**Topic 2: Basic Probability Solutions**

**Q1**

|  |  |  |  |
| --- | --- | --- | --- |
| Needs warranty- related repair | U.S. | Non-U.S. | Total |
| Yes | 0.025 | 0.015 | 0.04 |
| No | 0.575 | 0.385 | 0.96 |
| Total | 0.600 | 0.400 | 1.00 |

a) *P*(needs warranty repair) = 0.04

b) *P*(needs warranty repair and manufacturer based in U.S.) = 0.025

c) *P*(needs warranty repair or manufacturer based in U.S.)

*=P*(needs warranty repair) + *P*(manufacturer based in U.S.)

- *P*(needs warranty repair and manufacturer based in U.S.)

= 0.04 + 0.6 – 0.025 = 0.615

d) *P*(needs warranty repair or manufacturer not based in U.S.)

*=P*(needs warranty repair) + *P*(manufacturer not based in U.S.)

- *P*(needs warranty repair and manufacturer not based in U.S.)

= 0.04 + 0.4 - 0.015 = 0.425

**Q2**

1. P(*not enjoy | female*) = = = 0.1333
2. P(*male | enjoy*) == = 0.35
3. P(*male*) =  = 0.46

From part (b), P(*male | enjoy*) = 0.35

P(*male*)  P(*male | enjoy*)

=> enjoy shopping and gender are not independent

**Q3**

a)

(i) Let H: husband watch TV, : husband do not watch TV

W: wife watch TV, wife do not watch TV

P(H) = 0.6 , P(W | H) = 0.4,

P(W/H) = 

P(WH) = P(W | H)P(H) = (0.4)(0.6) = 0.24

(ii) P(W | ) = 0.3 , P() = 1-0.6 =0.4

P(W) = P(W | ) P() = (0.3)(0.4) = 0.12

P(W) = P(WH) + P(W) = 0.24 + 0.12 = 0.36

b)

(i) P(do not enjoy shopping | F) = 

(ii) P(M | enjoy shopping) = 

(iii) P(do not enjoy shopping) =  P(do not enjoy shopping | F)

Also, P(M) = P(M | enjoy shopping)

 Whether one enjoy shopping for clothing and their gender are not statistically independent.

**Q4**

310 = 59049 sequences

**Q5**

(5)(7)(4)(5) = 700 burgers

**Q6**

= 210 ways