JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION JUNE- 2016

B.Tech 8th Semester & M.Tech 2nd Semester

COURSE CODE: 10M11CE214 　　　　　　　　　　MAX. MARKS: 35

COURSE NAME: Construction Financial Management

COURSE CREDITS: 03 　　　　　　　　　　　　MAX. TIME 2 Hr

*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. **Use graph Sheet wherever required.***

1. A construction company has three choices of the type of crane to be used on its sites. The choices are: **[5 Marks]**
   a. 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.
   b. 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.
   c. 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?

2. A sewage pumping station is being designed. Two possible pumping schemes are proposed and the itemized costs of each scheme are shown below: **[5 Marks]**

Scheme Number		Scheme A	Scheme B
Pump	Cost of pumps ($)	120,000	190,000
	Life (years)	14	16
	Maintenance ($/year)	18,000	16,500
Pipe	Cost of pipes ($)	200,000	160,000
	Life (years)	30	30
	Cost of Pumping ($/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 the maximum pumping hours in a year = 8,760 hours)

3. The expenditure per month for a small-medium scale building project scheduled for 5 months are given below. The mark-up is 5%. The retention money of the billed cost is 10% if the cumulative payment is less than half of the total value of work (contract value) and then 0% thereafter. The retention money will be released at the end of month 6, one month after the completion of the contract. Payment is billed at the end of each month and received one month later by the contractor. The finance charge is 1% per month.

End of month	1	2	3	4	5
Expenditure ($)	1,000,000	2,100,000	2,500,000	2,500,000	2,500,000

By plotting the S-Curve and the cumulative interim payment graph, find the peak working capital requirement and the total financial charge on the working capital if it is totally borrowed.   **[5 Marks]**

4. There is a proposed project of constructing a self-financed highway, so the toll paid by the vehicles should be sufficient to recover the initial capital cost and all other costs that will be incurred over the life of the project. Establish a suitable charge on each vehicle passing the highway with the use of the following numerical values which are estimated based on 2014 prices.   **[10 Marks]**

1	Capital cost (construction cost and professional fees)	$500,000,000
2	Annual operation and maintenance cost	$15,000,000
3	Annual administration cost	$20,000,000
4	Replacement cost of autopay ticket machine	$4,000,000 every 5 years
5	Estimated annual traffic flow	10,000 vehicles per day in the first 5 years; the growth rate of traffic flow is 20% every 5 years
6	Life of project	25 years
7	Desirable rate of return (real)	8% p.a.
8	Estimated average inflation rate in the next 25 years	3% p.a. (averaged)

5. A construction company is considering setting up a new precast concrete yard. To do so, a new equipment, which has a life of four years and costs $1,000,000 has to be purchased. The revenue generated is estimated to be $500,000 per year. The total expenses associated with this precast concrete yard are estimated to be $120,000 per year. The profit tax rate is 25%.   **[10 Marks]**

   a. Assuming straight line depreciation and ignoring salvage values, carry out a financial analysis for the company. (You are expected to create an income statement and derive a cash flow table for IRR calculation, and then to compute the IRR).

   b. Carry out a new financial analysis and find the new IRR if the total capital of $1,000,000 is made up of $250,000 equity and $750,000 loan. The loan has to be paid back in three years (i.e. principal amortization of $250,000 per year) at an interest rate of 8% p.a.

   c. Compare the internal rates of return in (a) and (b) above and give comments on them. If the NPV method at a discount rate of 8% p.a. (the borrowing interest rate) is used in (a) and (b), what results will be expected? And why?