ENGINEERING ECONOMICS
ECO 1192B

First Partial Examination

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Winter 2011

1. You have 80 minutes (7 pm to 8:20 pm) to complete Partial Examination #1 which consists of 30 multiple choice questions.
2. *Questionnaires and answer sheets are colour coded (Blue, Pink and White). Please ensure that your questionnaire and answer sheet have matching colours.*
3. All questions must be answered on the Scantron sheet.
4. Please indicate your name, student number and course number on the front of the Scantron sheet by darkening the appropriate bubbles. Failure to provide this information could result in the cancellation of your examination.
5. Correct answers are worth one (1) point and incorrect answers zero (0).
6. You may keep the examination questionnaire.
7. You MUST show your University of Ottawa I.D. card as you hand-in the answer sheet AND sign the attendance sheet.
8. Thank you.

1. Given two valid mutually exclusive projects A and B: $P_A > P_B$; $N_A < N_B$ and $AEW_A < AEW_B$. Which project would you select?
   a) A
   b) B
   c) A and B
   d) Neither A nor B
   e) Need more information.

2. If the rate of interest is 12% compounded monthly, the effective rate of interest is
   a) 12%
   b) 1%
   c) 12.68%
   d) None of the above answers.

3. Given two valid mutually exclusive projects A and B: $P_A > P_B$; $N_A = N_B$ and $IRR_A > IRR_B$. Which project would you select?
   a) A
   b) B
   c) A and B
   d) Neither A nor B
   e) Need more information.

4. The Internal Rate of Return (IRR) method assumes that a project's profits (cash inflows) will be reinvested at
   a) the MARR.
   b) the IRR
   c) the ERR
   d) a negotiated rate of return

5. The incremental internal rate of return (ΔIRR) is the rate of return that equates the annual equivalent worth of one project to that of the other project.
   a) True
   b) False

6. The External Rate of Return (ERR) method assumes that the profits (cash inflows) generated by a project will be reinvested at
   a) the MARR.
   b) the IRR
   c) the ERR
   d) a negotiated rate of return

7. Your conclusion as to the better of projects A and B will be the same whether you choose the Annual Equivalent Worth Method or the IRR Method.
   a) True
   b) False

8. If a project's equivalent annuity is negative, its external rate of return (ERR)
   a) is less than the MARR.
   b) is equal to the MARR
   c) exceeds the MARR
   d) is equal to 0%.

9. You opt for the Net Present Worth Method to determine if projects A and B, of unequal duration, are economically valid. Will your conclusion be based on a common period of

analysis for the two projects?
a) Yes
b) No

10. What quarterly rate of interest is equivalent to a rate of interest of 12% compounded quarterly?
a) 1%
b) 3%
c) 12%
d) None of the above answers.

11. The nominal rate of interest will always exceed the effective rate of interest when
a) simple interest is used
b) within-year compounding is monthly or more frequently
c) a project's internal rate exceeds the MARR
d) None of the above answers.

12. Given two mutually exclusive projects A and B: $P_A > P_B$; $N_A > N_B$ and $IRR_A > IRR_B$. Which project would you select?
a) A
b) B
c) A and B
d) Neither A nor B
e) Need more information.

13. If a rate of interest is compounded annually, then the effective rate of interest rate will exceed the nominal interest rate.
a) True
b) False

INFORMATION FOR QUESTIONS 14 and 15

Projects A to F
- are ranked in ascending order of their first cost
- have identical lives (N)
- have negligible salvage values (SV=0).

PROJECTS	RATES OF RETURN					
	A	B	C	D	E	F
A	21	-	-	-	-	-

B	19	20	-	-	-	-
C	18	18	18	-	-	-
D	17	17	17	16	-	-
E	16	16	16	13	14	-
F	13	14	14	12	9	8

14. If MARR = 10% and projects A, B, C, D, E and F are mutually exclusive, the best project is:
a) A
b) C
c) D
d) E
e) F

15. If MARR = 15% and projects A, B, C, D, E and F are mutually exclusive, the best project is:
a) A
b) C
c) D
d) E
e) None of the above answers.

16. If the rate of interest is 12% compounded continuously, the nominal rate of interest is
a) 1%
b) 12%
c) 12.75%
d) None of the above answers.

17. If the rate of interest is 12% compounded continuously, the effective rate of interest is
a) 1%
b) 12%
c) 12.75%
d) None of the above answers.

18. If the rate of interest is 20% compounded quarterly, the actual rate of interest is
a) 20%
b) 21.55%
c) 5%
d) None of the above answers.

19. What monthly rate of interest is equivalent to a rate of interest of 12% compounded annually?
a) 1%
b) 12%
c) 0.9489%
d) None of the above answers.

20. The initial cost (P) of a project with a finite life is equivalent to an annuity of P(A/P,i%,N). The initial cost (P) of a project with an infinite life is equivalent to an annuity of P(A/P,i%,N) where (A/P,i%,N) is equal to
a) 1.
b) i%
c) 1÷i%
d) need more information to answer question.

21. Two tests available to determine the number of internal rates of return for project cash flows are:
a) Kaldor-Hicks criterion
b) Savage regret rule
c) Descartes and Norstrom's
c) None of the above answers.

22. The number of internal rates of return for a project will depend on the frequency of cash flow sign changes during the life of the project (i.e., the number of times a project's cash flow changes from +ve to –ve and from –ve to +ve.)
a) True
b) False

23. A project's individual IRR obtained from the Annual Equivalent Method would equal the same project's IRR obtained through the Present Worth method.
a) True
b) False

24. You are required to rank valid independent projects with different initial first cost from most preferred (i.e., best) to least preferred. Which decision criterion would generate an accurate ranking?
a) Net Present Worth
b) Simple payback
c) Annual Equivalent Worth
d) Internal Rate of Return (IRR).

INFORMATION FOR QUESTIONS 25 to 28

DETAILS	PROJECT A	PROJECT B
First Cost($)	40,000	80,000
Economic Life (years)	5	10
Annual Revenues ($)	20,000	30,000
Annual operating cost ($)	5,000	25,000 in the first year followed by annual decreases of $1,000 (e.g., 25,000 in year 1; 24,000 in year 2, etc.)
Salvage Value ($)	-1,000	5,000
MARR (%)	10	10

25. Which of the following DOES NOT give Project A's internal rate of return?
a) -40,000(A/P,i*,5) + 15,000 -1,000(A/F,i*,5) = 0
b) -40,000(F/P,i*,5) + 15,000(F/A,i*,5) -1,000 = 0
c) -40,000+15,000(P/A,i*,5) – 1,000(P/F,i*,5) = 0
d) -40,000(F/P,i*,5) + 15,000 (F/A,10%,5) – 1,000 = 0
e) None of the above answers.

26. Which of the following answers gives Project B's external rate of return?
a) -80,000(F/P,i*,10)+5,000(F/A,10%,10)+1,000(F/G,10%,10) + 5,000 = 0
b) -80,000(F/P,i*,10)+5,000(F/A,10%,10) -1,000(F/G,10%,10) + 5,000 = 0
c) -80,000(P/A,i*,10)+5,000(F/A,10%,10)+1,000(F/A,10%,10) + 5,000 = 0
d) -80,000(F/P,10%,10) + 5,000 + 1,000 + 5,000(A/G,10%10) = 0
e) None of the above answers.

27. Which of the following answers gives the incremental internal rate of return (i**) between Projects A and B?
a) -40,000(A/P,i**,5) + 15,000 -1,000(A/F,i**,5)
= -80,000(A/P,i**,10) + 5,000 + 1,000(A/G,i**,10) + 5,000(A/F,i**,10)
b) -40,000 + 15,000(P/A,i**,5) - 1,000(P/F,i**,5)

= -80,000(P/A,i**,10) + 5,000(P/A,i**,10) + 1,000(P/G,i**,10)
+ 5,000(P/F,i**,10)

c) -40,000 + 15,000(P/A,i**,5) -1,000(P/F,i**,5)
= -80,000(P/A,10%,10) + 5,000 + 1,000(P/G,10%,10) + 5,000(P/F,10%,10)

d) None of the above answers

28. Which of the following answers gives the incremental external rate of return (i**) between Projects A and B?

a) -40,000(A/P,i**,5) + 15,000 -1,000(A/F,i**,5)
= -80,000(A/P,i**,10) + 5,000(A/F,i**,10) + 1,000(A/G,i**,10)
+ 5,000(A/F,i**,10)

b) -40,000(F/P,i**,5) + 15,000(F/A,10%,5) - 1,000
= -80,000(F/P,i**,10) + 5,000(F/A,10%,10) + 1,000(P/G,10%,10)
+ 5,000

c) -40,000{1+(P/F,10%,5)}(F/P,i**,10) + 15,000(F/A,10%,10) – 1,000[1+(F/P,10%,5)]
= -80,000(F/P,i**,10) + 5,000(F/A,10%,10) + 1,000(P/G,10%,10) + 5,000

d) None of the above answers

29. What rate of interest compounded annually is equivalent to a semi-annual rate of interest of 3%?

a) 6%
b) 3%
c) 6.09%
d) None of the above answers.

30. What effective (annual) rate of interest compounded annually is equivalent to an actual monthly rate of 1%?

a) 12%
b) 1%
c) 12.68%
d) None of the above answers.

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