

MID-TERM 1 Questions

- 1) At some point in time Peter had \$3 000 in spare cash. He deposited this money in his bank account that pays a 1.1% annual interest rate. After one year he was approached by his friend who said that he could offer Peter an investment deal for a two-year period. What would the market equivalence be of Peter's money?
 - A) \$3 100
 - B) \$3 133
 - C) \$3 000
 - D) \$3 033
 - E) \$3 066

- 2) Bill wants to buy a new car in three years from now. He expects that the price of a car will be \$15 000 in three years. How much money should Bill put in his savings account now if a bank pays 5% interest rate on this account?
 - A) \$12 104
 - B) \$12 958
 - C) \$11 629
 - D) \$14 286
 - E) \$13 465

- 3) If the effective equivalent annual interest rate is 16.2%, and interest is compounded daily, what is the corresponding nominal annual interest rate?
 - A) 11%
 - B) 17%
 - C) 19%
 - D) 15%
 - E) 13%

- 4) It is known that the total interest paid over a 5-year period is \$2 081.13. What was the principal amount borrowed at a 6% nominal interest rate compounded quarterly?
 - A) \$4 000
 - B) \$7 000
 - C) \$3 000

- D) \$6 000
E) \$5 000
- 5) If you borrow \$2 000 today at 20% interest rate for 5 years, what is your simple interest in this case?
A) \$2 976.64
B) \$4 976.64
C) \$976.64
D) \$2 000
E) \$4 000
- 6) You need to borrow \$1 000. Bank A will lend you the money at 5% interest, compounded annually, whereas Bank B will lend you the money at 5% interest, compounded monthly. Bank B also offers you a free cell phone, valued at \$100, if you do business with them. What is the longest duration of the loan for which Bank B would be a better choice?
A) 10 years
B) 25 years
C) 30 years
D) 20 years
E) 15 years
- 7) What does the term "market equivalence" imply?
A) the ability to exchange one cash flow for another at no cost
B) the ability to obtain a zero net cash flow
C) the existence of a mathematical relationship between time and money
D) indifference on the part of a decision maker among available choices
E) the ability to exchange one cash flow for another at minimum cost
- 8) If an interest rate is 18% per year, what is the equivalent interest rate per quarter?
A) 4.5%
B) 8.6%
C) 4.8%

D) 6.2%

E) 3.8%

9) Emily is considering two mutually exclusive financial options: (i) to deposit \$4 000 in her bank's savings account that pays 4.6% annual interest, or (ii) to purchase a \$4 000 one-year guaranteed investment certificate with a monthly interest rate of 0.3%. From an opportunity cost standpoint, by making the decision to deposit \$4 000 in the bank account, Emily will

A) lose \$57.6 by the end of the year.

B) lose \$37.6 by the end of the year.

C) gain \$57.6 by the end of the year.

D) make zero economic profit.

E) gain \$37.6 by the end of the year.

10) The following table summarizes information for five projects:

Project	First Cost (in \$)	IRR on Overall Investment	IRR on Increments of Investment Compared with Projects (%)			
			1	2	3	4
1	100,000	19%				
2	175,000	15%	9%			
3	200,000	18%	17%	23%		
4	250,000	16%	12%	17%	13%	
5	300,000	17%	14%	11%	17%	16%

The data can be interpreted in the following way: The IRR on the incremental investment between project 5 and project 4 is 16%.

If all projects are independent and the company has at least \$1 025 000 to invest, which projects should be undertaken if the MARR is 16%?

A) only 2.

B) 1, 2, 3, 4 and 5.

C) 1, 3, 4 and 5.

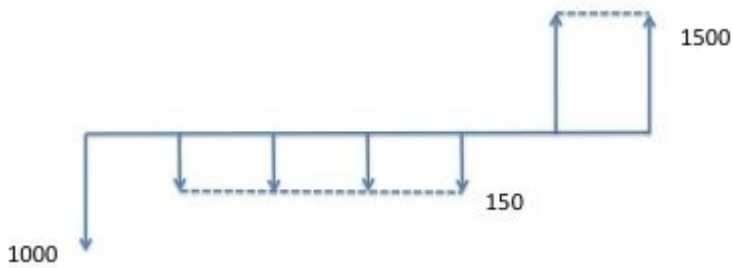
D) 2 and 4.

E) 1, 3 and 5.

- 11) A two-year project has \$100 million as initial investment and generates net savings of \$60 million per year. What is the project's IRR?
- A) 12.1%
 - B) 14.1%
 - C) 10.1%
 - D) 13.1%
 - E) 11.1%
- 12) I can invest for a pension in either the Senex or the Geriatrix pension plan. Senex requires me to invest \$1500 a year for the next 15 years, whereas Geriatrix requires an immediate deposit of \$5 000 and a subsequent annual investment of \$1 200 a year. If my MARR is 15%, how much greater is the present cost to me of the series of payments I would make to Geriatrix versus the series of payments I would make to Senex?
- A) \$4 222
 - B) \$3 863
 - C) \$4 127
 - D) \$2 457
 - E) \$3 246
- 13) In general, the IRR comparison method and the PW comparison method
- A) produce the same results for independent projects but not for mutually exclusive projects.
 - B) produce the same results for independent projects and mutually exclusive projects with equal lives.
 - C) produce different results for both independent projects and mutually exclusive projects.
 - D) produce the same results for independent projects and mutually exclusive projects with unequal lives.
 - E) produce the same results for mutually exclusive projects but not for independent projects.

- 14) I have 3 possible choices for a lawnmower. They have expected working lives of 3, 4 and 5 years. If I expect lawnmower technologies to be stable for the foreseeable future, over what period of time should I compare the equivalent uniform annual costs of the three choices?
- A) 45 years
 - B) 12 years
 - C) 30 years
 - D) 20 years
 - E) 60 years
- 15) A contingent project is an example of
- A) public projects.
 - B) independent projects.
 - C) mutually exclusive projects.
 - D) incremental projects.
 - E) related but not mutually exclusive projects.
- 16) A project requires no initial investment. It costs \$4 000 a year from now and earns \$8 000 two years from now. What is its internal rate of return?
- A) 100%
 - B) 50%
 - C) 75%
 - D) 24%
 - E) 141%

17) What is the IRR corresponding to this cashflow diagram?



- A) about 11.5%.
 - B) about 10.5%.
 - C) about 13.5%.
 - D) about 14.5%.
 - E) about 12.5%.
- 18) What is the exact payback period for a 10-year project that requires \$12 000 in initial investment, \$1 000 in annual maintenance costs and generates annual revenue of \$2 600 per year under 5% MARR?
- A) 7.9 years
 - B) 10 years
 - C) 7.5 years
 - D) 9.2 years
 - E) 8.4 years
- 19) The minimum acceptable rate of return (MARR) is
- A) the least interest rate among all alternative projects.
 - B) an interest rate that allows an investor to recoup the investment.
 - C) an interest rate, which is equal to a current bank interest rate.
 - D) a highest interest rate among all alternative projects.
 - E) an interest rate that must be earned for a project to be accepted.

- 20) How much should be set aside each month to accumulate \$10 000 at the end of year 3 under 12% annual interest rate compounded monthly?
- A) \$242.14
 - B) \$222.14
 - C) \$252.14
 - D) \$232.14
 - E) \$277.78
- 21) The internal rate of return (IRR) is negative if
- A) IRR cannot be negative.
 - B) a project is a simple investment.
 - C) a project just breaks even.
 - D) a cash inflow exceeds a cash outflow.
 - E) a project is losing money.
- 22) Jennifer lends \$2 000 to her friend who is launching a small business. Her friend promises to pay her 10% per year compounding interest. How much interest would Jennifer get at the end of four years?
- A) \$2 823
 - B) \$1 284
 - C) \$2 324
 - D) \$928
 - E) \$1 892
- 23) You want to have a million dollars in the bank when you retire. You think you can save \$5 000 a year in a bank that offers you 5% interest. If you make your first deposit in a year's time, how many years will it be from now before you can retire?
- A) 60
 - B) 70
 - C) 30
 - D) 50
 - E) 40

- 24) I can buy a Grapefruit laptop computer for \$3 000, or a Doors laptop for \$2 500. The Grapefruit has an expected life of five years, whereas the Doors is only expected to last four years. Both provide equivalent service. A four-year-old Grapefruit has a salvage value of \$200. If my MARR is 10%, what is the present cost of choosing the Grapefruit over the Doors?
- A) \$315
 - B) \$300
 - C) \$636
 - D) \$383
 - E) \$363
- 25) The internal rate of return (IRR) is
- A) the interest rate that ensures the positive cash flow of a project.
 - B) the interest rate that measures the return from operating costs
 - C) the interest rate that allows an investor to recoup the initial investment.
 - D) the interest rate that breaks even a project's costs and benefits.
 - E) the interest rate that is set up by an investor to guarantee that the return on investment will be higher than from a bank interest rate.

Midterm 1

List of Useful Formulas

Name	Symbol and Formula
Compound amount factor	$(F/P, i, N) = (1 + i)^N$
Present worth factor	$(P/F, i, N) = 1 / (1 + i)^N$
Sinking fund factor	$(A/F, i, N) = i / [(1 + i)^N - 1]$
Uniform series compound amount factor	$(F/A, i, N) = [(1 + i)^N - 1] / i$
Capital recovery factor	$(A/P, i, N) = \{i(1 + i)^N\} / [(1 + i)^N - 1]$
Series present worth factor	$(P/A, i, N) = [(1 + i)^N - 1] / \{i(1 + i)^N\}$
Arithmetic gradient to annuity conversion factor	$(A/G, i, N) = [1/i] - [N / \{(1 + i)^N - 1\}]$
Geometric gradient to present worth factor	$(P/A, g, i, N) = (P/A, i^0, N) / \{1 + g\}$ $(P/A, g, i, N)$ $= [\{(1 + i^0)^N - 1\} / \{ i^0 (1 + i^0)^N \}] * [1 / \{1 + g\}]$ $i^0 = [(1 + i) / (1 + g)] - 1$
Capitalized value formula	$P = A / i$
Capital recovery <u>formula</u>	$A = (P - S) (A/P, i, N) + Si$
Payback period	Payback period $= \text{First cost} / \text{Annual savings}$
Effective interest rate (i_e), annual nominal interest rate (r), number of sub-period (m), and nominal interest for each sub-period (i_s)	$i_s = r / m$ $i_e = (1 + i_s)^m - 1$ $i_e = (1 + r / m)^m - 1$

