

Question 15 (Unit 16)

Consider the following statements about ordered fields. For each one say whether the statement is true or false, justifying your answer with a brief proof or counter-example.

- (i) If  $K$  is an ordered field then every subfield  $M$  of  $K$  is an ordered field. [2]
- (ii) If  $K$  is an ordered field then  $K$  is algebraically closed. [2]
- (iii) If  $K$  is an ordered field and  $k \in K$  then  $k + k + k + k + k$  is not zero unless  $k = 0$ . [2]
- (iv) If  $K$  is an ordered field,  $x \in K$  and  $x \geq 0$ , then  $-x \leq 0$ . [2]
- (v) If  $K$  is an ordered field then there is no subfield  $L$  of  $K$  such that  $[K : L] = 2$ . [2]

[END OF QUESTION PAPER]