Second Semester Examination
2023/2024 Academic Session

July/August 2024

EPM 201 – Engineering Economy
(Ekonomi Kejuruteraan)

Duration: 2 hours
(Masa: 2 Jam)

Please check that this examination paper consists of THREE (3) pages of printed material before you begin the examination.

[Sila pastikan bahawa kertas peperiksaan ini mengandungi TIGA (3) muka surat yang bercetak sebelum anda memulakan peperiksaan ini.]

Instructions: Answer ALL **FOUR (4)** questions.

*[**Arahan**: Jawab **EMPAT (4)** soalan]*

1. [a] Describe THREE (3) roles of Engineering Economy in business decision making.

(30 marks)

[b] Two pumps capable of delivering 100hp to an agricultural application are being evaluated in a present economy study. The selected pump will only be utilized for one year, and it will have no market value at the end of the year. Data for both pumps are shown in Table 1[b].

Table 1[b]

	PUMP A	**PUMP B**
Initial Investment	RM 2,900.00	RM 6,200.00
Operating and Maintenance Cost	RM 170.00	RM 510.00

If electricity cost is RM 0.10 per 1kWh and the pump will be operated for 4,000 hours per year. Choose the best pump for the operation. Recall that 1hp = 0.746kWh.

(70 marks)

2. [a] The fixed cost incurred by a small genetics research lab are estimated to be RM125,000.00 per year. Variable costs are 70% of the annual revenue. Determine the annual profit if the revenue is RM200,000.00. Determine if the lab makes a profit or loss.

(30 marks)

[b] Suppose you take a personal loan of RM12,000 from a bank. The loan principle plus accumulated interest in four years is at interest, i = 10% per year. Calculate how much would you repay at the end of four years.

(20 marks)

[c] A company planned to have an investment of RM100,000.00 that will produce uniform annual revenue of RM53,100.00 for five years. Then, they will have a market recovery value of RM20,000.00 at the end of year five. Annual expenses will be RM30,000 for operating and maintaining the project. Draw a cash flow diagram for the five-year life of the project.

(50 marks)

3. [a] Explain Rate of Return (RoR) and Minimum Attractive Rate of Return (MARR) on investment and give ONE (1) example of the importance of both rate of returns in decision making over an investment.

(30 marks)

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[b] (i) Explain Depreciation and provide TWO (2) conditions for the property to be depreciable.

(ii) Calculate the amount of annual Depreciation and Rate of Depreciation under Straight Line (SL) Method from the following information: Purchased a second-hand machine for RM96,000, spent RM24,000 on its cartage, Repairs and installation, estimated useful life of machine 4 years. Estimated salvage/scrap value RM72,000.

(40 marks)

[c] Differentiate THREE (3) types of taxes imposed by the government.

(30 marks)

4. [a] Explain the replacement analysis with ONE(1) suitable example and provide TWO (2) reasons why replacement is needed.

(30 marks)

[b] Mr. Heng wants to buy a refrigerator for his cold drink shop. A company offers three alternatives (A1, A2 and A3) to him as the following details given in the Table 4[b]. If MARR is taken at 12%, choose the best alternative.

Table 4 [b]

	A1	A2	A3
Investment	800	700	750
Annual expense	30	55	60
Life span (years)	5	5	5

(70 marks)

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