

DIPLOMA IN AERONAUTICAL ENGINEERING

PROPELLERS (MARCH INTAKE)

EXAM

DURATION - 2 HOURS

INSTRUCTION – Attempt ALL Questions in Section A

-Attempt any TWO questions in Section B

SECTION A:

- 1) Explain any FOUR methods of improving the efficiency of a propeller stating the limitations of each. (8 marks)
- 2) Using sketches describe the operation of an Aircraft Propeller Speed Governor (12 marks)

SECTION B:

- 1)
 - a. Highlight the purpose of carrying out the following on propeller blades: (6 marks)
 - i. Painting the tips
 - ii. Blending
 - iii. balancing
 - b. Explain the relationship between the following aircraft propeller terminologies. Illustrate your answer (6 marks)
 - i. Slip
 - ii. Effective Pitch
 - iii. Geometric Pitch
 - c. Briefly describe any FOUR common defects on Aircraft Propeller Blades (8 marks)
- 2)
 - a. List FOUR types of propellers (4 Marks)
 - b. Illustrate any FOUR forces that act on a propeller in flight (8 Marks)
 - c. Define and illustrate the following terminologies as applicable to propellers: (8 marks)
 - i. Blade Angle
 - ii. Propeller slippage
 - iii. Blade Element Theory
 - iv. Helix angle

- 3)
- a. Explain any THREE De-Icing methods on modern aircraft propellers. (9 marks)
 - b. Explain THREE reasons why fixed pitch propellers are not suitable for modern high speed airplanes. (6 marks)
 - c. List any THREE materials used in the construction of propellers (3 marks)
 - d. Highlight the purpose of propeller reducing gears (2 marks)

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