Exam Questions – Normal Distribution

Q1.

The heights of adult females are normally distributed with mean 160 cm and standard deviation 8 cm.

(a) Find the probability that a randomly selected adult female has a height greater than 170 cm.

$X \sim N(160, 8^2)$

$P(x > 170) = 0.1056$ //

lower = 170
upper = 10^{10}
μ = 160
σ = 8

(3)

Any adult female whose height is greater than 170 cm is defined as tall.

An adult female is chosen at random. Given that she is tall,

(b) find the probability that she has a height greater than 180 cm.

$P(x > 180) = 0.00621$

lower = 180
upper = 10^{10}
μ = 160
σ = 8

$$\text{Given tall} = \frac{0.00621}{0.1056}$$ ← Probability tall

$= 0.0588$ //

(4)

Half of tall adult females have a height greater than *h* cm.

(c) Find the value of *h*.

$P(x > a) = 0.0528$

$a = 172.9\text{ cm}$ //

Inverse normal
area = 1 - 0.0528
= 0.9472
μ = 160
σ = 8

(5)

(Total 12 marks)