FINAL EXAMINATION – September 19th, 2018

## name:

# Scheduling (8 points)

A project to develop a commercial building is represented as per the following chart. Please compute the duration of the project using a network scheduling technique of your choosing.

|  |  |  |  |
| --- | --- | --- | --- |
| **Task** | **Duration [weeks]** | **Predecessor** | **Successor** |
| Basic Design | 20 |  |  |
| Detailed Design | 36 | Basic Design | Building Services |
| Permits | 24 | Basic Design | 50% of Procurement |
| Procurement | 54 | 10 weeks after Detailed Design is started | Building Services |
| Civil Work | 66 | Permits and 50% of Detailed Design | Finishes |
| Building Services | 40 | 70% of Civil Works | Finishes |
| Finishes | 36 | 50% of Building Services and Civil Works |  |
| Final test | 12 | Building Services, Finishes |  |
| Project Management |  |  |  |

# (6 points)

A real estate development company is considering building a recreational facility on a public plot of land. Based on current estimates, the required investment to design and construct the facility is $20million. The facility will assure a $2,000,000 annual post-tax income. The local government proposes two alternate schemes:

1. buy the perpetual real estate property for $10million;
2. sign a 30-year long BOT concession contract. In this case the government does not charge any payment, but the property must be transferred back at the end of the concession period.

The real estate company will fund the project by seeking to minimize the equity investment. Based on such consideration, which solution would you suggest?

Please consider the following information:

Free risk rate 2%

Market beta 1.5

Market risk premium 8%

Cost of Equity 14%

Cost of debt 8%

Non-deductible interest, no inflation

Feel free to make any additional assumption you may need.

# Estimate at completion (8 points)

Consider a pharmaceutical project to develop and launch a new drug compound by end of current year 2015. The EV report as per Dec 31st, 2014 is given in the chart below with figures expressed in $ amounts. Since it is imperative that the commercial launch is not delayed, your boss has just asked you to compute the range of cost estimates at completion that would make the project finish on time. What would you answer?

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Semester 1,  2013 | Sem 2, 2013 | Sem 1,  2014 | Sem 2, 2014 | Sem 1,  2015 | Sem 2, 2015 |
|  |  |  |  |  |  |  |
| BCWS | 190,000 | 196,000 | 300,000 | 400,000 | 350,000 | 160,000 |
| ACWP | 190,000 | 220,000 | 290,000 | 480,000 |  |  |
| BCWP | 176,000 | 180,000 | 185,000 | 495,000 |  |  |