Eric Yang

304263623

Homework 3

Problem 1

a. P(next packet arrives within 14ms) = 4/10

b. P(next packet arrives between 14 to 17ms) = 3/6

Problem 2

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| X Y | 0 | 1 | 2 | 3 | 4 | Total |
| 0 | 0.198 | 0.0494 | 0.0123 | 0.00309 | 0.000772 | 0.264 |
| 1 | 0.0494 | 0.0123 | 0.00309 | 0.000772 | 0 | 0.0656 |
| 2 | 0.0123 | 0.00309 | 0.000772 | 0 | 0 | 0.0162 |
| 3 | 0.00309 | 0.000772 | 0 | 0 | 0 | 0.00386 |
| 4 | 0.000772 | 0 | 0 | 0 | 0 | 0.000772 |
| Total | 0.264 | 0.0656 | 0.0162 | 0.00386 | 0.000772 | 0.35 |

Problem 3

|  |  |
| --- | --- |
| X | P(X) |
| 2 | 1/25 |
| 3 | 2/25 |
| 4 | 3/25 |
| 5 | 4/25 |
| 6 | 5/25 |
| 7 | 4/25 |
| 8 | 3/25 |
| 9 | 2/25 |
| 10 | 1/25 |
| Total | 1 |

1. Expected delay = 6 ms

Problem 4

4/40\*

Problem 5

1. P(x>=100) = = 0.4895
2. P(x>=50) = = 0.6997

Problem 6

P(x+y=n) =

Problem 7

1. 2c+10c+5c+13c+17c+25c = 1

c = 1/72 = 0.0139

1. P(Y<X) = P(X=2 and Y=1) + P(X=4 and Y=1) + P(X=4 and Y=3) = 47/72 = 0.653
2. P(Y>X) = P(X=1 and Y=3) + P(X=2 and Y=3) = 23/72 = 0.319
3. Marginal PMF of px(x)

|  |  |  |  |
| --- | --- | --- | --- |
| x | 1 | 2 | 4 |
| Px(x) | 0.167 | 0.25 | 0.583 |

Marginal PMF of py(y)

|  |  |  |
| --- | --- | --- |
| y | 1 | 3 |
| Py(y) | 0.333 | 0.667 |

1. P(1,1) = 0.0278

Px(1)Py(1) = 0.0556

Not independent

|  |  |  |  |
| --- | --- | --- | --- |
| x | 1 | 2 | 4 |
| Px|Y=3(x) | 0.208 | 0.271 | 0.521 |

Problem 8

1. P(x>=10) = 1-P(x<=9) = 1-0.755 = 0.245
2. P(n>=6) = = 0.0778

Problem 9

1. P(fail at 10th person) = (1-.985) = 0.0131

Problem 10

1. P(k>b) = 1 -