6 (a) (i) Explain what is meant by a *progressive transverse* wave.

progressive .....

.....

transverse .....

.....

..... [2]

(ii) Explain whether a longitudinal wave can be polarised.

.....

.....

.....

.....

.....

..... [2]

(b) A microwave emitter produces polarised microwaves that passes through a microwave polariser before reaching a microwave detector. The emitter, receiver and polariser are initially aligned along the horizontal axis as shown in Fig. 6.1.

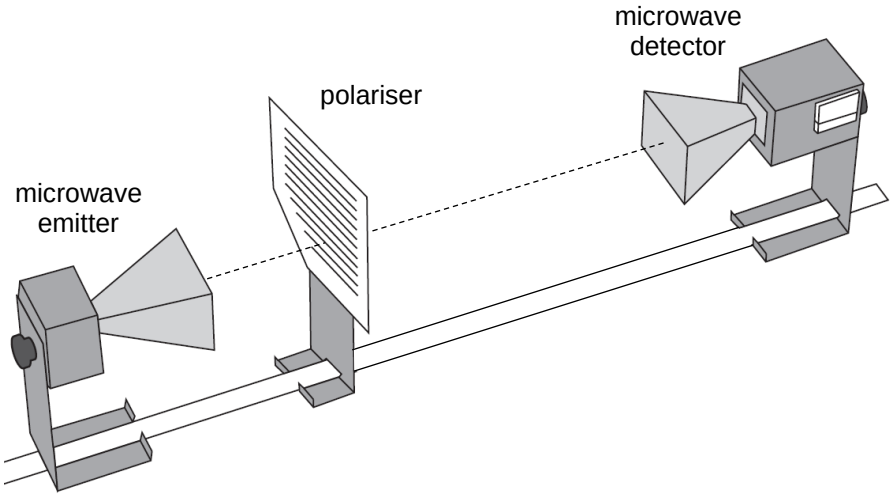

Fig. 6.1

Fig. 6.2 shows the variation with time of the electric field strength of the detected signal.

Graph A shows the variation obtained with the initial set up as per Fig. 6.1, which results in the maximum possible field strength that can be received via the set up.

Graph B shows the variation of the field strength after the polariser has been rotated about the horizontal axis by an angle θ.

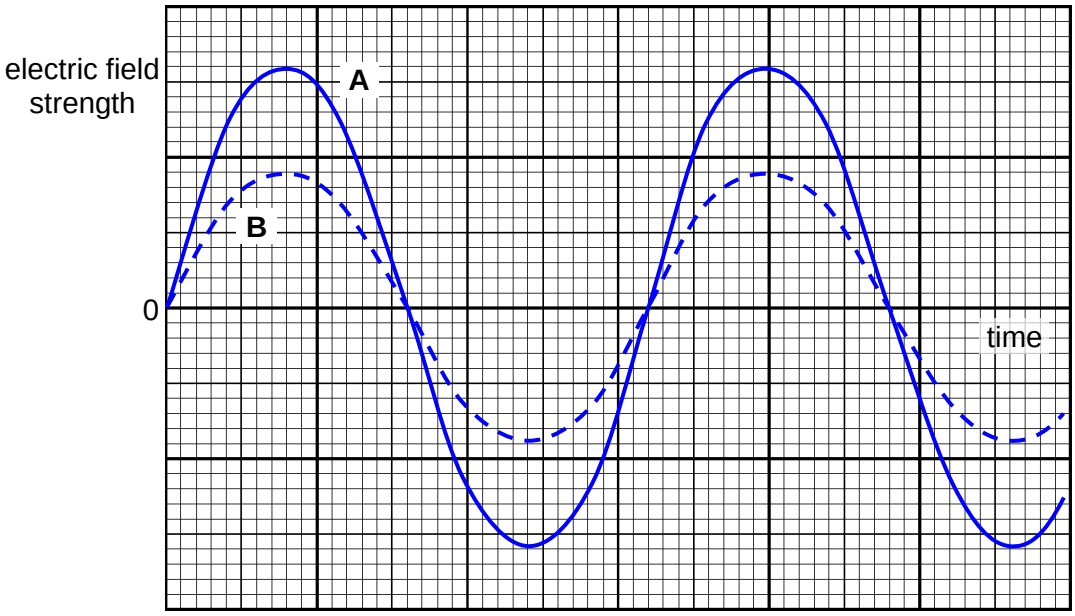

Fig. 6.2

(i) Use Fig. 6.2 to determine θ.

θ = ... ° [2]

(ii) Determine the ratio

$$\frac{\text{intensity of signal after rotation by } \theta}{\text{intensity of signal at maximum field strength}}$$

ratio = ... [2]

[Total: 8]