

SULIT



**BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK
KEMENTERIAN PENDIDIKAN TINGGI**

JABATAN PERDAGANGAN

PEPERIKSAAN AKHIR

SESI DISEMBER 2016

DPB2033: BUSINESS MATHEMATICS

TARIKH : 05 APRIL 2017

MASA : 8.30 AM – 10.30 AM (2 JAM)

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

Struktur (4 soalan)

Dokumen sokongan yang disertakan : Jadual PVIF dan PVIFA

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

SULIT

INSTRUCTION:

This section consists of **FOUR (4)** structured questions. Answer **ALL** questions.

ARAHAN:

Bahagian ini mengandungi EMPAT (4) soalan berstruktur. Jawab SEMUA soalan.

QUESTION 1**SOALAN 1**CLO1
C1

a) Differentiate the following functions;

Bezakan fungsi berikut;

i) $f(x) = -8x$

[2 marks]

[2 markah]

ii) $f(x) = 4x^{-9}$

[3 marks]

[3 markah]

iii) $y = 5x + 3$

[2 marks]

[2 markah]

iv) $y = 2x^2 + 6x - 20$

[3 marks]

[3 markah]

v) $y = \frac{x^2+1}{x}$

[5 marks]

[5 markah]

CLO1
C2

- b) The production cost in Ringgit Malaysia, per week of producing x tires is given by $C(x) = 4000 - 32x + 0.08x^2 + 0.00006x^3$ and the demand function for the tires is given by $P(x) = 250 + 0.02x - 0.001x^2$. Calculate;

Kos pengeluaran, di dalam Ringgit Malaysia bagi seminggu pengeluaran x tayar adalah $C(x) = 4000 - 32x + 0.08x^2 + 0.00006x^3$ dan fungsi permintaan bagi tayar adalah $P(x) = 250 + 0.02x - 0.001x^2$. Kirakan;

- i) The marginal cost function.

Fungsi kos marginal.

[2 marks]

[2 markah]

- ii) The marginal revenue function.

Fungsi hasil marginal.

[3 marks]

[3 markah]

- iii) The marginal profit function.

Fungsi untung marginal.

[3 marks]

[3 markah]

- iv) The marginal revenue when 200 units are produced.

Hasil marginal apabila 200 unit dihasilkan.

[2 marks]

[2 markah]

QUESTION 2
SOALAN 2

XYZ Company is considering whether to purchase Machine A or Machine B. Both machines are expected to be used for 4 years. Machine A can generate RM5,000 cash flow in Year 1, RM4,000 in Year 2, RM3,000 in Year 3, and RM1,000 in Year 4. Machine B can generate RM1,000 in Year 1, RM3,000 in Year 2, RM4,000 in Year 3, and RM6,750 in Year 4. The company's cost of capital is 10% for each machine and the initial investment for both machines is RM10,000. You are required to:

Syarikat XYZ sedang mempertimbangkan sama ada membeli Mesin A atau Mesin B. Kedua-dua mesin dijangka akan digunakan untuk 4 tahun. Mesin A akan menghasilkan aliran tunai RM5,000 dalam tahun pertama, RM4,000 dalam tahun ke-2, RM3,000 dalam tahun ke-3, dan RM1,000 dalam tahun ke-4. Mesin B boleh menghasilkan RM1,000 dalam tahun pertama, RM3,000 dalam tahun ke-2, RM4,000 dalam tahun ke-3, dan RM6,750 dalam tahun ke-4. Kos modal syarikat adalah 10% bagi setiap mesin dan pelaburan permulaan adalah RM10,000. Anda perlu:

CLO1
C1

- a) Calculate:

Kirakan:

- i) Payback period (PBP) for each machine.

Tempoh bayar balik (TBB) untuk setiap mesin.

[5 marks]

[5 markah]

- ii) Average rate of return (ARR) for each machine.

Kadar Pulangan Purata (KPK) untuk setiap mesin.

[5 marks]

[5 markah]

CLO1
C2

b) Choose the best machine using:

Pilih mesin yang terbaik menggunakan:

- i) Net Present Value method (NPV).
Kaedah Nilai Kini Bersih (NKB).

[10 marks]

[10 markah]

- ii) Both methods stated in a) i & ii.
Kedua-dua kaedah yang telah dinyatakan di a) i & ii.

[5 marks]

[5 markah]

QUESTION 3
SOALAN 3

CLO2
C2

- a) Mr. Rayyan invested an amount of RM13,900 in two different schemes (A and B) at the simple interest rates of 14% p.a. and 11% p.a. respectively. If the total amount of simple interest earned in 2 years is RM3,508, calculate:

Encik Rayyan telah melabur sebanyak RM13,900 di dalam dua skim yang berbeza (A dan B) pada kadar faedah mudah masing-masing 14% setahun dan 11% setahun. Jika jumlah faedah mudah diterima dalam 2 tahun adalah RM3,508, Kira:

- i) The amount invested in each scheme.
Jumlah yang dilabur bagi setiap skim.

[5 marks]

[5 markah]

- ii) Interest earned if he intend to invest in scheme B for 42 months.
Faedah diterima jika beliau ingin melabur di dalam skim B bagi 42 bulan.

[5 marks]

[5 markah]

CLO2
C3

- b) Peter invested RM25,000 for 4 years 9 months. The interest offered for the investment is 12% compounded semi-annually for first two years and 10% compounded quarterly for the rest of the period.

Peter telah melabur RM25,000 bagi 4 tahun 9 bulan. Faedah yang ditawarkan untuk pelaburan ini adalah 12% dikompaunkan setiap setengah tahun bagi dua tahun pertama dan 10% dikompaunkan setiap tiga bulan untuk tempoh berikutnya.

- i) Calculate the accumulated amount at the end of the four year.
Kira jumlah terkumpul pada akhir tahun ke empat.

[9 marks]

[9 markah]

- ii) If he withdraws RM6,000 at the end of Year 4, calculate the balance at the end of the investment period.

Jika beliau telah mengeluarkan RM6,000 pada akhir tahun ke-4, kira baki pada akhir tempoh pelaburan.

[6 marks]

[6 markah]

QUESTION 4
SOALAN 4

Green Valley Comp. produces bed sheet at factories in Parit Buntar, Seremban and Muar. The bed sheets are then shipped to four warehouses located in Rantau Panjang, Kuantan, Ipoh and Senai. The cost per ton (in RM) of shipping the bed sheets from each three factories to the four warehouses is as follow:

Syarikat Green Valley menghasilkan cadar di kilang bertempat di Parit Buntar, Seremban dan Muar. Kemudian cadar tersebut dihantar ke empat gudang bertempat di Rantau Panjang, Kuantan, Ipoh dan Senai. Kos per tan (dalam RM) penghantaran cadar dari tiga kilang berbeza ke empat gudang berbeza adalah seperti berikut:

From / Dari	To / ke			
	Rantau Panjang	Kuantan	Ipoh	Senai
Parit Buntar	40	20	70	30
Seremban	30	70	50	80
Muar	90	40	30	10

The factories at Parit Buntar, Seremban and Muar can supply 250 tons, 450 tons, and 500 tons of bed sheets per week respectively. The Rantau Panjang, Kuantan, Ipoh, and Senai warehouse each has a demand of 200 tons, 400 tons, 300 tons and 300 tons per week. The company wants to know the number of bed sheets (in tons) to ship from each plant to each warehouse in order to minimise the total shipping cost.

Kilang di Parit Buntar, Seremban dan Muar boleh menawarkan masing-masing 250 tan, 450 tan, dan 500 tan cadar seminggu. Gudang di Rantau Panjang, Kuantan, Ipoh, dan Senai mempunyai permintaan masing-masing 200 tan, 400 tan, 300 tan dan 300 tan seminggu. Syarikat ingin mengetahui bilangan cadar (dalam tan) untuk dihantar dari setiap kilang ke setiap gudang untuk meminimumkan jumlah kos penghantaran.

CLO2
C1

- a) Calculate the transportation cost by using North West Corner Method.
Kirakan kos pengangkutan dengan menggunakan kaedah Pepenjuru Barat Laut.

[5 marks]

[5 markah]

CLO2
C2

- b) Calculate the transportation cost by using Minimum Cost Method.
Kirakan kos pengangkutan dengan menggunakan Kaedah Kos Minimum.

[5 marks]

[5 markah]

CLO2
C3

- c) Calculate the optimal transportation cost by using the Stepping Stone Method.
Kirakan kos pengangkutan paling optima dengan menggunakan Kaedah Batu Loncatan.

[15 marks]

[15 markah]

SOALAN TAMAT

APPENDIX 1

Present value interest factors for one dollar discounted at k per cent for n periods: $PVIF_{k,n} = 1/(1+k)^n$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696	0.8621	0.8333	0.8065	0.8000	0.7692
2	0.9803	0.9612	0.9426	0.9246	0.9070	0.8900	0.8734	0.8573	0.8417	0.8264	0.8116	0.7972	0.7831	0.7695	0.7561	0.7432	0.6944	0.6504	0.6400	0.5917
3	0.9706	0.9423	0.9151	0.8890	0.8638	0.8396	0.8163	0.7938	0.7722	0.7513	0.7313	0.7118	0.6931	0.6750	0.6575	0.6407	0.5787	0.5245	0.5120	0.4552
4	0.9610	0.9238	0.8885	0.8548	0.8227	0.7921	0.7629	0.7350	0.7084	0.6830	0.6587	0.6355	0.6133	0.5921	0.5718	0.5523	0.4823	0.4230	0.4096	0.3501
5	0.9515	0.9057	0.8626	0.8219	0.7835	0.7473	0.7130	0.6806	0.6499	0.6209	0.5935	0.5674	0.5428	0.5194	0.4972	0.4761	0.4019	0.3411	0.3277	0.2693
6	0.9420	0.8880	0.8375	0.7903	0.7462	0.7050	0.6663	0.6302	0.5963	0.5645	0.5346	0.5066	0.4803	0.4556	0.4323	0.4104	0.3349	0.2751	0.2621	0.2072
7	0.9327	0.8706	0.8131	0.7599	0.7107	0.6651	0.6227	0.5835	0.5470	0.5132	0.4817	0.4523	0.4251	0.3996	0.3759	0.3538	0.2791	0.2218	0.2097	0.1594
8	0.9235	0.8535	0.7894	0.7307	0.6768	0.6274	0.5820	0.5403	0.5019	0.4665	0.4339	0.4039	0.3762	0.3506	0.3269	0.3050	0.2326	0.1789	0.1678	0.1226
9	0.9143	0.8368	0.7664	0.7026	0.6446	0.5919	0.5439	0.5002	0.4604	0.4241	0.3909	0.3606	0.3329	0.3075	0.2843	0.2630	0.1938	0.1443	0.1342	0.0943
10	0.9053	0.8203	0.7441	0.6756	0.6139	0.5584	0.5083	0.4632	0.4224	0.3855	0.3522	0.3220	0.2946	0.2697	0.2472	0.2267	0.1615	0.1164	0.1074	0.0725
11	0.8963	0.8043	0.7224	0.6496	0.5847	0.5268	0.4751	0.4289	0.3875	0.3505	0.3173	0.2875	0.2607	0.2366	0.2149	0.1954	0.1346	0.0938	0.0859	0.0558
12	0.8874	0.7885	0.7014	0.6246	0.5568	0.4970	0.4440	0.3971	0.3555	0.3186	0.2858	0.2567	0.2307	0.2076	0.1869	0.1685	0.1122	0.0757	0.0687	0.0429
13	0.8787	0.7730	0.6810	0.6006	0.5303	0.4688	0.4150	0.3677	0.3262	0.2897	0.2575	0.2292	0.2042	0.1821	0.1625	0.1452	0.0935	0.0670	0.0650	0.0330
14	0.8700	0.7579	0.6611	0.5775	0.5051	0.4423	0.3878	0.3405	0.2992	0.2633	0.2320	0.2046	0.1807	0.1597	0.1413	0.1252	0.0779	0.0492	0.0440	0.0254
15	0.8613	0.7430	0.6419	0.5553	0.4810	0.4173	0.3624	0.3152	0.2745	0.2394	0.2090	0.1827	0.1599	0.1401	0.1229	0.1079	0.0649	0.0397	0.0352	0.0195
16	0.8528	0.7284	0.6232	0.5339	0.4581	0.3936	0.3387	0.2919	0.2519	0.2176	0.1883	0.1631	0.1415	0.1229	0.1069	0.0930	0.0541	0.0320	0.0281	0.0150
17	0.8444	0.7142	0.6050	0.5134	0.4363	0.3714	0.3166	0.2703	0.2311	0.1978	0.1696	0.1456	0.1252	0.1078	0.0929	0.0802	0.0451	0.0258	0.0225	0.0116
18	0.8360	0.7002	0.5874	0.4936	0.4155	0.3503	0.2959	0.2502	0.2120	0.1799	0.1528	0.1300	0.1108	0.0946	0.0808	0.0691	0.0376	0.0208	0.0180	0.0089
19	0.8277	0.6864	0.5703	0.4746	0.3957	0.3305	0.2765	0.2317	0.1945	0.1635	0.1377	0.1161	0.0981	0.0829	0.0703	0.0596	0.0313	0.0168	0.0144	0.0068
20	0.8195	0.6730	0.5537	0.4564	0.3769	0.3118	0.2584	0.2145	0.1784	0.1486	0.1240	0.1037	0.0868	0.0728	0.0611	0.0514	0.0261	0.0135	0.0115	0.0053
21	0.8114	0.6598	0.5375	0.4388	0.3569	0.2942	0.2415	0.1987	0.1637	0.1351	0.1117	0.0926	0.0768	0.0638	0.0531	0.0443	0.0217	0.0109	0.0092	0.0040
22	0.8034	0.6468	0.5219	0.4220	0.3418	0.2775	0.2257	0.1839	0.1502	0.1228	0.1007	0.0826	0.0680	0.0560	0.0462	0.0382	0.0181	0.0088	0.0074	0.0031
23	0.7954	0.6342	0.5067	0.4057	0.3256	0.2618	0.2109	0.1703	0.1378	0.1117	0.0907	0.0738	0.0601	0.0491	0.0402	0.0329	0.0151	0.0071	0.0059	0.0024
24	0.7876	0.6217	0.4919	0.3901	0.3101	0.2470	0.1971	0.1577	0.1264	0.1015	0.0817	0.0659	0.0532	0.0431	0.0349	0.0284	0.0126	0.0057	0.0047	0.0018
25	0.7798	0.6095	0.4776	0.3751	0.2953	0.2330	0.1842	0.1460	0.1160	0.0923	0.0736	0.0588	0.0471	0.0378	0.0304	0.0245	0.0105	0.0046	0.0038	0.0014
30	0.7419	0.5521	0.4120	0.3083	0.2314	0.1741	0.1314	0.0994	0.0754	0.0573	0.0437	0.0334	0.0256	0.0196	0.0151	0.0118	0.0042	0.0016	0.0012	-
35	0.7059	0.5000	0.3554	0.2534	0.1813	0.1301	0.0937	0.0676	0.0490	0.0356	0.0259	0.0189	0.0139	0.0102	0.0075	0.0055	0.0017	0.0005	-	-
36	0.6989	0.4902	0.3450	0.2437	0.1727	0.1227	0.0875	0.0626	0.0449	0.0323	0.0234	0.0169	0.0123	0.0089	0.0065	0.0048	0.0014	-	-	-
40	0.6717	0.4529	0.3066	0.2083	0.1420	0.0972	0.0668	0.0460	0.0318	0.0221	0.0154	0.0107	0.0075	0.0053	0.0037	0.0026	0.0007	-	-	-
50	0.6080	0.3715	0.2281	0.1407	0.0872	0.0543	0.0339	0.0213	0.0134	0.0085	0.0054	0.0035	0.0022	0.0014	0.0009	0.0006	-	-	-	-

Present value interest factors for one-dollar annuity discounted at k per cent for n periods: $PVIFA = [1 - 1/(1+k)^n]$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696	0.8621	0.8333	0.8065	0.8000	0.7692
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.7125	1.6901	1.6681	1.6467	1.6252	1.6052	1.5278	1.4568	1.4400	1.3609
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4437	2.4018	2.3612	2.3216	2.2832	2.2459	2.1065	1.9813	1.9520	1.8161
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.1024	3.0373	2.9745	2.9137	2.8550	2.7982	2.5887	2.4043	2.3616	2.1662
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6959	3.6048	3.5172	3.4331	3.3522	3.2743	2.9906	2.7454	2.6893	2.4356
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.2305	4.1114	3.9975	3.8887	3.7845	3.6847	3.3255	3.0205	2.9514	2.6427
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8694	4.7122	4.5638	4.4226	4.2883	4.1604	4.0386	3.6046	3.2423	3.1611	2.8021
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	5.1461	4.9676	4.7988	4.6399	4.4873	4.3436	3.8372	3.4212	3.3289	2.9247
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5162	6.2469	5.9952	5.7590	5.5370	5.3282	5.1317	4.9464	4.7716	4.6065	4.0310	3.5655	3.4631	3.0190
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.8892	5.6502	5.4262	5.2161	5.0188	4.8332	4.1925	3.6819	3.5705	3.0915
11	10.3668	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8025	6.4951	6.2065	5.9377	5.6869	5.4527	5.2337	5.0286	4.3271	3.7757	3.6564	3.1473
12	11.2555	10.575	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.4924	6.1944	5.9176	5.6603	5.4206	5.1971	4.4392	3.8514	3.7251	3.1903
13	12.134	11.348	10.635	9.9656	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.7499	6.4235	6.1218	5.8424	5.5831	5.3423	4.5327	3.9124	3.7801	3.2233
14	13.004	12.106	11.296	10.563	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.9819	6.6282	6.3025	6.0021	5.7245	5.4675	4.6106	3.9616	3.8241	3.2487
15	13.865	12.849	11.938	11.118	10.380	9.7122	9.1079	8.5595	8.0607	7.6061	7.1909	6.8109	6.4624	6.1422	5.8474	5.5765	4.6755	4.0013	3.8593	3.2682
16	14.718	13.578	12.561	11.652	10.838	10.106	9.4466	8.8514	8.3126	7.8237	7.3792	6.9740	6.6039	6.2651	5.9542	5.6685	4.7296	4.0333	3.8874	3.2832
17	15.562	14.292	13.166	12.166	11.274	10.477	9.7632	9.1216	8.5436	8.0216	7.5488	7.1196	6.7291	6.3729	6.0472	5.7487	4.7746	4.0591	3.9099	3.2948
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.3719	8.7556	8.2014	7.7016	7.2497	6.8399	6.4674	6.1280	5.8178	4.8122	4.0799	3.9279	3.3037
19	17.226	15.678	14.324	13.134	12.085	11.158	10.336	9.6036	8.9501	8.3649	7.8393	7.3658	6.9380	6.5504	6.1982	5.8775	4.8435	4.0967	3.9424	3.3105
20	18.046	16.351	14.877	13.590	12.462	11.470	10.594	9.8181	9.1285	8.5136	7.9633	7.4694	7.0248	6.6231	6.2593	5.9288	4.8696	4.1103	3.9539	3.3158
21	18.857	17.011	15.415	14.029	12.821	11.764	10.836	10.017	9.2922	8.6487	8.0751	7.5620	7.1016	6.6870	6.3125	5.9731	4.8913	4.1212	3.9631	3.3198
22																				