

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VIII (NEW) - EXAMINATION – SUMMER 2018

Subject Code: 2180102/2180108

Date: 07/05/2018

Subject Name: Helicopter Engineering

Time: 10:30 AM to 01:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

	MARKS
Q.1 (a) Define disk solidity.	03
(b) Differentiate between feathering and flapping.	04
(c) Draw and explain function of primary components of conventional helicopter.	07
Q.2 (a) Define disk loading.	03
(b) Differentiate between cyclic and collective pitch.	04
(c) Discuss various types of main rotor configurations of helicopters.	07
OR	
(c) With diagram explain how blade tip velocity varies with forward flight.	07
Q.3 (a) Define power loading.	03
(b) Discuss geometry of a main rotor.	04
(c) Discuss various amount of power required at different phases of flight.	07
OR	
Q.3 (a) What do you understand by rotor solidity?	03
(b) Discuss various airfoil sections used for main rotors.	04
(c) What are difference between power required while hovering and cruising?	07
Q.4 (a) Why does twist provided on main rotor?	03
(b) How will you decide number of main rotor blades required?	04
(c) Discuss various types of main rotor blade plan form shape.	07

OR

- Q.4** (a) How will you determine tail rotor power requirement? **03**
- (b) Only draw airflow pattern while hovering in ground effect and hovering without ground effect. **04**
- (c) Give the reason why helicopter shows bank while cruising? **07**

- Q.5** (a) How will you modify wing tip if found it touches transonic speed? **03**
- (b) Explain airflow across main rotor blade during cruise. **04**
- (c) Discuss thrust and power coefficient. **07**

OR

- Q.5** (a) Define blade profile power. **03**
- (b) Discuss effects of disk loading on helicopter maneuverability. **04**
- (c) Discuss climb power and induce power. **07**
