

JAYA GROUP INSTITUTIONS-THIRUNINRAVUR
8TH SEMESTER – B.E / B.Tech
INTERNAL ASSESSMENT-I (MODEL EXAMINATION-I)

Sub.Name: HYPERSONIC AERODYNAMICS
Sub.Code: AE2031
Duration: 180 Minutes

Date: 9.2.15
Branch: AERONAUTICAL ENGG
Max.Marks: 100

PART-A

1. What is co-efficient of pressure?
2. Brief about hypersonic device.
3. What is an inviscid flow?
4. What is meant by viscous interaction?
5. Define Mach number and its unit.
6. Define mean free path.
7. What are the local surface inclination method?
8. Write the expression given in modified Newtonian law.
9. What are the assumptions made in Tangent wedge method?
10. Write the crux of Maslen's method.

PART-B

5X16= 80

11. (a) Explain (i) Thin shock layer theory(6)
(ii) Entropy layer (5)
(iii) Viscous interactions (5)

OR

(b) Write in detail about hypersonic similarity parameters.

12. (a) Briefly explain about hypersonic flight paths.

OR

(b) Derive the Expansion wave relations for inviscid hypersonic flow.

13. (a) Derive the expression for C_p using shock relations of hypersonic flow.

OR

(b) Explain in brief about **any four** local surface inclination methods. (4x4=16)

14. (a) Explain the Newtonian flow and derive the expression for co-efficient of pressure with illustrative examples.

OR

- (b) Write about (i) Modified Newtonian law. (8)
(ii) Shock expansion methods. (8)

15. (a) Discuss Thin shock layer theory

OR

- (b) Briefly explain about (i) Tangent wedge method. (8)
(ii) Tangent cone method. (8)