

**III B.Tech II Semester Supplementary Examinations,
November/December 2005
AIRCRAFT DESIGN PRACTICE
(Aeronautical Engineering)**

Time: 3 hours**Max Marks: 80**

**Answer any FIVE Questions
All Questions carry equal marks**

1. Frame specifications for an airplane to perform short -hop service in plains with a seating capacity of 25. Make use of sketches and plots to illustrate your answer. [16]
2. How are the $Cl - Cd - \alpha$, characteristics improved by modern low speed airfoil section . Hence describe one such section in use. Make use of sketches and plots to illustrate your answer. [16]
3. Consider a new design of airplane, Crew of 6, 250 passengers with 60 Kgs baggage each. Make use of std. data and trends for such designs. Estimate power requirements for a cruise speed of 800 Kms / hr. Assume parameters accordingly. Provide initial size and configuration lay out for this airplane. [16]
4. Consider a swept back, high wing airplane for civil applications. Recommend horizontal and vertical tail arrangement for this airplane with two options of engine locations. Make use of sketches and plots in support of your answers. [16]
5. (a) Differentiate between monocoque and semi- monocoque fuselage structures
(b) Define a truss structure. What are the various types of truss structures?
(c) What is the purpose of a fuselage pressure bulkhead? [6+6+4]
6. Define direct operating cost. What factors constitute the direct operating cost and how will you control these factors to reduce the cost of an aircraft? [16]
7. Draw the three views and neatly label the various components of a long-range large transport aircraft having four jet engines. Estimate the performance and stability characteristics of this aircraft and compare them with a short-range small transport similar aircraft. [16]
8. (a) What are the basic rules for detailed structural design?
(b) Write a note on 'crack propagation and its prevention'. [6+10]
