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DEPARTMENT OF AEROSPACE ENGINEERING

Faculty Name	:	**Mr. N.Venkatesh, AP/ Aero**	Academic Year	:	**2024-2025 (Even)**
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Course	:	**23AST101 Fundamentals of Aerospace Engineering**			

TWO MARKS
UNIT-4 AIRCRAFT POWER PLANTS

Basic Ideas about Aircraft Power Plant

1. **What is an aircraft power plant?**
   - An aircraft power plant is the engine or system that provides the necessary thrust to propel an aircraft. It includes piston engines, turboprops, turbojets, turbofans, and turboshaft engines.
2. **What are the main components of an aircraft power plant?**
   - The main components include the engine, fuel system, ignition system, lubrication system, and exhaust system.

Functions of Piston, Turboprop, Turboshaft, and Jet Engines

3. **What is the function of a piston engine in aircraft?**
   - A piston engine converts chemical energy from fuel into mechanical energy through combustion, driving a propeller for thrust.
4. **What is a turboprop engine, and how does it work?**
   - A turboprop engine is a type of gas turbine engine that drives a propeller. It combines the efficiency of a piston engine with the power of a jet engine, suitable for low to medium-speed aircraft.
5. **What is a turboshaft engine, and where is it used?**
   - A turboshaft engine is similar to a turboprop but delivers power to a shaft instead of a propeller. It is mainly used in helicopters.
6. **How does a jet engine produce thrust?**
   - A jet engine works on the principle of Newton's Third Law. It compresses air, mixes it with fuel, ignites the mixture, and expels hot gases at high speed, generating thrust.
7. **What are the main types of jet engines?**
   - The main types include turbojet, turbofan, turboprop, and turboshaft engines.
8. **What is the difference between a turbojet and a turbofan engine?**
   - A turbojet engine generates thrust by expelling high-speed exhaust gases, while a turbofan engine has a bypass fan that increases efficiency and reduces noise.

Applications of Different Engines

9. **Where are piston engines commonly used in aviation?**

- Piston engines are mainly used in light aircraft, training aircraft, and small private planes.

10. **Why are turboprop engines preferred for regional transport aircraft?**

- Turboprops provide better fuel efficiency at lower speeds and shorter runways, making them ideal for regional flights.

11. **Which aircraft commonly use turbofan engines?**

- Turbofan engines are used in commercial airliners and military transport aircraft due to their fuel efficiency and quieter operation.

12. **What are the typical applications of turboshaft engines?**

- Turboshaft engines are used in helicopters, power generation, and marine propulsion.

Principles of Operation of a Rocket

13. **What is the basic principle behind a rocket engine?**

- Rocket engines work on Newton's Third Law: "For every action, there is an equal and opposite reaction." They expel high-speed gases to generate thrust.

14. **What are the main components of a rocket engine?**

- The main components include the combustion chamber, nozzle, propellant (fuel and oxidizer), and ignition system.

15. **How does a liquid-propellant rocket engine work?**

- A liquid-propellant rocket engine burns liquid fuel and an oxidizer in a combustion chamber, generating high-pressure gases that are expelled through a nozzle to create thrust.

Types of Rockets

16. **What are the two main types of rockets?**

- The two main types are liquid-propellant rockets and solid-propellant rockets.

17. **What are solid-propellant rockets, and where are they used?**

- Solid-propellant rockets use pre-mixed solid fuel and oxidizer. They are used in missiles, launch boosters, and emergency escape systems.

18. **What is a hybrid rocket, and what are its advantages?**

- A hybrid rocket uses a solid fuel and a liquid or gaseous oxidizer. It offers better control than solid rockets and is safer than liquid rockets.