

23ASB201 AEROSPACE PROPULSION

Question Bank

UNIT II - JET ENGINE INTAKES AND EXHAUST NOZZLES

Part A – 2 Mark Questions

(Remembering, Understanding, and Applying Levels)

1. What is the ram effect in jet propulsion? *(Understanding)*
2. Define internal flow in an aircraft inlet. *(Remembering)*
3. What is a stall in subsonic inlets? *(Understanding)*
4. State the relation between minimum area ratio and external deceleration ratio.
(Remembering)
5. What is the function of a diffuser in an aircraft engine? *(Understanding)*
6. Define diffuser performance and mention the key parameters affecting it.
(Understanding)
7. List the different modes of operation of inlets. *(Remembering)*
8. What is a supersonic inlet? *(Understanding)*
9. Explain the starting problem in supersonic inlets. *(Understanding)*
10. What is shock swallowing by area variation? *(Understanding)*
11. Define nozzle efficiency. *(Remembering)*
12. What are the losses in nozzles? *(Understanding)*
13. Explain the effect of real flow through nozzles on engine performance. *(Applying)*
14. What is thrust reversal, and why is it used? *(Understanding)*
15. Name two types of thrust reversers used in jet propulsion. *(Remembering)*
16. How do shock waves affect supersonic inlet performance? *(Understanding)*

17. What is the difference between subsonic and supersonic inlets? (*Understanding*)
 18. Explain the significance of area variation in a nozzle. (*Applying*)
 19. What is the effect of boundary layer separation in an inlet? (*Understanding*)
 20. What is isentropic flow in a nozzle? (*Remembering*)
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Part B – 16 Mark Questions

(Applying, Analyzing, Evaluating, and Creating Levels)

1. Explain the ram effect in jet propulsion and derive the expression for total pressure recovery in an inlet. (*Applying*)
2. Discuss the causes and effects of stall in subsonic inlets. Suggest ways to prevent stalls. (*Analyzing*)
3. Derive the relation between the minimum area ratio and external deceleration ratio for a subsonic inlet. (*Applying*)
4. Explain the working of a diffuser in a propulsion system and analyze its performance parameters. (*Analyzing*)
5. Compare the different modes of operation of supersonic inlets and explain their significance. (*Analyzing*)
6. Discuss the starting problem in supersonic inlets and explain how shock swallowing by area variation is used to overcome it. (*Evaluating*)
7. Explain the real flow through nozzles and the factors that affect nozzle efficiency. (*Applying*)
8. Analyze the different types of losses in nozzles and their impact on engine performance. (*Analyzing*)

9. Describe in detail the working principle of thrust reversal and compare different types of thrust reversers used in aircraft engines. (*Applying*)
10. Illustrate with diagrams the effect of shock waves in supersonic inlets and methods to mitigate their impact. (*Analyzing*)
11. Evaluate the importance of nozzle efficiency and discuss techniques used to improve it in modern jet engines. (*Evaluating*)
12. Design a conceptual inlet system for a supersonic aircraft and justify your choice of design parameters. (*Creating*)
13. With the help of equations and diagrams, explain the role of area variation in controlling supersonic flow in nozzles and inlets. (*Applying*)
14. Discuss in detail the various factors affecting the performance of subsonic and supersonic inlets. (*Analyzing*)
15. Evaluate the impact of shock swallowing and boundary layer effects on supersonic inlet performance. (*Evaluating*)
16. Propose a new method for improving the efficiency of nozzles in high-speed aircraft engines. (*Creating*)