F 3558 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2014

Eighth Semester

Branch : Mechanical Engineering

AEROSPACE ENGINEERING–(Elective II) (M)

(Old Scheme—Prior to 2010 Admissions)

[Supplementary/Mercy Chance]

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 4 *marks.*

1. Explain the characteristics of mesosphere.
2. What is stagnation pressure ?
3. Explain Reynolds number.
4. Write short note on Horse Shoe Vortex ?
5. Explain the working of turbo fan.
6. Write short note on efficiency of a propeller.
7. Explain take-off and landing performance.
8. Explain endurance of airplanes.
9. Explain the working of solid propellant rockets.
10. Explain principles of wind tunnel testing.

(10 × 4 = 40 marks)

Part B

Answer **all** *questions.*
Each question carries 12 *marks.*

11. (a) Derive expressions for variation of pressure temperature and density with altitude in troposphere and stratosphere.

Or

(b) Explain the Navier stroke equations of motion for three dimensional, unsteady, compressible and viscous flow with body and pressure forces.

12. (a) Explain the characteristics of aerofoil.

Or

(b) Explain Mach number. Determine the Mach number of an aircraft flying at 1080km/hr at the altitude of 2000, 7000, and 15000 metres.

13. (a) Describe the Ramjet engine with neat diagram. Explain its advantages and disadvantages.

Or

(b) Find out the thrust produced by the propeller; slip stream velocity, ideal efficiency of the propeller given following details. The aircraft is flying at an altitude of 8000 meters, weighing 10,000 kg, at a speed of 180 m/s with a propeller of 4m. Lift/drag ratio is 5.

14. (a) Derive the equation of length of landing run of an airplane.

Or

(b) Write short note on (i) banked and circling flight ; (ii) thrust horse power for climbing and level flight ; (iii) Minimum drag.

15. (a) What are the different steps involved in wind tunnel testing ? Explain each step briefly.

Or

(b) Explain the working of solid and liquid propellant rocket engines with neat sketches.

(5 × 12 = 60 marks)