

B.E DEGREE EXAMINATIONS: NOV/DEC 2014

(Regulation 2009)

Seventh Semester

AERONAUTICAL ENGINEERING

AER119: Flight Vehicle Design

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Wind tunnel and CFD analysis were carried out on the aircraft configuration in the _____ phase of design
 - a) Preliminary
 - b) conceptual
 - c) Detailed
 - d) project
2. An aircraft capable of take-off and land both on the water surface and land surface is called as _____
 - a) Sea plane
 - b) Sail plane
 - c) Amphibians
 - d) Ornithopter
3. The ratio of the weight of the fuel carried to the maximum take-off weight is called as _____
 - a) Fuel- mass fraction
 - b) Mass ratio
 - c) Fuel fraction
 - d) Empty-mass fraction
4. Swept wing is used for _____
 - a) Decreasing drag divergence Mach Number
 - b) Increasing drag divergence Mach Number
 - c) Increasing Critical Mach Number
 - d) Decreasing Critical Mach Number
5. _____ wing configuration having a control surface called elevons
 - a) Swept
 - b) Elliptical
 - c) Bi-plane
 - d) Delta
6. The amount of fuel consumed by the piston engine to produce unit thrust is called as _____
 - a) TSFC
 - b) Thrust loading

22. a) Explain the effect of wing loading on the take-off and landing distance of an aircraft.

(OR)

b) Explain the advantages and disadvantages of the following aircraft configuration

(i) Swept wing (5)

(ii) Delta wing (5)

(iii) T-Tail (4)

23. a) Analyze the structural and aerodynamic advantages and disadvantages of the following:

V-Tail, H-Tail, cruciform, conventional tail, canard, No tail

(OR)

b) Explain the process of selection of wing parameters for design of an aircraft wing.

24. a) What are the phases of an aircraft take-off? Obtain an expression to estimate the take-off distance of an aircraft.

(OR)

b) What is longitudinal stability of an aircraft? Explain the wing contribution to the longitudinal stability of an aircraft.

25. a) (i) What are the requirements for aircraft pressurization system? (7)

(ii) Differentiate De-icing and anti icing system. (7)

(OR)

b) (i) Explain the working principle of RADAR. (7)

(ii) Describe any one advanced flight control system briefly. (7)
