C–4805

Sub. Code
91313

B.SC DEGREE EXAMINATION, APRIL 2025

First Semester

Aircraft Maintenance Science

BASIC AERODYNAMICS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. In which atmospheric layer is the lapse rate generally higher?

   (a) Troposphere (b) Stratosphere

   (c) Mesosphere (d) Thermosphere

2. How does temperature change with altitude in the International Standard Atmosphere (ISA)?

   (a) Temperature increases linearly with altitude

   (b) Temperature remains constant with altitude

   (c) Temperature decreases linearly with altitude

   (d) Temperature increases exponentially with altitude

3. What is the purpose of washin and washout on a swept wing aircraft?

(a) To maintain uniform lift distribution across wing

(b) To reduce induced drag and improve fuel efficiency

(c) To counteract adverse yaw during roll maneuvers

(d) To enhance stability and control at high speeds.

4. What does the Fineness ratio of an object represent?

(a) The ratio of its length to its width

(b) The ratio of its width to its height

(c) The ratio of its length to its diameter

(d) The ratio of its cross sectional area to its volume.

5. What is the purpose of horizontal stabilizer on an aircraft?

(a) To provide additional lift.

(b) To control the aircraft's pitch motion

(c) To reduce aerodynamics drag

(d) To increase fuel efficiency

6. Which Flight control surface is primary responsible for initiating and controlling turns?

(a) Elevator (b) Aileron

(c) Rudder (d) Spoiler

7. What is the primary objective of dynamic stability in aircraft?

   (a) To maintain a steady flight path in turbulent conditions.

   (b) To minimize fuel consumption during Flight

   (c) To ensure smooth and comfortable flight for passengers.

   (d) To allow the aircraft to recover quickly from disturbances.

8. What is meant by static stability in aircraft?

   (a) The aircraft's ability to maintain a constant speed during flight.

   (b) The aircraft's ability to return to its original position after a disturbances.

   (c) The aircraft's ability to resist changes its flight path.

   (d) The aircraft's ability to remain in level flight.

9. What Factors affect the speed of sound in air?

   (a) Temperature and Humidity

   (b) Altitude & Pressure

   (c) Density and viscosity

   (d) Wing size and shape

10. What is shock stall?

   (a) A stall caused by sudden turbulence in the atmosphere.

   (b) A stall caused by the formation of shock waves over the wings.

   (c) A stall induced by excessive angle of attack

   (d) A stall that occurs during takeoff and landing

Part B (5 × 5 = 25)

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

11. (a) What is the need to define ISA and give its value at standard sea level condition.

Or

(b) How does humidity affect air density and how do changes in humidity impact aircraft performance?

12. (a) Explain the differences between Laminar and turbulent boundary layers.

Or

(b) Discuss the concept of stall and its implications for Flight safety.

13. (a) Discuss the role of spoilers as secondary control surfaces and their contribution to roll control.

Or

(b) What is pitch control, and how do elevators influence the aircraft's pitch altitude?

14. (a) Explain in detail about Longitudinal stability.

Or

(b) Define spiral Divergence in dynamic stability.

15. (a) How does compressibility affect the speed of sound?

Or

(b) What is a shock wave? Explain, how do they influence the flight characteristics of aircrafts?

Part C

$(5 \times 8 = 40)$

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

16. (a) Derive the relation for the pressure variation in the gradient layers of the ISA.

Or

(b) Calculate the pressure ratio and density ratio at 47km and 0km.

17. (a) Define the terms: camber, chord, Mean Aerodynamic chord, Angle of attack.

Or

(b) (i) Explain the factors that influence the drag coefficient of an aircraft. (4)

(ii) Discuss the distinction between parasite drag and induced drag. (4)

18. (a) What are the three primary flight controls on an aircraft, and what are their respective functions?

Or

(b) How does the vertical Fin contribute to the yaw control?

19. (a) Explain in detail about Lateral and directional stability of an aircraft.

Or

(b) Explain the phenomenon of Dutch roll stability.

20. (a) What is shock drag, and how does it differ from other forms of drag experienced by the aircraft?

Or

(b) Explain with neat sketch about critical mach number?

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C–4806

Sub. Code
91315

B.Sc. DEGREE EXAMINATION, APRIL 2025

First Semester

Aircraft Maintenance Science

MATHEMATICS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Section A $(10 \times 1 = 10)$

Answer **all** questions.

1. Find the rank of the matrix $\begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}$.

   (a) 1 (b) 2

   (c) 5 (d) 0

2. If A is orthogonal then $|A| = \pm 1$. Say true or false

   (a) True

   (b) False

   (c) Neither (a) or (b)

   (d) None

3. The angle between the lines $x=1,\ y=2$ and $y+1=0$ and $z=0$ is

(a) 0 (b) $\frac{\pi}{3}$

(c) $\frac{\pi}{4}$ (d) $\frac{\pi}{2}$

4. Find the values of k so the line $\frac{x-2}{2k}=\frac{y-3}{3}=\frac{z+2}{-1}$ find $\frac{x-2}{8}=\frac{y-3}{6}=\frac{z+2}{-2}$ are parallel

(a) –2 (b) 2

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

5. The bending of a curve at a point is termed as _____ of the curve at the point.

(a) Radius (b) Center

(c) Curvature (d) None

6. Find the radius of curvature of the curve $y=e^x$ at the point (0,1)

(a) $2\sqrt{2}$ (b) $\sqrt{2}$

(c) $\sqrt{3}$ (d) 2

7. If $f(x,y,z)=0$ then the value of $\frac{\partial x}{\partial y}\cdot\frac{\partial y}{\partial z}\cdot\frac{\partial z}{\partial x}$ is

(a) 1 (b) –1

(c) 0 (d) None

8. If $f(x,y) = e^{xy^2}$, then total differential of the function at the point (1, 2) is

(a) $e(dx + dy)$ (b) $e^4(dx + dy)$

(c) $e^4(4dx + dy)$ (d) $4e^4(dx + dy)$

9. In PERT chart, the activity time distribution is

(a) Normal (b) Binomial

(c) Poisson (d) Beta

10. Critical path method is good for

(a) Small project only (b) Large project only

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

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

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

11. (a) Find the eigen values of the matrix $\begin{bmatrix} 1 & -2 \\ -5 & -4 \end{bmatrix}$. Hence form the matrix whose eigen values are $\frac{1}{6}$ and –1.

Or

(b) If $A = \begin{bmatrix} 1 & 2 & -3 \\ 0 & 3 & 2 \\ 0 & 0 & -2 \end{bmatrix}$, find the eigen values of $3A^3 + 5A^2 - 6A + 2I$.

12. (a) Show that the plane $2x-2y+z+12=0$ touches the sphere $x^2+y^2+z^2-2x-4y+2z=3$ and find the point of contact.

Or

(b) Find the equation of the right circular cylinder of radius 2 whose axis is the line $\frac{x-l}{2}=\frac{y-2}{1}=\frac{z-3}{2}$.

13. (a) Find ρ for the curve $r=ae^{\theta\cot\alpha}$.

Or

(b) Find the envelop of the family of lines $x\cos^3\alpha+y\sin^3\alpha=a$ the parameter being α.

14. (a) If $x=r\cos\theta,\ y=r\sin\theta$, find $\frac{\partial(x,y)}{\partial(r,\theta)}$.

Or

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

15. (a) Explain the terms, critical path, critical activities.

Or

(b) Explain the measure of certainty in PERT.

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

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

16. (a) Verify Cayley – Hamilton theorem for the matrix $A = \begin{bmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \end{bmatrix}$.

Or

(b) Find the eigen values and eigen vectors of the matrix $\begin{pmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{pmatrix}$.

17. (a) Find the equations to the lines in which the plane $2x + y - z = 0$ cuts the cone $4x^2 - y^2 + 3z^2 = 0$.

Or

(b) Find the equation of the plane passing through the points $(1, -2, 2)$ and $(-3, 1, -2)$ and perpendicular to the plane $2x + y - z + 6 = 0$.

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

Or

(b) Find the center of curvature of the curve $x^2 = 4ay$ at (x, y).

19. (a) Find the absolute maximum and minimum value of $f(x,y) = 2 + 2x + 2y - x^2 - y^2$ on triangular plate in the first quadrant, bounded by the lines $x = 0$, $y = 0$ and $y = q - x$.

Or

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

20. (a) Explain CPM in network analysis.

Or

(b) Mention the applications of PERT/CPM.

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C–4807

Sub. Code
91323

B.Sc. DEGREE EXAMINATION, APRIL 2025

Second Semester

Aircraft Material Science

WORK SHOP PRACTICE

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Section A $(10 \times 1 = 10)$

Answer **all** questions.

1. Five involving oils, petrol, paints, paraffin oil, can be exhinguished using
   (a) Soda acid exhinguisher
   (b) Foam type tire exhinguisher
   (c) CO_2 gas exhingusiher
   (d) Cc14 tire exhinguisher
2. Core of tools can be performed well by
   (a) good book keeping
   (b) Signature must be received before issuing the tools
   (c) Tools much be identify properly
   (d) All of these
3. Dial gauges are used to check the
   (a) Dimensions
   (b) Ovalty strengthness of objects
   (c) Depth
   (d) All of these

4. Least count of vernier caliper is

(a) 0.01 mm (b) 0.02 mm

(c) 0.1 mm (d) None of these

5. Quenching means

(a) Heating the materials and cooling in air

(b) Heating the materials and cooling them in oil bath

(c) Heating the materials and cooling it in chemical acid tank

(d) None of these

6. Case carburizing is used to

(a) Mould the casting

(b) Strengthen the engine casting by odding carbon , nitrogen and cyanide

(c) Heating the materials

(d) All of these

7. The permissible variantion allowed on size of the hole is termed

(a) Fut

(b) Limit

(c) Tolerance

(d) Any one of these

8. Clearance hit means

(a) size of the hole smaller than the shaft

(b) size of the hole larger than the shaft

(c) size of the exactly in size with shaft

(d) none of these

9. The length of the file is measured from

(a) Handle to end

(b) Shoulder to the blade tip

(c) Only steel portion

(d) None of these

10. All the cutting tools are made up of

(a) Maild steel

(b) Cast iron

(c) High carbon steel , hard and tempered

(d) All of these

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

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

11. (a) Mention any four safety precautions to be following white working on compressed gases like oxygen.

Or

(b) Explain various elements of fire.

12. (a) Explain various types of hammers with a sketch.

Or

(b) Explain lubrication equipment and methods.

13. (a) Explain the construction of dail gauge with sketch.

Or

(b) Explain the application of slip gauge with a sketch.

14. (a) Explain various drill sizes for bolt holes.

Or

(b) Explain various classes of fits.

15. (a) Mention nitriding and other surface hardening methods.

Or

(b) Explain the annealing method heat treatment.

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

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

16. (a) Explain various types of fire exhinguishers used.

Or

(b) Explain various safety measures to be followed on the workshop floor.

17. (a) Explain dimensions and tolerances of materials.

Or

(b) Explain the important of calibration of tools.

18. (a) Explain the construction of veriner bevel protractor.

Or

(b) Explain the various types of micrometers.

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

Or

(b) Explain the hardening method heat treatment.

20. (a) Explain the limits of bow, twist and wear.

Or

(b) Explain brinell hardness testing procedure.

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C–4808	Sub. Code 91325

B.Sc. DEGREE EXAMINATION, APRIL 2025.

Second Semester

Aircraft Maintenance Science

ELECTRONIC FUNDAMENTALS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 1 = 10)$

Answer **all** questions.

1. The positive end of a diode is known as the _____.

   (a) Cathode (b) Anode

   (c) Ideal end (d) Forward end

2. The acronym LED stands for _____.

   (a) light energized diode

   (b) light emitting diode

   (c) low energy device

   (d) low energy dynamo

3. Which junction is forward biased when transistor is used as an amplifier?

   (a) Emitter-Base

   (b) Emitter-Collector

   (c) Collector-Base

   (d) No junction is forward biased

4. A transistor has ———————— PN junctions.

(a) one (b) two

(c) three (d) four

5. When an input electrical signal A = 10100 is applied to a NOT gate, its output signal is

(a) 01011 (b) 10101

(c) 10100 (d) 00101

6. The only function of a NOT gate is to

(a) stop a signal

(b) re-complement a signal

(c) invert an input signal

(d) acts as a universal gate

7. Metals of large areas embedded in PCB are known as?

(a) Traces (b) Planes

(c) Targets (d) Regions

8. Which type of PCB requires minimum soldering on component side in order to avoid replacement oriented difficulties?

(a) Single-sided PCB

(b) Double-sided PCB

(c) Both (a) and (b)

(d) None of the above

9. Which of the following is an analog transducer?

(a) Encoders

(b) Strain gauge

(c) Digital tachometers

(d) Limit switches

10. What is the principle of operation of LVDT?

(a) Mutual inductance

(b) Self-inductance

(c) Permanence

(d) Reluctance

Part B

$(5 \times 5 = 25)$

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

11. (a) Draw symbol of diode and explain.

Or

(b) List the uses of silicon — controlled rectifiers.

12. (a) Write the operation of transistor.

Or

(b) List the application of the transistor.

13. (a) Write the truth table for a AND gate with symbol diagram.

Or

(b) Discuss the need for an operational amplifier,

14. (a) How to choose PCB (Printed Circuit Board) material?

Or

(b) Write the use of printed circuit board?

15. (a) Give four applications of Transducer.

Or

(b) What is feedback system?

Part C (5 × 8 = 40)

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

16. (a) Explain series and parallel connection of the diode with neat diagram.

Or

(b) Describe about the characteristics silicon — controlled rectifiers.

17. (a) Briefly explain about the transistor characteristics.

Or

(b) Describe about Common Emitter configuration.

18. (a) Which are the logic gates are called as universal gate and explain briefly.

Or

(b) Write the truth table for an OR gate and NOT gate with symbol diagram.

19. (a) What should be considered when designing a multi-layer PCB?

Or

(b) When a couple of PCBs are connected into a system, how should ground lines of each PCB be connected?

20. (a) What are uses of open and closed loop system?

Or

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

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C–4809	Sub. Code
	91333

B.Sc. DEGREE EXAMINATION, APRIL 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. The cast iron contains iron with a proportion of "C"

   (a) 1.25% C (b) 0.8% C

   (c) 4.2 to 4.8% C (d) All of the above

2. All the cutting tools are?

   (a) Hardened and tampered

   (b) Heated

   (c) Both (a) and (b)

   (d) None of the above

3. The aircraft is constructed on?

   (a) Copper (b) Silver

   (c) Aluminium (d) All of these

4. The material aluminium is used for aircraft construction due to?

   (a) Colour

   (b) Malleable

   (c) Low weight and more load

   (d) All of the above

5. Honey comb is made of ————————.

(a) Plastic (b) Leather

(c) Composite (d) Any of these

6. Annealing means _____.

(a) The process of heating the material and cooling it in air

(b) Cooling in water

(c) Cooling in oil

(d) All of these

7. Tempering is done to?

(a) Increase hardenability

(b) To release thermal stress

(c) Both (a) and (b)

(d) None of these

8. The applied method of removing corrosion is

(a) Quenching

(b) Filing

(c) Anodizing electroplating

(d) All of these

9. The term tolerance refers to _____.

(a) Max limit - min limit

(b) Any size of minimum limit

(c) Both (a) and (b)

(d) All of these

10. All bolts are made of _____.

(a) Case-hardened steel

(b) Mild steel

(c) Medium carbon steel

(d) All of these

Part B (5 × 5 = 25)

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

11. (a) Explain various types of steel used in craft construction.

Or

(b) Explain the purpose of alloying elements on steel.

12. (a) Explain the Brinell Hardness Test for testing iron and steel

Or

(b) Explain the Rockwell Hardness Test of testing iron and steel.

13. (a) Explain the characteristics of composite materials

Or

(b) Explain the sandwich construction of composite materials.

14. (a) Explain various fasteners used in aircraft construction.

Or

(b) Explain the riveting procedure to be followed in aircraft construction.

15. (a) Explain various aircraft specification.

Or

(b) Explain the identification and marking of aircraft bolts.

Part C (5 × 8 = 40)

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

16. (a) Explain various properties of ferrous materials.

Or

(b) Explain the method of measuring fatigue strength.

17. (a) Explain the properties of aluminium.

Or

(b) Explain the properties of copper.

18. (a) Explain various defection of defects used in aircraft construction.

Or

(b) Explain various types of solid and blind rivets.

19. (a) Explain the wire locking method used in aircraft construction.

Or

(b) Explain any one of the methods of heat treatment.

20. (a) Explain identification and marking of bolts.

Or

(b) Explain standard types of screw machine.

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C–4810

Sub. Code
91334

B.Sc. DEGREE EXAMINATION, APRIL 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. Which of the following statements
   (a) Every Indian registered aircraft is required to possess a current and valid certificate of airworthiness(C of A)
   (b) C of A is necessary even if the aircraft is flowing in the vicinity of the departing aerodrome for test for renewal of C of A
   (c) It is the responsibility of the manufacturer and DGCA to ensure that the aircraft has a valid C of A
   (d) All the above statements or true

2. CAR is issued under the provision of
   (a) Section 5B of Aircraft Act 1934
   (b) 133A of Aircraft Rule 1937
   (c) A and B are correct
   (d) None of the above

3. Total number of engine hours =

(a) Number of airframe hours × number of aircraft in the fleet

(b) Number of airframe hours × number of engines installed on that type of aircraft

(c) Number of engines in the fleet × total number of aircraft of all types with the operator

(d) None of these

4. Rule 49 deals with

(a) Type certificate

(b) Maintenance standard and certificate

(c) C of R

(d) Airworthiness

5. Repetitive defect means

(a) Defects that recur in the different aircraft

(b) Defect which recurs in the same aircraft

(c) Both (a) and (b) correct

(d) None of the above

6. How many aircraft can constitution a fleet

(a) Minimum 2 of a particular type of model

(b) Minimum 5 different types of model

(c) Minimum 4 of a particular type of model

(d) None of the above

7. Operator of non-public transport aircraft when flying out station away from the parent base the defect observed shall be recorded in

(a) Engine log book (b) Aircraft log book

(c) Journey log book (d) None of the above

8. Aircraft shall not be fuelled within a radar equipment under test in use in aircraft ground installation

(a) 300 meters (b) 300 feet

(c) 30 meters (d) None

9. Petroleum in bulk means

(a) Petroleum in a receptacle of over 1900 liters

(b) Petroleum content in a container existing 900 liters in capacity

(c) Petroleum in receptacle exceeding 900 gallons in capacity

(d) None of the above

10. Mark the correct statement

(a) Overwing refuelling shall be carried out during electrical storms only if the aircraft is properly Earthed and bounded to the aircraft

(b) During refuelling the refuelling valve will be opened first and ensured that the fuel flows into the aircraft only after the bonding connection is made to ensure safety

(c) Both (a) and (b) are correct

(d) Both (a) and (b) are incorrect

Part B (5 × 5 = 25)

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

11. (a) Describe the purpose of CAR 145.

Or

(b) Write the procedure for issuing taxi permits by the quality manager to facilitate taxing of the aircraft

12. (a) Under what circumstances registration of an aircraft can be cancelled.

Or

(b) Write down the different sections of CAR and explain any four.

13. (a) Explain the conditions of suspension or cancellation of certificate airworthiness (C of A).

Or

(b) What are the circumferences necessitating in flight testing?

14. (a) What are the contents available in a first aid kit in an aircraft?

Or

(b) What are the contents of the medical kit in the aircraft?

15. (a) What is the special precaution to be taken in the fuelling zone?

Or

(b) Enumerate the safety precautions against fire hazards of aircraft.

Part C (5 × 8 = 40)

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

16. (a) Narrate the procedure for defect recording, reporting, investigation rectification and analysis of an aircraft.

Or

(b) Write down the power of the Central government to make order in an emergency.

17. (a) Explain the procedure for the registration of aircraft.

Or

(b) What are the basic facility and general requirements for approval of an organization?

18. (a) What are the special precautions to be taken in the fuelling zone?

Or

(b) Describe the form of the weight schedule and the persons preparing and the contents of the weight schedule.

19. (a) Write down the instruments and types of equipment to be equipped in an aircraft operated by instrument flight rules. (IFR)

Or

(b) What are the documents to be carried on board the aircraft?

20. (a) Write in detail about the air safety and accident/incident prevention program.

Or

(b) Explain the procedures to be followed for servicing and maintenance of aircraft during fuelling.

———————

C–4811	Sub. Code
	91336

B.Sc. DEGREE EXAMINATION, APRIL 2025

Third Semester

Aircraft Maintenance Science

ELECTRICAL FUNDAMENTALS – I

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. Which among the following is not an insulator?
   (a) Wool (b) Plastic
   (c) Silver (d) Paper

2. Electrical resistivity of a given metallic wire depends upon
   (a) Its length (b) Its thickness
   (c) Its shape (d) Nature of the material

3. When the length of the conductor is doubled and the area of cross-section remains the same then its resistance
   (a) Remains the same
   (b) Will be doubled
   (c) Will become half
   (d) Will increase by four times

4. In a lead-acid cell, hydrogen is liberated at ————
   (a) positive plate
   (b) negative plate
   (c) both positive and negative plates
   (d) none of the plates

5. A potentiometer based wire wound has ———— number of terminals?

(a) 1 (b) 2

(c) 3 (d) 4

6. What is the equivalent resistance of series combination of 3 resistors?

(a) Rs = R1 + R2 + R3

(b) Rs = 1(R1+R2+R3)

(c) Rs = 1R1+1R2+1R3

(d) Rs = (R1+R2)R3

7. The rate of doing work is called ————

(a) Force (b) Acceleration

(c) Power (d) Displacement

8. Voltage regulation in the power system is ————

(a) dip in voltage at sending end

(b) rise in voltage at sending end

(c) rise in voltage at receiving end

(d) dip in voltage at receiving end

9. Which of the following is a passive device?

(a) Transistor (b) Rectifier

(c) Capacitor (d) Vaccuum Tubes

10. What happens to the capacitance when a dielectric material is inserted between the plates of a parallel plate capacitor?

(a) Capacitance decreases

(b) Capacitance remains same

(c) Capacitance increases

(d) Depends upon the material of the dielectric

Part B (5 × 5 = 25)

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

11. (a) Write short note on conduction of electricity in solid.

Or

(b) Write about coulomb's law.

12. (a) How does the nickel cadmium cells work?

Or

(b) What are types of alkaline cells and its uses?

13. (a) What is mean by tolerance and limitation?

Or

(b) What are the different types of resistor?

14. (a) Define power with formula.

Or

(b) Find the energy in kWh consumed in 10 hours by four devices of power 500 W each.

15. (a) Define voltage rating.

Or

(b) Explain about capacitance.

Part C (5 × 8 = 40)

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

16. (a) How does the electrostatic laws of attraction and repulsion works?

Or

(b) Write the production of electricity by magnetism and motion.

17. (a) Discuss about primary cell and secondary cell.

Or

(b) Explain the operation of thermocouples.

18. (a) Discuss on calculating the resistance value series connected resistors and parallel connected resistors.

Or

(b) How will you find the positive and negative temperature coefficient of conductance?

19. (a) Briefly explain about kinetic and potential energy.

Or

(b) A crane pulls up a car weighing 500 kg to a vertical height of 4 m. Calculate the work done by the crane.

20. (a) Write about construction and operation of capacitor.

Or

(b) Discuss on calculating the capacitance value series connected capacitors and parallel connected capacitors.

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C–4812

Sub. Code
91343

B.Sc. DEGREE EXAMINATION, APRIL 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 Engineering drawings, what does a solid thick line represent?

   (a) Hidden edges (b) Center lines

   (c) Visible edges (d) Dimension lines

2. Under ATA 100, what is chapter 32 concerned with

   (a) Landing Gear (b) Electrical power

   (c) Flight controls (d) Fuel system

3. Which of the following methods is commonly used to inspect aircraft hoses for internal damage?

   (a) Ultrasonic testing (b) X-ray Inspection

   (c) Visual Inspection (d) Hydrostatic testing

4. Which Non-destructive testing method is commonly used to detect surface cracks in springs?

   (a) Ultrasonic testing

   (b) Magnetic particle Inspection

   (c) X-Ray detection

   (d) Tensile testing

5. What tool is often used for inspect the surface of bearings for cracks or pits?

(a) Micrometer (b) Stethoscope

(c) Magnifying glass (d) Vernier Caliper

6. Which defect is characterized by small, round depressions on the gear teeth surface?

(a) pitting (b) scoring

(c) spalling (d) cracking

7. Which tool is often used to measure the thread pitch of a screw jack?

(a) Caliper (b) Thread gauge

(c) Micrometer (d) Dial indicator

8. Which of the following component is typically part of a flexible control system in an aircraft?

(a) Rigid Rods (b) Hydraulic actuators

(c) Flexible cables (d) Fuel lines

9. What is the main advantage of using automated material handling systems?

(a) Lower initial costs

(b) Increased labor requirements

(c) Enhanced safety and efficiency

(d) Simplified maintenance procedures

10. What is the main concern when handling materials in a high-humidity environment?

(a) Increased static electricity

(b) Material corrosion and nest

(c) Reduced air quality

(d) Enhanced visibility

Part B (5 × 5 = 25)

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

11. (a) Write short notes about drawing Instruments.

Or

(b) Describe schematic diagrams.

12. (a) Explain about pipes and hoses used in aircraft.

Or

(b) Describe the common uses of springs in aircraft maintenance.

13. (a) Explain the testing of bearings.

Or

(b) Write short notes about backlash.

14. (a) Explain the Inspection of lever devices.

Or

(b) State the functions of Bowden cables.

15. (a) What is material handling in maintenance practices?

Or

(b) Explain – Bonding practices.

Part C (5 × 8 = 40)

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

16. (a) Explain in detail about first angle projection?

Or

(b) Explain ATA 100 specifications.

17. (a) Explain in detail about Installation and clamping of pipes.

Or

(b) Explain the Inspection and testing of springs.

18. (a) Explain the defects in bearings and their causes.

Or

(b) Explain the Inspection of belts and pulleys.

19. (a) Explain the Inspection of screw jacks.

Or

(b) Explain in detail about aircraft flexible control systems.

20. (a) Explain the working, Bending and forming of sheet metal.

Or

(b) Explain the environmental conditions in material handling.

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C–4813

Sub. Code
91344

B.Sc. DEGREE EXAMINATION, APRIL 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. What is the main purpose of Illumination in a work environment?

   (a) To improve aesthetic appeal

   (b) To reduce energy consumption

   (c) To enhance visibility and safety

   (d) To decrease the temperature

2. Which frequency range is most likely to cause motion sickness in humans?

   (a) 0.1 to 0.5 HZ (b) 1 to 2 HZ

   (c) 5 to 10 HZ (d) 20 to 50 HZ

3. Prolonged exposure to sound levels above which threshold is considered potentially harmful to human hearing?

   (a) 60 dB (b) 70 dB

   (c) 85 dB (d) 100 dB

4. In the context of decision-making peer pressure can lead to

   (a) More cautious and delibrate choices

   (b) Groupthink and risky behaviors

   (c) Increased adherence to safety protocols

   (d) Enhanced team work and collaboration.

5. Domestic stress can negatively impact work performance by

   (a) Increasing job satisfaction

   (b) Improving work-life balance

   (c) Creating distractions and reducing focus

   (d) Enhancing communication with colleagues

6. What is the primary purpose of implementing shift work schedules?

   (a) To reduce employee productivity

   (b) To ensure 24/7 operational continuity

   (c) To increase workplace accidents

   (d) To discourage employee satisfaction

7. Workers engaged in repetitive tasks should be encouraged to

   (a) Avoid breaks and rest periods

   (b) Maintain static postures

   (c) Alternative tasks and take regular breaks

   (d) Ignore ergonomic principles.

8. Work logging helps in

   (a) Hiding performance metrics

   (b) Tracking progress and milestones

   (c) Avoiding feedback loops

   (d) Reducing transparency

9. Long-term implications of errors in human factors may include.

(a) Reduced operational costs

(b) Improved employee morale

(c) Legal and regulatory consequences

(d) Enhanced customer satisfaction

10. Which of the following is an example of a physical hazard in the workplace?

(a) Excessive noise levels

(b) Poor lighting conditions

(c) High workloads

(d) Conflicting Instructions

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

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

11. (a) Explain the Incidents attributable to human factors.

Or

(b) Describe noise and fumes.

12. (a) Explain about Information processing.

Or

(b) Explain the term peer pressure.

13. (a) Explain the terms.

(i) Time pressure

(ii) Deadlines

Or

(b) Write short notes about medication.

14. (a) What do you mean by repetitive tasks?

Or

(b) Explain work logging and recording.

15. (a) What are the types of error in maintenance tasks?

Or

(b) How a human can avoid and manage errors in workplace?

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

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

16. (a) Explain murphy's law in detail.

Or

(b) Explain in detail about the climate and temperature in a working environment.

17. (a) Explain in detail about claustrophobia.

Or

(b) Explain in detail about team working.

18. (a) Explain in detail about work load.

Or

(b) Explain – shift work.

19. (a) Describe in detail about the importance of communication with in and between teams.

Or

(b) What is dissemination of information – Explain in detail.

20. (a) Explain in detail about error models and theories.

Or

(b) Explain – dealing with emergencies.

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C–4814

Sub. Code
91346

B.Sc. DEGREE EXAMINATION, APRIL 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. The speed of a D.C. shunt motor can be increased by
   (a) Increasing the resistance in armature circuit
   (b) Increasing the resistance in field circuit
   (c) Reducing the resistance in the field circuit
   (d) Reducing the resistance in the armature circuit

2. Which of the following motors, on removal of load, will run at the highest speed?
   (a) Shunt motor
   (b) Series motor
   (c) Differential compound
   (d) Cumulative compound

3. The variation of a quantity such as voltage or current shown on a graph is known as
   (a) Waveform
   (b) Peak value
   (c) Instantaneous value
   (d) Period

4. The maximum instantaneous value measured from zero value is known as

(a) Peak value (b) Peak to peak value

(c) Cycle (d) Period

5. The capacitor doesn't allow sudden changes in _____.

(a) Voltage (b) Current

(c) Resistance (d) Capacitance

6. An Inductor works as a _____ circuit for DC supply.

(a) Open (b) Short

(c) Polar (d) Non-polar

7. A transformer is a

(a) Steps up or down DC voltages

(b) Changes AC to DC

(c) Steps up or down AC voltages

(d) Changes DC to AC

8. Transformer core are laminated in order to

(a) Reduce copper loss

(b) Minimize eddy current loss

(c) Reduce eddy current and hysteresis loss

(d) Reduce hysteresis loss

9. Determine the principle that governs the operation of an a.c. generator.

(a) Eddy currents (b) Faraday's law

(c) Lenz's law (d) Electromagnetic induction

10. By synchronous wattage of an induction motor is meant

(a) Stator input in watts

(b) Rotor output in watts

(c) Rotor input in watts

(d) Shaft output in watts

Part B (5 × 5 = 25)

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

11. (a) Draw the circuit for various types of DC motor.

Or

(b) What are the essential parts of DC machine?

12. (a) What is an Alternating Current?

Or

(b) A sinusoidal current has an rms value of 14 mA. Find the peak-to-peak value.

13. (a) In ac circuit, resistance 5 ohm is connected with capacitor having capacitive reactance 12 ohm. Supply of 260 V is connected to the circuit. Calculate the voltage across resistance.

Or

(b) State the definition of and write the formula for power factor.

14. (a) Compare two winding transformer and auto-transformer.

Or

(b) Mention the applications of band pass and band stop filter.

15. (a) Mention some Advantages of AC Generators.

Or

(b) Explain any two types of single phase induction motors.

Part C (5 × 8 = 40)

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

16. (a) Explain the construction of a DC generator.

Or

(b) What is the need of starter for DC shunt motor?

17. (a) Explain on Sinusoidal Waveform with Basic Form Factor Formula.

Or

(b) Discuss the relation between voltage, current and power.

18. (a) State the phase relationships between current and voltage in an inductor and in a capacitor.

Or

(b) Discuss on power dissipation in inductive, capacitive and resistive.

19. (a) Explain the constructional differences between core and shell-type transformers.

Or

(b) Explain the operating of low pass and high pass filter.

20. (a) Describe the construction of revolving armature and revolving field type AC generators.

Or

(b) Explain one method of starting a synchronous motor.

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