Sri Lanka Institute of Information Technology

Lab Submission
<Lab sheet No-06>

<IT24103909>

<Chathumal M.G.A.K>

Probability and Statistics|IT2120

B.Sc. (Hons) in Information Technology

1. An IT company claims that their newly developed learning platform improves stu dent performance in online tests. According to previous data, 85% of students who used the platform passed their online tests. A batch of 50 students is selected at random who have completed the course using this platform. Let X denote the number of students who passed the test out of 50 students. **i. What is the distribution of X?**

Since we have a fixed number of trials (n=50) and success probability p=0.85, the distribution is Binomial.

Therefore:

X ~ Binomial(n=50, p=0.85)

ii. What is the probability that at least 47 students passed the test?

```
> # (iii) Probability that exactly 15 calls are received
> prob_X_eq_15 <- dpois(15, lambda)
> cat("P(X = 15) =", prob_X_eq_15, "\n")
P(X = 15) = 0.07239112
```

2. A call center receives an average of 12 customer calls per hour.

i. What is the random variable (X) for the problem

Random variable:

X = number of customer calls received in one hour **ii. What is the distribution of X?**

Since calls arrive on average at a constant rate (12 per hour),

the distribution is Poisson with parameter $\lambda = 12$.

Therefore:

X ~ Poisson(lambda=12)

iii. What is the probability that exactly 15 calls are received in an hour

```
> prob_X_eq_15 <- dpois(15, lambda=12)
> prob_X_eq_15
[1] 0.07239112
```