THE OPEN UNIVERSITY OF SRI LANKA
Department of Civil Engineering
Construction Management Programme – Level 7
Post Graduate Diploma

CEX7110 – Construction Project Appraisal
FINAL EXAMINATION – 2011/2012

Time Allowed: Three Hours

Date: 12-03-2012 (Monday) Time: 1400 - 1700 hrs.

Answer any Four (04) questions.

Q1.

(a) Capital investment decisions are those that involve current outlays (payments) in return for a stream of benefits in future years. Explain the significance of capital investment decisions for a contractor who intends to invest on an earth moving machinery.

(Marks 06)

(b) Explain what is understood by 'capital recovery factor'. What is the use of this to a prospective investor?

(Marks 06)

(c) "Lenders are the losers during a period of high inflation". Explain this statement.

(Marks 06)

(d) Describe 'dual rate of return' and explain how it is formed.

(Marks 07)

Q2

(a) You plan to retire at age 40 after a successful but short career. You would like to accumulate enough money by age 40 to withdraw Rs.225, 000 per year for 40 years. You plan to pay into your account 15 equal installments beginning when you are 25 and ending when you are 39. Your account bears interest of 12 percent per year.

(i) How much do you need to accumulate in your account by the time you retire?
(ii) How much do you need to pay into your account in each of the 15 equal installments?

(Marks 10)

(b) The Delta company is considering the purchase of a machine for, Rs.720, 000. The machine has an eight-year useful life and no salvage value. The estimated cash flows are:

End of Year	Inflows	Major Repair Outflow
1	190,000	
2	180,000	
3	160,000	
4	200,000	100,000
5	180,000	
6	160,000	
7	180,000	
8	200,000	

Determine the payback period of the decision to purchase the machine.

(Marks 05)

(c) Describe the pay back method. What are its main strengths and weaknesses?

(Marks 10)

Q3.

(a) Under a special licensing arrangement, ABC Company has an opportunity to market a new product in Sri Lanka for a five-year period. The product would be purchased from the manufacturer, with ABC Company responsible for all costs of promotion and distribution. The licensing arrangement could be renewed at the end of the five-year period at the option of the manufacturer. After careful study, ABC Company has estimated that the following costs and revenues would be associated with the new product (all values in Rupees):

Cost of equipment needed	6,000,000
Working capital needed	10,000,000
Cost of overhaul of the equipment in four years	500,000
Salvage value of the equipment in five years	1,000,000
Annual revenues and costs:	
Sales revenues	20,000,000
Cost of goods sold	12,500,000
Indirect Costs (for salaries, advertising, and others)	35,000

At the end of the five-year period, the working capital would be released for investment elsewhere if the manufacturer decided not to renew the licensing arrangement. ABC Company's cost of capital is 20%. Would you recommend that the new product be introduced? Ignore income taxes..

(Marks 11)

(b) Explain the theoretical arguments for preferring Net Present Value (NPV) to Internal Rate of Return (IRR) when choosing among mutually exclusive projects.

(Marks 07)

(c) Compare the advantages of 'Net Present Value' over Non-discounting methods in capital budgeting.

(Marks 07)

Q4.

(a) Explain alternative ways of incorporating inflation in the computations made under discounting cash flow techniques. You may use an example to illustrate your answer.

(Marks 08)

(b) The following information has been taken from a construction project;

Interest rate = 24%

Inflation rate = 18%

Determine the effective interest rate applicable for the project

(Marks 05)

(c) Sigma is a precast concrete production company that is intending to purchase a new 'cement sand block' casting machine at a cost of Rs.750,000 in a bid to diversify its business. The machine has an expected life of five years and can produce 100 blocks per day and will be used 260 days per year. The following information are provided too;

Salvage value is Rs. 20,000

Maintenance required Rs.100, 000 at the end of the third year.

Sales price per block	Rs. 70.00
Cash production cost per block	
Direct materials	Rs. 37.50
Variable labour and overhead cost	Rs. 21.25

Assuming a 16 percent discount rate, related to Sigma's prospective investment, determine the net present value of the investment.

(Marks 12)

Q5.

(a) Briefly explain what is understood by the following two terms; compounding and discounting. Use examples to illustrate your answer..

(Marks 07)

(b)
Verma Company, which borrows at an interest rate of 14% owns a machine with the following characteristics.

Book value (and tax basis)	$40,000
Current market value	$30,000
Expected salvage value at end of its 5-year remaining life	$0
Annual depreciation expense, straight–line method	$8,000
Annual cash operating costs	$30,000

Verma's mangers look for opportunities consistent with their desire to create a JIT manufacturing environment. The managers believe that by replacing the old machine and rearranging part of production area, the company could reduce its investment in inventory by $60,000 as well as save on operating costs. The replacement machine has the following characteristics.

Purchase price	$100,000
Useful life	5 years
Expected salvage value	$0
Annual cash operating costs	$12,000
Annual straight line depreciation expense	$20,000

Rearrangement costs are expected to be $12,000 and can be expensed immediately for both book and tax purposes. By the end of the life of the new machine, Verma's managers expected to be further advanced in their implementation of the JIT philosophy and so do not anticipate returning to the prior, higher level of inventory. Also, you may ignore any tax considerations.

i) Assuming that the reduction in working capital is treated as a reduction in the required investment, determine the additional investment required for the purchase of the new machine.

(Marks 06)

ii) Determine whether Verma should purchase the new machine and undertake the plant arrangement.

(Marks 12)

Q6.

Belmouth Company has the opportunity to market a new product. The sales manager believes the company could sell 20,000 units per year at $10 per unit for five years. The product requires machinery that costs $200,000 and has a five-year life and no salvage value. Variable costs per unit are $4. The machinery has fixed operating costs requiring cash disbursements of $30,000 annually. Straight-line depreciation will be used for both book and tax purposes. The tax rate is 40% and the interest rate is 14%.

(a) Determine the increase in annual net income and in annual cash inflows expected from the investment.

(Marks 06)

(b) Determine the NPV of the investment.

(Marks 05)

(c) Determine the payback period.

(Marks 05)

(d) Determine the approximate IRR of the investment.

(Marks 04)

(e) Suppose the machinery has salvage value of $5,000 at the end of its useful life, which is considered in determining depreciation expense. The tax rate on the gain at the end of the asset's life is 40%. How will your answer to (b) change.

(Marks 05)