

xiv) What are the safety requirements for airplanes?

xv) What are the places where power plant can be fixed? What is the benefit of engines under the wing in an airplane?

SECTION-C

Note: Long answer type questions. Attempt any three questions. $3 \times 10 = 30$

Q.3 Describe the post Wright brother's history of aviation till today.

Q.4 How the airfoils are named? Discuss all the NACA series.

Q.5 What is stability? How the longitudinal and lateral stability defined? Discuss the effect of wing and tail in longitudinal and lateral stability.

Q.6 Explain the working of rate of climb indicator. Explain the working of flight control system?

Q.7 Discuss the basic steps in aircraft design and explain the properties of aircraft materials.

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3rd Sem. / AME

Subject : Introduction to Aeronautics

Time : 3 Hrs.

M.M. : 100

SECTION-A

Note: Very Short Answer type questions. Attempt any 15 parts. $(15 \times 2 = 30)$

Q.1 a) What are important parts of aircraft gas turbine engines?

b) Classify heavier than air aircrafts.

c) Explain digits in NACA 4 airfoil digit series.

d) What are the high lift devices used in aircrafts.

e) What is endurance? What is the condition for maximum endurance?

f) Describe drag bucket.

g) What is the role of wing position for longitudinal stabilities of aircrafts?

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- h) Describe the working of a turbofan engine.
- i) Discuss Joule Brayton cycle for a turbo jet engine.
- j) What is a ramjet engine?
- k) What are the different materials used in aircraft construction?
- l) What is deicing system? When it is used?
- m) Name the basic avionic instruments used in aircrafts.
- n) What are the different performance measuring instruments used in aircrafts?
- o) What is the function of electrical system?
- p) What do you mean by airworthiness?
- q) What is the use of APU?
- r) What is altimeter?

SECTION-B

Note: Short answer type questions. Attempt any ten parts 10x4=40

- Q.2 i) Describe some of the unique aircrafts of the ancient times?

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- ii) Describe the lifting surfaces of an airplane.
- iii) Describe briefly the major milestones in the aviation field.
- iv) What is the importance of drag polar.
- v) What is the requirement of stability? Compare the stability of civil and military aircrafts?
- vi) Explain the application of different types of engines used in aircrafts.
- vii) Explain the working of a ramjet engine.
- viii) What are the different methods to control boundary layer?
- ix) Explain the working of turn and bank indicator.
- x) What are the loads acting on wing? How the loads are distributed and transferred.
- xi) Explain briefly the working of hydraulic system in an aircraft.
- xii) What do you mean by airworthiness?
- xiii) What happens to the airplane if it is statically stable/unstable?

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