Practice Exam 3

STA 220 – Spring 2009

1. The following life table describes the life of a microwave oven. Use this data to answer the following questions.

Age(months of use)	P(working)
0 months	1.00
10 months	0.90
20 months	0.85
30 months	0.82
40 months	0.78
50 months	0.70
60 months	0.60
70 months	0.45
80 months	0.20
90 months	0.00

a) Draw the survivorship curve for microwave ovens
b) What is the probability that a microwave oven is working at 50 months of use?
c) What is the risk of 10 to 40 months of use?
d) When is a microwave at its least risk of breaking down?
e) What is the probability that a microwave which is working at 30 months of use will still be working at 70 months of use?
f) How long do you expect a microwave to last?
g) Suppose a microwave is working at 40 months of use. What is the risk for 60 months of use?
h) Suppose a microwave is working at 40 months of use. What is its average life expectancy?

2. Below is a life table for two brands of dishwashers.

Years	Brand A	Brand B
0 years	1.00	1.00
2 years	0.90	0.70
4 years	0.85	0.60
6 years	0.70	0.45
8 years	0.30	0.30
10 years	0.10	0.20
12 years	0.00	0.00

a) What is the probability that a Brand A dishwasher is still working at 4 years?
b) What is the probability that a Brand B dishwasher breaks down before 6 years?

c) If a restaurant purchases a Brand A and a Brand B dishwasher at the same time, what is the probability that both of these dishwashers will be working 8 years later?
d) What is the probability that both of these dishwashers in c, above, will both fail before 8 years?
e) What is the probability that at least one of these two dishwashers will be working 8 years later?
f) Which dishwasher will last longer? Why?
g) I bought a Brand B dishwasher 4 years ago. What is the likelihood that it will last another 2 years?
h) What is the life expectancy of my 4 year old Brand B dishwasher?

3. The following is a contingency table containing hypothetical car and TV purchase data.

		Car Purchase			
TV Purchase		USA	Europe	Japan	Total
	USA	172	38	16	226
	Europe	41	152	118	311
	Japan	37	91	45	173
	Total	250	281	179	710

a) P(a person owns a USA car)?
b) P(a person owns a USA tv)?
c) P(a person owns a European car and Japanese TV)?
d) P(a person owns a Japanese car and European TV)?
e) P(a person owns a Japanese car)?
f) P(a person owns a USA car)?
g) P(a USA TV owner buys a Japanese car)?
h) P(a Japanese car owner buys a USA TV)?
i) P(a European car owner buys a European TV)?
j) P(a person who buys a foreign car buys a foreign TV)?

4. The table below gives some results of a survey regarding smoking habits and attitudes toward nicotine.

Response	Smokers	Non-Smokers
Nicotine is addictive	750	170
Nicotine is not addictive	50	200
Don't know or care	200	50

a) What is the probability that a person is a smoker?
b) What is the probability that a person is a smoker and thinks nicotine is addictive?
c) What is the probability that a smoker has an opinion regarding the addictive properties of nicotine?