

Roll No: -----



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: B. Tech ASE/ASEA

Subject (Course): Introduction to Aerospace and Avionics Engg.

Course Code : ASEG 204

No. of page/s:02

Semester – III

Max. Marks : 100

Duration : 3 Hrs

Section A (4x5= 20) marks

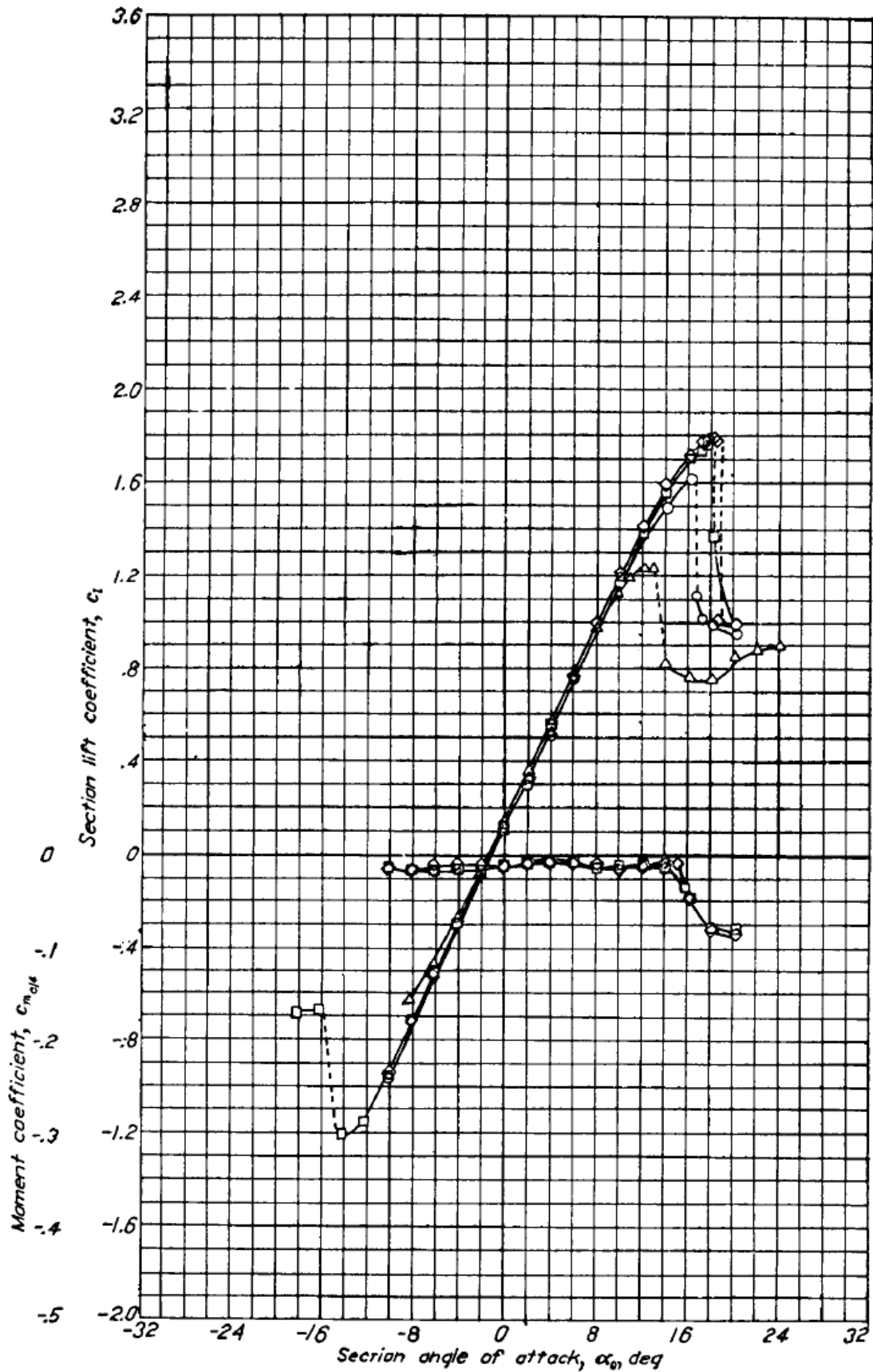
1. Name the aircraft control surfaces along with their functions with the help of sketch.
2. What are different types of jet engines? Explain with the sketch.
3. What are different parts of aircraft *wing* and their basic functions?
4. Why cabin pressurization system is required in aircraft?

Section B (5x8=40) marks

5. Consider a wing with an aspect ratio of 10 and a NACA 23012 airfoil section. Assume $Re=5 \times 10^6$. The span efficiency factor is $e=0.95$. If the wing is at a 4 deg angle of attack, Calculate C_L and C_D .
6. Derive the fundamental thrust equation for jet engine.
7. Consider a low-speed airplane flying at a velocity of 55 m/s. If the velocity at a point on the fuselage is 62 m/s, what is pressure coefficient at this point?
8. Explain the function of selector valve in hydraulic system
9. Explain different types of antenna used in aircrafts.

Section C (2x20=40 Marks; ANY TWO)

10. Compare different types of fuselage structures of aircrafts. Explain function of different structural members of each.
11. Compare different types of oxygen systems used in aircrafts. Explain components wise details of each.
12. Explain working of ILS (Instrumented Landing System) used in aircraft.



NACA 23012 Wing Section

Roll No: -----



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: B. Tech ASE/ASEA

Subject (Course): Introduction to Aerospace and Avionics Engg.

Course Code : ASEG 204

No. of page/s:01

Semester – III

Max. Marks : 100

Duration : 3 Hrs

Section A (4x5= 20) marks

1. Describe different Helicopter Configurations along with sketch.
2. What are different strokes/stages of piston engines? Explain with p-v diagram.
3. Name different parts of *monocoque fuselage* with their basic functions with help of sketch.
4. What are basic requirements of cabin pressurization system?

Section B (5x8=40) marks

5. What is the function of FLAP in aircraft? Compare different types of FLAPs.
6. Derive the fundamental thrust equation of Rocket engine.
7. Consider a wing mounted in the test section of a subsonic wind tunnel. The velocity of the airflow is 40 m/s. If the velocity at a point on the wing is 50 m/s, what is the pressure coefficient at this point?
8. What are *primary* and *Auxiliary* Control of aircrafts?
9. Differentiate between HF and VHF radio waves used for aircraft communication.

Section C (2x20=40 marks; ANY TWO)

10. What are different types of landing gears used in aircrafts? Explain structural details of each with some aircraft examples.
11. Compare Hydraulic and Pneumatic actuated systems. What are the applications of Hydraulic and Pneumatic system in aircraft?
12. A) Explain components wise detailed function of Autopilot used in aircraft.
B) Explain different types of Navigation methods.