5 The variation with time t of the displacement x of a point in a transverse wave T_1 is shown in Fig. 5.1.

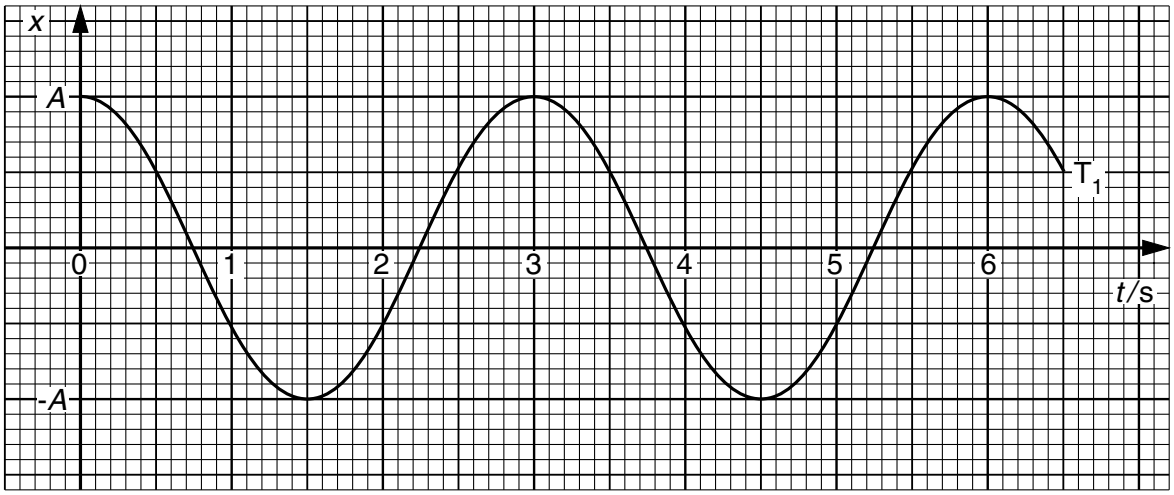

Fig. 5.1

(a) By reference to displacement and direction of travel of wave energy, explain what is meant by a *transverse wave*.

.....

.....[1]

(b) A second transverse wave T_2, of amplitude A has the same waveform as wave T_1 but lags behind T_1 by a phase angle of 60°. The two waves T_1 and T_2 pass through the same point.

(i) On Fig. 5.1, draw the variation with time t of the displacement x of the point in wave T_2. [2]

(ii) Explain what is meant by the *principle of superposition* of two waves.

.....

.....

.....[2]

(iii) For the time $t = 1.0$ s, use Fig. 5.1 to determine, in terms of A,

1. the displacement due to wave T_1 alone,

displacement = ...

2. the displacement due to wave T_2 alone,

displacement = ...

3. the resultant displacement due to both waves.

displacement = ...
[3]

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Turn over for question 6