School of Aeronautics (Neemrana)

Question Paper For Back / Re-back Internal Assessment Examination (Theory) - Old Scheme i.e 2012 Syllabus

Instructions For Students / Faculty

Back / Re-back Internal Examination (Total 60 Marks, 2 Hrs, Syllabus From Beginning of The Session)

Total number of questions to be given are 10, each carrying 10 marks and it is compulsory to attend 2 questions from Part A and 4 questions from Part B. There is a choice of two questions out of four in part A and 4 questions out of 6 in Part B. Part A will be theoretical or derivation type **(Not More Than 70 Words For Question).** Part B will be fully numerically oriented questions **(Not More Than 70 Words For Question)**, except for the list of subjects given below. No objective type or fill in the blanks shall be given, but subpart of question can be given for both Part A & B.

* LIST OF ELABORATIVE THEORY QUESTION SUBJECTS: Aircraft Materials, Aircraft System, Aircraft Rules & Regulation-I, Mechanics of Composite Materials, Aircraft Design, Aircraft Rules & Regulation-II, Avionics-I, Helicopter Theory, Maintenance of Airframe and System Design, Avionics-II, Airlines and Airport Management, Maintenance of Power Plant & Systems
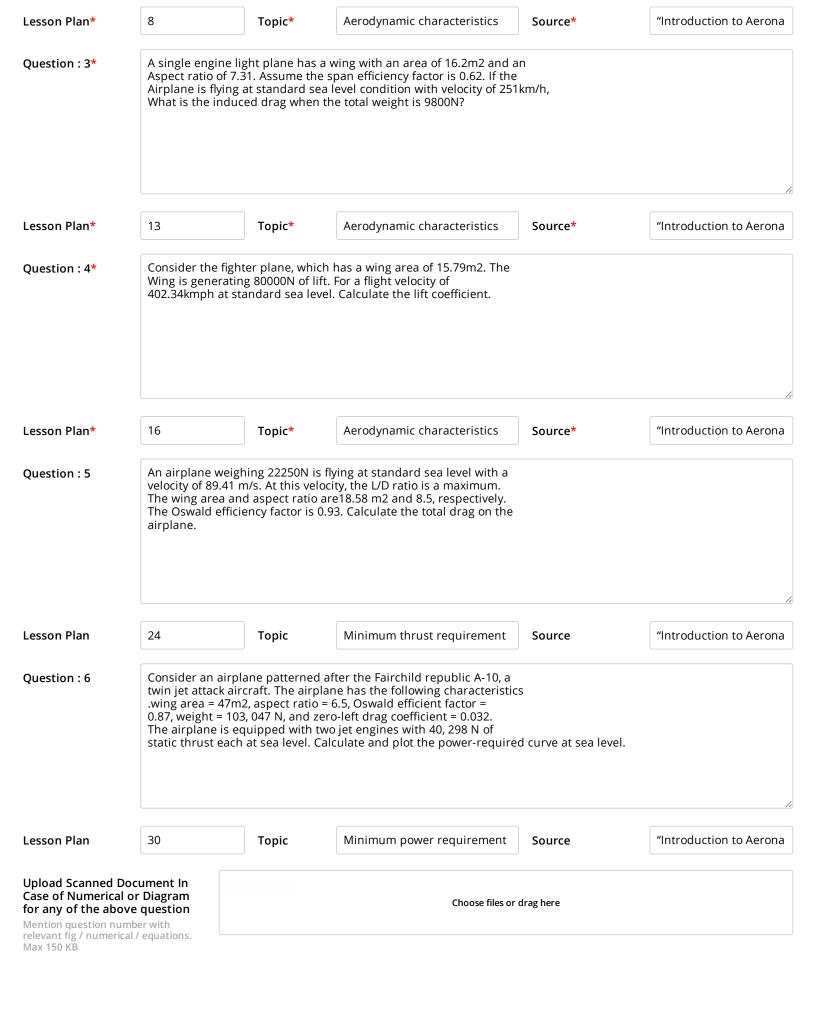
FACULTY MEMBERS, PLEASE ENSURE EXCEPT ABOVE LISTED SUBJECTS, NO THEORITICAL ELABORATIVE QUESTION SHOULD BE GIVEN IN PART 'B' OF QUESTION PAPER

STUDENT IS ALLOWED TO ENTER LATE NOT MORE THAN 15 MIN AFTER STARTING OF EXAM, AND MAY LEAVE THE EXAM HALL ON EXPIRY OF ATLEAST OF 1 Hr FROM THE STARTING TIME OF EXAMINATION

Question Paper & Student Details

Name of Faculty* Bipin Dwivedi

Date of Submission of QP 16/03/2021

Subject* 7AN4 – Aircraft Performance (Old)

Date of Examination* 17/03/2021

Email Id of Faculty:* bipinkumardwivedi@soaneemrana.org

Course* B.Tech (Aeronautical Engineering)

Phone Number of Faculty* 931 400 9035

Semester* Semester : 7

Student Name

Student Reg No.

Part A

Question : 1*
Explain the following
a) Geopotential altitude
b) Geometric altitude

Lesson Plan* 3   **Topic*** International standard atmosp   **Source*** "Introduction to Aerona

Question : 2*

Define and explain the true and equivalent airspeed.

Lesson Plan* 5   **Topic*** Airspeed indicator   **Source*** "Introduction to Aerona

Question : 3*

Define drag polar. Plot a graph between drag coefficient versus lift coefficient.

Lesson Plan* 12   **Topic*** Aerodynamic characteristics   **Source*** "Introduction to Aerona

Question : 4*

Obtain the relation between zero- lift drag and drag due to lift at minimum thrust required.

Lesson Plan* 28   **Topic*** Minimum thrust requirement   **Source*** "Introduction to Aerona

Part B

Question : 1*

If the sea level temperature and pressure is 150C and 100000N/m2 respectively, whereas at some unknown height pressure is 71000N/m2 and the temperature is -180C. Is the Atmosphere between these two heights Stable or unstable?

Lesson Plan* 3   **Topic*** International standard atmosp   **Source*** "Introduction to Aerona

Question : 2*

Consider a low-speed airplane flying at a velocity of 55m/sec. If the velocity at a point on the fuselage is 62m/sec, what is pressure coefficient at this point?

Lesson Plan*	8	**Topic***	Aerodynamic characteristics	**Source***	"Introduction to Aerona

Question : 3*

A single engine light plane has a wing with an area of 16.2m2 and an
Aspect ratio of 7.31. Assume the span efficiency factor is 0.62. If the
Airplane is flying at standard sea level condition with velocity of 251km/h,
What is the induced drag when the total weight is 9800N?

Lesson Plan*	13	**Topic***	Aerodynamic characteristics	**Source***	"Introduction to Aerona

Question : 4*

Consider the fighter plane, which has a wing area of 15.79m2. The
Wing is generating 80000N of lift. For a flight velocity of
402.34kmph at standard sea level. Calculate the lift coefficient.

Lesson Plan*	16	**Topic***	Aerodynamic characteristics	**Source***	"Introduction to Aerona

Question : 5

An airplane weighing 22250N is flying at standard sea level with a
velocity of 89.41 m/s. At this velocity, the L/D ratio is a maximum.
The wing area and aspect ratio are18.58 m2 and 8.5, respectively.
The Oswald efficiency factor is 0.93. Calculate the total drag on the
airplane.

Lesson Plan	24	**Topic**	Minimum thrust requirement	**Source**	"Introduction to Aerona

Question : 6

Consider an airplane patterned after the Fairchild republic A-10, a
twin jet attack aircraft. The airplane has the following characteristics
.wing area = 47m2, aspect ratio = 6.5, Oswald efficient factor =
0.87, weight = 103, 047 N, and zero-left drag coefficient = 0.032.
The airplane is equipped with two jet engines with 40, 298 N of
static thrust each at sea level. Calculate and plot the power-required curve at sea level.

Lesson Plan	30	**Topic**	Minimum power requirement	**Source**	"Introduction to Aerona

**Upload Scanned Document In
Case of Numerical or Diagram
for any of the above question**

Mention question number with
relevant fig / numerical / equations.
Max 150 KB

Choose files or drag here

I have scrutinized the question paper. There is no spelling mistake or any type of irrelevant question.