

(ECE3455, Q2) Sketch the magnitude and phase of Bode plot of the following transfer function.

$$T(s) = \frac{10^6 S(S+100)(S+10^4)}{(S+10)(S+1000)^2(S+10^5)}$$

Solution:

We first change  $T(s)$  so that terms are in  $(1+Ts)$  form

$$T(s) = \frac{10^6 S \times 100 (1+S/100) 10^4 (1+S/10^4)}{10 (1+S/10) 10^6 (1+S/10^3)^2 10^5 (1+S/10^5)}$$

$$T(s) = \frac{S (1+S/100) (1+S/10^4)}{(1+S/10) (1+S/10^3)^2 (1+S/10^5)} \quad s = j\omega$$

The magnitude and phase of  $T(s)$  are shown in next pages.

171

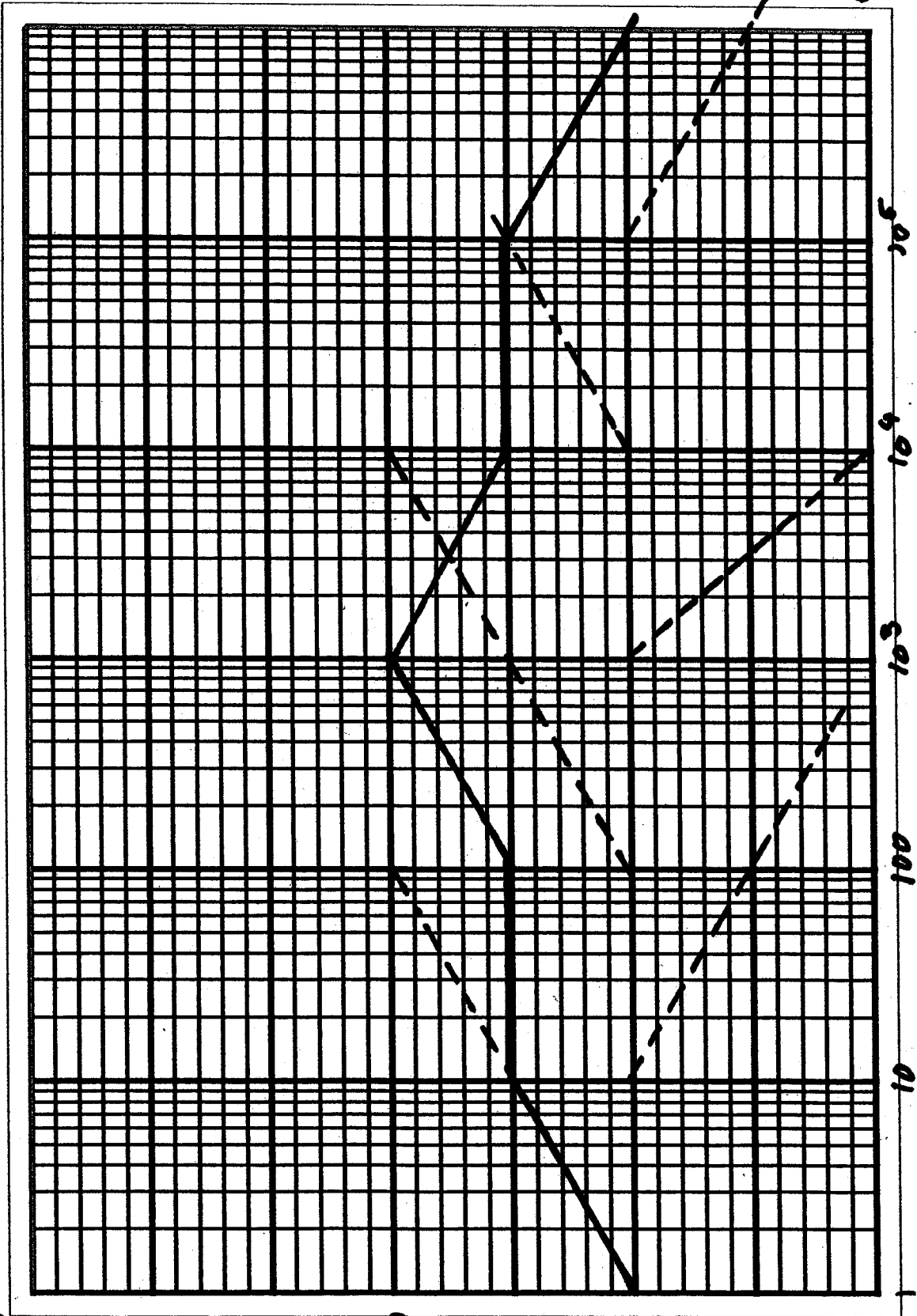
dB

40

20

0

-20



10<sup>5</sup>

10<sup>4</sup>

10<sup>3</sup>

10<sup>2</sup>

10

2 1/s

17

