C–7508	Sub. Code 11823

B.Sc. DEGREE EXAMINATION, APRIL 2026

Second Semester

Aeronautical Science

AIRCRAFT BASICS ELECTRICITY AND ELECTRONICS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. Ohm's Law states that :

   (a) Current = Voltage × Resistance

   (b) Voltage = Current × Resistance

   (c) Resistance = Current × Voltage

   (d) Power = Voltage × Current

2. CRO stands for :

   (a) Current Resistance Oscillator

   (b) Cathode Ray Oscilloscope

   (c) Capacitor Rectifier Output

   (d) Current Ratio Output

3. The electrolyte in a nickel-cadmium (Ni-Cd) battery is :

(a) Sulfuric acid

(b) Sodium carbonate

(c) Distilled water

(d) Potassium hydroxide

4. A typical ground power circuit for a large aircraft operates at :

(a) 5V DC

(b) 50V AC

(c) 28V DC or 115V AC

(d) 240V DC

5. The principle of operation of a DC motor?

(a) Lorentz force principle

(b) Fleming's right-hand rule

(c) Faraday's law of induction

(d) Ohm's law

6. Inverters are used in aircraft to :

(a) Convert AC to DC

(b) Convert DC to AC

(c) Store electrical energy

(d) Regulate voltage

7. A bridge rectifier uses how many diodes?

(a) 2 (b) 4

(c) 6 (d) 8

8. "Which of the following is NOT part of basic power distribution?

(a) Bus bars

(b) Circuit breakers

(c) Carburetors

(d) Switches

9. Navigation lights are typically positioned on :

(a) Cockpit windows

(b) Landing gear

(c) Engine nacelles

(d) Wingtips and tail

10. The landing gear position indicating circuit provides :

(a) Engine RPM

(b) Light indications for gear status

(c) Hydraulic pressure values

(d) Brake temperature readings

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the working principle of a capacitor with a neat sketch.

Or

(b) Explain the working principle, advantages and disadvantages of a Multimeter.

12. (a) Differentiate between lead-acid and Ni-Cd batteries in terms of construction and performance.

Or

(b) Describe the steps in performing a capacity check on an aircraft battery.

13. (a) Differentiate between shunt, series, and compound DC motors.

Or

(b) Explain the purpose of a current limiter.

14. (a) Write a short note on the need for voltage regulation in aircraft systems.

Or

(b) Describe the characteristics of aircraft electric wire.

15. (a) State the color coding and placement of aircraft navigation lights.

Or

(b) Explain the role of the turbine engine auto ignition system.

Part C ($5 \times 8 = 40$)

Answer **all** questions, choosing either (a) or (b).

16. (a) Explain the basic laws of an electrical system with examples and diagrams.

Or

(b) Explain various circuit control devices with diagrams.

17. (a) Describe in detail the methods of charging aircraft batteries.

Or

(b) Explain the layout and operation of aircraft battery circuits with suitable diagrams.

18. (a) Explain the construction and working principle of DC motors.

Or

(b) Explain the construction, operation, and advantages of brushless alternators used in aircraft.

19. (a) Explain the construction and working of an SCR. How is it used in power control circuits in aircraft?

Or

(b) Discuss in detail the basic power distribution system in large aircraft.

20. (a) Explain with a neat diagram the construction and working of a starter circuit in an aircraft.

Or

(b) Discuss the anti-skid brake system — components, working principle, and advantages in modern aircraft.

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C–7509

Sub. Code
11825

B.Sc. DEGREE EXAMINATION, APRIL 2026

Second Semester

Aeronautical Science

APPLIED MECHANICS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. Which of the following is a scalar quantity?
   (a) Force (b) Acceleration
   (c) Displacement (d) Energy

2. What does kinetics study in mechanics?
   (a) Only motion of objects
   (b) Motion and the forces causing it
   (c) Mass and velocity only
   (d) Displacement and acceleration only

3. Which law states that force is equal to the rate of change of momentum?
   (a) Newton's First Law
   (b) Newton's Second Law
   (c) Newton's Third Law
   (d) Law of Gravitation

4. Which property does moment of inertia depend on?

(a) Volume only

(b) Shape and distribution of area

(c) Weight of object

(d) Length only

5. What is true about rolling resistance compared to sliding friction?

(a) It is greater than sliding friction

(b) It is less than sliding friction

(c) Both are equal

(d) It is not related

6. Which of the following best defines the angle of friction?

(a) Angle between applied force and surface

(b) Angle between reaction and horizontal

(c) Angle between normal reaction and resultant reaction

(d) Angle between frictional force and normal

7. Which of the following methods is faster for calculating force in one specific member of a large frame?

(a) Method of joints

(b) Method of sections

(c) Method of moment

(d) None of the above

8. Which of the following is NOT an assumption made in the analysis of perfect frames?

(a) Members are pin-jointed

(b) Loads act only at the joints

(c) Self-weight of members is considered

(d) Members are subject to bending

9. The point beyond which Hooke's Law is no longer valid is called :

(a) Breaking point (b) Ultimate point

(c) Elastic limit (d) Proportional limit

10. The Factor of Safety is the ratio of :

(a) Working stress to ultimate stress

(b) Ultimate stress to working stress

(c) Load to area

(d) Strain to stress

Part B $(5 \times 5 = 25)$

Answer **all** questions, choosing either (a) or (b).

11. (a) Classify different system of forces with suitable examples.

Or

(b) State and explain the principle of virtual work.

12. (a) State and explain the principle of transmissibility of forces.

Or

(b) Find the Centre of Gravity of right circular cone of height 60 mm and base radius 40 mm from its base and vertex.

13. (a) State and explain the laws of dry friction.

Or

(b) Explain the concept of belt friction. How does it affect motion when the belt moves over a pulley on an inclined plane?

14. (a) What is a frame? State the difference between a perfect frame and an imperfect frame.

Or

(b) What are the assumptions should be made while solving truss problems?

15. (a) Explain clearly different types of stresses and strains.

Or

(b) Explain different types of beams briefly.

Part C (5 × 8 = 40)

Answer **all** questions, choosing either (a) or (b).

16. (a) State and prove Lamis theorem.

Or

(b) State the law of parallelogram of forces and show that the resultant $R = V(P^2 + Q^2)$ when the two forces P and Q are acting at right angles to each other. Find the value of R if the angle between the forces is zero.

17. (a) Explain the Newton's law of motion.

Or

(b) Differentiate between rectilinear and curvilinear motion. Provide examples from engineering applications.

18. (a) Explain how friction affects the operation of a wedge used to lift a body.

Or

(b) What are simple machines? Give examples and explain their use in reducing effort in lifting or moving loads.

19. (a) Explain with Suitable sketches the terms: Method of section and Method of joints, as applied to trusses.

Or

(b) Describe cantilever trusses with skew load.

20. (a) A body is Subjected to direct stresses in two mutually Perpendicular directions accompanied by a simple shear stress Draw the Mohr's circle of stresses and explain how will you obtain the principal stresses and Principal planes.

Or

(b) Draw the S.F and B.M diagram for a simply Supported beam of length L carrying a Point load W at its middle point.

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C–7511

Sub. Code
11836

B.Sc. DEGREE EXAMINATION, APRIL 2026

Third Semester

Aeronautical Science

FLUID MECHANICS & HYDRAULIC MACHINES

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. The numerical value of 1 Pa of pressure is equal to

   (a) 1 N/m^2 (b) 1 kN/m^2

   (c) 1 MN/m^2 (d) none of these

2. The absolute pressure is equal to

   (a) Gauge pressure – Atmospheric pressure

   (b) Gauge pressure + Vacuum pressure

   (c) Atmospheric pressure + Gauge pressure

   (d) Atmospheric pressure – Gauge pressure

3. The metacentric height of a floating body is the distance between

   (a) centre of gravity and centre of buoyancy

   (b) centre of gravity and meta centre

   (c) centre of buoyancy and meta centre

   (d) none of these

4. When a body floating in a liquid is given a small angular displacement it starts oscillating about a point. This point is known as

   (a) centre of pressure

   (b) centre of gravity

   (c) centre of buoyancy

   (d) meta centre

5. What is the force exerted by a jet on a surface?

   (a) Equal to the rate of change of momentum of the fluid

   (b) Equal to the pressure of the fluid

   (c) Equal to the velocity of the fluid

   (d) Equal to the density of the fluid

6. What is jet propulsion?

   (a) A method of propulsion that uses a jet of fluid to generate thrust

   (b) A method of propulsion that uses a propeller to generate thrust

   (c) A method of propulsion that uses a wing to generate lift

   (d) A method of propulsion that uses a rocket to generate thrust

7. What is the primary function of a hydraulic press?

   (a) To generate high pressure and force for metal forming

   (b) To generate low pressure and flow rate for fluid power systems

   (c) To generate high flow rate and pressure for hydraulic systems

   (d) To generate low pressure and force for material handling

8. What is the primary function of a hydraulic accumulator?

(a) To store energy in the form of compressed fluid

(b) To generate high pressure and flow rate

(c) To regulate fluid flow and pressure

(d) To filter contaminants from the fluid

9. What is the principle behind the operation of a hydraulic intensifier?

(a) Pascal's Law

(b) Bernoulli's Principle

(c) Archimedes Principle

(d) Newton's Law

10. What is the primary function of a hydraulic coupling?

(a) To transmit power between two shafts

(b) To generate high pressure and flow rate

(c) To regulate fluid flow and pressure

(d) To filter contaminants from the fluid

Part B

$(5 \times 5 = 25)$

Answer **all** questions, choosing either (a) or (b).

11. (a) Define: Density, weight density, specific volume and specific gravity of a fluid.

Or

(b) Define pressure. Explain about absolute, gauge, vacuum pressure.

12. (a) Define:

(i) Buoyancy

(ii) Center of buoyancy

(iii) Meta center

(iv) Meta centric height.

Or

(b) What do you understand by Total Pressure' and Centre of Pressure'?

13. (a) What do you mean by "equivalent pipe" and "flow through parallel pipes"?

Or

(b) Explain about Venturi meter with sketch.

14. (a) Explain Force exerted by a jet on hinged plate.

Or

(b) Write short notes on Centrifugal pump.

15. (a) Write in detail about the Gear pump.

Or

(b) Write in detail about the hydraulic press.

Part C $(5 \times 8 = 40)$

Answer **all** questions, choosing either (a) or (b).

16. (a) The right limb of a simple U-tube manometer containing mercury is open to the atmosphere while the left limb is connected to a pipe in which a fluid of sp.gr 0.9 is flowing. The centre of the pipe is

12 cm below the level of mercury in the right limb. Find the pressure of fluid in the pipe if the difference of mercury level in the two limbs is 20 cm.

Or

(b) Differentiate between:

(i) Liquids and gases,

(ii) Real fluids and ideal fluids,

(iii) Specific weight and specific volume of a fluid.

17. (a) Write short notes on.

(i) Velocity potential function,

(ii) Stream function.

Or

(b) Define the terms meta-centre, centre of buoyancy, meta-centric height, gauge pressure and absolute pressure.

18. (a) What is a venturimeter? Derive an expression for the discharge through a venturimeter.

Or

(b) An oil of sp. gr. 0.7 is flowing through a pipe of diameter 300 mm at the rate of 500 litres/s. Find the head lost due to friction and power required to maintain the flow for a length of 100Gm. Take v = .29 stokes.

19. (a) Obtain an expression for the force exerted by a jet of water on a fixed vertical plate in the direction of the jet.

Or

(b) With a neat sketch, explain the principle and working of centrifugal pump.

20. (a) What is a hydraulic intensifier? Explain its principle and working.

Or

(b) Explain the working principle of following hydraulic devices.

(i) Hydraulic lift

(ii) Hydraulic crane.

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C–7512	Sub. Code 11843

B.Sc. DEGREE EXAMINATION, APRIL 2026

Fourth Semester

Aeronautical Science

AIRCRAFT INSTRUMENTS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. In level flight an aircraft's _____ changes such as to bring the nose up, then the movement of the horizon element relative to the fixed aircraft symbol will be displayed.
   (a) Pitch attitude (b) Roll attitude
   (c) Yaw Attitude (d) None of these

2. Head-up displays designed for use in public transport aircraft during the _____.
   (a) approach
   (b) landing
   (c) descending phase of flight
   (d) all

3. In order to obtain indications of _____,it is of course necessary to know the relationship between the pressure, temperature and density variables, and altitude.
   (a) Airspeed, (b) Altitude
   (c) Vertical speed (d) All

4. The indications of a _____ remain unaffected by Position error.
   (a) Vertical speed indicator
   (b) Altimeter
   (c) Airspeed indicator
   (d) None of these

5. Other familiar mechanical systems possessing gyroscopic properties are _____
   (a) aircraft propellers
   (b) jet engine compressor
   (c) turbine assemblies
   (d) all

6. Direction indicator is used in conjunction with _____.
   (a) altimeter
   (b) airspeed indicator
   (c) magnetic Compass
   (d) none of these

7. In its basic form, a system consists of a variable capacitor located in _____.
   (a) a fuel tank, (b) an amplifier
   (c) an indicator (d) all

8. In the application of the capacitor principle to a fuel quantity indicating system, an even smaller unit, _____ is the standard unit of measurement.
   (a) the Pico farad (b) micro farad
   (c) nano farad (d) none of these

9. Compass is one of the most important instruments for _____.
   (a) navigation (b) communication
   (c) none of these (d) all

10. Aircraft's instruments introduce a form of disturbance that impacts your compass, and this disruption is referred to as _____.

(a) deviation (b) compensation

(c) variation (d) all

Part B

(5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) What do you understand the CRT display?

Or

(b) Write short note on display configuration.

12. (a) What are the various effects of independent static vent?

Or

(b) Discuss about the Mach meter operating principle.

13. (a) Discuss about the erection error of gyroscope.

Or

(b) Explain the significance of direction indicator.

14. (a) What is called capacitor and its importance in fuel quantity indicating system?

Or

(b) What do you understand the permittivity?

15. (a) List down the components of gyro magnetic compass system.

Or

(b) Write short note on remote reading compass construction.

Part C (5 × 8 = 40)

Answer **all** questions, choosing either (a) or (b).

16. (a) Discuss about the scale and operating ranges in instruments.

Or

(b) Describe about the liquid crystal display.

17. (a) Discuss about the location of probes and static vents in basic air data system.

Or

(b) State and prove that Q code for altimeter setting in altimeter is important.

18. (a) Explain about electric gyro horizon.

Or

(b) Discuss about the importance of rate gyroscope.

19. (a) Explain about the measurement of fuel quantity by weight.

Or

(b) What is EGT and its method of measuring in engine?

20. (a) Explain the construction details of direct reading compass.

Or

(b) Describe the calibration procedure of remote reading compass.

C–7513	Sub. Code 11844

B.Sc. DEGREE EXAMINATION, APRIL 2026

Fourth Semester

Aeronautical Science

AIRCRAFT RULES AND AIRWORTHINESS REGULATIONS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. CAR section 2 represents the _____.

   (a) General

   (b) Airworthiness

   (c) Air Transport

   (d) None of these

2. Whenever a change/revision is affected to a CAR, it shall be termed as revision _____.

   (a) the revision number

   (b) date of revision

   (c) effective date

   (d) all

3. No person shall fly any aircraft unless it has been registered and bears its _____.

(a) nationality

(b) registration marks

(c) name and residence of the owner

(d) all

4. The C of A shall be revalidated/revoked, subject to the completion of the _____.

(a) required repair

(b) modification

(c) maintenance action

(d) all

5. For category A and L, the additional experience should be a minimum of _____ in civil aircraft maintenance environment.

(a) 5 months

(b) 6 months

(c) 10 months

(d) all

6. Aircraft maintenance experience gained outside a civil aircraft maintenance environment can include aircraft maintenance experience gained in _____.

(a) armed forces

(b) coast guards

(c) police

(d) all

7. The term "maintenance programme" is intended to include _____.

(a) scheduled maintenance tasks

(b) associated procedures

(c) standard maintenance practices

(d) all

8. Issuance of Certificate of Airworthiness, an aircraft must be _____.

(a) Type Certified

(b) type certificate validated

(c) type accepted by DGCA

(d) all

9. Fuelling Zone is regarded as the area extending _____ radially from the aircraft fuelling point.

(a) 6 metres

(b) 10 metres

(c) 3 metres

(d) all

10. The fuelling of an aircraft shall be done under the supervision of a person nominated by _____.

(a) operator

(b) as specified in the Quality Control Manual

(c) authorised person from the oil company

(d) all

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Write down the three sections of engine log book.

Or

(b) What is DGCA and its role?

12. (a) Write the procedure for registration of aircraft in Category "A" in India.

Or

(b) List down the categories of special certificate of airworthiness.

13. (a) What is the significance of AME licence category A and B1.

Or

(b) When authorisation is required for a limited scope of work?

14. (a) Write down the documents (up to date amendments) submitted to regional office for issuance of C of A.

Or

(b) Explain flight crew requirements for flight test.

15. (a) Write short note on fuelling place of aircraft.

Or

(b) What are the key areas of air safety?

Part C

(5 × 8 = 40)

Answer **all** questions, choosing either (a) or (b).

16. (a) List down the information contained in the journey log book.

Or

(b) Enumerate the procedure for promulgation of CAR.

17. (a) List down the documents required for submission of application for registration of aircraft.

Or

(b) Under what conditions, the C of A cancelled or suspended?

18. (a) List down the privileges of following categories of license holder in A, B1 and B2.

Or

(b) Enumerate the data endorsed in the individual log book for considering as the experience of AME.

19. (a) List down the documents/literature for C of A retention for new aircraft.

Or

(b) Under what circumstances the C of A will be suspended or cancelled?

20. (a) Explain the special precautions to be taken in the fuelling zone.

Or

(b) Describe about the flight safety manual and its documentation system.

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C–7514	Sub. Code 11846

B.Sc. DEGREE EXAMINATION, APRIL 2026

Fourth Semester

Aeronautical Science

AERO ENGINEERING THERMODYNAMICS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. A substance consists of a large number of particles called _____.

   (a) molecules (b) energy

   (c) control volume (d) all

2. Intensive properties are those that are independent of the mass of a system, such as

   (a) temperature (b) pressure

   (c) density (d) all

3. That transfers heat from a low-temperature medium to a high-temperature one is the _____.

   (a) heat pump (b) heat engine

   (c) refrigerator (d) all

4. COP of the refrigerator is _____.

   (a) greater than 1 (b) less than 1

   (c) equal to one (d) all

5. A chemical reaction during which a fuel is oxidized and a large quantity of energy is released is called _____.

(a) combustion (b) expansion

(c) compression (d) all

6. Specific heat depends on _____.

(a) the change in temperature

(b) the mass of the system, and

(c) phase of the substance

(d) all

7. The reciprocating compressor maximum delivery pressure may be as _____.

(a) 1000 bar (b) 300 bar

(c) 100 bar (d) All

8. The casing for the compressor is so designed that the kinetic energy of the air is converted into _____.

(a) pressure energy (b) thermal energy

(c) mechanical energy (d) all

9. The gas in cooling chamber of a closed cycle gas turbine is cooled at

(a) constant volume

(b) constant pressure

(c) constant temperature

(d) none of these

10. To increase the efficiency of gas turbine _____.

(a) increase the inlet velocity

(b) increase the inlet pressure

(c) increase the inlet temperature

(d) none of these

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Write down the application areas of thermodynamics.

Or

(b) Explain about the open system or a control volume in thermodynamics.

12. (a) What do you understand the reversed Carnot cycle?

Or

(b) Prove that thermal efficiency of Otto cycle as a function of compression ratio.

13. (a) Write short note on hydro carbon fuels.

Or

(b) What do you understand the theoretical combustion?

14. (a) Derive the work done by the centrifugal air compressor.

Or

(b) Write short note on Pre-whirl.

15. (a) Write the classification of gas turbines.

Or

(b) What do you understand the electric propulsive system?

Part C (5 × 8 = 40)

Answer **all** questions, choosing either (a) or (b).

16. (a) Explain about the isentropic efficiency of a turbine.

Or

(b) What is called entropy generation and also explain about it.

17. (a) A refrigerator uses refrigerant-134 a as the working fluid and operates on an ideal vapor-compression refrigeration cycle between 0.14 and 0.8 MPa. If the mass flow rate of the refrigerant is 0.05 kg/s, determine (i) the rate of heat removal from the refrigerated space and the power input to the compressor, (ii) the rate of heat rejection to the environment, and (iii) the COP of the refrigerator.

Or

(b) Distinguish between the closed and open gas turbine engine and its applications with suitable diagram.

18. (a) Discuss about the ideal-gas mixture.

Or

(b) Discuss about the theoretical and actual combustion process.

19. (a) A centrifugal compressor delivers 50 kg of air per minute at a pressure of 2 bar and 97' C. The intake pressure and temperature of the air is I bar and 15" C. If no heat is lost to the surrounding, find: (i) index of compression and (ii) power required, if the compression is isothermal. Take R = 287 i/kg K.

Or

(b) Multistage reciprocating compressor how it works?

20. (a) List down the points of comparison between open and close cycle gas turbine.

Or

(b) List down the types of inlets used in gas turbine engine.

C–7516

Sub. Code
11852

B.Sc. DEGREE EXAMINATION, APRIL 2026.

Fifth Semester

Aeronautical Science

GAS TURBINE ENGINE

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. At what mach number range to scramjet engines typically operate?

   (a) 1 to 2 (b) 2 to 3

   (c) 3 to 6 (d) Above 5

2. What does Ve represent in the thrust equation?

   (a) Velocity of incoming air

   (b) Exhaust gas velocity

   (c) Volume flow rate of air

   (d) Compressor exit velocity

3. What type of exhaust nozzle is commonly used in subsonic jet engines?

   (a) Converging nozzle

   (b) Converging-diverging nozzle

   (c) Diverging nozzle

   (d) Variable-geometry nozzle

4. Which component is responsible for activating the thrust reveres system in most gas turbine engines?

(a) Hydraulic actuator

(b) Electronic control unit

(c) Pneumatic actuator

(d) Pilot-operated mechanical lever

5. Which of the following forces primarily acts on a propeller during operation?

(a) Lift and drag (b) Centrifugal force

(c) Thrust and toque (d) Buoyant force

6. The working principle of a Turboprop engine is based on which law of thermodynamics?

(a) Zeroth law (b) First law

(c) Second law (d) Third law

7. In a gas turbine engine, the fuel control unit ensures that the fuel supply is regulated based on which of the following parameters?

(a) Altitude and air pressure

(b) Temperature and humidity

(c) Engine speed and power demand

(d) Fuel density

8. What does FADEC stand for in Gas turbine engine systems?

(a) Full Automated Digital Engine Control

(b) Full Authority Digital Engine Control

(c) Fuel and Air Digital Engine Control

(d) Fuel Automated Digital Engine Control

9. Which of the following components does the lubrication system primarily protect from wear and tear?

(a) Combustion chamber

(b) Turbine blados

(c) Fuel control unit

(d) Bearings and shafts

10. The high-voltage output from the ignition exciter is delivered to the spark plugs through which component?

(a) Ignition transformer

(b) Voltage regulator

(c) Fuel control unit

(d) Compressor

Part B

$(5 \times 5 = 25)$

Answer **all** questions, choosing either (a) or (b).

11. (a) Write short note about the types of Gas turbine engine.

Or

(b) Differentiate Ramjet and Scramjet engine.

12. (a) Describe about Air intake, compressor, combustion chamber.

Or

(b) Discuss about Noise Suppression System.

13. (a) Explain the operation of Turbo prop engine.

Or

(b) Briefly explain the various types of forces acting on a propeller.

14. (a) Explain about the operation of fuel control unit.

Or

(b) Explain Electronic engine controls.

15. (a) Explain the functions of lubrication system unit.

Or

(b) Describe the working principle of air turbine.

Part C (5 × 8 = 40)

Answer **all** questions, choosing either (a) or (b).

16. (a) Briefly explain the principles of Jet Propulsion.

Or

(b) Explain the factors affecting the thrust and performance of gas turbine engine.

17. (a) Explain Thrust reversal mechanism.

Or

(b) Explain the thrust calculation procedure for Turbofan engine.

18. (a) Briefly explain the forces acting on a propeller.

Or

(b) Explain the functions of propeller control unit.

19. (a) Explain the types of characteristics of Jet Fuel.

Or

(b) Describe in detail about FADEC system.

20. (a) Explain the types of lubricants.

Or

(b) Explain about Ignition system and its operation.

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C–7520	Sub. Code 11861

B.Sc. DEGREE EXAMINATION, APRIL 2026

Sixth Semester

Aeronautical Science

AIRCRAFT MAINTENANCE, GROUND HANDLING AND SUPPORT EQUIPMENT

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. Which document details the scheduled maintenance intervals for an aircraft?

   (a) Technical Logbook

   (b) Minimum Equipment List

   (c) Illustrated Parts Catalogue

   (d) Maintenance Planning Document (MPD)

2. What is the primary objective of a Continuous Airworthiness Maintenance Program (CAMP)?

   (a) Increase flight hours

   (b) Ensure operational safety and reliability

   (c) Reduce maintenance staff

   (d) Enhance cabin aesthetics

3. A shimmy damper is used to:

(a) Prevent brake overheating

(b) Dampen oscillations in nose wheel steering

(c) Assist in gear extension

(d) Control landing gear retraction speed

4. The red line on a shock strut indicates:

(a) Minimum extension marking

(b) Over-temperature warning

(c) Maximum load capacity

(d) Hydraulic fluid level

5. The purpose of a doubler in sheet metal repair is to:

(a) Fill gaps

(b) Reinforce the repaired area

(c) Seal the surface

(d) Improve airflow

6. The primary tool for removing damaged rivets is:

(a) Rivet gun

(b) Chisel

(c) Pin punch and drill

(d) File

7. Which fire extinguisher agent is most effective on Class C electrical fires?

(a) Water

(b) Foam

(c) CO_2 (Carbon Dioxide)

(d) Dry Chemical Powder

8. What is the term for controlling aircraft movement under its own power on ground?

(a) Towing

(b) Pushback

(c) Taxiing

(d) Docking

9. Which ground support equipment is used to provide electrical power to an aircraft on ground?

(a) Air Start Unit

(b) Pre-oiling Unit

(c) Ground Power Unit (GPU)

(d) Hydraulic Test Stand

10. Which of the following equipment is essential for engine lubrication before first start after maintenance?

(a) Hydraulic Stand

(b) Air Start Unit

(c) GPU

(d) Pre-oiling Equipment

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the purpose and scope of a 100-hour inspection.

Or

(b) Write a short note on the purpose of the Aircraft Technical Logbook.

12. (a) Describe the steps involved in performing a landing gear retraction test.

Or

(b) Explain the role of a shimmy damper in nose wheel assemblies and it's types.

13. (a) Briefly describe about the classification of structural damage.

Or

(b) What is the procedure for removing a failed rivet?

14. (a) Explain about precautions against wind storm damage.

Or

(b) What are the precautions done before taxing?

15. (a) Discuss about the tow bars used in towing process.

Or

(b) Explain about the pre oiling equipment.

Part C

(5 × 8 = 40)

Answer **all** questions, choosing either (a) or (b).

16. (a) Discuss in detail the different types of aircraft maintenance checks (A, B, C, D checks).

Or

(b) Explain with a flow diagram the maintenance documentation hierarchy.

17. (a) Discuss the structural inspection points of landing gear components after a heavy landing.

Or

(b) Explain the inspection procedure for wheel assembly and brake system.

18. (a) Explain rivet repair carried out in sheet metal in detail.

Or

(b) Discuss the repair procedures for a cracked spar in an aircraft wing.

19. (a) Explain the hazards of improper grounding during refuelling and the preventive measures.

Or

(b) Describe the taxiing procedures and the role of marshallers in guiding aircraft on ground.

20. (a) Explain about the air conditioning and heating unit.

Or

(b) Describe the functions, applications, and maintenance of Hydraulic Power Units (HPU) used in ground support.

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C–7521	Sub. Code 11862

B.Sc. DEGREE EXAMINATION, APRIL 2026

Sixth Semester

Aeronautical Science

AERO ENGINE MAINTENANCE

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. The inspection of engine parts during overhaul is divided into _____ categories:

   (a) Visual (b) Structural

   (c) Dimensional (d) All

2. Inspect the cylinder head for internal and external cracks by _____.

   (a) bright light (b) magnifying glass

   (c) microscope (d) all

3. Propeller is an aerodynamic device which converts _____.

   (a) rotational energy into propulsive

   (b) internal energy in to mechanical

   (c) mechanical in to electric

   (d) all

4. Propellers are most suitable for use at subsonic airspeeds generally below about _____.

(a) 480 mph (b) 500 mph

(c) 700 mph (d) All

5. A run-up area is a location at an _____ where pilots can perform run-up checks of their aircraft.

(a) Airport (b) Hangar

(c) Maintenance shop (d) All

6. Engine runup _____ an increase of engine RPM to a

(a) high power setting (b) low power setting

(c) idle power setting (d) all

7. Accumulation of dirt on the compressor blades reduces _____.

(a) the aerodynamic efficiency of the blades

(b) engine performance

(c) erosion

(d) all

8. The main causes of turbine blades failure are _____.

(a) high temperatures

(b) high stresses

(c) potential environment of high vibration

(d) all

9. Preheat an aircraft engine when the temperature drops below _____.

(a) 32 F (b) 50 F

(c) 60 F (d) All

10. For safety reasons, run-ups on large transport category aircrafts require the utmost coordination between the _____.

(a) Certifying staffs in the cockpit

(b) Ground crew

(c) Apron supervisor

(d) All

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) What are the 10 steps of complete overhaul?

Or

(b) How to inspect the crankshaft of the piston engine?

12. (a) List down and explain the types of aircraft propeller.

Or

(b) List down the role of propeller governor.

13. (a) Write short note on engine ground running.

Or

(b) List down the precautions to be followed while engine shut down.

14. (a) What are the factors that affect the reason for blade failure?

Or

(b) Write the significance of horoscope inspection.

15. (a) Write down the general safety guideline for engine runup.

Or

(b) Explain the impact of turbine temperature.

Part C (5 × 8 = 40)

Answer **all** questions, choosing either (a) or (b).

16. (a) Explain about the cylinder grinding during inspection.

Or

(b) Describe about the dimensional checks of crankshaft.

17. (a) Enumerate the forces acting on the propeller blade.

Or

(b) List down the inspections of wood propeller.

18. (a) Explain the post stopping procedure of reciprocating engine.

Or

(b) List down the ignition system checks in piston engine.

19. (a) Enumerate the major inspections of combustion chamber.

Or

(b) Describe the causes and signs of foreign object damage of gas turbine engine.

20. (a) Enumerate typical runup checks and their purpose.

Or

(b) List down and explain the factors affecting gas turbine engine performance.

C–7523	Sub. Code 11864B

B.Sc. DEGREE EXAMINATION, APRIL 2026.

Sixth Semester

Aeronautical Science

AIRCRAFT MAINTENANCE MANAGEMENT

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. The maintenance of an air craft provides assurance of _____

   (a) flight safety (b) reliability
   (c) airworthiness (d) All

2. The MSG-2 process was slightly different for the _____ maintenance areas.

   (a) Five (b) Four
   (c) Three (d) None of these.

3. There are categories of tasks developed by the MSG-3 approach

   (a) airframe (b) structural item
   (c) zonal (d) All.

4. Considerable amount of documentation required to _____

   (a) understand
   (b) identify
   (c) implement the maintenance requirements
   (d) All.

5. Controlled documents are used to certify airworthiness of the
   (a) aircraft (b) engines
   (c) components (d) All.

6. The DQC normally comply with the _____
   (a) airworthiness training
   (b) required inspection authorization
   (c) quality assurance
   (d) All.

7. The technicians at the flight line often work in adverse conditions like _____
   (a) hot weather (b) rain
   (c) snow (d) All

8. The MCC department's primary function, is to ensure that _____
   (a) all aircraft are available for daily flying
   (b) grounding of aircraft
   (c) under repair
   (d) None of these.

9. Quality audit should be performed on _____
   (a) once in six months
   (b) every year
   (c) once in three year
   (d) None of these.

10. The supervisor of quality audits is also responsible for auditing all outside organizations that have dealings with M&E. This includes
   (a) parts suppliers
   (b) parts pools
   (c) third-party maintenance organizations
   (d) All

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) What do you understand the reliability of maintenance.

Or

(b) List down the maintenance program objectives?

12. (a) Describe the aircraft maintenance manual.

Or

(b) Write the role of MMEL

13. (a) List down the responsibility of Manager (production planning & Control)

Or

(b) Write the role of production planning.

14. (a) List down the maintenance tasks of line maintenance

Or

(b) List down the role of crew, for entry of log book.

15. (a) Write down the functions of Quality assurance department.

Or

(b) List down he Repetitive Records for quality audit.

Part C (5 × 8 = 40)

Answer **all** questions, choosing either (a) or (b).

16. (a) How to establishing a maintenance programme?

Or

(b) List down the maintenance steering group -2 process steps.

17. (a) List down and explain the regulator documents required for maintenance of aircraft

Or

(b) Write the importance of ATA in overall format of the maintenance manual.

18. (a) Describe the forecasting of M & E organisation.

Or

(b) How to execute the planning of Checks "C"?

19. (a) Prove that maintenance & Engineering responsible for controlling maintenance activities.

Or

(b) List down the typical 48 hours checks of line maintenance.

20. (a) Describe the data collections for typical reliability program.

Or

(b) Explain the maintenance safety program and also primary responsibility of reliability program manager.

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