R09

Code No: C7609

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.Tech I Semester Examinations March/April-2011
AIRCRAFT SYSTEMS
(AEROSPACE ENGINEERING)

Time: 3hours **Max.Marks:60**

Answer any five questions
All questions carry equal marks

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1. a) What do you understand by 'systems engineering'? Explaining various system attributes, discuss the application of engineering systems. (6M)
   b) Write a short note on the product life cycle and various stages involved in the engineering processes. (6M)

2. a) Explain how a hydraulic fluid from the reservoir of an aircraft is circulated to the control surface through proper piping? Bring out the necessity of emergency hydraulic power sources. (6M)
   b) Provide a note on implementation of the basic hydraulic system in an airbus aircraft. Use neat sketches to support your description. (6M)

3. a) Write detailed notes on AC power generation principles. Explain the need and methods to regulate the generated voltages from individual generators operated in parallel for a multi-engine aircraft. (6M)
   b) What is meant by 'Electrical load management system (ELMS)'? Explain the ELMS functionality with the help of a neat line diagram in case of Boeing 777 civil aircraft. (6M)

4. a) Brief the procedures to be adopted while starting an aircraft engine with special reference to control of various parameters. List out the sequential operations associated with engine starting. (6M)
   b) Write short notes on (i) Fuel quantity measurement systems, and
   (ii) Fuel pressurization systems. (6M)

5. a) Explain the need for controlled environment in an aircraft. Explain the design concepts involved in such controlling techniques. (6M)
   b) Bring out the uses of bleed air in various pneumatic sub-systems. Discuss the use of bleed air in wing and engine anti-ice protection purpose. Make use of neat sketches for explanation. (6M)

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6. a) Illustrate in detail the fly-by-wire system with the help of neat sketches and its advantages. (6M)
   b) What are the possible reasons for a designer to incorporate trim and feel units in a flight control system? Explain their operating principles in your own statements with supporting sketches. (6M)

7. a) Illustrate 'Requirements capture', a key activity in identifying and quantifying all the necessary strands of information that contribute to a complete and coherent system design. (6M)
   b) Write short notes on:
      (i) Markov analysis, and
      (ii) Failure modes and effects analysis. (6M)

8. a) Write a detailed note on system configurations.
   b) Write short notes on:
      (i) forward compatibility, and (ii) backward compatibility. (6M)

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