



INDIAN INSTITUTE OF TECHNOLOGY HARAGPUR
Mid-Autumn Semester Examination 2022-23

Date of Examination: Autumn, 2022 Session (FN/AN): Duration: 2 Hours Full Marks 30

Subject No.: HS60009 Subject Name: FINANCIAL MANAGEMENT

Department/Center/School: Humanities and Social Sciences

Specific charts, graph paper, log book etc., required: PV and FV Tables can be used

Special Instructions (if any): (i) Answer all the questions. (ii) Use of financial calculator is NOT permitted. Use of non-programmable calculator is permitted. (iii) While answering all the necessary steps/calculations should be clearly shown. (iv) This question paper contains 2 printed pages.

1. What is the value today of a 15-year annuity that pays \$650 a year? The annuity's first payment occurs six years from today. The annual interest rate is 11 percent for Years 1 through 5, and 13 percent thereafter. [2]

2. Southern California Publishing Company is trying to decide whether to revise its popular textbook, Financial Psychoanalysis Made Simple. The company has estimated that the revision will cost \$75,000. Cash flows from increased sales will be \$21,000 the first year. These cash flows will increase by 4 percent per year. The book will go out of print five years from now. Assume that the initial cost is paid now and revenues are received at the end of each year. If the company requires a return of 10 percent for such an investment, should it undertake the revision? [3]

3. Mark Weinstein has been working on an advanced technology in laser eye surgery. His technology will be available in the near term. He anticipates his first annual cash flow from the technology to be \$175,000, received two years from today. Subsequent annual cash flows will grow at 3.5 percent in perpetuity. What is the present value of the technology if the discount rate is 10 percent? [3]

4. Cutler Petroleum, Inc., is trying to evaluate a generation project with the following cash flows:

Year	Cash Flow
0	-\$ 85,000,000
1	125,000,000
2	-15,000,000

(i) If the company requires a 10 percent return on its investments, should it accept this project? Why?

(ii) Compute the IRR for this project. How many IRRs are there? If you apply the IRR decision rule, should you accept the project or not? What's going on here? [3]

5. Explain the managerial utility function proposed by O. Williamson. Explain why there can arise a conflict between shareholder's and manager's goals? Suggest measures to minimize/prevent this problem? [4]

6. Consider the following cash flows on two mutually exclusive projects for the Bahamas Recreation Corporation (BRC). Both projects require an annual return of 14 percent.

Year	Deepwater Fishing	New Submarine Ride
0	-\$950,000	-\$1,850,000
1	370,000	900,000
2	510,000	800,000
3	420,000	750,000

As a financial analyst for BRC, you are asked the following questions:

- (i) If your decision rule is to accept the project with the greater IRR, which project should you choose?
- (ii) Because you are fully aware of the IRR rule's scale problem, you calculate the incremental IRR for the cash flows. Based on your computation, which project should you choose?
- (ii) To be prudent, you compute the NPV for both projects. Which project should you choose? Is it consistent with the incremental IRR rule? [5]

7. Howell Petroleum is considering a new project that complements its existing business. The machine required for the project costs \$3.8 million. The marketing department predicts that sales related to the project will be \$2.5 million per year for the next four years, after which the market will cease to exist. The machine will be depreciated down to zero over its four-year economic life using the straight line method. Cost of goods sold and operating expenses related to the project are predicted to be 25 percent of sales. Howell also needs to add net working capital of \$150,000 immediately. The additional net working capital will be recovered in full at the end of the project's life. The corporate tax rate is 35 percent. The required rate of return for Howell is 16 percent. Should Howell proceed with the project? [5]

8. Vandalay Industries is considering the purchase of a new machine for the production of latex. Machine A costs \$2,900,000 and will last for six years. Variable costs are 35 percent of sales, and fixed costs are \$195,000 per year. Machine B costs \$5,700,000 and will last for nine years. Variable costs for this machine are 30 percent and fixed costs are \$165,000 per year. The sales for each machine will be \$12 million per year. The required return is 10 percent and the tax rate is 35 percent. Both machines will be depreciated on a straight-line basis. If the company plans to replace the machine when it wears out on a perpetual basis, which machine should you choose? [5]

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