C–6369

Sub. Code
91313

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

First Semester

Aircraft Maintenance Science

BASIC AERODYNAMICS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Section A (10 × 1 = 10)

Answer **all** questions.

1. In terms of aerodynamic performance, how does high humidity affect lift

   (a) It increases lift

   (b) It decreases lift

   (c) It has no effect on lift

   (d) It increases drag

2. The standard atmospheric condition in the ISA consists of approximately how many percentage of oxygen

   (a) 18% (b) 21%

   (c) 25% (d) 30%

3. What happens when the ailerons are deflected in opposite directions on an aircraft

   (a) The aircraft turns

   (b) The aircraft climbs

   (c) The aircraft rolls

   (d) The aircraft pitches

4. During a turn, which of the following forces must be increased to maintain level flight

(a) Lift (b) Thrust

(c) Weight (d) Drag

5. At a stagnation point on a wing, the pressure is typically

(a) Zero (b) Minimum

(c) Maximum (d) Constant

6. The horizontal tail plane of an aircraft contributes to

(a) Longitudinal stability

(b) Lateral stability

(c) Directional stability

(d) Spiral stability

7. Which configuration is most commonly associated with increased lateral stability

(a) Low-wing configuration

(b) Tandem-wing configuration

(c) Mid-wing configuration

(d) High-wing configuration

8. What is the primary factor responsible for the generation of lift on an airfoil

(a) Air density (b) Angle of attack

(c) Wing shape (d) Speed of the aircraft

9. When an aircraft reaches mach 1, the flow becomes

(a) Subsonic (b) Supersonic

(c) Transonic (d) Hypersonic

10. What happens to the air pressure as an aircraft passes through a shock wave

(a) The pressure decreases drastically

(b) The pressure increases suddenly

(c) The pressure remains constant

(d) The pressure oscillates between high and low

Section B (5 × 5 = 25)

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

11. (a) Calculate the pressure ratio at 7 km and 0 km.

Or

(b) Explain the relationship between temperature and attitude with neat graph.

12. (a) What is wash in and wash out in aerodynamics. Explain.

Or

(b) Explain the generation of lift and drag.

13. (a) Write short notes about level flight conditions.

Or

(b) What are spoilers and how they do differ from other control surfaces?

14. (a) Define stability of aircraft and discuss its types.

Or

(b) Discuss about spiral stability.

15. (a) Explain the role of shock waves.

Or

(b) Explain the behavior of Aeroplane at shock stalls.

Section C (5 × 8 = 40)

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

16. (a) Describe in detail about the composition and structure of Earth's atmosphere.

Or

(b) Explain about international standard atmosphere.

17. (a) Describe the terms shown below

(i) Aerodynamic resultant

(ii) Lift and drag coefficient.

Or

(b) Explain the different types of drag.

18. (a) Discuss in detail about primary control surfaces of aircraft.

Or

(b) Explain the fundamental principles behind the guiding of aircraft.

19. (a) Explain-Lateral stability.

Or

(b) Explain in detail about directional stability.

20. (a) Describe compressibility and incompressibility in high speed theory.

Or

(b) Discuss the challenges and aerodynamic phenomena associated with supersonic speeds in aircraft.

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C–6370	Sub. Code 91315

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025.

First Semester

Aircraft Maintenance Science

MATHEMATICS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Section A (10 × 1 = 10)

Answer **all** questions.

1. The equation $|A - \lambda I| = 0$ is called _____ equation.

   (a) linear (b) non-linear

   (c) characteristic (d) trivial

2. If λ is an eigenvalue of A, then λ^n is an eigenvalue of _____

   (a) A (b) A^n

   (c) A^{-1} (d) nA

3. The centre of the sphere $x^2 + y^2 + z^2 + 2x - 4y - 6z + 5 = 0$ is

   (a) (1, 2, 3) (b) (–1, 2, 3)

   (c) (1, –2, 3) (d) (1, 2, –3)

4. The fixed point is called the _____ of the sphere.

(a) centre (b) tangent

(c) radius (d) none of these

5. The locus '*C*' of the centre of curvature for a curve '*C*' is called the _____

(a) Involute (b) Parameter

(c) Envelope (d) Evolute

6. The envelope of $A\alpha^2 + B\alpha + C = 0$ is

(a) $B^2 - 4AC = 0$ (b) $B^2 + 4aC = 0$

(c) $\frac{B^2}{4AC}$ (d) $\frac{4AC}{B^2}$

7. The Jacobian of $u = \frac{2x - y}{2}$, $v = \frac{y}{2}$ is

(a) 0 (b) 1

(c) $\frac{1}{2}$ (d) $\frac{3}{4}$

8. If $v = \frac{x^3 y^3}{x^3 + y^3}$, then $x\frac{\partial v}{\partial x} + y\frac{\partial v}{\partial y} =$

(a) v (b) $2v$

(c) $3v$ (d) $\frac{v}{2}$

9. What is the main purpose of PERT and CPM?

(a) To minimize costs

(b) To control quality

(c) To optimize resources

(d) To manage time effectively

10. The Earliest Finish Time (EFT) is calculated as

(a) EST – duration (b) EST + duration

(c) LFT – duration (d) LFT + duration

Section B (5 × 5 = 25)

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

11. (a) Find A^4 using Cayley–Hamilton theorem for $A = \begin{pmatrix} 1 & 2 & 3 \\ 2 & -1 & 4 \\ 3 & 1 & -1 \end{pmatrix}$.

Or

(b) If $\lambda_1, \lambda_2, ..., \lambda_n$ are the eigen values of A, find the eigen values of $(A - \lambda I)^2$.

12. (a) Find the centre and radius of the sphere $2x^2 + 2y^2 + 2z^2 + 6x - 6y + 8z + 9 = 0$.

Or

(b) Find the equation of the tangent planes to the sphere $x^2 + y^2 + z^2 - 2x - 4y - 6z - 2 = 0$ which are parallel to the planes $2x - y + 2z + 1 = 0$.

13. (a) Find the radius of curvature of the curve $x = 3a\cos\theta - a\cos 3\theta$; $y = 3a\sin\theta - a\sin 3\theta$.

Or

(b) Find the coordinate of the centre of curvature on the parabola $y^2 = 4ax$ at any point (x, y).

14. (a) $f(x, y) = x^2y + \sin y + e^x$ in Taylor's series about $(1, \pi)$.

Or

(b) If $x = uv$, $y = \dfrac{u+v}{u-v}$, find $\dfrac{\partial(u,v)}{\partial(x,y)}$.

15. (a) Explain the steps involved in the program Evaluation and Review Technique (PERT).

Or

(b) Explain how to calculate the latest start and finish times for activities in a project network.

Section C (5 × 8 = 40)

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

16. (a) Verify Cayley–Hamilton theorem for $\begin{pmatrix} 1 & 0 & 3 \\ 2 & 1 & -1 \\ 1 & -1 & 1 \end{pmatrix}$ and find its inverse.

Or

(b) Find the eigen value and eigen vectors of $\begin{pmatrix} 6 & -6 & 5 \\ 14 & -13 & 10 \\ 7 & -6 & 4 \end{pmatrix}$.

17. (a) Find the equation of the sphere which passes through the points (0, 0, 0), (0, 1, –1), (–1, 2, 0) and (1, 2, 3).

Or

(b) Find the radius of the curve $x^3 + y^3 = 3axy$ at $\left(\frac{3a}{2}, \frac{3a}{2}\right)$.

18. (a) Find the equation of the evolute of the circle $x^{\frac{2}{3}} + y^{\frac{2}{3}} = a^{\frac{2}{3}}$.

Or

(b) Find the envelope of the family of straight lines $y\cos\alpha - x\sin\alpha = a\cos 2\alpha$, α -being the parameter.

19. (a) Expand $e^x \sin y$ in powers of x and y as for as terms of the third degree.

Or

(b) Explain $\tan^{-1}\left(\frac{y}{x}\right)$ in the neighbourhood of (1, 1).

20. (a) Explain how to determine the critical path in CPM and its significance in project management.

Or

(b) Define :

(i) Critical Path Method (CPM)

(ii) Programme Evaluation and Review Technique (PERT)

(iii) Computation of earliest time

(iv) Computation of Latest time

(v) Floats.

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C–6371

Sub. Code
91323

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Second Semester

Aircraft Maintenance Science

WORKSHOP PRACTICES

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. Aircraft safety engineering refers to _____
   (a) Assembly of all functional parts
   (b) Familiarization with aircraft components
   (c) To make aircraft technicians aware of preventive measures to avoid accidents and awareness
   (d) All of these
2. While working with electricity
   (a) Wear costly dresses
   (b) Don't wear loose shins
   (c) Use spanners, screwdrivers, etc
   (d) All of these
3. Mallet belongs to _____
   (a) Marking tools (b) Electric tools
   (c) Hand tools (d) None of these

4. Care of tools is necessary to

(a) Identify the tools

(b) To keep the work continuous

(c) Keeping the tools neat

(d) All of these

5. Least count of micrometer is

(a) 0.01 (b) 0.001

(c) 0.0001 (d) None of these

6. Micrometers are used to check

(a) Diameter length

(b) Flatness

(c) Topper

(d) All of these

7. External micrometer is identified by _____

(a) Internal pointers (b) External pointers

(c) Blunt pointers (d) None of these

8. Dimensions are used to mark _____

(a) Linear measurements

(b) Depth

(c) Circular measurement

(d) None of these

9. The word clearance refers to _____

(a) Max size-min size

(b) Passage

(c) Gap

(d) All of these

10. Heat treatment refers to _____

(a) Heat the materials

(b) To impart mechanical properties to materials

(c) Melt the materials

(d) All of these

Part B (5 × 5 = 25)

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

11. (a) Mention any five aspects of safe working practices.

Or

(b) Mention any five-safety engineering precautionary practices in the aircraft bay while using oils and chemicals.

12. (a) Mention any five common hand tool types with neat sketches.

Or

(b) Discuss common power tool types.

13. (a) Draw a neat sketch of a micrometer and label the parts and explain.

Or

(b) Write short notes on standards of workmanship and precision instruments.

14. (a) Explain the various classes of fits.

Or

(b) Explain the standard methods for checking the sizes of shafts.

15. (a) Define heat treatment and discuss annealing.

Or

(b) Explain hardening in detail.

Part C (5 × 8 = 40)

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

16. (a) Write short notes on elements of the tire and why is aircraft safety necessary.

Or

(b) Mention a few safety precautions while working with aircraft electricity.

17. (a) Write short notes on the care and control of tools.

Or

(b) Write short notes on the calibration of tools and equipment.

18. (a) Explain the construction of the vernier caliper with a neat sketch.

Or

(b) Write short notes on:

(i) Dial gauges

(ii) Slip gauges.

19. (a) Explain common systems of fits and clearances.

Or

(b) Explain the standard methods of checking shafts and bearings.

20. (a) Write short notes on tempering and normalizing.

Or

(b) What is normalizing? Explain in detail.

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C–6372

Sub. Code
91325

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Second Semester

Aircraft Maintenance Science

ELECTRONIC FUNDAMENTALS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. Diodes have _____ terminals.

   (a) 4 (b) 3

   (c) 2 (d) 1

2. From the following semiconductor diodes, only _____ operates in forward bias only.

   (a) LED (b) Zener diode

   (c) Photdiode (d) None of the above

3. BJT stands for _____

   (a) Bi-Junction Transfer

   (b) Blue Junction Transistor

   (c) Bipolar Junction Transistor

   (d) Base Junction Transistor

4. The emitter-base junction of a bipolar transistor is _____

(a) Always reverse biased

(b) Forward biased or reverse biased

(c) Always forward biased

(d) Neither forward or reverse biased

5. An Ex-OR gate gives a high output

(a) If there are odd number of 1's in the input

(b) If there are even number of 1's in the input

(c) If there are odd number of 0's in the input

(d) If there are even number of 0's in the input

6. _____ is the base of binary number system.

(a) 2 (b) 4

(c) 8 (d) 16

7. Tracks on a PCB should never cross.

(a) True (b) False

8. What effects can be observed if the separate power and ground planes are provided with large conducting surfaces for better decoupling in PCB layouts?

(a) Increase in self-inductance

(b) Reduction in self-inductance

(c) Stability in self-inductance

(d) None of the above

9. Benefits of feedback

(a) Performance of system is greater

(b) Need for system much larger path gain and system instability

(c) Controlled variable accurately follows the desired value

(d) Affected by parameter variations

10. Effect of feedback on sensitivity is minimum in

(a) Open loop control system

(b) Closed loop control system

(c) None of the mentioned

(d) Both of the mentioned

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

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

11. (a) Write short note on varistor.

Or

(b) List the applications of the diode.

12. (a) Define Transistor and Draw symbol of Transistor.

Or

(b) What are the types of transistor configurations?

13. (a) What are the basic digital logic gates?

Or

(b) Write the truth table for an EX-OR gate with symbol diagram.

14. (a) Where does the heat come from in a PCB?

Or

(b) Write a short note on PCB board.

15. (a) What are types in synchro system?

Or

(b) What are advantages of closed loop system?

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

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

16. (a) Explain about light emitting diode.

Or

(b) Draw and explain V-I characteristics of PN diode.

17. (a) Briefly explain about Transistor and its various configurations.

Or

(b) Describe about Common collector configuration.

18. (a) Explain about Ex-NOR gate with neat diagram.

Or

(b) Write a brief note on operational amplifier.

19. (a) Give detail explanation about double layered board.

Or

(b) What's the reason for copper coating in PCB?

20. (a) Explain the principles of syncbro system?

Or

(b) Describe construction and working principle of R.V.D.T.

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C–6373

Sub. Code
91333

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Third Semester

Aircraft Maintenance Science

AIRCRAFT MATERIALS AND HARDWARE

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. Metallurgy is the science and technology of metals that deals with
   (a) Extracting metals from ores
   (b) Machining of metals
   (c) Both (a) and (b)
   (d) None of these

2. Ferrous metals play a role which give up
   (a) Electrons to provide a metallic bond
   (b) Protons to provide a physical structure
   (c) Neutrons to get charged
   (d) All of these

3. P16 iron is the type of ferrous materials used in
   (a) Foundry
   (b) Machine shop
   (c) Sheet meter working
   (d) All of above

4. All the tools used on lathe is made up of
   (a) Iron (b) High Carbon steel
   (c) High speed steel (d) All of these

5. Composite materials are the materials that are mode of
   (a) Single bulk materials
   (b) Two or more materials together
   (c) neither (a) nor (b)
   (d) Both (a) and (b)

6. Fuselage of Aircraft is made of
   (a) Steel (b) Copper
   (c) Aluminum (d) All of these

7. Corrosion is an electrochemical attack of
   (a) Sulphur with carbon
   (b) Magnesium with carbon
   (c) Oxygen with carbon
   (d) None of these

8. The purpose of wire locking in Aircraft construction is to provide
   (a) Hold to wings
   (b) Rigid fastening support to rotating fans
   (c) Both (a) and (b)
   (d) None of these

9. Screw threads are termed as
   (a) Foundation bolts (b) Fasteners
   (c) Shuds (d) None

10. Keys are used for
   (a) Power transmission
   (b) To fasten two rotating elements
   (c) Locks
   (d) All of these

Part B (5 × 5 = 25)

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

11. (a) Define Annealing. Explain the process of Annealing.

Or

(b) Explain the purpose and advantages of Annealing.

12. (a) Define Non-ferrous metals. Explain the properties of Non-ferrous metals.

Or

(b) Explain various alloys of Aluminum.

13. (a) Define composite materials. Explain the advantages of composite materials.

Or

(b) Explain various types of wood used in aircraft construction.

14. (a) Define wire locking and discuss the importance of wire locking used in construction of Aircraft.

Or

(b) Explain various causes of corrosion and Define Corrosion.

15. (a) Define Screw and Explain the terms of Screw threads.

Or

(b) Explain various types of studs used Aircraft construction.

Part C

(5 × 8 = 40)

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

16. (a) Define Heat treatment and Explain their advantages.

Or

(b) Explain Rock Well Hardness of inspecting heat treatment.

17. (a) Explain the various alloys of copper used in aircraft materials.

Or

(b) Explain the properties of Aluminum used in aircraft construction.

18. (a) Explain various types of fabrics used as composite materials.

Or

(b) Explain the repairs of non-composite and composite materials.

19. (a) Explain various types of corrosion.

Or

(b) Explain various types of rivets in aircraft construction.

20. (a) Explain specification and identification of bolts used in aircraft Construction.

Or

(b) Explain various types of screw fasteners.

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C–6374

Sub. Code
91334

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025.

Third Semester

Aircraft Maintenance Science

AVIATION LEGISLATION

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. Chicago convention signed at chicago on _____

   (a) 7th day of December 1942

   (b) 7th day of December 1947

   (c) 8th day of December 1944

   (d) 7th day of December 1944

2. Aircraft capable of taking off and landing from either on land or water is called

   (a) Air balloon

   (b) Airship

   (c) Scheduled aircraft

   (d) Amphibian

3. The civil aviation requirement (CAR) are promulgated under _____ section.

   (a) 10 (b) 11

   (c) 12 (d) 13

4. Under which rule aircraft shall be registered for flying?

(a) Rule 50 of the aircraft rule 1937

(b) Rule 5 of the aircraft rule 1937

(c) Rule 15 of the aircraft rule 1937

(d) Rule 25 of the aircraft rule 1937

5. The certificate of airworthiness (CofA) of an aircraft shall be deemed to be suspended under rule_____

(a) Subrule 1 of rule 55

(b) Subrule 2 of rules 55

(c) Subrule 3 of rule 55

(d) Subrule 4 of rules 55

6. CAR-145 Rev.0 was introduced in the year _____ in order to harmonize requirements for approval of aircraft maintenance organization.

(a) 26th January 2001

(b) 26th January 2004

(c) 26th January 2005

(d) None of the above

7. The AME licenses in CAR 66 pattern are available in _____

(a) Three different ways

(b) Four different ways

(c) Two different ways

(d) Five different ways

8. Special flight is issued by director general for the aircraft under rule _____

(a) Rule 55 of the aircraft rule 1937

(b) Rule 55A of the aircraft rule 1934

(c) Rule 55A of the aircraft rule 1937

(d) None of the above

9. The maximum weight, according to its certificate of airworthiness or flight manual, at which an aircraft is permitted take off means _____

(a) Empty weight

(b) Fully loaded weight

(c) Maximum takeoff weight

(d) None of the above

10. Safety management system (SMS) implementation plan is done by _____

(a) Accountable manager

(b) Quality control manager

(c) Safety manager

(d) Maintenance manager

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

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

11. (a) Write about the emergency power of Central Government for protecting the public health.

Or

(b) Write down the classification of aircrafts with a chart.

12. (a) Under what are the conditions the certificate of airworthiness (CofA) shall be suspended or cancelled?

Or

(b) Write down the different categories of aircraft maintenance engineers (AME) licenses of aircrafts and helicopters?

13. (a) Explain :

(i) Aircraft component

(ii) Defect

(iii) Repetitive defect

(iv) Major repair

(v) Scheduled operator

Or

(b) What is

(i) Special flight permit

(ii) Airworthiness

(iii) Maintenance checklist

14. (a) List out the information available in the weight schedule.

Or

(b) Write down the procedures to be carried out during test flight.

15. (a) What are the instruments and equipments to be equipped in aircraft in accordance with the Instrument Flight Rules (IFR)?

Or

(b) Explain about the labeling and colour coding of fuel tanks to identify the grade of fuel they contain.

Part C

(5 × 8 = 40)

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

16. (a) Write down the power of Central Government to prohibit or regulate construction of buildings, planting of trees etc. as per Aircraft Act 1934.

Or

(b) What is the procedure for registration of aircrafts?

17. (a) Under what are the conditions the registration of aircraft may be cancelled?

Or

(b) Write down the list of major defects (classification of major defects).

18. (a) What are the conditions for the issuance of a special flight permit?

Or

(b) List out the documents to be carried on board the aircraft.

19. (a) Under what are the circumstances an aircraft shall be flight tested?

Or

(b) Write short notes on :

(i) Ground proximity warning system (GPWS).

(ii) Flight Data Recorder (FDR) and Cockpit Voice Recorder (CVR).

(iii) Airborne collusion avoidance system (ACAS)

(iv) Emergency locator transmitter (ELT).

20. (a) Write down the safety precautions against static electricity discharge bonding and earthing during fueling of aircrafts.

Or

(b) What are the conditions to be observed while servicing and maintaining of aircraft during fueling?

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C–6375

Sub. Code
91336

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025.

Third Semester

Aircraft Maintenance Science

ELECTRICAL FUNDAMENTALS – I

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Section A (10 × 1 = 10)

Answer **all** questions.

1. When an object gains electrons, it becomes?
   (a) Positively charged
   (b) Negatively charged
   (c) Neutral
   (d) Both positively and negatively charged

2. Materials which do not allow electricity to pass through are known as _____
   (a) Semiconductor (b) Conductor
   (c) Insulator (d) Semi-insulator

3. A battery charge acts like a _____
   (a) Converter (b) Rectifier
   (c) Cyclo converter (d) Copper

4. Kilowatt-hour(kWh) is a unit of?
   (a) Current (b) Power
   (c) Energy (d) Resistance

5. When current flows through a conductor, the conductor will heat up. If the conductor temperature exceeds the insulation rating of the cable then the

(a) insulation can be damaged

(b) circuit current will stop

(c) cable will begin to cool

(d) circuit current increase

6. The voltage dependent resistor normally only conducts when the

(a) circuit current exceeds a certain designed value

(b) power rating of the supply is exceeded

(c) supply voltage needs boosting

(d) supply voltage exceeds a designed limit

7. The rate of doing work is called _____

(a) Force (b) Acceleration

(c) Power (d) Displacement

8. The energy possessed by the body by virtue of its motion is known as?

(a) Chemical energy (b) Thermal energy

(c) Potential energy (d) Kinetic energy

9. For which medium capacitance is high?

(a) Air (b) Mica

(c) Water (d) Metal

10. For high frequencies. capacitor acts as

(a) Open circuit (b) Short circuit

(c) Amplifier (d) Rectifier

Section B (5 × 5 = 25)

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

11. (a) What is difference between semiconductors and insulators?

Or

(b) Write a short note on electromotive force?

12. (a) Define lead acid battery.

Or

(b) Define Kirchhoff's voltage and current laws.

13. (a) Explain the operation of potentiometer and its uses.

Or

(b) Explain how to find the tolerance and limitation of resistor.

14. (a) Define potential energy.

Or

(b) A 100 W light bulb operates for 5 hours. How much energy is dissipated in the form of light and heat?

15. (a) Discuss the factors affecting capacitance.

Or

(b) Explain about the methods for testing capacitors.

Section C (5 × 8 = 40)

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

16. (a) Explain the electrostatic laws of attraction and repulsion.

Or

(b) What are the methods used to produce the electricity? Explain in detail.

17. (a) Explain detail about nickel cadmium cell and its chemicals reaction.

Or

(b) Give detail explanation on operation of photo-cells.

18. (a) Derive the calculation of total resistance using series and series parallel connection.

Or

(b) Describe the construction of Wheatstone Bridge.

19. (a) Explain how power is dissipated by a resistor.

Or

(b) Explain the concept of energy dissipation and its relation to power.

20. (a) Explain the operation and function of a capacitor.

Or

(b) How will calculate the capacitance and voltage in series and parallel circuit?

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C–6376

Sub. Code
91343

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Fourth Semester

Aircraft Maintenance Science

MAINTENANCE PRACTICES — I

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. In third angle projection, which angle is used to visualize the object?

   (a) 45 degrees (b) 90 degrees

   (c) 180 degrees (d) 270 degrees

2. In a wiring diagram, what do straight lines with a dot at the end represent?

   (a) Resistors (b) Junctions

   (c) Capacitors (d) Diodes

3. Which regulatory body sets guidelines and standards for the inspection and testing of aircraft pipes and hoses?

   (a) FAA (Federal Aviation Administration)

   (b) NTSB (National Transportation Safety Board)

   (c) ICAO (International Civil Aviation Organization)

   (d) EASA (European Union Aviation Safety Agency)

4. What safety factor is typically considered during the design and testing of springs for aerospace applications?
   (a) 1.0 (b) 1.5
   (c) 2.0 (d) 3.0

5. Which of the following is a common defect in bearings caused by insufficient lubrication?
   (a) Corrosion (b) Brinelling
   (c) Fretting (d) Fatigue spalling

6. What is a critical parameter to check during the inspection of sprockets?
   (a) Surface color (b) Teeth count
   (c) Chain pitch (d) Overall diameter

7. During inspection, what should be checked to ensure the integrity of push-pull rod ends?
   (a) Only the outer diameter
   (b) Only the inner diameter
   (c) Both the outer and inner diameter
   (d) The thread pitch

8. What is the primary purpose of inspecting control cables in aircraft?
   (a) To check the color consistency
   (b) To verify proper alignment
   (c) To ensure freedom of movement and correct operation
   (d) To measure overall length

9. What tool is commonly used for marking out measurements on sheet metal?
   (a) Micrometer (b) Vernier Caliper
   (c) Scriber (d) Surface gauge

10. Which parameter is critical to monitor during the curing process of adhesive bonding?
   (a) Temperature (b) Surface roughness
   (c) Humidity (d) Color

Part B (5 × 5 = 25)

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

11. (a) Write short notes about projectors in Engineering Drawing.

Or

(b) Explain ATA 100 specifications.

12. (a) Explain Bending and flaring of aircraft pipes.

Or

(b) Explain inspection of springs.

13. (a) What are the requirements of bearings for lubrication?

Or

(b) Explain inspection of gears.

14. (a) Explain the swaging of end fittings.

Or

(b) Write short notes on aircraft flexible control systems.

15. (a) Explain the calculation of bond allowance of sheet metal.

Or

(b) Describe the environmental conditions of material handling.

Part C (5 × 8 = 40)

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

16. (a) Explain in detail about third angle projection.

Or

(b) Explain about wiring diagram and block diagram.

17. (a) Explain the inspection and testing of aircraft pipes and hoses.

Or

(b) Explain the installation and clamping of pipes.

18. (a) Explain the cleaning and inspection of bearings.

Or

(b) Explain the inspection of chains and sprockets.

19. (a) Explain the inspection of push-pull rod systems.

Or

(b) Explain the inspection and testing of control cables.

20. (a) Explain the inspection of sheet metal work.

Or

(b) Explain about Bonding practices.

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C–6377

Sub. Code
91344

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Fourth Semester

Aircraft Maintenance Science

HUMAN FACTORS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. Murphy's law is often associated with which field?
   (a) Physics (b) Engineering
   (c) Literature (d) Medicine

2. What is the optimal temperature range for human comfort in indoor environments?
   (a) 15–18 °C (b) 18–22 °C
   (c) 22–26 °C (d) 26–30 °C

3. What is Claustrophobia?
   (a) Fear of heights
   (b) Fear of open spaces
   (c) Fear of enclosed spaces
   (d) Fear of flying

4. What is a key factor that contributes to employee demotivation?
   (a) Clear goals and objectives
   (b) Regular feedback and recognition
   (c) Micromanagement and lack of thrust
   (d) Opportunities for career advancement

5. Time pressure in the workplace is most likely lead to
   (a) Increased productivity
   (b) Reduced stress levels
   (c) Improved decision making
   (d) More errors and mistakes

6. Drug abuse in the context of human factors primarily affects.
   (a) Personal relationship only
   (b) Workplace safety and performance
   (c) Job satisfaction alone
   (d) Physical health exclusively

7. Visual inspection is crucial in ensuring.
   (a) Auditory communication
   (b) Taste perception
   (c) Safety and quality
   (d) Smell detection

8. Which communication channel is typically used for urgent and critical information in organizations?
   (a) Telephone calls or instant messaging
   (b) Face-to-Face meetings
   (c) Social Media platforms
   (d) Written Memos

9. Which type of error in maintenance tasks occurs due to a lack of knowledge or skills?
   (a) Procedural error (b) Skill-based error
   (c) Decision error (d) Knowledge-based error

10. Which factor is crucial for successful emergency management in human factors?
   (a) Confusion and chaos
   (b) Lack of coordination
   (c) Clear communication
   (d) Avoiding teamwork

Part B (5 × 5 = 25)

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

11. (a) Explain Murphy's Law.

Or

(b) Explain the term vibration in human factors.

12. (a) Describe about attention and perception.

Or

(b) Write short notes about culture issues.

13. (a) How fitness and health is related to human factors?

Or

(b) Write short note about effects of drug abuse.

14. (a) What is visual inspection. Explain.

Or

(b) Explain about work logging.

15. (a) Write short notes about error models.

Or

(b) How a human can recognize and avoid hazards in working environment.

Part C (5 × 8 = 40)

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

16. (a) Explain in detail about the incidents attributable to human error.

Or

(b) Explain the terms.

(i) Illumination

(ii) Noiose and fumes

17. (a) Explain in detail about the responsibility of individual and group members in an organization.

Or

(b) Explain the terms.

(i) Motivation

(ii) Peer pressure

18. (a) Explain in detail about stress.

Or

(b) Explain about sleep and fatigue in human factors.

19. (a) Explain in detail about communication.

Or

(b) Explain in detail about dissemination of information.

20. (a) Explain in detail about the type of error in maintenance tasks.

Or

(b) Explain – dealing with emergencies.

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C–6378

Sub. Code
91346

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Fourth Semester

Aircraft Maintenance Science

ELECTRICAL FUNDAMENTALS — II

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. In a DC generator, the iron losses mainly take place in
   (a) Yoke
   (b) Commutator
   (c) armature conductors
   (d) armature rotor

2. If the speed of a D.C. shunt. motor is increased, the back EMF of the motor will
   (a) Increase (b) Decrease
   (c) remain same (d) become zero

3. The maximum variation between the maximum positive and the maximum negative value is known as?
   (a) Peak value
   (b) Peak to peak value
   (c) Cycle
   (d) Period

4. What is the duration of one cycle known as

(a) Waveform

(b) Peak value

(c) Instantaneous value

(d) Period

5. In an impedance parallel network. the reactive component will either lead or lag the voltage by _____ degrees.

(a) 0 (b) 90

(c) 45 (d) 180

6. The Inductor doesn't allow sudden changes in

(a) Voltage (b) Current

(c) Resistance (d) Inductance

7. The transformer ratings are expressed in terms of

(a) KW (Kilo-Watt)

(b) Volts

(c) KVAR (Kilo-Volt-Ampere-Reactive)

(d) KVA (Kilo-Volt-Ampere)

8. In a transformer, tappings are usually provided

(a) High voltage side

(b) Low voltage side

(c) Primary side

(d) Both option (a) and (b)

9. In an AC generator, a 'X' is a rectangular coil made up of a large number of turns of copper wire coiled around a soft iron core. Determine the identity of X.

(a) Slip ring (b) Armature

(c) Copper brushes (d) Field magnet

10. With increase of load, the speed of induction motor operating in the stable region

(a) Increases

(b) Decreases

(c) Remains constant

(d) Increases and then becomes constant

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

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

11. (a) Explain characteristics of DC generators.

Or

(b) Give application of all types of DC generators.

12. (a) What is Average Value?

Or

(b) Write the Equations and formulas for Peak to Peak Voltage.

13. (a) If in an alternating current circuit, capacitance C is connected to a supply of 200 V,5OHz. Current in the circuit is 1.89 A. Find the capacitance C.

Or

(b) What is the difference between inductive impedance and capacitive impedance?

14. (a) Mention the different losses in transformer. How to overcome.

Or

(b) Mention the applications of auto-transformer.

15. (a) How does an AC generator produce electricity?

Or

(b) Mention some specific applications of synchronous motor.

Part C

(5 × 8 = 40)

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

16. (a) Write the principle of DC Motor with neat diagram.

Or

(b) Explain the methods speed control of DC shunt three motor.

17. (a) Details describe the principle behind the single and three phase.

Or

(b) Explain the purpose of triangle wave and square wave in detail.

18. (a) Describe on apparent power and reactive power.

Or

(b) An inductor of 100 mH, a capacitor of 400 μF and a resistor of 20 Ω are connected in series with a 15 V. variable frequency ac source. Calculate the frequency at which the power factor of the circuit is unity.

19. (a) Describe working of transformer and explain the different types of single phase transformer.

Or

(b) List the losses. which occur in a loaded transformer. Deduce the relationship between losses for maximum efficiency.

20. (a) Explain the operating principle of three-phase alternator.

Or

(b) Explain the working principle of single phase induction motor .Mention its four applications.

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C–6379

Sub. Code
91351

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Fifth Semester

Aircraft Maintenance Science

MAINTENANCE PRACTICES – II

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. What is the primary difference between soldering and brazing?
   (a) Brazing uses a higher temperature than soldering
   (b) Brazing is limited to non-metallic materials
   (c) Soldering does not use a filler material
   (d) Brazing requires melting the base metal

2. Which bonding process is most suitable for joining non-metallic materials?
   (a) Brazing (b) Welding
   (c) Adhesive bonding (d) Soldering

3. What type of equipment is commonly used to weigh an aircraft?
   (a) Hydraulic jacks
   (b) Load cells or platform scales
   (c) Torque wrenches
   (d) Pressure gauges

4. During a post-lightning strike inspection, what type of damage is most critical to check for on composite materials?
   (a) Dents
   (b) Delamination and thermal damage
   (c) Corrosion
   (d) Paint chipping

5. What should be avoided during towing to prevent damage to the aircraft?
   (a) Turning on the aircraft lights
   (b) Moving the aircraft in strong winds
   (c) Sharp turns or sudden stops
   (d) Operating the aircraft's engines

6. What environmental condition would most likely require both deicing and anti-icing procedures?
   (a) Heavy rain
   (b) High humidity
   (c) Freezing rain or snow
   (d) Dry and cold weather

7. Which of the following is not a method of non-destructive testing?
   (a) Radiographic testing
   (b) Ultrasonic testing
   (c) Magnetic particle testing
   (d) Tensile testing

8. Which tool is best suited for inspecting hairline cracks on the surface of a metal component?
   (a) Magnifying glass (b) Telescope
   (c) Baroscope (d) X-ray device

9. What is the primary material used for flame-proof coatings?
   (a) Aluminium
   (b) Epoxy-based compounds
   (c) Plastic polymers
   (d) Glass fibers

10. What materia is commonly used for aircraft seat belts to ensure durability?

(a) Nylon or polyester webbing

(b) Cotton

(c) Steel mesh

(d) Leather

Part B (5 × 5 = 25)

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

11. (a) Describe the tools used in soldering methods.

Or

(b) Explain the types in welded joints.

12. (a) How centre of gravity is calculated in Aircraft?

Or

(b) List out the inspection methods followed after heavy landings.

13. (a) What are the safety precautions associated in Aircraft taxing?

Or

(b) Describe about De-icing procedure in Aircraft.

14. (a) Explain about Die Penetrate testing.

Or

(b) Explain about Magnetic particle inspection.

15. (a) Write short notes about Flame proofing.

Or

(b) Describe about pilot's personal equipment.

Part C (5 × 8 = 40)

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

16. (a) Discuss in detail about inspection of soldered joints.

Or

(b) Explain the inspection of welded joints.

17. (a) Explain the procedure of Aircraft weighing.

Or

(b) Explain in detail about the inspection following lightning strikes and HIRF penetration.

18. (a) Describe in detail about Aircraft Jacking.

Or

(b) Explain about the ground supplies of Electrical hydraulic and pneumatic system.

19. (a) Explain the visual inspection techniques.

Or

(b) Explain the terms :

(i) Radiography

(ii) Eddy current inspection.

20. (a) Discuss in detail about Fire detection systems.

Or

(b) Explain the system testing of Ground handling equipment.

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C–6380

Sub. Code
91352

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Fifth Semester

Aircraft maintenance Science

DIGITAL TECHNIQUES AND ELECTRONIC INSTRUMENTATION SYSTEMS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. Convert 101111 into binary number.

   (a) 46 (b) 47

   (c) 44 (d) 42

2. Which is not an analog-to-digital (ADC) conversion error?

   (a) Differential nonlinearity

   (b) Missing code

   (c) Incorrect code

   (d) Offset

3. The type of Ethernet data bus adapted for airborne applications is _____

   (a) Airborne Simplex Ethernet

   (b) Airborne Duplex Ethernet

   (c) Multiplexed Ethernet

   (d) Avionics Full Duplex Switched Ethernet

4. A universal logic gate is one which can be used to generate any logic function. Which of the following is a universal logic gate?

(a) OR (b) AND

(c) XOR (d) NAND

5. Which form of memory allows for the permanent storage of programs and data once they have been created?

(a) EPROM (b) PROM

(c) EEPROM (d) None of the above

6. FBW system replaces the manual flight controls of an aircraft with an _____ interface.

(a) Automatic (b) Electronic

(c) Mechanical (d) Thermal

7. The Field Effect LCD implements additional plates known as

(a) Polarizers (b) Depolarizers

(c) Saturators (d) Reflectors

8. Which of the following component/s utilize the electromagnetic principle?

(a) Generators (b) Motors

(c) Relays (d) all of these

9. An EADI display of flight directior commands are coloured

(a) Cyan (b) Magenta

(c) Red (d) Green

10. Which system is responsible for providing traffic advisories to avoid potential mid-air collisions in modern aircraft?

(a) IRS (b) GPS

(c) TCAS (d) FMS

Part B (5 × 5 = 25)

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

11. (a) Convert 672_8 to the hexadecimal number system.

Or

(b) How to convert analog signal into digital signal?

12. (a) Explain NOT and Ex-OR gate with logic gate symbols, tables and equivalent circuits.

Or

(b) List the application of fiber optics in Aircraft.

13. (a) Explain about hardware and software.

Or

(b) Explain the airworthiness requirements for software in aviation.

14. (a) Explain the operation of liquid crystal display.

Or

(b) Discuss on HIRF lightning.

15. (a) Explain the roles and functions traffic collision avoidance system in modern aircraft.

Or

(b) Describe about Fly-By-Wire.

Part C (5 × 8 = 40)

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

16. (a) How to Convert Decimal to Binary? With example.

Or

(b) Explain the Operation and application of digital to analogue converters.

17. (a) Explain the role of ARINC and other specifications in aircraft system.

Or

(b) Discuss about the interpretation of logic diagram in aircraft.

18. (a) Explain the various memory devices such as RAM, ROM, and PROM in detail?

Or

(b) Discuss on awareness of Restrictions on Software Changes in Aviation.

19. (a) Illustrate on special handling of components sensitive to electrostatic discharges.

Or

(b) Briefly explain on electromagnetic compatibility and electromagnetic interference.

20. (a) What are operation are processed by the flight management system?

Or

(b) Briefly explain about electronic centralized aircraft monitoring.

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C–6381

Sub. Code
91353A

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Fifth Semester

Aircraft Maintenance Science

AEROPLANE STRUCTURE AND SYSTEMS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. What type of stress cause deformation by sliding along a plane parallel to the direction of the force?

   (a) Tensile stress (b) Compressive stress

   (c) Shear stress (d) Bending stress

2. What type of stress occurs in a cylindrical pressure vessel, such as pipe or a tank?

   (a) Bending stress (b) Hoop stress

   (c) Torsional stress (d) Longitudinal stress

3. Which type of bolt is commonly used in aircraft structures due to its high strength-to-weight ratio?

   (a) Steel bolt (b) Aluminium bolt

   (c) Titanium bolt (d) Hi-shear bolt

4. Which of the following is a type of structural component used to reinforce the skin of an aircraft's fuselage?

(a) Stringer (b) Longerons

(c) Frames (d) Doublers

5. What secures bolts and screws from loosening?

(a) Safety wire (b) Cotter pin

(c) Both (a) and (b) (d) None

6. What provides additional lift during takeoff and landing?

(a) Flaps (b) Slats

(c) Spoilers (d) Ailerons

7. Which component is used to connect leading edge and trailing edge of wing?

(a) Longerons (b) Ribs

(c) Spar (d) Strut

8. What is the primary material used in modern aircraft wing construction?

(a) Wood (b) Aluminium

(c) Steel (d) Carbon fiber composites

9. Which material is commonly used for cabin seating to ensure fire safety and comfort?

(a) Cotton fabric

(b) Flame-retardant synthetic materials

(c) Leather without treatment

(d) Wooden frames with cusions

10. What is used to move and secure cargo inside the aircraft?

(a) Conveyor belts and straps

(b) Hydraulic lifts only

(c) Wooden pallets

(d) Automatic loaders without restraints

Part B (5 × 5 = 25)

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

11. (a) Write a short note on safe life design concept.

Or

(b) Describe about Hoop stress, Fatigue and Torsion.

12. (a) Define the terms Bulkheads, Frames and Beams in aircraft fuselage.

Or

(b) Write the short notes on methods of alignment in Aircraft symmetry.

13. (a) Describe about the engine attachments.

Or

(b) Write a short note on doors and emergency exits in fuselage.

14. (a) Briefly explain about High Lift/Drag attachments.

Or

(b) Write a short note about control surface attachment.

15. (a) Briefly explain about cabin layout.

Or

(b) Write the short notes on Emergency equipment requirements.

Part C (5 × 8 = 40)

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

16. (a) Explain in detail about airworthiness requirements for structural strength.

Or

(b) Explain in detail about the Lightning strike protection provision in detail.

17. (a) Discuss in detail about the structure assembly techniques in aircraft.

Or

(b) What are the methods to protect the surfaces of an aircraft? Explain that methods in detail.

18. (a) Discuss the undercarriage attachments in detail.

Or

(b) Illustrate in detail on window and windscreen construction and its mechanism.

19. (a) Discuss in detail about Aircraft landing gear and its construction.

(b) Illustrate on Aircraft control surfaces construction and its attachment.

20. (a) Discuss about the Lightning strike protection on Aluminium and Composite structures.

Or

(b) Explain in detail about cargo handling.

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C–6383

Sub. Code
91353C

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Fifth Semester

Aircraft Maintenance Science

AIRCRAFT ELECTRICAL SYSTEMS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. One complete of negative and positive values of alternating quantities I called

   (a) Time period (b) Amplitude

   (c) Frequency (d) Cycle

2. Which of the following can he a source of supply in dc power supplies?

   (a) Battery

   (b) Dry cell

   (c) Full wave rectifier

   (d) All of the mentioned

3. The output voltage of a cell changes when a current is drawn from the cell, due to

(a) Internal resistance

(b) Decrease in load resistance

(c) Inductance of the connected load

(d) Depth of discharge of the cell

4. How are the cells connected in a battery?

(a) Except one (b) One after the other

(c) Only first and last (d) Any two

5. A bus-bar is rated by

(a) current only

(b) current and voltage only

(c) current, voltage and frequency only

(d) current, voltage, frequency and short time current capacity

6. What type of flux is suitable for solder

(a) zinc chloride

(b) tallow

(c) hydrochloride

(d) rosin

7. Flemings right hand rule is used to find the

(a) direction of rotation

(b) direction of flux

(c) direction of EMF

(d) direction of torque

8. In relation to electrical drawing, the following symbol is uses for _____

(a) Buzzer

(b) Horn

(c) Lightening arrester

(d) Power circuit breaker

9. Where is the red position light mounted?

(a) On the right wing tip

(b) On top of the vertical stabilizer

(c) On the left wing tip

(d) On the fuselage tail cone

10. What is the function of an Anti-lock braking system?

(a) Used for car parking

(b) To maintain tractive force

(c) Programming the system

(d) To drive the car

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

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

11. (a) What are advantage and disadvantage of AC supply?

Or

(b) List the some of the application of circuit protection devices?

12. (a) Explain the different types of batteries used in aircraft.

Or

(b) Write about nature of the electrolyte and its preparation.

13. (a) Explain about the bus bar and its types.

Or

(b) Write a short note about the soldering,

14. (a) Describe the different types of aircraft generators specific applications.

Or

(b) Describe the role of current limiters in generator output control and their application in aircraft systems.

15. (a) Explain the advantages of lighting systems in aircraft in terms of both safety and comfort.

Or

(b) Describe the features of emergency lighting in aircraft, including its design and installation.

Part C

(5 × 8 = 40)

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

16. (a) Explain the series and parallel connection to design the electrical circuits.

Or

(b) What are the circuit protection devices used in aircraft? Explain in detail.

17. (a) Explain the construction of the lead acid battery and its chemical action.

Or

(b) What are the preparation and pre-installion checks as to be done in aircraft for installation of batteries.

18. (a) Describe how the electrical load is been analysis in the aircraft.

Or

(b) Explain the benefits of emergency power generation and its operation.

19. (a) Explain the construction features of aircraft generators and how they are designed to meet the operational demands of an aircraft.

Or

(b) Explain the maintenance and inspection procedures for aircraft generators, including their installation.

20. (a) Explain the purpose and installation of various lighting systems such as navigation. landing, anti-collision, taxiing lighting in aircraft.

Or

(b) Discuss the inspection and maintenance procedures for aircraft lighting circuits and systems.

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C–6384	Sub. Code 91354A

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025.

Fifth Semester

Aircraft Maintenance Science

GAS TURBINE ENGINES

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. In a gas turbine engine, which component is primarily responsible for increasing the kinetic energy of the airflow?

   (a) compressor

   (b) turbine

   (c) combustion chamber

   (d) nozzle

2. Which component of a turbofan engine is responsible for by passing air around the cone?

   (a) compressor (b) fan

   (c) turbine (d) nozzle

3. Which of the following factors affects the net thrust of a gas turbine engine?

   (a) inlet air velocity (b) exhaust gas velocity

   (c) engine drag (d) all of the above

4. In modern turbofan engines, a typical bypass ratio might range from:

(a) 1:1 to 2:1 (b) 4:1 to 6:1

(c) 10:1 to 15:1 (d) 0.5:1 to 1:1

5. In an axial compressor, the air is compressed primarily in the direction.

(a) radial (b) axial

(c) tangential (d) vertical

6. In a reaction turbine, the steam (or working fluid) enters the rotor blades with

(a) zero velocity (b) a high velocity

(c) a pressure drop (d) a velocity increase

7. What does FADEC stand for in the context of gas turbine engines?

(a) full authority digital engine control

(b) full aircraft digital engine control

(c) functional aircraft digital engine control

(d) flight automated digital engine control

8. Which type of fuel pump is most commonly used in modern gas turbine engines?

(a) gear pump (b) diaphragm pump

(c) piston pump (d) centrifugal pump

9. Which of the following is the most common cause of low oil pressure in a gas turbine engine?

(a) low oil viscosity (b) oil system over fill

(c) clogged oil filter (d) high oil temperature

10. Which type of fuel flow meter is commonly used in gas turbine engines?

(a) positive displacement flow meter

(b) rotameter

(c) turbine flow meter

(d) vortex flow meter

Part B (5 × 5 = 25)

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

11. (a) Write short notes about potential energy and kinetic energy.

Or

(b) Explain the operation of turbojet engine.

12. (a) Describe the terms

(i) Gross thrust

(ii) Choked nozzle thrust.

Or

(b) Describe the terms

(i) by pass ratio

(ii) engine pressure ratio.

13. (a) Differentiate between axial and centrifugal compressors.

Or

(b) Describe about impulse and reaction turbines.

14. (a) Explain the fuel system components.

Or

(b) Describe the terms

(i) fuel nozzles

(ii) drain valves.

15. (a) Write short notes on EGT.

Or

(b) Explain the terms

(i) fuel flow meter

(ii) torque meter.

Part C (5 × 8 = 40)

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

16. (a) Explain the construction and operation of turboprop engine.

Or

(b) Discuss in detail about brayton cycle.

17. (a) Briefly explain about thrust distribution and resultant thrust.

Or

(b) Explain the terms

(i) specific fuel consumption

(ii) compressor ratio.

18. (a) Explain the causes and effects of compressor stall and surge.

Or

(b) Describe in detail about convergent and divergent nozzles.

19. (a) Briefly explain about FADEC.

Or

(b) Explain in detail about fuel pump and filters.

20. (a) Explain about EPR.

Or

(b) Explain in detail about oil pressure and oil temperature.

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C–6386

Sub. Code
91354C

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025.

Fifth Semester

Aircraft Maintenance Science

AIRCRAFT INSTRUMENT SYSTEMS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. Which instrument measures the aircraft altitude?
   (a) Altimeter
   (b) Airspeed indicator
   (c) Attitude indicator
   (d) Vertical speed indicator

2. What is the standard sea-level temperature in the international standard atmosphere?
   (a) 0°C (b) 15°C
   (c) 25°C (d) –10°C

3. What type of display is commonly used in modern aircraft cockpits?
   (a) Analog dials (b) Manual toggles
   (c) Paper charts (d) Digital LCD or LED screens

4. Which principle is followed when designing the layout of an aircraft instrument panel?
   (a) Random placement for cost savings
   (b) Grouping instruments based on function and priority
   (c) Symmetrical alignment regardless of function
   (d) Arrangement according to pilot preference

5. What does a barometer measure?

(a) Atmosphere pressure

(b) Air temperature

(c) Wind speed

(d) Altitude

6. The airspeed indicator derives its readings from

(a) GPS signals

(b) Gyroscope system

(c) Pitot-static system

(d) Magnetic field sensors

7. Which principle do gyroscope instruments primarily rely on?

(a) Rigidity in space and precession

(b) Gravity and magnetism

(c) Atmosphere pressure

(d) Electrical current flow

8. What does the turn indicator measure?

(a) Aircraft altitude

(b) Airspeed during a turn

(c) Engine performance during a turn

(d) The rate of turn and coordination

9. What type of compass uses a separate directional indicator?

(a) Direct reading compass

(b) Remote reading compass

(c) Gyrocompass

(d) Magnetic compass

10. What is the primary advantage of a direct reading compass?

(a) Easy reading

(b) Reduced maintenance

(c) Simplified installation

(d) Increased accuracy

Part B (5 × 5 = 25)

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

11. (a) Define the term "International Standard Atmosphere" (ISA) and give short notes on it.

Or

(b) Describe the concept of static pressure and dynamic pressure in aircraft instrument system.

12. (a) Write a short note about panels and layout of instrument system.

Or

(b) Describe about instrument element mechanism.

13. (a) Briefly explain about Barometer in air data instrument.

Or

(b) Write the short notes on Machmeter in air data instrument.

14. (a) Describe about Gyroscopic theory with its rigidity.

Or

(b) Write the applications of Gyro in different aircraft systems.

15. (a) Describe about the fundamentals of magnetism.

Or

(b) Write a short note on different terminologies related to Earth's magnetism.

Part C (5 × 8 = 40)

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

16. (a) Explain about the fundamentals of pitot-static systems in detail.

Or

(b) What is Atmosphere? Explain the different layers of atmosphere with neat diagram.

17. (a) Discuss in detail about the classification of flight data display with neat sketches.

Or

(b) Discuss in detail about the operational range markings.

18. (a) Explain the working principle of Altimeter and its types in detail.

Or

(b) With the help of neat diagram explain Airspeed indicator in detail.

19. (a) Illustrate the working principle of Directional Gyro/Direction indicator in detail.

Or

(b) Explain about the working principle of Artificial horizon/Horizon gyro in detail.

20. (a) Discuss about types of compasses and their advantages and disadvantages.

Or

(b) Explain the constructional features of Remote reading compasses with application.

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C–6387

Sub. Code
91355A

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025.

Fifth Semester

Aircraft Maintenance Science

AEROPLANE HYDRAULIC SYSTEMS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Section A (10 × 1 = 10)

Answer **all** questions.

1. What is the primary function of a passive hydraulic system?

   (a) To generate power

   (b) To transmit power

   (c) To control fluid flow

   (d) To absorb shocks and vibrations

2. What is the purpose of an accumulator in a passive hydraulic system?

   (a) To filter the fluid

   (b) To regulate the pressure

   (c) To store energy

   (d) To control the flow rate

3. Which type of hydraulic circuit is commonly used in mobile equipment,` such as excavators and cranes?

(a) Open-centre circuit

(b) Closed-centre circuit

(c) Power pack type circuit

(d) Load-sensing circuit

4. What is the primary purpose of regular hydraulic fluid sampling?

(a) To check fluid viscosity

(b) To detect fluid contamination

(c) To measure fluid pressure

(d) To test fluid temperature

5. What is the fire point of a hydraulic fluid?

(a) The temperature at which it ignites

(b) The temperature at which it vaporizes

(c) The temperature at which it becomes viscous

(d) The temperature at which it loses its lubricity

6. What is the primary function of viscosity in a hydraulic fluid?

(a) To provide lubricity

(b) To prevent corrosion

(c) To transmit pressure

(d) To control flow rate

7. Which component is responsible for regulating main pressure in a hydraulic system?

(a) Pressure relief valve

(b) Pressure regulator valve

(c) Flow control valve

(d) Directional control valve

8. What is the purpose of a pneumatic system in a aeroplane?

(a) To generate hydraulic pressure

(b) To provide air pressure for starting the engine

(c) To power pneumatic tools and equipment

(d) To provide cooling air for the engine

9. Which type of hydraulic accumulator is commonly used in aeroplane applications?

(a) Piston-type accumulator

(b) Bladder-type accumulator

(c) Diaphragm-type accumulator

(d) Weight-loaded accumulator

10. What is the recommended frequency for replacing hydraulic filters?

(a) Daily

(b) Weekly

(c) Monthly

(d) As specified by the manufacturer

Section B (5 × 5 = 25)

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

11. (a) What is static pressure and how does it differ from dynamic pressure in a fluid system?

Or

(b) Describe the concept of mechanical advantage and its application in transmission systems.

12. (a) Describe the advantages and disadvantages of using a power pump in a basic hydraulic system.

Or

(b) Describe the components of a hydraulic power pack system.

13. (a) Describe the differences between mineral oil-based and synthetic hydraulic fluids.

Or

(b) Explain the benefits of using PAO-based fluids in high-temperature applications.

14. (a) How do pneumatic accumulators store and release pressure during emergencies?

Or

(b) What are the key components of an indication and warning system?

15. (a) What is the purpose of an accumulator in a hydraulic system?

Or

(b) What are the different types of hydraulic seals and how do they differ in application?

Section C (5 × 8 = 40)

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

16. (a) Discuss the advantages and disadvantages of using passive hydraulic systems in industrial applications.

Or

(b) Describe the process of converting fluid pressure into mechanical force and movement using a hydraulic cylinder.

17. (a) Describe the impact of hydraulic system technology on various industries, including manufacturing, construction and aerospace.

Or

(b) Explain the operation of a hydraulic power pack system.

18. (a) Explain the types of tests used to evaluate the compatibility of hydraulic fluids with aircraft materials.

Or

(b) Describe the different types of filters used in hydraulic systems.

19. (a) What types of valves are commonly used for pressure control in hydraulic and pneumatic systems?

Or

(b) How do indication and warning systems integrate with hydraulic and pneumatic systems to monitor pressure and flow?

20. (a) What is the difference between direct-acting and pilot-operated pressure relief valves?

Or

(b) How does regular maintenance, such as flushing and bleeding, prevent system failures?

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C–6389

Sub. Code
91355C

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Fifth Semester

Aircraft Maintenance Science

AIRCRAFT COMMUNICATION AND NAVIGATION SYSTEMS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Section A (10 × 1 = 10)

Answer **all** questions.

1. The frequency band of UHF is

   (a) 3 to 30 MHz (b) 30 to 300 MHz

   (c) 300 to 3000 MHz (d) 3 to 30 GHz

2. The skip zone is produced by

   (a) Ground wave (b) Space wave

   (c) Sky wave (d) EM wave

3. The length of an antenna should be equal to

   (a) λ of intermediate frequency

   (b) λ of audio frequency

   (c) λ of carrier wave

   (d) $\lambda, \lambda/2, \lambda/4$ or fraction of λ of carrier wave

4. The intermediate frequency of receiver is

(a) 10 KHz (b) 20 MHz

(c) 455 MHz (d) 455 KHz

5. The standard for Communication, Navigation and Identification system is

(a) ARINC 500 and 700

(b) ARINC 700

(c) ARINC 500

(d) ARINC 429 and 629

6. HF communication system operates in the frequency range of

(a) 2 to 30 MHz (b) 3 to 30 MHz

(c) 3 to 300 MHz (d) 2 to 300 MHz

7. VOR is used to find the direction of

(a) Aircraft (b) ATC

(c) VOR station (d) Radio stations

8. Space segment of GPS consist of

(a) 21 Satellites (b) 24 Satellites

(c) 12 Satellites (d) 3 Satellites

9. The "A scope" of radar indicates

(a) altitude of the target

(b) distance of the target

(c) direction of the target

(d) distance and direction of the target

10. The color added to weather radar display enhances

(a) resolution of the image

(b) storm activity image

(c) terrain mapping

(d) weather viewing

Section B (5 × 5 = 25)

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

11. (a) What is skip zone? Explain with the help of diagram.

Or

(b) Write short notes on UHF frequency band.

12. (a) What are the functions of a transmitter?

Or

(b) Draw a diagram of carbon microphone and explain.

13. (a) Explain different modes of operation of HF communications system.

Or

(b) Explain the frequency selection of VHF communication system.

14. (a) Explain the principle of ADF.

Or

(b) Describe Course Deviation Indicator.

15. (a) What are the different frequency bands used by weather radar? Explain.

Or

(b) What are the functions of duplexer of radar?

Section C (5 × 8 = 40)

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

16. (a) What are the different types of carrier waves? Explain.

Or

(b) What are the various frequency bands used for radio system? Explain.

17. (a) Draw a block diagram of a super heterodyne receiver and explain.

Or

(b) What are the different types of antenna used in aircraft? Explain.

18. (a) Draw a block diagram of VHF receiver and explain.

Or

(b) Explain the operation of satellite communication system.

19. (a) Explain the operation of Global Positioning System.

Or

(b) Explain the operation of VOR transmitter.

20. (a) Explain the operation of color weather radar system.

Or

(b) Write short notes on following :

(i) Wave guide

(ii) Magnetron.

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