7

(i) price oil increase from $ 1.80 to $ 2.20 per gallon

$$\% \Delta P = \frac{P_1 - P_0}{\bar{P}} \times 100\%$$

$$= \frac{2.20 - 1.80}{\left(\frac{2.20 + 1.80}{2}\right)} \times 100\%$$

$$= \frac{0.4}{2} \times 100\% = 20\%$$

n_D short run = 0.2

$$0.2 = \frac{\% \Delta Q_D}{\% \Delta P}$$

$$0.2 = \frac{\% \Delta Q_D}{20\%}$$

$$4\% = \% \Delta Q_D$$

∴ decrease 4% in short run

n_D long run = 0.7

$$0.7 = \frac{\% \Delta Q_D}{\% \Delta P}$$

$$0.7 = \frac{\% \Delta Q_D}{20\%}$$

$$14\% = \% \Delta Q_D$$

∴ decrease 14% in long run

(ii) The elasticity depends on the time horizon, More substitues lead to more elasticity

b)

7. income 20,000 , P = 8 & Q_D = 40
P = 10 & Q_D = 32

$$n_D = \frac{1}{\text{slope}} \times \frac{\bar{P}}{Q_D}$$

$$= \frac{1}{-1/4} \times \frac{(8+10)/2}{(40+32)/2}$$

$$= -4 \cdot \frac{18/2}{72/2}$$

$$= -4 \cdot \frac{1}{4}$$

$$= -1$$

income 24000 P = 8 & Q_D = 50
P = 10 & Q_D = 45

$$n_D = \frac{1}{\text{slope}} \times \frac{\bar{P}}{\bar{Q}}$$

$$= \frac{1}{-2/5} \times \frac{(10+8)/2}{(50+45)/2}$$

$$= -\frac{1}{\frac{2}{5}} \times \frac{18}{95}$$

$$= -\frac{9}{19} = \approx -0.47$$

b) price $ 12

$$n_I = \frac{\%\ \Delta Q_D}{\%\ \Delta I}$$

$$= \frac{\frac{30-24}{24} \times 100}{\frac{24000-20000}{20000} \times 100} = \frac{\frac{6}{24}}{\frac{4000}{20000}} = \frac{5}{4} = 1.25$$

price is ₹ 16

$$n_I = \frac{\% \Delta Q_D}{\% \Delta I}$$

$$= \frac{\frac{12-8}{8} \times 100}{\frac{24000-20000}{20000} \times 100}$$

$$= \frac{\frac{4}{8} \times 100}{\frac{4000}{20000} \times 100} = \frac{5}{2} = 2.5$$