DATE : .....

Ans 5. $B_W = 20kHz$

Sampled + quantized → encoded PCM

Sampled at Nyquist rate.
encoded to 128 levels

as minimum sampling rate = bits × signals / rate

level $= 2^n$

$n = \log_2 L$

$n = \log_2 128$

$n = 7$

$= 7 \times 28000$

$= 196000$ Hz

or

$= \frac{7}{R_b}$

$= \frac{7}{280000}$

1960 kHz

$= 2.5 \times 10^{-5}$ sec

b) Signaling rate $R_b = nfs$
Bit rate

$= 7 \times 2fm$

$= 7 \times 2 \times 20000$

$= 280000$ bits/sec

or 280 K bits/sec