THE OPEN UNIVERSITY OF SRI LANKA
Department of Civil Engineering
Construction Management Programme - Level 7
CEX7110 – Construction Project Appraisal
FINAL EXAMINATION – 2013/2014
Time Allowed: Three Hours

Date: 25-08-2014 (Monday) Time: 0930 - 1230 hrs.

The paper consists of 06 questions. Answer Four (04) questions.

Q1.

(a) Explain what is understood by 'capital recovery factor'. What is the use of this to an investor envisaging purchasing an excavator?

(Marks 06)

(b) Capital budgeting techniques are useful for decision making involved in condruction industry. Give three probable instances from condruction industry where capital budgeting techniques can be useful in decision making.

(Marks 06)

(c) 'Lenders are the losers during a period of high inflation'. Explain this statement taking examples from condruction industry.

(Marks 06)

(d) Explain 'Discounted cash flow yield' while emphasizing on its benefits to a firm contemplating on a new investment.

(Marks 07)

Q2

(a) Describe the pay back period method. Explian its main strengths and weaknesses.

(Marks 12)

(b) Compute the payback period for the set of cash flows given below (in Rs.):

Year	0	1	2	3	4	5-10	11	Total
Net cash flows	-315	-770	160	190	200	220	370	1,155

(Marks 06)

(c) 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 for the purchase the machine.

(Marks 07)

Q3.

(a) An entrepreneur is thnking of purchasing a small van and running it on a licensed route. The delivered cost of the van would be Rs. 350,000 and the net revenue from operation would be Rs. 140,000 in the frist year, and Rs.130,000, Rs.120,000, Rs.110,000 and Rs.100,000 respectively thereafter. After 5 years, increasing breakdowns would make the van uneconomic to run. How would you advise the entrepreneur? His cost of captal is 22%.

(Marks 10)

(b) Explain the theoretical arguments for preferring Net Present Value (NPV) to Internal Rate of Return (IRR) when choosing among mutually exclusive projects. You may illustrate your answer with examples taken from the construction industry.

(Marks 08)

(c) Compare the advantages of 'Net Present Value' over Non-discounting methods in capital budgeting. You may illustrate your answer with examples taken from the construction industry.

(Marks 07)

Q4.

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

(Marks 08)

(b) The following information has been taken from a construction project;
Interest rate = 22%
Inflation rate = 16%
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.1,500,000 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. 40,000
Maintenance required Rs.200, 000 at the end of the third year.

Sales price per block	Rs. 140
Cash production cost per block	
Direct materials	Rs. 75
Variable labour and overhead cost	Rs. 43

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

(Marks 12)

Q5.

(a) A firm is considering three projects each with initial investment of Rs.1,000,000 and a life of 5 years. The estimated profits generated by the projects are as follows;

Year	Project 1	Project 2	Project 3
1	200,000	350,000	150,000
2	200,000	200,000	150,000
3	200,000	150,000	150,000
4	200,000	150,000	200,000
5	200,000	150,000	350,000
Total	1,000,000	1,000,000	1,000,000

Compute the accounting rate of return (ARR) of the three projects.

(Marks 07)

(b)Jaydee Ltd. is considering investing in new equipment. The following data is available;

	Present Equipment (5 years old)	Proposed Equipment
Capital cost (Rs.)	1,000,000	1,500,000
Written down value (Rs.)	500,000	1,500,000
Estimated life (Years)	10	10
Running hours per annum (Hours)	2000	2000
Output per hour (units)	10	15
Selling price per unit (Rs.)	50	46
Unit costs (Rs.)		
power	3	3
consumable stores	5	5
materials	22	20
wages	5	5

The present equipment would realize Rs.400,000 if sold now, but scrap value should be zero after five years. The proposed equipment is expected to be worth Rs. 750,000 after 5 years and would have no scrap value after 10 years.

The company's cost of capital is 12% p.a. Ignoring tax, calculate the following for both equipment::

i)Accounting rate of return for both scenarios of original investment and average investment.

ii) Net Present Value (NPV)

Explain whether Jaydee Ltd. should replace its equipment.

(Marks 18)

Q6.

(a) Discuss the advantages of Net Present Value (NPV) method over Internal Rate of Return (IRR) as a capital appraisal technique.

(Marks 10)

(b)

The computing system used by the Access Limited is outdated. Access management has decided to purchase a new computing sytem to be funded through retained profits. The CEO has asked the costing department to make a recommendation as to which of the two computing systems should be purchased. The two systems are equivalent in their ability to meet the Access Limited's needs and in their ease of use. The mainframe system consists of one large mainframe computer with remote terminals and printers located throughout the Access Limited offices. The personal computer system consists of a much smaller mainframe computern, a few remote terminals, and a dozen personal computers, which will be networked to the small mainframe. Each system would last five years. The controller has decided to use a 12 per cent discount rate for the analysis. The table below presents pertinent financial information. Determine the NPVs of the two systems and recommend the system which Access Limited should purchase.

Cost Element	Mainframe System(SLR)	Personal Computer System (SLR)
Salvage value of the old computer (time 0)*	25,000,000	25,000,000
Acqulisition cost of new system (time 0)	(400,000,000)	(300,000,000)
Acqulisition cost of software (time 0)	(40,000,000)	(75,000,000)
Cost of updating system (time 3)	(40,000,000)	(60,000,000)
Salvage value of new system (time 5)	50,000,000	30,000,000
Operating cost (time 1,2,3,4,5):		
Personnel	(300,000,000)	(220,000,000)
Maintenance	(25,000,000)	(10,000,000)
Other	(10,000,000)	(5,000,000)
Data-link service cost (time 1,2,3,4,5)	(20,000,000)	(20,000,000)
Revenue from time-share customers (times 1,2,3,4,5)	20,000,000	
*Time 0 denotes "immediately". Time 1 denotes the end of year 1, etc.		

(Marks 15)