

The crust is much thinner than the mantle, and the core accounts for only a small fraction of Mars's volume.

[No marks would be given for an answer based on the lithosphere/asthenosphere distinction, which depends on physical properties (notably resistance to flow, or rigidity) rather than composition.]

(c) (i) It is likely to be (largely) the product of partial melting of peridotite, and so will be largely basalt/basaltic. This composition can be inferred on the basis of the volcano types [5.6.5] and samples of SNC meteorites. [8.5.2]

[Marks would also be given for evidence from Viking Landers in place of any of the above items. S281 discusses atmospheric analyses only, e.g. Table 8.1, but some of you will know about surface analyses.]

(ii) The most suitable type of realistic evidence would be seismic. [3.2.2] [Deep boreholes would not be acceptable - these are not even feasible on the Earth.]

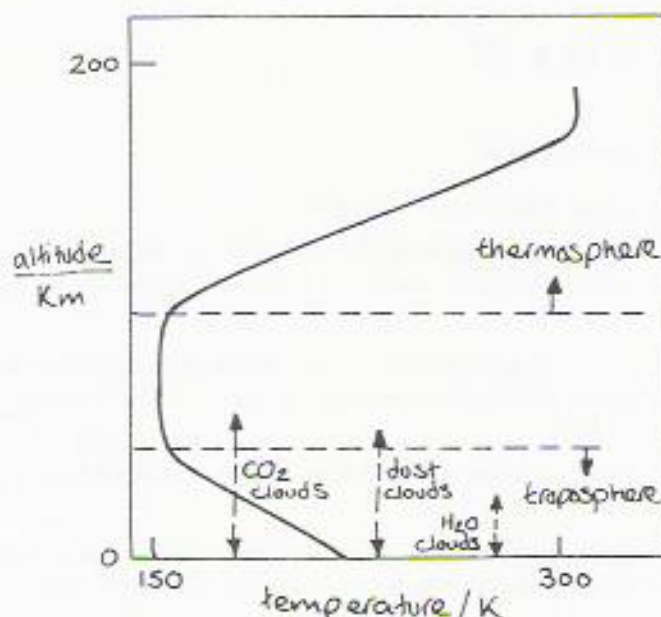
Question 5

[Book 2 (sub)sections are given.]

(a) The troposphere is the region of an atmosphere in which the heating of the planetary surface causes a decrease of temperature with altitude, whereas in the thermosphere the direct heating of the atmosphere leads to an increase in temperature with altitude. In the troposphere, the decrease of temperature with altitude leads to vertical transport of energy dominated by convection, giving rise to vertical mixing, whereas in the thermosphere the temperature gradient suppresses convection. [6.4.2]

[This is a case where the glossary definitions are of direct relevance, and are embedded in the answer. However, the question does not ask you to reproduce or paraphrase the glossary definitions: you have to decide whether any information in the glossary is relevant, and, if so, in what way it should be incorporated in the answer. Therefore, appropriately used information in the glossary *does* earn marks.]

(b) For Mars...[6.4.2 and 6.4.3]



[There is little explicit information in S281 on the altitude ranges of clouds on Mars, so the marking scheme would be lenient on this point.]