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PROGRAM STUDI D-III TEKNOLOGI PEMELIHARAAN PESAWAT

UJIAN AKHIR SEMESTER GASAL 2025/2026

Mata Kuliah	**Mesin Turbin I**	**Semester**	**V**
Sifat Ujian	***Close Book / ~~Open Book~~***	**Kelas**	
Dosen Koordinator	**Ramadhana Luhur Prabangkara., S.Tr.T.,M.Tr.T.**	**Hari / Tgl.**	
Pembuat Soal	**1. Ramadhana Luhur P., S.Tr.T.,M.Tr.T.**	**Waktu**	**100 menit**
		Tempat	**Ruang TPP**

Petunjuk Umum

1. Isikan identitas anda ke dalam lembar jawaban
2. Tersedia waktu 100 menit untuk mengerjakan ujian
3. Periksa dan bacalah soal-soal dengan teliti sebelum anda menjawabnya
4. Periksalah pekerjaan anda sebelum diserahkan kepada pengawas

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MULTIPLE CHOICE

1. **Ram effect** due to aircraft forward speed will cause the efficiency of the engine to:
   a. Remain constant
   b. Decrease
   c. Increase
2. The efficiency of a gas turbine engine at altitude:
   a. Decreases
   b. Remains constant
   c. Increases
3. Which statement is true regarding jet engines?
   a. At higher engine speeds, thrust increases rapidly with small increases in RPM
   b. At lower engine speeds, thrust increases rapidly with small increases in RPM
   c. The thrust delivered per pound of air consumed is less at high altitude

4. Some turboprop and turbojet engines are equipped with two spool or split compressors. When these engines are operated at high altitudes, the:
   a. Low pressure rotor will increase in speed as the compressor load decreases in the lower density air
   b. Low pressure rotor will decrease in speed as the compressor load decreases in the lower density air
   c. Throttle must be retarded to prevent overspeeding of the high pressure rotor due to the lower density air
5. **Ram effect** due to aircraft forward speed will cause the thrust of the engine to:
   a. Remain constant
   b. Decrease
   c. Increase
6. With a fixed throttle, and with increased mass airflow, what happens to EPR?
   a. EPR goes up
   b. EPR remains constant
   c. EPR goes down
7. At what stage in a gas turbine engine are gas pressures the greatest?
   a. Compressor outlet
   b. Turbine outlet
   c. Compressor inlet
8. Increasing ram effect with increased speed:
   a. Reduces thrust due to reduced compressor efficiency
   b. Increases thrust due to increased maximum airflow
   c. Reduces thrust due to reduced turbine temperature
9. The highest heat to metal contact in a jet engine is the:
   a. Burner cans
   b. Turbine inlet guide vanes
   c. Turbine blades
10. Which compressor type gives the greatest advantages for both starting flexibility and improved high altitude performance?
    a. Single spool, axial flow
    b. Dual stage, centrifugal flow
    c. Split spool, axial flow

11. Which of the following is the ultimate limiting factor of turbine engine operation?
    a. Compressor inlet air temperature
    b. Burner can pressure
    c. Turbine inlet temperature
12. At altitude, idling RPM is:
    a. Same as at sea level
    b. Higher than at sea level
    c. Lower than at sea level
13. Thrust:
    a. Increases with high temperature
    b. Increases with low temperature
    c. Decreases with low temperature
14. Which of the following variables affect the inlet air density of a turbine engine?
    a. Altitude of the aircraft, Ambient temperature
    b. Compression ratio, Turbine inlet temperature, Altitude of the aircraft, Ambient temperature
    c. Speed of the aircraft, Compression ratio, Turbine inlet temperature, Altitude of the aircraft
15. The propulsive efficiency is:
    a. Low, with a low mass flow acceleration
    b. High, with a low mass flow acceleration
    c. High, with a high mass flow acceleration
16. The RPM for maximum power would be:
    a. Lower on a colder day
    b. Lower on a hotter day
    c. Greater on a colder day
17. How does engine thrust vary with temperature?
    a. Increase in temperature gives greater thrust because of low friction in compressors
    b. Low temperatures give low thrust
    c. Low temperature gives greater mass flow and therefore greater thrust
18. A method of comparing engine efficiencies is by comparing:
    a. Fuel consumption
    b. Thrust to weight ratio
    c. Specific fuel consumption

19. With a fixed throttle in a climb:
    a. RPM will increase
    b. RPM will remain constant
    c. RPM will decrease
20. The point of maximum velocity in the engine is in the:
    a. Exhaust exit nozzle
    b. Combustion chamber
    c. Nozzle guide vanes
21. At constant RPM, the pressure ratio of the compressor and the temperature rise across the compressor:
    a. Increases with height
    b. Remains constant irrespective of height
    c. Decreases with height
22. With the aircraft stationary, propulsive efficiency:
    a. Depends on RPM
    b. Is minimum
    c. Is maximum
23. The efficiency of conversion of kinetic energy into propulsive work is a measure of:
    a. Mechanical efficiency
    b. Propulsive efficiency
    c. Thermal efficiency
24. What effect does high atmospheric humidity have on the operation of a jet engine?
    a. Decreases compressor and turbine RPM
    b. Decreases engine pressure ratio
    c. Has little or no effect
25. Power is adjusted in a gas turbine engine by:
    a. Increasing fuel flow
    b. Increasing air and fuel flow
    c. Increasing airflow to the combustion chamber
26. The engine rating plug:
    a. Is permanently connected to the EEC
    b. Is connected to the EPR transmitter
    c. Is permanently connected to the engine casing

27. Flat rated thrust is defined as:
    a. The thrust at the ambient temperature point above which thrust drops below 100%
    b. That power achieved at idle RPM
    c. That power achieved at maximum EGT
28. Thrust rating on an FADEC-controlled engine can be changed by:
    a. Varying the ballast resistor in the EGT system
    b. Changing the engine rating plug
    c. Varying the EPR datum plug
29. Propeller torque is analogous to:
    a. Engine RPM
    b. Shaft horsepower
    c. Propeller RPM
30. The total power in a turboprop engine is the:
    a. SHP
    b. BHP
    c. ESHp
31. In a dive, with the throttles fixed, the EPR will:
    a. Not change
    b. Increase
    c. Decrease
32. With an increase in forward speed, the engine thrust:
    a. Decreases slightly but recovers due to ram effect
    b. Increases
    c. Decreases
33. The main factor considered when designing an engine is:
    a. Maximum fuel consumption
    b. Maximum turbine temperature
    c. Maximum tip speed
34. To ensure an engine maintains self-sustaining speed:
    a. Idle remains the same for any density
    b. Idle increases with density decrease
    c. Idle increases with density increase
35. A factor that limits EGT is the:
    a. Jet pipe

b. Compressors

c. Turbine

Essay Questions

1. Explain how the ram effect contributes to the efficiency and thrust of a jet engine, especially at higher speeds.
2. Describe the impact of altitude on a gas turbine engine's performance, focusing on changes in efficiency and thrust.
3. Discuss the relationship between turbine inlet temperature and engine performance. How does it limit the engine's operation?
4. How does atmospheric humidity affect a jet engine's performance? Explain the changes it causes in engine parameters like thrust and efficiency.
5. What is the importance of propulsive efficiency in engine performance, and how does it differ from other types of engine efficiency?