Daily Question – Applied Mathematics - Day 2 Dec 2025

Topic: Normal Distribution and Probability

The records for a school athletics club show that the height, H metres, achieved by students in the high jump is normally distributed with mean 1.4 metres and standard deviation 0.15 metres.

(a) Find the proportion of these students achieving a height of more than 1.6 metres.

(1)

The records also show that the time, T seconds, to run 1500 metres is normally distributed with mean 330 seconds and standard deviation 26 seconds.

The school's Head would like to use these distributions to estimate the proportion of students from the school athletics club who can jump higher than 1.6 metres **and** can run 1500 metres in less than 5 minutes.

(b) State a necessary assumption about H and T for the Head to calculate an estimate of this proportion.

(1)

(c) Find the Head's estimate of this proportion.

(3)

Students in the school athletics club also throw the discus.

The random variable $D \sim N(\mu, \sigma^2)$ represents the distance, in metres, that a student can throw the discus.

Given that $P(D < 16.3) = 0.30$ and $P(D > 29.0) = 0.10$

(d) calculate the value of μ and the value of σ

(5)

(Total for question = 10 marks)