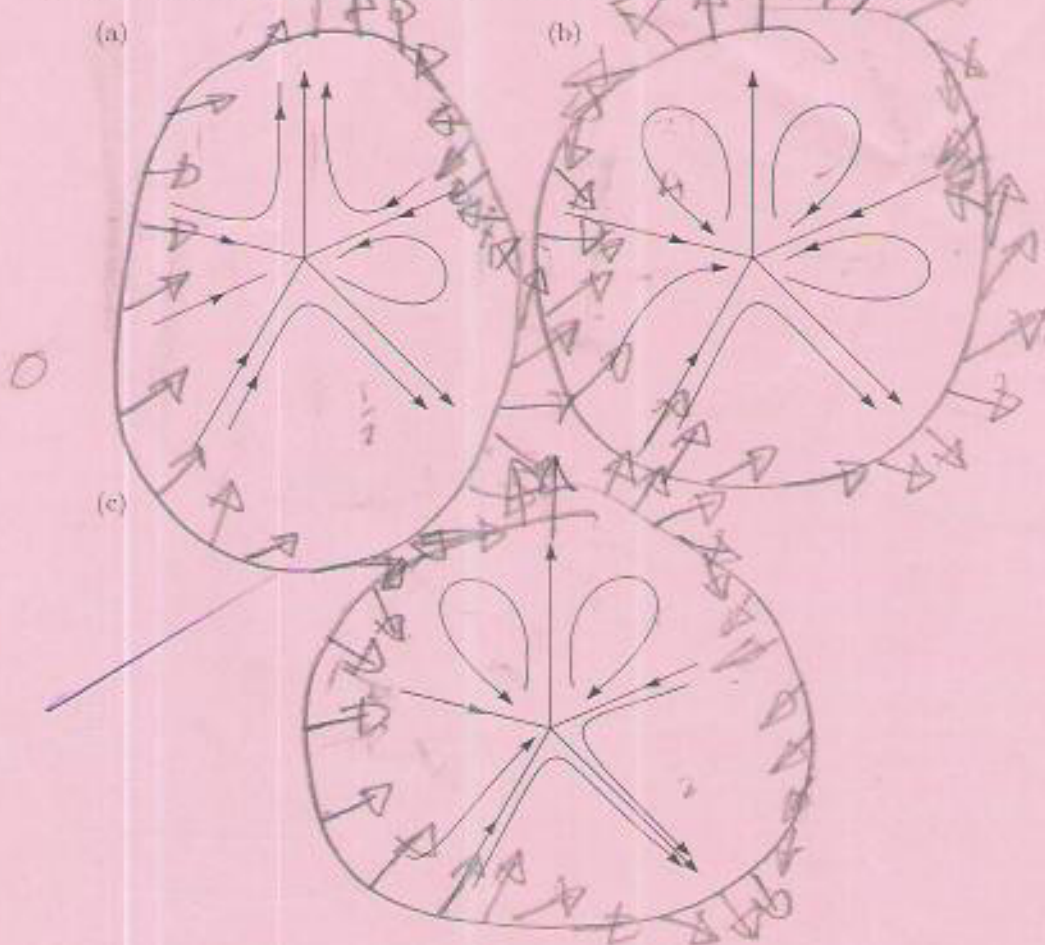


Question 16

(i) Calculate the indices of the rest points 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?

(iii) On what closed orientable surface, if any, could there be a flow with precisely 1 singularity of type (a), and no others?

(iv) On what closed orientable surface, if any, could there be a flow with precisely 1 singularity of type (c), and no others?

(v) Sketch a rest point of index  $-1$ .

(vi) There is exactly one closed orientable surface which could carry a flow with the following six singularities: two singularities each with an index of  $+1$  and four singularities each with an index of  $-1$ . Which surface is it? Illustrate by a sketch that such a flow is possible.

[END OF QUESTION PAPER]