

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS:ME
BRANCH: SER**

**SEMESTER :
SESSION : SP/22**

SUBJECT: SR 577 BOUNDARY LAYER THEORY

TIME:

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 10 questions each of 5 marks and total 50 marks.
 2. The missing data, if any, may be assumed suitably.
 3. Before attempting the question paper, be sure that you have got the correct question paper.
 4. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1 Discuss the different types of fluids based on their stress strain curve. [5]
- Q.2 What is the significance of Blassius equations? Mention the assumptions suitably. [5]
- Q.3 With a neat sketch, discuss the phenomena of separation. [5]
- Q.4 With a neat sketch, explain why a heap of sugar is formed in a glass full of water after stirring. [5]
- Q.5 Derive the momentum integral equation. How is the momentum integral equation different than Blassius equation? [5]
- Q.6 Show that in a compressible inviscid fluid over a blunt body, the rise in the temperature at the leading edge is proportional to the square of the free stream velocity? [5]
- Q.7 Discuss the effect of Prandtl number on the fluid flow at high altitude. [5]
- Q.8 What do you understand by the unsteady boundary layer equations (uBLE). Discuss its impact on the boundary layer formation of a circular cylinder. [5]
- Q.9 With suitable examples, discuss the active and passive boundary layer control technique. [5]
- Q.10 Show mathematically that how a porous wall helps in delaying the separation. [5]

27/04/2022

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