Code No: D7603 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M.Tech II - Semester Examinations, March/April 2011

COMPUTATIONAL APPROACHES TO AEROSPACE VEHICLE DESIGN

(AEROSPACE ENGINEERING)

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

Answer any five questions

All questions carry equal marks

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1. What are the issues involved in the analysis and design of coupled systems? Explain through schematic diagrams the multidisciplinary optimization process work flow using N-square diagram and blackboard-based approaches. [12]

2. Discuss the salient features of penalty function method for constrained optimization used in aerospace vehicle design. [12]

3. Explain multi-objective optimization in the context of aerospace vehicle design giving examples. Discuss direct and eigenvector methods of multi-objective weight assignment. [12]

4. Discuss complex variable approach for conducting sensitivity analysis to design based on computational approaches. What are its advantages over finite differences? Discuss the issues involved in its implementation for aerospace vehicle design. [12]

5. Discuss the relevance of approximation models in aerospace vehicle design. Explain the approach based on intervening variables for building approximation models. [12]

6. How uncertainty can be classified? Explain uncertainty modeling using probabilistic approach and fuzzy set theory with examples. [12]

7. Discuss Fully Integrated Optimization (FIO) approach for Multidisciplinary Design Optimization (MDO) along with its advantages and disadvantages. [12]

8. Explain Simultaneous Analysis and Design (SAND) formulation for multidisciplinary design optimization and discuss its advantages and disadvantages as compared with Fully Integrated Optimization (FIO) approach. [12]

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