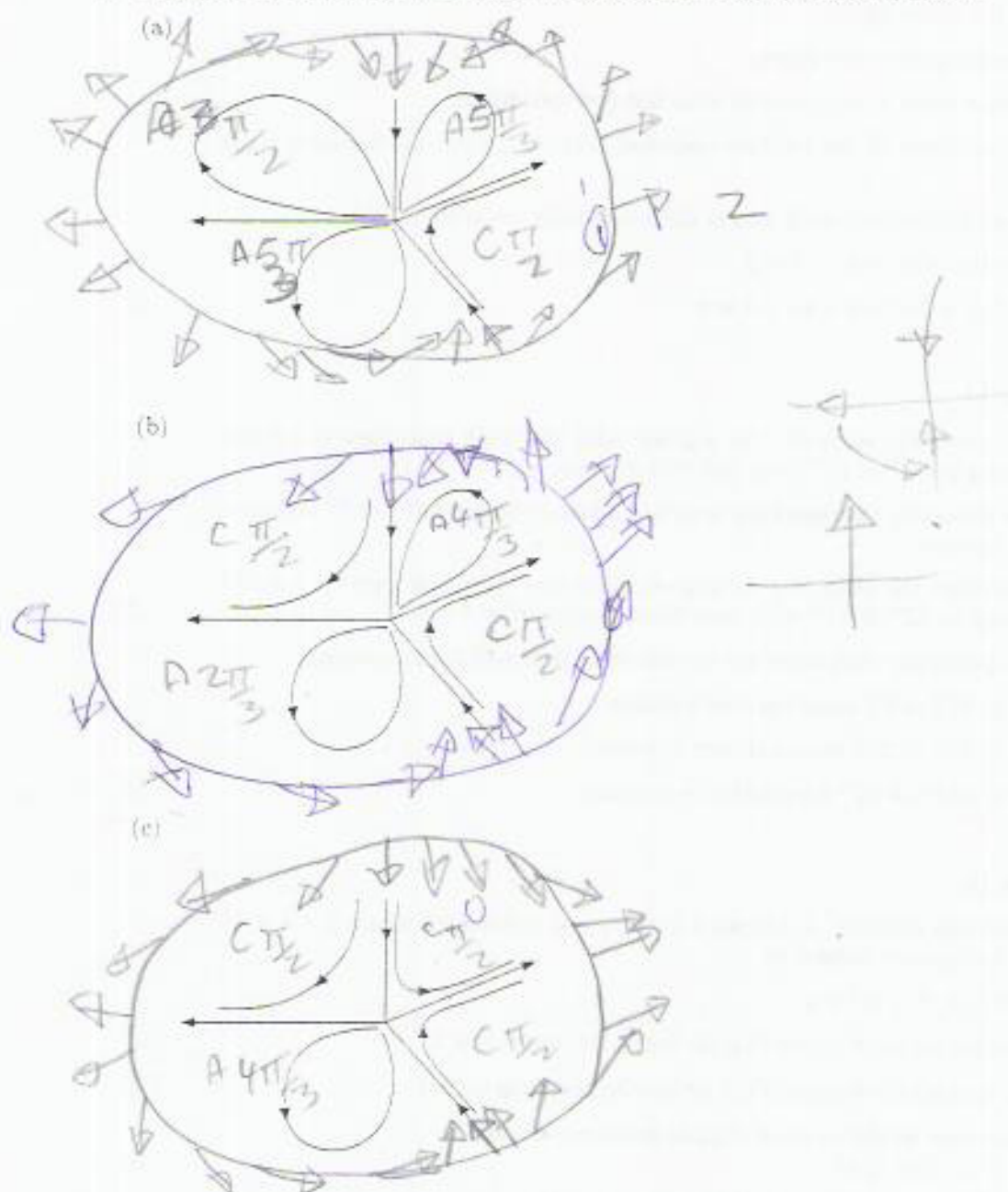


Question 16

(i) Calculate the indices of the rest point in the diagrams (a), (b), and (c) below.



- (ii) On what closed orientable surface, if any, could there be a flow with precisely 1 singularity of type (a), 1 singularity of type (b), and no others? [3]
- (iii) On what closed orientable surface, if any, could there be a flow with precisely 1 singularity of type (a), and no others? [2]
- (iv) On what closed orientable surface, if any, could there be a flow with precisely 4 singularities of type (c), and no others? [2]
- (v) Sketch a rest point of index -1 . [1]
- (vi) There is exactly one closed orientable surface which could carry a flow with the following four singularities: two singularities each with an index of $+1$ and two singularities each with an index of -1 . Which surface is it? Illustrate by a sketch that such a flow is possible. [4]

[END OF QUESTION PAPER]