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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

END SEMESTER EXAMINATION-2015

M.Tech 2nd Semester

COURSE CODE: 10M11CE214

MAX. MARKS: 45

COURSE NAME: Construction Financial Management

COURSE CREDITS: 03

MAX. TIME: 3 HRS

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

All question carry equal Marks. Use graph sheets if required.

1. PQR Construction Co. expanded rapidly during 2014 by investing in new plant and equipment and other inventory. As a result, total assets increased from \$400,000 at the beginning of 2012 to \$700,000 at the end of 2014. The owner's equity at the beginning of the year was \$250,000 and the company's net profit for the year was \$50,000. Assuming the company paid no dividends during 2014,
 - a. What were the company's total liabilities at the beginning and at the end of the year if there is no change in capital stock of the company during 2014?
 - b. What were the company's total liabilities at the end of 2014 if it received \$200,000 in 2014 from the sale of additional capital stock?

2. A company has borrowed \$100,000 from a bank which charges the former 5% interest p.a. The loan has to be recovered in 5 years compounded annually.
 - a. How much should the company pay at the end of each year to the bank (assuming uniform payment)?
 - b. The bank changes the interest rate to 4% p.a. at the beginning of the third year. What will be the amount of the company's last payment (i.e. payment at the end of year 5) if it keeps on paying the bank the same amount as calculated in (a) above at the end of years 3 and 4?
 - c. Continued from (b), what will be the company's repayment schedule if it chooses to pay back the bank in the form of uniform payments at the end of years 3, 4 and 5?

3. Based on the project data presented in the table below, calculate the following for the projects:
- The revenue using the percentage-of-completion method,
 - The gross profit to date, using the percentage-of-completion method, and
 - The amount of over / under billing for each project.

Project Financial data	Project X
Contract amount	\$15,000,00
Original estimated cost	14,400,00
Amount billed to date	10,700,00
Payments received to date	10,900,00
Cost incurred to date	11,450,00
Forecasted cost to complete	3,000,00
Costs paid to date	9,400,00

4. There are two alternatives to construct a storage house. Both serve the purpose of allowing construction materials to be stored in the house. However, due to different construction methods (one is made of wood and the other made of bricks), different life spans and cash flow patterns are associated with each alternative as follows:

	Alternative 1 (Wood)	Alternative 2 (bricks)
Life span	10 years	15 years
Initial capital cost	\$900,000	\$1,300,000
Operation and maintenance cost	\$80,000 p.a.	\$20,000 p.a.

Assuming the discount rate to be 16% p.a., choose the better alternative by comparing the alternatives based on the same number of years, i.e. 60 years:

- The present value method, and
- The equivalent annual cost method.

5. For Project [A] using the Incremental IRR Analysis. Show its IRR and NPV value. Details are shown below:

	Project A
Initial capital	\$5,000,000
Annual operation/maintenance cost	\$40,000
Annual benefit	\$580,000

n is taken as 2 years, and the minimum desirable rate of return is 6% p.a.

6. Explain the statement IRR as Financial Indicator and NPV as Economic indicator. Graphically represent the IRR versus NPV graph. Justify the statement for the following Conditions:

- If an investor has an [*all-equity case*] investment (i.e. no borrowing from bank; the capital is totally provided by the investor) in which an initial capital outlay of \$10,000 leads to a receipt of \$5,000 each year for three years as shown in Table below.
- If the investor uses \$4,000 as the equity of the investment and borrows \$6,000 as a loan [*Equity Loan Case*] (paying 10% interest per annum), making a total of \$10,000 serving as the initial capital outlay of the same investment, then the net annual receipts in the next three years, having deducted the three annual principal amortizations and the annual interest payments from the gross annual receipts, are calculated to be \$2,400, \$2,600 and \$2,800.

7. A construction company has three choices of the type of crane to be used on its sites. The choices are:

- A fully automatic crane – this will add \$900,000 a year to its fixed cost but the variable cost (hiring of operators, fuel, etc.) per hour will only be \$40.
- A semi-automatic crane – this will add \$500,000 a year to its fixed cost but v (variable cost per hour) will be \$200, since more operators will be needed.
- A mainly hand operated crane – this will add \$200,000 a year to its fixed cost, but v will be \$500 per hour.

Which type of crane should the company choose? Draw the break Even Graph on a graph sheet.

8. A sewage pumping station is being designed. Two possible pumping schemes are proposed and the itemized costs of each scheme are shown below:

Scheme number		Scheme A	Scheme B
Pump	Cost of pumps (\$)	120,000	190,000
	Life (years)	14	16
	Maintenance (\$/year)	10,000	15,000
Pipe	Cost of pumps (\$)	200,000	160,000
	Life (years)	30	30
	Cost of pumping (\$/hour)	2.00	1.60

What is the most economical range of pumping time in hours/year for each scheme? Take $i=5\%$ p.a. and maximum pumping hours in a year = 8,760 hours.

9. A small subcontractor is considering purchasing rock drilling equipment, which has a life of four years and costs \$75,000. The average revenue generated per year is estimated to be \$40,000 coming from rock drilling related works. The expense associated with maintaining the equipment is estimated to be \$15,000 per annum. The profit tax rate is 25%. Use [$i = 5\%$ p.a.]
- Assuming straight-line depreciation for the equipment and ignoring salvage value, carry out a financial analysis for the subcontractor.
 - If the total capital of \$75,000 is made up of \$15,000 equity and \$60,000 loan from a bank at an interest rate of 5% p.a. for a period of 3 years. The three end of year amortizations for the loan are equal, \$20,000 each time. This time the financial analysis has to be modified. Carry out the modified financial analysis.

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