STAT2032/6046

Examiners' Report for Mid-Semester Exam 2017

Summary Statistics:

	Highest Mark	Average	Standard Deviation
STAT 2032	47	28.2	10
STAT 6046	49.5	34.2	9

Question 1:

(a) *Common mistake:*
Some students misunderstand what the question is asking for, which should be the present value rather than compound interest rate.

Suggestion:
Read questions carefully. "The present value" in the question clearly indicates what to be calculated.

(b) *Common mistake:*
Some students take nominal annual rate of discount as nominal annual interest rate.

Suggestion:
Read questions carefully. "The nominal annual rate of discount" in the question clearly indicates it is a rate of discount rather than a rate of interest.

(c) *Common mistake:*
Similar to Q1a, some students misunderstand what the question is asking for, which should be the accumulated value.

Suggestion:
Read questions carefully. "The accumulated value" in the question clearly indicates what to be calculated.

(d) *Common mistake:*
Some students do not know how to derive the force of interest from the accumulated value function S(t).

Suggestion:
Review the "force of interest" section in Lecture Notes Week 2 from page 15 to page 17. Related tutorial questions, review questions, Quizzes and etc. will provide a deeper understanding of this section.

(e) *Common mistake:*
Some students could obtain $v^n = 0.5$, however they do not put it back to the annuity equation to work out the interest rate.

Suggestion:
Remember to work out the final answer.

Question 2:

Common mistake 1:
Some students don't know how to calculate the present value with continuous payment and continuous interest rate.

Suggestion:
Review the "continuous annuity" section in Lecture Notes Week 4 from page 2 to page 5. Similar questions can be found in course materials, such as Question 5, Quiz 2; Question 3(c) Mid-Semester Exam 2014 and etc.

Common mistake 2:

Some students do not know how to deal with the "3-year deferred" part.

Suggestion:
Review the "deferred annuity" section in Lecture Notes Week 3 from page 8 to page 9. In addition, Review the "force of interest" section in Lecture Notes Week 2, in particular how to calculate S(0) with the force of interest.

Question 3:

Common mistake:
Some students find the accumulated value of each cash flow and then add them together (some students make calculation mistakes in the process.). This method is OK but it would be quicker and easier by recognising the cash flows as basic annuities or decreasing annuities (the general formula for increasing annuities can be applied to decreasing annuities as well by assuming the increment as a negative value).

Suggestion:
Review "increasing and decreasing annuities" section in Lecture Notes Week 4. Related tutorial questions, review questions, Quizzes and etc. would be helpful exercises.

Question 4:

Common mistake 1:

Some students treat the incomes start from year 0. In fact, the first payment happens at the end of year 9.

Read the question carefully. The first sentence indicates the cash flows start from the end of year 9.

Common mistake 2:

Misuse of annuity & perpetuity terms.

Many students are confused about the usage of immediate annuity and annuity due. As the lecture notes in week 3 explained, "In the case of present value, an immediate annuity refers to an annuity valued one payment period before the first payment." If the reference time point is chosen at t=9, the annuity term to use should be an annuity due.

Similarly, the present value of an immediate perpetuity is calculating the present value of all future cash flows at the time one period before the first payment.

Suggestion:

Draw a time line. Identify which cash flows are included in a specific annuity or perpetuity term. Carefully identity the reference point of each annuity or perpetuity term and determine how many periods they need to discount.

Question 5:

Common mistake 1:

Some students assume either real rate is fixed or the money rate is fixed. Using the linear interpolation to calculate one rate, then use the relationship $(1 + i) = (1 + r) * (1 + i_r)$ to calculate the other rate for each year. This is not a reasonable assumption when both rates can be calculated directly through linear interpolation.

Common mistake 2:

Misuse of trial values in linear interpolation.

To get the accurate estimation for the true value through linear interpolation requires the true values are close enough to the trial values and preferably right between the two trial values. Using two trial values far away from the true value is likely to lead to an inaccurate estimation.

Suggestion:

Calculate more trial values. Use trial values such that the $f(x_1)$ and $f(x_2)$ are close enough to the true value's function output $f(x_0)$.

Also, whenever you get an estimation $\hat{x}_0$, it is always worthwhile to check its accuracy by substituting it back to function $f(x)$ to see if the estimated $f(\hat{x}_0)$ are close enough to the true function output $f(x_0)$.