มหาวิทยาลัยสงขลานครินทร์
คณะวิศวกรรมศาสตร์

การสอบปลายภาค   ประจำปีการศึกษา 1/2558

วันที่ 19 ธันวาคม 2558   เวลา 09.00-12.00 น.

วิชา 215-002 General Economics   ห้อง S102, S203

คำสั่ง

1.ข้อสอบมีทั้งหมด 6 ข้อ 8 หน้า ทำหมดทุกข้อ ในข้อสอบ โดยแสดงขั้นตอนการคำนวณอย่างชัดเจน

2.อนุญาตให้นำ ชีด Power Point, ตารางดอกเบี้ย, ดิกชันนารี และ เครื่องคิดเลข เข้าห้องสอบ

3.อนุญาตให้ใช้ดินสอ และใช้หน้าหลังของกระดาษ ได้

4.เขียนเลขที่นั่งสอบ (จากใบเซ็นชื่อ) ลงใน ☐ ที่หน้าปก (ถ้าไม่มีหัก 1 คะแนน)

ผู้สอบ ชื่อ-สกุล....................................รหัสนักศึกษา.............................

ผู้ออกข้อสอบ รศ.ไพโรจน์ คีรีรัตน์

คะแนน

ข้อ	คะแนนเต็ม	คะแนนที่ได้
1	10	....
2	10	....
3	10	....
4	10	....
6	10	....
	60	....

Q 1.

A company plans to sell a copier that prints documents on both sides simultaneously, cutting in half the time it takes to complete big commercially jobs. The costs associated with producing chemically-treated vinyl rollers and fiber-impregnated rubber rollers are shown below.

	Chemically-Treated Vinyl Rollers	Fiber-Impregnated Rubber Rollers
First cost, THB	-500,000	-950,000
Annual cost, THB	-1,000,000	-850,000
Salvage value, THB	50,000	110,000
Life, years	3	6

Determine which of the two types should be selected by calculating the rate of return. Assume the company's MARR is 20% per year.

Q 2.

Two alternative machines will produce the same product, but one is capable of higher-quality work, which can be expected to return greater revenue. The followings are relevant data:

	Machine I	Machine II
Capital Investment, THB	200,000	300,000
Life, years	6	4
Salvage value, THB	40,000	0
Annual receipts, THB	1,500,000	2,000,000
Annual expenses, THB	1,400,000	1,800,000
Depreciation method	MACRS (GDS)	MACRS (GDS)
Recovery period, years	3	3

Determine which is the better alternative, assuming an income-tax rate of 40% and after-tax MARR of 10%.

Q 3.

A company, 5 years ago, purchased for THB450,000 a microwave signal graphical plotter for corrosion detection in concrete structures. It is expected to have the market values and annual operating costs shown below for its remaining useful life of up to 3 years. It could be traded now at an appraised market value of THB80,000.

Year	Market Value at End of Year, THB	Annual Operating Cost, THB
1	60,000	-500,000
2	40,000	-530,000
3	10,000	-600,000

A replacement plotter with new Internet-based, digital technology costing THB1,250,000 has an estimated THB100,000 salvage value after its 5-year life and the annual operating costs of THB310,000 per year. At an interest rate of 15% per year, should the present plotter be replaced?

Q 4.

4.1 For the value shown, calculate the conventional B-C ratio at i = 10% per year.

	PW, THB	AW, THB	FW, THB
First cost	100,000	-	259,370
M&O cost	61,446	10,000	159,374
Benefit	-	40,000	637,496
Disbenefits	30,723	5,000	-

4.2 A project to control flooding from rare, but sometimes heavy rainfalls in the arid area will have the cash flows shown below. Determine which project should be selected on the basis of B-C analysis at i= 8% per year and a 20-year study period.

	Sanitary Sewers	Open Channels
First cost, THB	26 million	53 million
M&O cost, THB per year	400,000	30,000
Homeowner cleanup costs, THB per year	60,000	0

Q 5.

A manufacturer can purchase a new line of fuel injectors from either of two companies. Cost and savings estimates are made, but the savings estimate is unreliable at this time. Use an AW analysis at 10% per year to determine if the selection between company A and company B changes when the savings per year may vary as much as 40% from the best estimates made thus far.

	Company A	Company B
First cost, THB	-1,500,000	-900,000
Annual operating cost, THB	-210,000	-240,000
Savings best estimate, THB per year	450,000	390,000
Salvage, THB	150,000	111,000
Life, years	5	5

Q 6.

A large decision tree in the figure below has an outcome branch detailed. If decisions D1, D2, D3 are all options in a 1-year period, find the decision path that maximizes the outcome value. There are specific investments necessary for decision nodes D1, D2, and D3, as indicated on each branch.