.437	.1839	.0180	.0980	55.457	10.201	7.541	76.926	22
23	5.871	.1703	.0164	.0964	60.893	10.371	7.779	80.673	23
24	6.341	.1577	.0150	.0950	66.765	10.529	8.007	84.300	24
25	6.848	.1460	.0137	.0937	73.106	10.675	8.225	87.804	25
26	7.396	.1352	.0125	.0925	79.954	10.810	8.435	91.184	26
27	7.988	.1252	.0114	.0914	87.351	10.935	8.636	94.439	27
28	8.627	.1159	.0105	.0905	95.339	11.051	8.829	97.569	28
29	9.317	.1073	.00962	.0896	103.966	11.158	9.013	100.574	29
30	10.063	.0994	.00883	.0888	113.283	11.258	9.190	103.456	30
31	10.868	.0920	.00811	.0881	123.346	11.350	9.358	106.216	31
32	11.737	.0852	.00745	.0875	134.214	11.435	9.520	108.858	32
33	12.676	.0789	.00685	.0869	145.951	11.514	9.674	111.382	33
34	13.690	.0730	.00630	.0863	158.627	11.587	9.821	113.792	34
35	14.785	.0676	.00580	.0858	172.317	11.655	9.961	116.092	35
40	21.725	.0460	.00386	.0839	259.057	11.925	10.570	126.042	40
45	31.920	.0313	.00259	.0826	386.506	12.108	11.045	133.733	45
50	46.902	.0213	.00174	.0817	573.771	12.233	11.411	139.593	50
55	68.914	.0145	.00118	.0812	848.925	12.319	11.690	144.006	55
60	101.257	.00988	.00080	.0808	1 253.2	12.377	11.902	147.300	60
65	148.780	.00672	.00054	.0805	1 847.3	12.416	12.060	149.739	65
70	218.607	.00457	.00037	.0804	2 720.1	12.443	12.178	151.533	70
75	321.205	.00311	.00025	.0802	4 002.6	12.461	12.266	152.845	75
80	471.956	.00212	.00017	.0802	5 887.0	12.474	12.330	153.800	80
85	693.458	.00144	.00012	.0801	8 655.7	12.482	12.377	154.492	85
90	1 018.9	.00098	.00008	.0801	12 724.0	12.488	12.412	154.993	90
95	1 497.1	.00067	.00005	.0801	18 701.6	12.492	12.437	155.352	95
100	2 199.8	.00045	.00004	.0800	27 484.6	12.494	12.455	155.611	100

FINAL EXAMINATION

Table 2 : Depreciation Percentages for Accelerated Cost Recovery System Method

Recovery Year	Property Class (year)			
	3	5	10	15
1	25	15	8	5
2	38	22	14	10
3	37	21	12	9
4		21	10	8
5		21	10	7
6			10	7
7			9	6
8			9	6
9			9	6
10			9	6
11				6
12				6
13				6
14				6
15				6

Table 3: Cash flow : Compound Interest , i = 8%

n	Single Payment		Series of Uniform Payment				Arithmetic Gradient	
	F/P	P/F	A/F	F/A	A/P	P/A	P/G	A/G
1	1.0800	0.9259	1.00000	1.0000	1.08000	0.9259		
2	1.1664	0.8573	0.48077	2.0800	0.56077	1.7833	0.8573	0.4808
3	1.2597	0.7938	0.30803	3.2464	0.38803	2.5771	2.4450	0.9487
4	1.3605	0.7350	0.22192	4.5061	0.30192	3.3121	4.6501	1.4040
5	1.4693	0.6806	0.17046	5.8666	0.25046	3.9927	7.3724	1.8465