AMP - Aviation Maintenance Technician Powerplant Practice Exam (Sample)

Study Guide

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Questions

1. **Who establishes mandatory replacement times for critical components of turbine engines?**
   A. Aircraft manufacturer
   B. Component manufacturer
   C. Engine manufacturer
   D. FAA

2. **What are the main components of a turbine engine?**
   A. Compressor, combustion chamber, turbine, and exhaust
   B. Compressor, ignition system, fuel lines, and exhaust
   C. Compressor, fuel tank, combustion chamber, and starter
   D. Compressor, turbine, cooling system, and exhaust

3. **The rearward thrust capability of an engine with the thrust reverser system deployed is**
   A. less than its forward capability.
   B. greater than its forward capability.
   C. equal to its forward capability.
   D. variable and depends on the engine type.

4. **Ice formation on a propeller blade will?**
   A. produce unbalance and vibration
   B. increase thrust and drag
   C. cause a change in blade angle
   D. decrease the noise level

5. **Which of the following instrument conditions is acceptable and does not require immediate correction?**
   A. Case paint chipped
   B. Instrument glass fogged
   C. Mounting screws loose
   D. All of the above require immediate correction

6. What does "specific fuel consumption" (SFC) measure?

- **A. The total fuel usage during entirety of a flight**
- **B. The efficiency in pounds of fuel burned per hour per horsepower**
- **C. The total miles per gallon achieved by an engine**
- **D. The amount of fuel pressure generated by a fuel pump**

7. What is the primary function of a turbine's heat exchanger?

- **A. To cool the engine oil**
- **B. To manage engine temperatures by exchanging heat between fluids**
- **C. To increase fuel pressure before combustion**
- **D. To regulate air flow through the engine**

8. Which of the following statements concerning the installation of a new fixed pitch wood propeller is true?

- **A. Inspect the bolts for proper torque after every 50 hours and annual inspection.**
- **B. Install and tighten the bolts to the proper torque during installation; no inspection interval after that.**
- **C. Inspect the bolts for proper torque after the first flight and after the first 25 hours of flying.**
- **D. Bolts do not require inspection if the propeller shows no visible sign of wear.**

9. What are the 14 CFR Part 43 regulations about?

- **A. Flight crew licensing standards**
- **B. Maintenance and alteration standards for aircraft**
- **C. Fuel quality standards for aviation**
- **D. Safety regulations for passenger aircraft**

10. How is engine wear typically assessed during maintenance?

- **A. By measuring fuel usage and efficiency**
- **B. Through inspections, measuring component clearances, and checking for damage**
- **C. Based on engine noise and vibrations**
- **D. Through computer diagnostics and software analysis**

Answers

1. C
2. A
3. A
4. A
5. A
6. B
7. B
8. C
9. B
10. B

Explanations

1. Who establishes mandatory replacement times for critical components of turbine engines?

A. Aircraft manufacturer

B. Component manufacturer

C. Engine manufacturer

D. FAA

The engine manufacturer is responsible for setting and enforcing mandatory replacement times for critical components of turbine engines. They have the most comprehensive knowledge of their engines, materials used, and potential wear and tear over time. The aircraft manufacturer determines the overall design and construction of the plane, while the component manufacturer produces individual parts that make up the engine. The FAA, or Federal Aviation Administration, sets regulations and standards for aircraft maintenance and safety but does not establish specific replacement times for engine components.

2. What are the main components of a turbine engine?

A. Compressor, combustion chamber, turbine, and exhaust

B. Compressor, ignition system, fuel lines, and exhaust

C. Compressor, fuel tank, combustion chamber, and starter

D. Compressor, turbine, cooling system, and exhaust

The main components of a turbine engine include the compressor, combustion chamber, turbine, and exhaust. Each of these elements plays a critical role in the engine's operation. The compressor is responsible for taking in ambient air and compressing it, which increases the air pressure before it enters the combustion chamber. This high-pressure air allows for more efficient combustion of the fuel, which is essential for generating the necessary thrust. The combustion chamber is where the fuel is mixed with the compressed air and ignited. This process generates high-temperature and high-pressure gases that expand and flow into the turbine section of the engine. The turbine extracts energy from these high-pressure gases. As the gases pass through the turbine, they cause it to spin, which drives the compressor. This is a critical step in maintaining the continuous operation of the engine. Finally, the exhaust system directs the gases out of the engine, providing thrust. The efficient expulsion of exhaust gases is fundamental to the engine's propulsion capability. While the other choices contain some correct components, they either omit essential parts or include elements that are not fundamental to the turbine engine's core operation. For example, the ignition system is important but not a main component of the engine itself, and the fuel tank is not considered a principal

3. The rearward thrust capability of an engine with the thrust reverser system deployed is

A. less than its forward capability.

B. greater than its forward capability.

C. equal to its forward capability.

D. variable and depends on the engine type.

When the thrust reversers are deployed, the airflow is redirected in the opposite direction, creating a rearward thrust. Because this thrust is generated by redirecting the existing forward thrust, it will always be less than the forward capability of the engine. This is why option A is correct. Option B is incorrect because it implies that the rearward thrust is greater than the forward thrust, which is not the case. Option C is also incorrect because it states that the rearward thrust is equal to the forward thrust, which is also not true. Option D is incorrect because while it is true that the thrust reverser capability can vary depending on the type of engine, the question is specifically asking about the rearward thrust capability in relation to the forward capability.

4. Ice formation on a propeller blade will?

A. produce unbalance and vibration

B. increase thrust and drag

C. cause a change in blade angle

D. decrease the noise level

When ice forms on a propeller blade, it adds weight to one side of the blade, causing the blade to become unbalanced and vibrate. This can result in a decrease in efficiency and can even cause damage to the propeller or engine. Option B and D are incorrect because ice formation would not increase thrust or decrease noise level. Option C is incorrect because ice formation would not cause a change in the blade angle.

5. Which of the following instrument conditions is acceptable and does not require immediate correction?

A. Case paint chipped

B. Instrument glass fogged

C. Mounting screws loose

D. All of the above require immediate correction

A Having chipped paint on the case of an instrument is considered acceptable and does not require immediate correction. This may be due to normal wear and tear and does not affect the functionality of the instrument. B: Having fogged glass on an instrument can obstruct the view and may hinder the accuracy of readings, thus it requires immediate correction. C: Loose mounting screws can cause instability and affect the accuracy of readings, therefore they require immediate correction. D: This option is incorrect as not all of the given conditions require immediate correction. Only option B and C would need to be corrected immediately.

6. What does "specific fuel consumption" (SFC) measure?

- A. The total fuel usage during entirety of a flight
- **B. The efficiency in pounds of fuel burned per hour per horsepower**
- C. The total miles per gallon achieved by an engine
- D. The amount of fuel pressure generated by a fuel pump

Specific fuel consumption (SFC) is a critical measure used to evaluate the efficiency of an engine in terms of fuel usage. It is expressed as the amount of fuel consumed per unit of power produced over a specified period, typically in pounds of fuel burned per hour per horsepower. This measurement allows engineers and technicians to assess how effectively an engine converts fuel into usable power, highlighting its performance characteristics and efficiency under various operating conditions. In aviation, understanding SFC is essential because it directly influences operational costs and overall aircraft performance. A lower SFC indicates that the engine is able to produce more power with less fuel, which is advantageous for reducing fuel expenses and maximizing range. In contrast, the other options do not accurately define specific fuel consumption. For instance, measuring the total fuel usage during a flight would not provide insight into the engine's efficiency relative to its power output. Similarly, the total miles per gallon achieved by an engine is more indicative of the vehicle's overall fuel efficiency rather than the SFC specific to the engine alone. Additionally, the amount of fuel pressure generated by a fuel pump pertains to fuel system functionality and not to the concept of fuel consumption efficiency.

7. What is the primary function of a turbine's heat exchanger?

- A. To cool the engine oil
- **B. To manage engine temperatures by exchanging heat between fluids**
- C. To increase fuel pressure before combustion
- D. To regulate air flow through the engine

The primary function of a turbine's heat exchanger is to manage engine temperatures by exchanging heat between fluids. In turbine engines, maintaining optimal temperature is crucial for efficient performance and longevity of components. The heat exchanger facilitates this by transferring heat from the hotter fluid, typically engine oil or fuel, to a cooler fluid, helping to prevent overheating. This process not only enhances the efficiency of the engine but also contributes to maintaining the structural integrity of sensitive components. By regulating temperatures effectively, the heat exchanger plays a vital role in the overall thermal management system of turbine engines. This function is essential for ensuring the safe and reliable operation of the engine during various phases of flight and conditions.

8. Which of the following statements concerning the installation of a new fixed pitch wood propeller is true?

A. Inspect the bolts for proper torque after every 50 hours and annual inspection.

B. Install and tighten the bolts to the proper torque during installation; no inspection interval after that.

C. Inspect the bolts for proper torque after the first flight and after the first 25 hours of flying.

D. Bolts do not require inspection if the propeller shows no visible sign of wear.

After installing a new fixed pitch wood propeller, it is important to inspect the bolts for proper torque since they can loosen during the first few hours of flight. Option A is incorrect because a proper torque check is needed more often during the initial break-in period, not just after the annual inspection. Option B is incorrect because bolts can still loosen over time and must be inspected periodically. Option D is incorrect because even if the propeller appears to be in good condition, the bolts can still loosen and cause safety hazards. Therefore, option C is the best choice, as it ensures proper torque is maintained after the initial break-in period, which can help prevent accidents due to bolt failure.

9. What are the 14 CFR Part 43 regulations about?

A. Flight crew licensing standards

B. Maintenance and alteration standards for aircraft

C. Fuel quality standards for aviation

D. Safety regulations for passenger aircraft

The 14 CFR Part 43 regulations address maintenance and alteration standards for aircraft, which is critical for ensuring airworthiness and safety in aviation. This part of the Code of Federal Regulations outlines the mandatory requirements that maintenance personnel must follow when performing any maintenance, preventive maintenance, rebuilding, and alterations on aircraft. These regulations establish the framework for how maintenance should be performed, the qualifications required for individuals doing this work, and the documentation necessary to verify that it has been carried out correctly. By adhering to these standards, aviation maintenance technicians help ensure that all aircraft are safe for operation, thereby safeguarding passengers, crew, and cargo during flight. The other options relate to different areas of aviation regulation, such as flight crew licensing standards, fuel quality, and broader safety regulations, which, while important, do not specifically focus on the maintenance and alteration of aircraft as set forth in Part 43.

10. How is engine wear typically assessed during maintenance?

A. By measuring fuel usage and efficiency

B. Through inspections, measuring component clearances, and checking for damage

C. Based on engine noise and vibrations

D. Through computer diagnostics and software analysis

Engine wear is primarily assessed by performing a combination of inspections, measuring component clearances, and checking for damage. This method allows technicians to directly observe the physical state of engine components, which is critical for determining wear levels. During maintenance, various components such as bearings, pistons, and cylinder walls can be measured to identify any degradation in their dimensions that may affect engine performance. For example, when measuring clearances between moving parts, technicians can ensure that they are still within acceptable tolerances. Any excessive wear can lead to increased heat, reduced efficiency, and even engine failure if left unaddressed. Also, visual inspections can reveal signs of damage, such as scoring or pitting, which indicates that components may no longer function properly. While fuel usage and efficiency, engine noise and vibrations, and computer diagnostics can provide useful information regarding an engine's operational status, they do not deliver the direct assessment of wear that physical measurements and inspections can. They can indicate potential issues, but the thorough evaluation of component conditions remains essential for a comprehensive assessment of engine wear.