

# Multi Engine Oral Exam Questions

1. What are the requirements for a multi-engine rating?
2. What is the max rated horse power at sea level? At 12,000 msl?
3. What is the rated engine speed?
4. What is the engine type?
5. What are the type of propellers?
6. What is the max fuel capacity?
7. What is the usable fuel?
8. What is the minimum octane?
9. What is the max oil capacity?
10. What is the max ramp weight?
11. What is the max takeoff weight?
12. What is the max landing weight?
13. Weight and Balance. Beware of C.G. loaded with and without fuel.
14. Using the above situation. less than full fuel will be allowed. Be prepared to calculate time and/or distance with the fuel available. Don't forget VFR or IFR reserves.
15. Number of hydraulic systems
16. Number of electric motors
17. Methods for checking gear down
18. What if the indicator lights for the landing gear are not on?
19. Correct crossfeeding with one engine out and feeding both engines from one tank.
20. Calculate % performance lost when one engine inoperative versus 2 engines from one tank.  
(2 engine climb rate - 1 engine climb rate) / 2 engine climb rate \* 100.
21. Calculate Accelerate-stop distance. (Don't forget Density Altitude)
22. Calculate single engine ceiling
23. Define the critical density altitude. Where  $V_{mc}$  equals  $V_s$ .
24. Describe Propeller operation and how the propeller feathers.
25. Describe the unfeathering procedures.
26. Know V-Speeds
  - $V_{so}$
  - $V_{s1}$
  - $V_{mc}$
  - $V_x$
  - $V_y$
  - $V_{xse}$
  - $V_{yse}$
  - $V_a$
  - $V_{fe}$
  - $V_{lo\ up}$
  - $V_{lo\ down}$
  - $V_{le}$
  - $V_{no}$
  - $V_{ne}$
  - Max X-wind
27. What is  $V_{sse}$ ?

28. What does the white arc represent and what is the speed range?
29. What does the green arc represent and what is the speed range?
30. What does the yellow arc represent and what is the speed range?
31. How many red radials are there? What are their significance?
32. How many blue radials are there? What are their significance?
33. What are the maneuvering limits?
34. What are the load limits?
35. What is the suction range?
36. How many carburetors?
37. What are the certification standards (11 factors) for computing  $V_{mc}$ ?
38. What condition is  $V_{mc}$  for your airplane? (stalled or unstalled)
39. What is  $V_{mc}$ ?
40. Explain correct recovery in  $V_{mc}$  demonstrations.
41. When performing the demonstration of  $V_{mc}$ , how much bank is the pilot limited to using?
42. Explain spin recovery.
43. Explain MEL - minimum equipment list.
44. Explain how to determine if flight can be conducted with a component inoperative. Placarded inoperative and component not required by FAR's.
45. Methods of emergency gear extension.
46. Calculate takeoff and landing distances.
47. Is this airplane approved for flight in icing conditions?
48. Know the RPM drop limitations during the magneto check.
49. Describe the 10 items of  $V_{mc}$ .
50. Describe the capacity of the battery and the alternators.
51. What is the first indication of engine failure?
52. What is the minimum feathering rpm?
53. What items should be systematically checked if engine roughness occurs?
54. What steps must be taken if an engine failure occurs during flight below  $V_{mc}$ ?
55. When is the gear extended before landing with one engine inoperative?
56. What is the final approach speed on one engine? (runway made, no go around possible)
57. When are the flaps extended on a single engine approach?
58. How do you crossfeed?
59. What restrictions are there during crossfeed operations?
60. What is the purpose of the red light in the upper center part of the panel?
61. When does the gear horn sound?
62. What can be done if the landing gear does not extend?
63. What should be done if suction is below 4.3" Hg?
64. What should be done if the alternator overvoltage light illuminates?
65. What should be done if a door opens in flight?
66. What should be done if a propeller overspeed occurs?
67. What are the normal panel indications when an engine is shut down?
68. How is a vacuum pump failure noted?
69. What instruments should be monitored in this case?
70. How many alternators are required for VFR or IFR flight?
71. What happens if the heater overheats?
72. What is the maximum allowable RPM drop during the feathering check in the runup?
73. What is the strut inflation for the nose gear?
74. What is the strut inflation for the main gear?
75. What is the ground limitation for pitot heat?
76. How long do you wait for an oil pressure indication after engine start before shutting down?

77. What is the limit on cranking the starter?
78. What are the procedures for starting with external power?
79. Why is it a poor procedure to idle an engine at a low power setting for extended periods of time?
80. Why not operate at high power settings on the ground?
81. What is the normal magneto drop during the runup and what are the limitations?
82. When is the landing gear retracted after takeoff?
83. What should be done if the cylinder head temp becomes too hot?
84. What happens if the alternator voltage becomes too high?
85. What is the maximum alternator output?
86. The total output of both alternators should not exceed what amperage?
87. What keeps the gear in the retracted position?
88. What happens if the hydraulic system malfunctions or leaks?
89. Which annunciation lights come on when the battery switch is turned on?
90. Why are the prop controls pushed forward before landing?
91. How are the gear lights dimmed?
92. What is the normal final approach speed?
93. Can your aircraft be flown with full fuel, max. number of passengers and full baggage?
94. What happens when the CG is too far forward?
95. What happens when the CG is too far aft?
96. Where is the datum line?
97. What does the basic empty weight include?
98. What happens to the CG as the fuel is burned or gear retracted?
99. How many fuel tanks, and where are they located?
100. Where are the electric fuel pumps?
101. What kind of trim tab is on the airplane?
102. What direction do the props rotate as seen from the cockpit?
103. Explain the use of the electric boost pumps; low and high setting?
104. What is the purpose of the alternate air?
105. How many cowl flap settings are there, and when are they used?
106. What is the advantage of counter-rotating props?
107. What is the critical engine?
108. What controls the pitch of the prop?
109. Prop overspeeding and sluggish rpm control are indications of what problem?
110. How long does it take for the prop to feather?
111. Describe the gear system.
112. How long does it take for the prop to feather?
113. Describe the gear system.
114. How long does gear extension or retraction take?
115. How is the gear held in the extended position?
116. Describe the procedure for emergency gear extension, and how the system works.
117. How do you know the gear is down and locked if the horn and light are inoperative?
118. Where is the gear pump and reservoir located?
119. Is there a squat switch(s), where is it located, what is its purpose?
120. Is it possible to retract the gear on the ground?
121. What is the range of the nose wheel steering?
122. Is the hydraulic reservoir for the brake the same as for the gear?
123. What are the flap settings and speeds?
124. How are the flaps operated?
125. Can both engines run off the same fuel tank?
126. Should both engines be on crossfeed?

127. Describe the electrical system. Sources, volts, amps, limits, safety items?
128. Where is the external power plug located?
129. What warns of alternator malfunction?
130. With only the master switch on and no other electrical equipment operating, what is indicated on the ammeters?
131. What instruments belong to the pitot-static system and how are they operated?
132. Where is the alternate static source?
133. How is the alternate static source operated?
134. How is the static source drained?
135. Where is the heater located?
136. Where is the fuel drawn for the heater? Rate per hour?
137. How is the static system drained?
138. What is the maximum altimeter/airspeed error when utilizing the alternate static source?
139. Where is the heater located?
140. When does the heater fan automatically shut off?
141. Where is the fuel drawn for the heater/
142. What is a synchrophaser?
143. What is the main gear tire pressure?
144. What is the nose gear tire pressure?
145. Where are the batteries located?
146. Where is the aircraft serial number located?
147. What are the four ways to disconnect the autopilot?
148. When can you reset a CB?
149. What is the engine setting for zero thrust?
150. What is the 2-engine service ceiling?
151. What is the single engine absolute ceiling?
152. What is the 2-engine rate-of-climb at sea level and gross weight?
153. What is the single engine rate-of-climb at sea level and gross weight?
154. How is the stall warning horn differentiated from the gear warning horn?
155. The minimum airspeed for unfeathering their propeller is?
156. With an engine inoperative & feathered, where is the ball?
157. If the runway length is critical but no obstructions are present, the recommended flap setting for takeoff is?
158. As altitude increases, stall speed (TAS)?
159. As altitude increases,  $V_{mc}$  (TAS)?
160. As the CG moves aft,  $V_{mc}$ ?
161. How would  $V_{mc}$  be effected with a larger engine?
162. How does turbocharging effect  $V_{mc}$  compared to non-turbos?
163. What is the highest single drag item on the airplane?
164. What is the second highest drag item on the airplane?
165. Where is the fuel drawn for the heater? Rate per hour?
166. How is the static system drained?
167. What is the purpose of the springs on each gear?
168. What is the purpose of the springs on the nose gear?
169. Will the heater operate with the right engine inoperative?
170. Which items draw the most electrical current?
171. When installed, what is the function of the warning horn silence button?
172. Be prepared to discuss the following:
  - Does a single engine airplane have a  $V_{mc}$  speed?
  - Which item, of which  $V_{mc}$  is a function, will cause  $V_{mc}$  to increase substantially?

- How should the minimum length runway at sea level, no wind, standard day?
- Explain the difference between a windmilling propeller and zero thrust.
- What throttle positions used to cause the propeller to windmill? Produce zero thrust?
- What is the reason multi-engine airplanes have feathering propellers?
- Discuss the relationship between  $V_{mc}$  and  $V_s$  in this plane and in a conventional twin with clockwise rotating propellers. Graph  $V_{mc}$  versus  $V_s$  for each case.