PRERNA AVIATION

DGCA CPL Practice Paper 20

Technical General - Engines & Propellers

ANSWER KEY & EXPLAINED SOLUTIONS

2026-reviewed sectional practice. Not an official DGCA paper or a verified full-length latest-pattern mock.

01 B	02 C	03 A	04 D	05 A
06 D	07 B	08 C	09 A	10 B
11 A	12 D	13 B	14 C	15 A
16 C	17 D	18 B	19 A	20 B
21 C	22 A	23 D	24 D	25 C

01. In a piston engine, compression ratio is the ratio of cylinder volume at:

Answer: B. Bottom dead centre to volume at top dead centre

Compression ratio compares maximum cylinder volume with minimum clearance volume. It is a geometric ratio, not a direct rpm or temperature ratio.

Topic: Engine geometry | Study reference: SYS

02. A four-stroke piston engine completes one operating cycle in:

Answer: C. Two crankshaft revolutions

The intake, compression, power and exhaust strokes require four piston strokes, corresponding to two crankshaft revolutions.

Topic: Four-stroke cycle | Study reference: SYS

03. During the compression stroke of a conventional four-stroke spark-ignition engine, the valves are normally:

Answer: A. Both closed

With both valves closed, the rising piston compresses the charge. Valve timing near stroke boundaries can vary, but the main compression phase requires a closed cylinder.

Topic: Valve operation | Study reference: SYS

04. Dual ignition in many aircraft piston engines improves reliability and also:

Answer: D. Promotes more effective combustion through two ignition points

Two independent ignition systems provide redundancy, and two plugs per cylinder can improve combustion. A normal magneto check assesses the system according to aircraft procedures.

Topic: Dual ignition | Study reference: SYS

05. For a normally aspirated piston engine, increasing altitude at unchanged throttle generally causes maximum available power to:

Answer: A. Decrease

Lower ambient pressure and density reduce the air mass entering the cylinders. Less oxygen is available for combustion, reducing power unless compensated by an appropriate induction system.

Topic: Altitude and power | Study reference: SYS

06. A turbocharger wastegate controls boost mainly by regulating:

Answer: D. Exhaust flow bypassing the turbine

The wastegate changes how much exhaust drives the turbine versus bypasses it. This helps control compressor output and manifold pressure within the system's design.

Topic: Turbocharger control | Study reference: SYS

07. An intercooler in a turbocharged induction system primarily:

Answer: B. Cools compressed intake air

Compression raises air temperature. Cooling the compressed charge increases its density and can improve operating margins, depending on engine design.

Topic: Intercooling | Study reference: SYS

08. A mixture that is excessively rich for the operating condition may cause:

Answer: C. Incomplete combustion, reduced power and plug fouling

Too much fuel relative to air can impair combustion and foul plugs. Mixture settings must follow approved procedures rather than a universal rich-or-lean rule.

Topic: Mixture effects | Study reference: SYS

09. A fuel-injected piston engine differs from a conventional float-carburettor engine because fuel is metered and delivered:

Answer: A. Through injection nozzles rather than a carburettor venturi discharge

Fuel injection supplies metered fuel through injectors. It avoids the conventional carburettor's specific venturi fuel-discharge arrangement, though other induction or icing issues can still exist.

Topic: Fuel injection | Study reference: SYS

10. A dry-sump lubrication system stores most of its oil in:

Answer: B. A separate tank

A dry-sump system uses a separate oil tank and scavenge arrangement. A wet-sump system stores oil mainly in the engine sump.

Topic: Lubrication layout | Study reference: SYS

11. A scavenge pump in a dry-sump oil system primarily:

Answer: A. Returns oil from the engine to the tank

Oil that collects in engine areas is returned to the tank by the scavenge system. Pressure pumps supply oil to the required lubrication points.

Topic: Oil circulation | Study reference: SYS

12. An oil cooler removes heat from engine oil by:

Answer: D. Transferring it to another medium such as airflow

Oil carries heat away from components. A cooler transfers part of that heat to air or another cooling medium, helping maintain the required temperature range.

Topic: Oil cooling | Study reference: SYS

13. A propeller blade's geometric pitch is related to the:

Answer: B. Theoretical distance it would advance in one revolution without slip

Geometric pitch is an ideal screw-like advance distance. Actual advance differs because the propeller operates in air with aerodynamic slip and changing inflow.

Topic: Propeller pitch | Study reference: SYS

14. Propeller blades are twisted along their span mainly because:

Answer: C. Rotational speed and relative airflow vary from root to tip

Blade sections farther from the hub move faster. Twist helps maintain suitable local blade angles relative to the changing airflow along the span.

Topic: Blade twist | Study reference: SYS

15. With a constant-speed propeller governor operating normally, an overspeed tendency is corrected by a pitch change that generally:

Answer: A. Increases blade angle to absorb more torque

Increasing blade angle increases aerodynamic load and tends to reduce rpm. The mechanical direction of oil flow varies with design, but the governing objective is to restore selected rpm.

Topic: Propeller governing | Study reference: SYS

16. Propeller torque reaction tends to roll a single-engine aeroplane:

Answer: C. Opposite to the propeller's rotation

The engine turns the propeller, and an equal opposite reaction acts on the aircraft. The resulting direction depends on the propeller's direction of rotation.

Topic: Torque reaction | Study reference: AERO

17. P-factor is most associated with unequal blade loading when the propeller disc is:

Answer: D. Inclined to the relative airflow at significant angle of attack

At an inclined disc, descending and ascending blades can experience different effective airflow and loading. This asymmetric thrust can produce yaw; direction depends on rotation.

Topic: Asymmetric blade effect | Study reference: AERO

18. A gas-turbine compressor stall involves:

Answer: B. Disruption or breakdown of normal airflow through compressor blade passages

Compressor blades are aerofoils and can stall when airflow conditions are unsuitable. A severe disturbance can lead to surge; indications and response are engine-specific.

Topic: Compressor aerodynamics | Study reference: SYS

19. Compressor surge is a system-level instability that can involve:

Answer: A. Large pressure and flow oscillations, sometimes with flow reversal

Surge is an unstable compressor operating condition with major pressure/flow fluctuations. It is distinct from a normal scheduled acceleration.

Topic: Compressor surge | Study reference: SYS

20. A turbofan's bypass ratio compares:

Answer: B. Air mass flow bypassing the core with air mass flow through the core

Bypass ratio is bypass-stream mass flow divided by core-stream mass flow. It describes the engine flow arrangement, not a fuel-consumption ratio.

Topic: Turbofan terminology | Study reference: SYS

21. In a turboprop engine, most useful propulsive power is delivered through:

Answer: C. A propeller driven by the turbine system

A turboprop extracts substantial turbine power to drive a propeller, usually through reduction gearing. Exhaust thrust may contribute, but the propeller provides the main propulsive effect.

Topic: Turboprop principle | Study reference: SYS

22. Reduction gearing between a turbine and propeller is used mainly to:

Answer: A. Allow the turbine and propeller to operate at suitable different rotational speeds

Turbines operate efficiently at high rpm, while propeller efficiency and tip-speed limits favour lower rpm. Reduction gearing reconciles these requirements.

Topic: Reduction gearbox | Study reference: SYS

23. A gas-turbine engine's exhaust gas temperature indication is useful for monitoring:

Answer: D. Thermal operating limits at the specified measurement location

Temperature monitoring supports detection of excessive thermal conditions. EGT, ITT and similar terms refer to particular measurement locations and must be interpreted using the engine's limits.

Topic: Engine indications | Study reference: SYS

24. A 'hot start' in a turbine engine refers to a start in which:

Answer: D. Temperature exceeds the permitted start limit

A hot start involves excessive engine temperature during starting. It is an abnormal condition requiring the applicable aircraft/engine procedure.

Topic: Starting abnormalities | Study reference: SYS

25. Engine indications should be assessed together because:

Answer: C. A single reading may be ambiguous without related parameters and operating context

Pressure, temperature, rpm and other parameters provide complementary evidence.
Cross-checking against limits, trends and the operating situation supports better fault recognition.

Topic: Engine monitoring | Study reference: SYS

Study references & review notes

Use these sources to revise the concepts behind your answers. Questions and explanations are newly written; they are not reproduced from an official question bank.

AERO — FAA PHAK, Chapter 5: Aerodynamics of Flight

https://www.faa.gov/sites/faa.gov/files/07_phak_ch5_0.pdf

SYS — FAA PHAK, Chapter 7: Aircraft Systems

https://www.faa.gov/sites/faa.gov/files/09_phak_ch7.pdf

Scope: foundation-to-intermediate CPL ground-subject practice. This set does not claim complete coverage of the latest DGCA syllabus. Consult the current DGCA CAR Section 7, Series B and Pariksha notices for the applicable syllabus and examination requirements. Aircraft-type-specific Technical Specific and a complete RTR(A) course are not included.

FAA references support general theory only, not Indian regulatory requirements. CAP 413 is used for standard phrase meanings, not UK-specific operating rules. Weather reports, fuel reserves and flight scenarios in questions are illustrative. For operational use, consult current approved publications and aircraft manuals.

Reviewed and prepared: 30 October 2026. Official session instructions and syllabus pointers were checked; exact current subject-wise question counts and durations were not independently verified.