(P.) A continuous s/g is bandlimited to 5KHz. The s/g is quantized in 8 levels of a PCM s/m with probabilities 0.25, 0.2, 0.2, 0.1, 0.1, 0.05, 0.05 & 0.05. Calculate the entropy & the rate of information.

Ans) $H(x) = -0.25\log(0.25) - [0.2\log(0.2) \times 2]$

$- 2\times0.1\log(0.1) - 3\times0.05\log(0.05)$

$= 2.74$ bits / symbol

$f_m = 5KHz$

We know $f_s = 2f_m$

$= 2 \times 5KHz = 10KHz$

$R = r\,H(x)$

$= 10,000 \times 2.74$

$= 27400$ bits / sec