ACTEX EXAM P STUDY MANUAL – April 2020 Edition

Errata List, by S. Broverman Updated July 28/20

Jun 24/20 Page 387, Solution to #27. The first and second lines should say
"Suppose that X_1 is the amount of Jim's loss and X_2 is the amount of Bob's loss. They are independent and both equal to X, where the distribution of X has pdf …".
Also in the pdf on line 2, X_2 should be X.

May 22/20 Page 494, #18, in answers B,C,D and E, y should be λ

May 22/20 Page 501, #18 solution, e^{-y} should be $e^{-\lambda}$ in every occurrence

May 22/20 Page 512, #4 solution, final line should be
Then $P(S<4)=1\times 0.85+1\times 0.15+0.88\times 0.05=0.994$. Answer: D

May 22/20 Page 518, #24 solution is incorrect. The correct solution is the following.

24. Let X_A be the number of sales for manufacturer A, and X_B for B, and X_{CD} for manufacturers C and D combined. X_A, X_B and X_{CD} have a multinominal distribution with
$n=10$ and $p_A=0.10$, $p_B=0.15$, $p_{CD}=0.75$
We wish to find the probability $P[(X_A\geq 2)\cap(X_B\geq 2)]=1-P[(X_A\leq 1)\cup(X_B\leq 1)]$.
$P[(X_A\leq 1)\cup(X_B\leq 1)]=P(X_A\leq 1)+P(X_B\leq 1)-P[(X_A\leq 1)\cap(X_B\leq 1)]$.
$P(X_A\leq 1)=P(X_A=0)+P(X_A=1)=(.9)^{10}+10(.9)^9(.1)=0.7361$.
$P(X_B\leq 1)=P(X_B=0)+P(X_B=1)=(.85)^{10}+10(.85)^9(.15)=0.5443$.
The sales numbers that result in the event $(X_A\leq 1)\cap(X_B\leq 1)$ are as follows:

	Sales			
X_A	0	1	0	1
X_B	0	0	1	1
X_{CD}	10	9	9	8

According to the multinomial probability function,
$$P[(X_A=x_A)\cap(X_B=x_B)\cap(X_{CD}=x_{CD})]=\frac{10!}{x_A!\times x_B!\times x_{CD}!}\times p_A^{x_A}\times p_B^{x_B}\times p_{CD}^{x_{CD}}$$
The probabilities of the combinations above are
$P[(X_A=0)\cap(X_B=0)\cap(X_{CD}=10)]$
$=\frac{10!}{0!\times 0\times 10!}\times(0.1)^0\times(0.15)^0\times(0.75)^{10}=0.0563.$
In a similar way, we get $P[(X_A=1)\cap(X_B=0)\cap(X_{CD}=9)]=0.0751$,
$P[(X_A=0)\cap(X_B=1)\cap(X_{CD}=9)]=0.1126$, and
$P[(X_A=1)\cap(X_B=1)\cap(X_{CD}=8)]=0.1352$.
Then, $P[(X_A\leq 1)\cap(X_B\leq 1)]=0.0563+0.0751+0.1126+0.1352=0.3792$,
and $P[(X_A\leq 1)\cup(X_B\leq 1)]=0.7361+0.5443-0.3792=.9012$,
and the probability that no manufacturer gets dropped is $1-0.9012=0.0988$. Answer: A

May 22/20 Page 520, #29 solution is incorrect.
The value of -450 on the 6th line from the bottom should be -225. This changes the bottom line of the solution to be
The total expected insurance payment is 12,500 x .09 – 225 + 738.99 = 1,639 Answer : E

Jul 28/20 Page 523, #13. The question should have
"A policyholder is selected at random and found to have high blood pressure. Calculate the probability that the policyholder is over age 65."

Jul 28/20 Page 525, #24. Answer should be A) 1/32 B) 1/16 C) 1/8 D) 3/16 E) 5/16

Jul 26/20 Page 526, #25 answers should be A) 5/22 B) 5/23 C) 5/24 D) 1/5 E) 5/26

Jul 28/20 Page 533, #24 solution. The result of the integral in the second last line before the graph should be $4t^3 - 3t + 1$.
The following should be added right after the graph:
$$E[T] = \int_0^{1/2} P(T > t)\,dt = \int_0^{1/2} (4t^3 - 3t + 1)\,dt = \frac{3}{16} \ .$$

Jul 26/20 Page 534, #25 solution is incorrect.
In the third paragraph of the solution, second line the conditional probability should say that there are 12 ways that the total could be 8 from Die 3 for a probability of $\frac{12}{36} = \frac{1}{3}$.

Then it should say $P[(\text{total of } 8) \cap (\text{Die } 3)] = \frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$ and then

$$P[\text{total of } 8] = \frac{5}{108} + \frac{2}{27} + \frac{1}{9} = \frac{25}{108} \ ,$$

And $P(\text{Die } 1 \mid \text{total of } 8) = \frac{P[(\text{Die } 1) \cap (\text{total } 8)]}{P[\text{total of } 8]} = \frac{5/108}{25/108} = \frac{1}{5}$ Answer: D