
PARUL UNIVERSITY FACULTY OF ENGINEERING & TECHNOLOGY B.TECH MIDSEM EXAMINATION 7th SEMESTER

Subject Name (Code): Helicopter Engineering (203101433) Branch: Aeronautical Date: 05/08/2022 Time: 10.30AM to 12.30PM Total Marks: 40 Sr. Marks No. Q.l (A) Multiple Choice Questions 05 1. What is the relation between the induced velocity in far wake region (w) and that at the rotor disk (v) for hovering condition? a. w=v b. w=v2 d. w=v/2c. w=2v2. In order to increase the hovering efficiency, which parameter must be taken care of? a. High power by thrust ratio b. High thrust by area ratio c. Low induced drag d. High rotor tip speed 3. For momentum theory analysis, what is rotor modelled as? a. Thin actuator disk b. Thick actuator disk c. Angled blade d. Two dimensional airfoil 4. Which of these is an important parameter for selecting the rotor blade based on aerodynamic efficiency? a. Solidity ratio b. Structural ratio c. Figure of merit d. Hovering ratio 5. Vertical take-off of helicopter can be done by using which control? b. Collective a. Rudder padel c. Cyclic d. None of the above (B) Fill in the blanks. 05 (1) The full form of VTOL is (2) The function of tail rotor in conventional configuration is (3) Azimuth angle represents (4) Advance ratio is defined as (5) Blade lock number is defined as Q.2 Attempt any four (Short Questions) 12 (1) What are the limitations of helicopter? (2) Define and explain figure of merit. (3) Explain primary controls of helicopter. (4) Explain about reverse flow region that occur during forward flight.

(5) Derive the relation between disk loading and power loading.

Q.3	Attempt any two	08
	(1) Discuss the advantages and applications of helicopter.	
	(2) Draw and explain tandem and contra rotor configurations.	
	(3) Draw and explain conventional and side by side configurations.	
Q.4	(A) Explain the momentum analysis for hover and derive the equation of induced velocity.	05
	(B) Draw and explain velocity distribution over rotor blades for hover.	05
	OR	
	(B) Draw and explain velocity distribution over rotor blades for forward flight.	05