1. **(1 points)** From a present worth analysis of project A, if $PW_A < 0$, then $ROR_A < MARR$.

TRUE **FALSE**

2. **(1 points)** From a present worth analysis of a project A, if $AW_A > 0$, then $PW_A > 0$.

TRUE **FALSE**

3. **(2 points)** Capital recovery does not consider the salvage value.

TRUE **FALSE**

4. **(2 points)** The capitalized cost is the annual worth of an alternative.

TRUE **FALSE**

5. **(2 points)** If the ROR of the incremental cash flow is greater than MARR, the alternative with smaller investment survives.

TRUE **FALSE**

6. **(2 points)** The number of ROR values is the same as the number of sign changes in the corresponding net cash flow.

TRUE **FALSE**

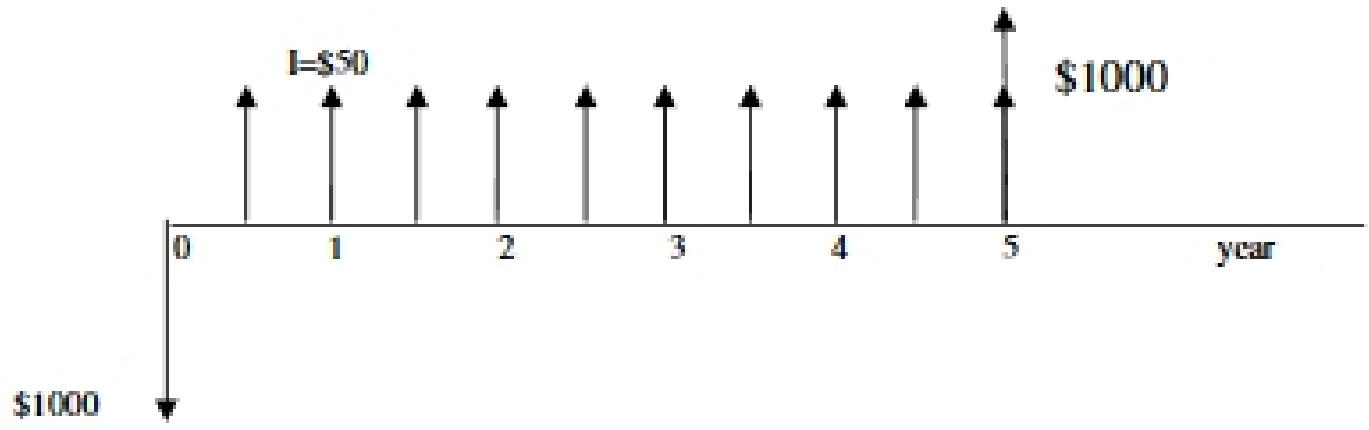
7. **(2 points)** To compare alternatives with different service lives using AW analysis, study period method or least common multiple method should be used.

TRUE **FALSE**

8. **(2 points)** Composite rate of return is always unique.

TRUE **FALSE**

9. (2 points) Below is the cash flow of a bond. Then what is this bond?



(a) 5% coupon rate $1000 face value 5-year bond paid annually
(b) 10% coupon rate $1000 face value 5-year bond paid semiannually
(c) 5% coupon rate $1000 face value 5-year bond paid semiannually
(d) 10% coupon rate $1000 face value 5-year bond paid annually

10. (4 points) Initial investment cost of alternatives A, B, C and D is A<B<C<D. Now suppose we want to select best alternative using ROR analysis and incremental rates of return of each pair of alternatives are shown below. Assume MARR=15%, which two statements is true?

Comparison	Rate of return, %
A-to-D	33.4
B-to-D	18.6
C-to-D	16.6
A-to-B	-7.1
A-to-C	9.0
B-to-C	23.9

(a) Alternative A is better than alternative B
(b) Alternative B is better than alternative C
(c) Alternative C is better than alternative D
(d) Alternative D is the best

11. **(15 points)**Atari needs $5 million in new investment capital to develop and market games software for its new GPS2-ZX system. The plan is to sell $10000 face-value corporate bonds at a discount of $9500 now. The bond pays a dividend each 6 months based on a coupon rate of 5% per year with 10000 face value returned after 5 years. Will a purchase make at least 6% per year compounded semiannually?

Semiannual bond dividend is 10,000(0.05)/2 = $250 per 6 months.
Semiannual interest rate expected is 6%/2 = 3%.

PW = -9500 + 250(P/A,3%,10) + 10,000(P/F,3%,10)
= -9500 + 250(8.53) + 10,000(0.7441)
= $73.5

Yes, the bond investment makes the target rate since PW > 0.

12. **(15 points)** A set of three projects can be independently undertaken by your company. Information concerning the initial investments and the PW of these projects are as listed. If the company has only $10,000 today, and if project B cannot go together with C, then what is the portfolio (i.e. combination of projects) that can maximize your company's profit?
Hint: Do you really need to listing out all possibilities?

Project	Investment	Present Worth
A	$3,000	$69,399
B	$3,000	$37,510
C	$4,000	$58,209
D	$4,000	$53,094

Possible bundle includes {AB},{AC},{AD},{ABD},{BD},{CD},{A},{B},{C},{D},{DN}
Because PW for each project is positive, possible bundle includes {AC} {ABD} and {CD}.
For {ABD} PW=69,399+37,510+53,094=160,003
For {AC} PW=69,399+58,209=127,608
For {CD} PW=58,209+53,094=111,303
That shows the portfolio that maximize profit is {ABD} with profit 160,003