



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2011/2012**

COURSE NAME : **ENGINEERING ECONOMY**

COURSE CODE : **BPK 30902**

PROGRAMME : **BEB, BEC, BEH, BEU, BED, BEB,
BEH, BEE**

EXAMINATION DATE : **JUNE 2012**

DURATION : **2 HOURS 30 MINUTES**

INSTRUCTION : **ANSWER ALL QUESTIONS**

THIS PAPER CONTAINS FOUR (4) PAGES

- Q1** (a) Explain what engineering economy is? (4 marks)
- (b) Engineering economy analysis is important to choose preferred alternative. Explain briefly on the engineering economy analysis procedures. (8 marks)
- (c) Cost is one of criteria need to be considered in engineering economy analysis. Explain briefly any four (4) of the following type of cost: (8 marks)
- (i) Book Cost
 - (ii) Maintenance Cost
 - (iii) Recurring Cost
 - (iv) Investment Cost
 - (v) Disposal Cost
 - (vi) Fixed Cost
 - (vii) Indirect Cost
 - (viii) Incremental Cost
- Q2** (a) Compound interest is most commonly used type of interest nowadays. Explain the differences between compound interest and simple interest. (2 marks)
- (b) Suppose you borrow money of RM 150,000 from a bank in order to start a business. Assume the loan interest is at 12% per annum. Calculate the amount of your debt at the end of the fifth year according to the calculation of both types of simple interest and compound interest. (8 marks)
- (d) A man invested RM2,400 in a bank fixed deposit with 8% interest per year. After two years, he added RM1,000 into the fixed deposit account. He closed the account 5 years after opening it.
- (i) Calculate the interest that he earned annually during the five years period. (6 marks)
 - (ii) Sketch the cash flow diagram for the given investment situation. (4 marks)

Q3 (a) Determine how much would you need to invest in an investment fund that paying 5% interest if you needed RM10,000 seven (7) years from today. (6 marks)

(b) Assume that you are an engineer in a factory making electronic components and are required to manage purchasing of a new machine that cost RM100,000. If financing for the purchase was from a bank with an interest rate of 6% per year and a repayment period of 20 years, calculate the total repayment to be paid by the factory. (6 marks)

(c) Syarikat MEKAR Sdn. Bhd. applies for a RM150,000 loan to build a new factory. Interest on the loan is 9% per annum compounded monthly. If the company can afford to pay RM2500 a month, calculate how long it takes to pay off the loan. (8 marks)

Q4 (a) Compare and contrast the terms *discounting* and *compounding*. (4 marks)

(b) Ali has RM12,000 for investment purposes. His bank has offered the following three choices:

1. A special saving certificate that will pay RM100 each month for 5 years and a lump sum payment at the end of 5 years of RM13,000
2. Buy a share that will be worth RM20,000 in 5 years
3. Put the money in a savings account that will have an interest rate of 12% per year compounded monthly

Make a recommendation to Ali using present worth analysis.

(10 marks)

(c) A new process for manufacturing components will have a first cost of RM35,000 with annual costs of RM17,000. Extra income associated with the new process is expected to be RM22,000 per year. Determine the pay back period at $i = 10\%$ per year. (6 marks)

Q5 (a) Classify each of the following each cash flows as a benefit, disbenefit, or cost.

1. RM700,000 per year maintenance by Port Klang authority
2. Expenditure of RM45 million for tunnel construction on East-West Highway
3. Reduction of RM375,000 per year in car accident repairs because of improved lighting
4. RM700,000 per year loss of revenue by farmers because of highway right-of-way purchases

(4 marks)

(b) Two routes are under consideration for a new highway segment. The long route would be 25 km with initial cost of RM21 million. The short trans-mountain route would span 10 km with an initial cost of RM45 million. Maintenance cost are estimated at RM40,000 and RM15,000 per year for the long route and the short route, respectively. Additionally, a major overhaul and resurfacing will be required every 10 years at a cost of 10% of the first cost of each route. The volume of traffic is expected to be 400,000 vehicles per year, regardless of which route is selected.

If the vehicle operating expense is assumed to be 35 cent/km and the value of reduced travel time for the short route is estimated at RM900,000 per year, determine which route should be selected, using a conventional B/C analysis. Assume an infinite life for each road, an interest rate of 6% per year, and that one of the roads will be built.

(8 marks)

(c) A furniture company wants to study whether to retain the use of existing equipment (defender) or to replace them with new and more productive equipment (challenger). The cost information for both equipments is as follows with an interest rate of 20% per annum:

Information	Defender	Challenger
Initial cost, RM	450,000	-
Current value, RM	25,000	700,000
Operation cost, RM	160,000	70,000
Lifetime, year	5	10
Residual value, RM	0	50,000

Determine whether replacement of existing equipment needs to be replaced with new equipment or not using replacement analysis.

(8 marks)



**UNIVERSITI TUN HUSSEIN ONN MALAYSIA
BORANG PENYEDIAAN KERTAS SOALAN PEPERIKSAAN AKHIR**

**BAHAGIAN A
(Untuk Diksi Oleh Staf Akademik)**

Peperiksaan : Semester * I (ii) III Sesi 111/112

1.0 Nama 1. MOHD. HAKIMI BIN ZOHARI 012-9382534/8343
(HURUF BESAR) (Samb. Tel/HP)

2. DR. AZIZI BIN MISKON 7612/019658 0614
(HURUF BESAR) (Samb. Tel/HP)

3. DR. NORSHAHIDA BINTI MOHD SAAD 7534
(HURUF BESAR) (Samb. Tel/HP)

Kod Kursus : BPK309024 BPK30902
(Nyatakan Kod Lain jika ada)

Nama Kursus : ENGINEERING ECONOMY

Jangka masa Peperiksaan : 2 jam 30 minit

Bilangan Pelajar : 425 orang

Bahasa : Bahasa Malaysia Bahasa Inggeris

(Bagi soalan Bahasa Inggeris hendaklah disediakan terjemahannya dalam Bahasa Malaysia)

2.0 Draf Kertas Soalan ini terdiri daripada:

1. Soalan Subjektif : 3 muka surat

2. Gambar rajah : muka surat

3. Pelan : muka surat

4. Carta : muka surat

5. Soalan Objektif : muka surat

3.0 Bahan rujukan dan keperluan-keperluan lain yang perlu disediakan oleh PPA :-

	Bilangan Dikehendaki
1. <u>kertas Joseph</u>	<u>425</u>
2. _____	_____
3. _____	_____


4.0 Lain-lain arahan : Tiada

 **MOHD. HAKIMI BIN ZOHARI**
Pensyarah
Jabatan Kejuruteraan Komputer
Fakulti Kejuruteraan Elektrik dan Elektronik
Universiti Tun Hussein Onn Malaysia

14/5/2012
Tarikh

**BAHAGIAN B
(Untuk Dekan/Ketua Pusat)**

5.0 Kertas soalan ini telah disemak dan ianya adalah diluluskan untuk dikeluarkan pada peperiksaan Semester * I (ii) III Sesi 111/112

 **MOHD. AZOB BIN H. JOHARI**
Dekan
Fakulti Kejuruteraan Elektrik dan Elektronik
Universiti Tun Hussein Onn Malaysia.

24 MAY 2012
Tarikh