Casual Examination (But keep your shirt on)

1. (1 point) Let N be the number of tails that a distribution of one random variable can have. Calculate the maximum value of N.

   (A) Less than 0.5 **(B)** At least 0.5 but no more than 1.5 **(C)** At least 1.5 but no more than 1.998 **(D)** At least 1.998 but no more than 2.001 **(E)** At least 2.001

2. (2 points) According to "Loss Models etc." which one of the following characteristics should a collection of distributions have?

   (A) Be smooth

   (B) Be down-to-earth

   (C) Be confrontational

   (D) Have a tail

   (E) Fly

3. (3 points) You are given:

   - The distribution of X is Poisson with mean 3
   - The distribution of Y is Poisson with mean 2
   - X and Y are independent.

   Calculate the variance of $X + Y$.

   (A) More than 3.56 but at most 4.12 **(B)** More than 4.12 but at most 4.76 **(C)** More than 4.76 but at most 4.998 **(D)** More than 4.998 but at most 5.001 **(E)** More than 5.001

4. (4 points) The force of mortality at age x is $\mu(x) = x$. According to the Old Testament what is $2\,\{\mathring{e}_0\}^2$?

   (A) More than 2 but at most 2.47 **(B)** More than 2.47 but at most 2.89 **(C)** More than 2.89 but at most 2.999 **(D)** More than 2.999 but at most 3.001 **(E)** More than 3.001

5. (5 points) On the last day of February at 12 A.M. an insurance contract is written. The insurance will reimburse 10 times the entire loss times

the number of days until the last day of the year if the loss occurs on the 312-th day of the contract. The loss has a paraplegic distribution with mean 4,000,0000,000,000,000 and variance 120,000,000,000,000. Calculate the probability that insurer will incur a loss.

(A) At least 0.000000000000000 but less than 0.0000000001 **(B)** At least 0.0000000001 but less than 0.05 **(C)** At least 0.05 but less than 0.50 **(D)** At least 0.75 but no more than 0.9 **(E)** At least 0.9

6. (6 points) Another actuary is doing a simulation of the experience of the actuary in question #5. What can you say about <u>his</u> variance[1]?

   I. Too little

   II. Too much

   III. Just right

   (A) I and II only **(B)** I and III only **(C)** II and III only **(D)** I, II and III **(E)** None of I, II or III seems right

7. (No point) A loss is uniformly distributed over the interval from 0 to 1,000,000,000,000,000. A deductible of 7,000,000,000,000 is applied. Calculate the variance of the payment.

   (A) Between 1 and 10 **(B)** Between 10 and 1,000 **(C)** Between 1,000 and 1,000,000 **(D)** Between 1,000,000 and 1,000,000,000 **(E)** Over 1,000,000,000

8. (Absolutely no point) According to "Actuarial Mathematics" By Bowers et al., what is wrong with percentile premiums? They give

   (A) Conflicting results for $Var\left(\begin{matrix} m_r \\ x:y:\overset{\mu}{\lambda} \end{matrix} \overset{\sim}{\mathcal{L}}^{p'(j)}_{8.6:\pi}\right)$

   (B) Conflated results

   (C) Convoluted results

   (D) All of the above

   (E) None of the above

[1] Since question #5 doesn't pertain to this question, a grading adjustment will be made.

9. (10 points) A Shooter and Fisherman walk into a bar. Which of the following statements is true?

   (A) The Shooter gets Hurt

   (B) The Fisherman gets Hurt

   (C) Both get Hurt

   (D) Neither gets Hurt

   (E) Both get Spring Water

10. (20 points) N has a distribution with $\alpha = 2$ and $\theta = 5,000,000$. Name that distribution.

    (A) Pareto **(B)** Burrito **(C)** Buzz **(D)** Inverted exponential **(E)** Inverted Comma

11. According to Vlasic's model, which of the following statements are true?

    (A) Bonds will become worthless eventually unless they are pickled

    (B) Because of "mean reversion" bonds will cease to have value by the year 2100

    (C) Reversion is fine if it were not mean

    (D) The model uses Itô's lemma, which is too hard because it uses Calculus and no actuary should be required to know it

    (E) The correct answer is not given by A, B, C or D.

Solutions to Casual Exam

1. Looking at the answers you find that D has the shortest range. So that has to be it. (It is good to conjecture that the most reasonable exact answer is 2.)

   Answer: D

2. This is a faulty question, because Chapter 2 of KPW is not in the syllabus. It has been replaced by the Study Note.

3. See Solution to Question 1. The range is closest in D. So that is the answer. (A pattern has developed!)

   Answer: D

4. See Solutions to Questions 1 and 3. The answer is again D. (Now the pattern is certain! Another shortcut found!!)

   Answer: D

5. Using the shortcut, the only correct answer is A. Besides, the question carefully and thoughtfully doesn't tell you whether it is a leap year or not, nor does it, as it is wont, tell you whether 12 A.M. is noon or midnight. So the insurer can hide behind ambiguity and pay nothing.

   Answer: A

6. There is something wrong with each of the answers A, B, C and D, the correct answer has to be E

   Answer: E

7. The ranges are not close. Besides there are too many zeros. So the answer has to be E.

   Answer: E

8. Clearly the symbol betrays the right answer.

   Answer: A

9. There is no one in the bar named Hurt. So E is the only correct answer.

   Answer: E

10. Upon looking through the what feels like five hundred pages of tables and other useful material mercifully provided in the exam, one finds that there are no distributions by the name of B, C, D or E. Hence the answer is A.

    Answer: A

11. There is no model called "Vlasic's model." So all the statements are false.