# Sanjay Ghodawat University, Kolhapur

2020-21

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

EXM/P/09/00

| | | |
|---|---|---|
| **Year and Program: Third Year B.Tech** | **School of Technology** | **Department: Aeronautical Engineering** |
| **Course Code: AET 304** | **Course Title: FLIGHT MECHANICS** | **Semester : VI** |
| **Day and Date: Tuesday,08.06.2021** | **End Semester Examination** | **Time : 2 Hrs.**<br>**Max Marks : 50** |

**Instructions**: 1) All Questions are compulsory.

| | | | Marks | Bloom's Level | CO |
|---|---|---|---|---|---|
| **Q.1** | | **Answer/Solve the following (any Two)** | | | |
| | a) | Derive Equations of motion of a rigid flight vehicle. | 8 | 3 | 1 |
| | b) | An aircraft weight 510000N has a wing loading od 2820N/m² and has 4 jet engines each producing a trust of 33000N which can be assumed to be constant at normal flight incidences .The overall drag polar equation is Cd =0.0216+0.04 Cl².Estimate<br>a) R/C maximum and corresponding angle of Climb<br>b) Angle of climb maximum and corresponding R/C | 8 | 3 | 2 |
| | c) | Discuss the importance of the V-n diagram in detail | 8 | 2 | 2 |
| **Q.2** | | **Answer/Solve the following (any two)** | | | |
| | a) | Explain Airfoil nomenclature with wing characteristics. | 8 | 2 | 3 |
| | b) | Derive the complete Longitudinal Stick free static stability equation from basic principle and state the stability conditions. | 8 | 3 | 4 |
| | c) | Define Neutral point and Derive Stick fixed static margin from stick fixed static stability general equation and state the stability conditions. | 8 | 3 | 4 |
| **Q.3** | | **Answer/Solve the following (any two)** | | | |
| | a) | Discuss on Cross coupling effect and Aileron reversal. | 9 | 2 | 5 |
| | b) | Discuss Dutch roll,Spiraldivergence,Spin and Autorotation in detail. | 9 | 2 | 5 |

| | | | | |
|---|---|---|---|---|
| c) | What is Routh's Decrement and How it helps to interpret Dynamic stability. | 9 | 2 | 5 |

*****