

R09

Code No: 09A82104

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year II Semester Examinations, May - 2013

Helicopter Engineering  
(Aeronautical Engineering)

Time: 3 Hours

Answer any Five Questions  
All Questions Carry Equal Marks

Max.



- 1.a) Describe the unique features of a helicopter and state its applications
- b) Describe NOTAR and Fenestron anti-torque systems for helicopters using figures. [7+8]
- 2.a) Explain translational lift and transverse flow effect during forward flight of a helicopter.
- b) Explain briefly the ground effect on helicopters in flight. [8+7]
3. Describe momentum theory of hover stating the assumptions. How do you define figure of merit? [15]
4. Derive an expression for the thrust of a helicopter in hover using the blade element theory. [15]
5. Discuss the features of airflow through main rotor during hover, climb and descent with the help of diagrams. [15]
6. Define static longitudinal stability of a helicopter and discuss the conditions of static stability for speed stability and angle of attack stability. What are the contributions of horizontal stabilizer for speed stability and angle of attack stability? [15]
- 7.a) What are differences between hovering and vertical flight? Why are the rotor blades twisted about their longitudinal axis?
- b) Define VTOL aircraft and STOL aircraft. Describe the combination of basic components of V/STOL configurations. [7+8]
8. Explain with the help of a diagram the basic elements of a hovercraft. What are its advantages and disadvantages? Discuss the applications of a hovercraft. [15]

