C–3192	Sub. Code 11814

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

First Semester

WORKSHOP PRACTICES

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. List out types of fire extinguishers.

2. List out the rules for chemical storage.

3. What is the use of common screw driver?

4. List out the commonly used torque trenches.

5. What is vernier micrometer?

6. When are the uses of bevel protractor?

7. Define interference fit.

8. What is twist drill?

9. Define brazing.

10. Write the significance of bench lathe.

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

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

11. (a) List out the safety precautions while handling chemicals.

Or

(b) Write the classification of fire agents used in workshop.

12. (a) List out the precautions for files.

Or

(b) How will you calibrate the tools and equipments?

13. (a) Write short notes on micrometer and its types.

Or

(b) List out the types of inside caliper.

14. (a) Explain about the Tolerance Analysis.

Or

(b) Discuss about the Designation of Tolerance.

15. (a) List out the speed changing conditions for lathe.

Or

(b) Write the comparison between plain and universal milling.

Part C (3 × 10 = 30)

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

16. (a) List out the safety precautions when working with electricity in workshop.

Or

(b) Discuss about the common power tools types.

17. (a) List out the vernier caliper callibration procedure.

Or

(b) Write short notes on :

(i) Uses of Calliper

(ii) Zero error in calliper.

18. (a) Discuss about the Twist Drill.

Or

(b) Describe about the principal parts of Column type Milling machine.

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C–3193	Sub. Code 11815

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

First Semester

BASIC ELECTRICITY AND ELECTRONICS

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is the significance of Resistance in series?

2. What are the uses of kirchoff's law?

3. List out the types of speed control of series motor.

4. What is known as "drop reaction triangle"?

5. What is called induction motor?

6. What is the significance of stator of an induction motor?

7. Write the application of non-linear resistor.

8. What is the basic principle of Cathode Ray oscillope?

9. Write the two types of full wave rectifier.

10. What is chopper?

Part B (5 × 5 = 25)

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

11. (a) Write short notes on Relative potential.

Or

(b) Discuss about the transformer tests.

12. (a) What are the speed control of shunt motor?

Or

(b) What are the necessasity of starter in DC motor?

13. (a) Write short notes on Linear Induction Motor.

Or

(b) List out the properties of Linear Induction Motor.

14. (a) Briefly explain about the Power MOSFET circuit.

Or

(b) Discuss about the Series-Parallel combination of resistors.

15. (a) What is linear regulator and its advantages and disadvantages?

Or

(b) List out and explain different types of chopper circuit.

Part C (3 × 10 = 30)

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

16. (a) Explain about the series-parallel circuit of DC motor.

Or

(b) Describe about the Squirrel Cage Motor.

17. (a) Describe about the speed control of Induction Motor.

Or

(b) Explain about the functions of generator with block diagram.

18. (a) List out the discuss about the different types of inverters.

Or

(b) Describe about the Silicon Bilateral Switch.

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C–3194	Sub. Code 11823

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Second Semester

MATHEMATICS — II

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Evaluate $\int_1^b \int_1^a \frac{dxdy}{xy}$.
2. Sketch roughly the region of integration for $\int_0^1 \int_0^x f(x,y)\,dydx$.
3. Define gradient.
4. Define irrotational vector.
5. Find the critical points of the transformation $w = z^2$.
6. Find the fixed points of $w = \frac{3z-4}{z-1}$.
7. Find the laplace transform of $\left[\frac{1}{\sqrt{t}}\right]$.

8. Solve $\frac{dy}{dx} = 1,\ y(0) = 0$ using Laplace transform.

9. Define range.

10. Define median and mode.

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

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

11. (a) Evaluate $\int_0^1 \int_0^1 \int_0^2 xyz\ dzdydx$.

Or

(b) Why do we change the order of integration in multiple integrals? Justify you answer with an example.

12. (a) If $\vec{F} = (4xy - 3x^2z^2)i + 2x^2\vec{j} - 2x^3z\vec{k}$, check whether the integral $\int_C \vec{F} \cdot d\vec{r}$ is independent of path C.

Or

(b) Using the divergence theorem of Gauss, evaluate $\iint_S \vec{F} \cdot \hat{n} dS$ where $\vec{F} = x^3\vec{i} + y^3\vec{j} + z^3\vec{k}$ and S is the sphere $x^2 + y^2 + z^2 = a^2$.

13. (a) Find the bilinear transformation that maps the points $\infty, i, 0$ onto $0, i, \infty$ respectively.

Or

(b) If $f(z)$ is analytic, show that $f(z)$ is constant if real part of $f(z)$ is constant.

14. (a) Find $L^{-1}\left[\log\left(\frac{s^2+1}{s^2}\right)\right]$.

Or

(b) State and prove initial value theorem.

15. (a) Calculate the mean and standard deviation for the following :

x:	25	35	45	55	65	75	85
y:	3	61	132	153	140	51	2

Or

(b) Find the variance of the following data :

6, 8, 10, 12, 14, 16, 18, 20, 22, 24.

Part C (3 × 10 = 30)

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

16. (a) Change the order of integration in $I = \int_0^1 \int_{x^2}^{2-x} f(x, y)\, dxdy$.

Or

(b) Find the area between $y^2 = 4x$ and $x^2 = 4y$ by using Green's theorem.

17. (a) Find the bilinear transformation that maps $z = (1, i, -1)$ into $W = (2, i, -2)$.

Or

(b) Find the image of the circle $|z-1| = 1$ in the complex plane under the mapping $w = \frac{1}{z}$.

18. (a) Apply convolution theorem, to find the inverse Laplace transformation of $\frac{s^2}{(x^2+a^2)(s^2+b^2)}$.

Or

(b) Calculate the mean deviation about median for the following data.

Class :	0-10	10-20	20-30	30-40	40-50	50-60
Frequency :	6	7	15	16	4	2

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C–3191	Sub. Code
	11813

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

First Semester

MATHEMATICS — I

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Find the sum and product of eigen values of the matrix $A = \begin{bmatrix} 1 & 2 & -2 \\ 1 & 0 & 3 \\ -2 & -1 & -3 \end{bmatrix}$.

2. Prove that A and A^T have the same eigen values.

3. Define direction cosines.

4. Write the formula for angle between two lines.

5. Define envelope of a family of curves.

6. Define curvature and radius of curvature.

7. If $u = xy + yz + zx$, where $x = e^t$, $y = e^{-t}$ and $z = \frac{1}{t}$ find $\frac{dy}{dt}$.

8. Find $\frac{dy}{dx}$, when $x^y + y^x = c$.

9. Solve $(D^2 - 4D + 13)y = 0$.

10. Solve for x from the equations $x' - y = t$ and $x + y' = 1$.

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

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

11. (a) Find the eigen values and eigen vectors of $A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$.

Or

(b) Verify the Cayley – Hamilton theorem for the matrix $A = \begin{bmatrix} 5 & 3 \\ 1 & 3 \end{bmatrix}$.

12. (a) Find the equation of the plane passing through the point (1, 2, –1) and perpendicular to the planes $x + y - 2z = 5$ and $3x = y + 4z = 12$.

Or

(b) Find the length of the shortest distance between the lines $\frac{x-2}{2} = \frac{y+1}{3} = \frac{z}{4}$; $2x + 3y - 5z - 6 = 0 = 3x - 2y - z + 3$.

13. (a) Find the radius of curvature at $(a, 0)$ on the curve $xy^2 = a^3 - x^3$.

Or

(b) Find the equation of the circle of curvature of the parabola $y^2 = 12x$ at the point (3, 6).

14. (a) If $u = f(x, y)$ where $x = r\cos\theta$ and $y = r\sin\theta$, prove that $\left(\frac{\partial u}{\partial x}\right)^2 + \left(\frac{\partial u}{\partial y}\right)^2 = \left(\frac{\partial u}{\partial r}\right)^2 + \frac{1}{r^2}\left(\frac{\partial u}{\partial \theta}\right)^2$.

Or

(b) If u and v are functions of x and y then prove that $\frac{\partial(u, v)}{\partial(x, y)} \times \frac{\partial(x, y)}{\partial(u, v)} = 1$.

15. (a) Solve $(D^2 + 5D + 4)y = e^{-x}\sin 2x$.

Or

(b) Solve the simultaneous equations

$dx/dt + 2x - 3y = 5t$

$dy/dt - 3x + 2y = 2e^{2t}$.

Part C (3 × 10 = 30)

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

16. (a) Verify that the matrix $A = \frac{1}{3}\begin{bmatrix} 2 & 2 & 1 \\ -2 & 1 & 2 \\ 1 & -2 & 2 \end{bmatrix}$ is an orthogonal matrix. Also verify that $\frac{1}{\lambda}$ is an eigen value of A, if λ is an eigen value and that the eigen values of A are of unit modulus.

Or

(b) Find the matrix M that diagonalise the matrix $A = \begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$ by means of similarity transformation.

17. (a) Find the angle between the lines whose direction cosines are given by the equations $l + 3m + 5n = 0$ and $2/l - 6/m - 5/n = 0$.

Or

(b) Find the evolute of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$.

18. (a) Using Taylor's series, verify that $\log(1 + x + y) = (x + y) - \frac{1}{2}(x + y)^2 + \frac{1}{3}(x + y)^3 - \cdots$

Or

(b) Solve the equation $\frac{d^2y}{dx^2} + y = x\cos x$, by the method of variation of parameters.

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C–3195	Sub. Code
	11824

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Second Semester

ENGINEERING MECHANICS AND STRENGTH OF MATERIALS

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Define kinematics of a body.
2. State moment of force.
3. Define transmissibility.
4. Two concurrent forces of 12N and 18N are acting at an angle at 60°. Find the resultant force.
5. Find the magnitude of the two forces, such that if they act at right angles their resultant is $\sqrt{10}$N . But it they act at 60°, their resultant is $\sqrt{13}$N .
6. Define moment of inertia.
7. Define rigid body and momentum.

8. Define co-efficient of friction.

9. Define redundant frame.

10. Define torsion of shafts.

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

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

11. (a) Five forces are acting on a particle. The magnitude of the forces are 300N, 600N, 700N, 900N and P and their respective angles with the horizontal are 0°, 60°, 135°, 210°, 270°. If the vertical component of all the forces is 1000N. Find the value of P. Also calculate the magnitude and direction of the resultant assuming that the first force acts towards the point, while all the remaining forces act away from the point.

Or

(b) Explain fundamental concepts of mechanics.

12. (a) Explain the principle of virtual work.

Or

(b) Explain various types of forces.

13. (a) Explain Newton's law's of motion.

Or

(b) Explain the concept of center of gravity.

14. (a) Explain the laws of friction.

Or

(b) Explain the mechanical efficient of simple machines.

15. (a) Explain the limitations of Euler's theory.

Or

(b) Explain free and forced body vibrations.

Part C $(3 \times 10 = 30)$

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

16. (a) Explain the method of resolution of forces.

Or

(b) Explain moment of a couple-force.

17. (a) Derive the equation for efficiency of screw jack.

Or

(b) Explain the theory of belt friction on pulleys.

18. (a) Explain theory of simple bending.

Or

(b) Explain torsion of circular shafts.

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C–3196	Sub. Code 11832

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Third Semester

THERMODYNAMICS

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Write the two types of properties and its significance.

2. What is the significance of thermodynamic equilibrium?

3. Write the equation of state of an ideal gas.

4. Define specific heat at constant pressure.

5. State Gibbs theorem.

6. What is called partial volume?

7. What is called volumetric efficiency?

8. Write the classification of rotary compressor.

9. List out the basic components of gas turbine engine.

10. Write the types of combustion chambers.

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

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

11. (a) Write the importance of Steady flow process.

Or

(b) Write short notes on Energy Reservoir.

12. (a) What are the components used in Vapour compression plant?

Or

(b) Discuss about the brayton cycle with neat sketch.

13. (a) Write the importance of Dalton's law of partial pressure.

Or

(b) Derive the entropy change of an ideal gas.

14. (a) Discuss about the effect of pressure on volumetric efficiency.

Or

(b) Write short notes on Rotor Blower.

15. (a) Write short notes on composite propeller.

Or

(b) Discuss about the valve timing diagram.

Part C (3 × 10 = 30)

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

16. (a) Prove that the heat transfer is a path function.

Or

(b) Explain the working principles of Ammonia Vapour Compression system with a diagram.

17. (a) In an ideal diesel cycle, the compression ratio is 16 and at the beginning of isentropic compression, the temperature is 15°C and pressure is 0.1 Mpa. Heat is added until the temperature at the end of the constant pressure process is 1480°C. Calculate the (i) Cut-off ratio (ii) heat supplied per kg of air (iii) cycle efficiency.

Or

(b) Discuss about the properties of mixture of gases.

18. (a) (i) List out advantages and disadvantages of closed Gas turbine cycle.

(ii) Disadvantages of turbofan engine.

Or

(b) Derive the thrust equation of an turbojet engine.

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C–3197	Sub. Code 11833

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Third Semester

FLUID MECHANICS AND HYDRAULIC MACHINES

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Differentiate simple manometer and differential manometer.
2. What are the different types of mechanical pressure gauges?
3. What do you mean by meta centric height?
4. What do you mean by buoyancy?
5. Define water hammers.
6. Draw the compound pipe and parallel pipe.
7. Define jet.
8. Draw the reciprocating pump and mention its parts.
9. What is hydraulic accumulator?
10. What are the types of valves?

Part B (5 × 5 = 25)

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

11. (a) What is manometer? Write about its type with suitable sketch.

Or

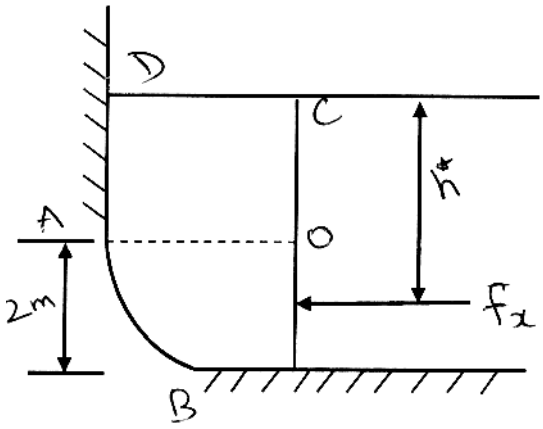
(b) Write definition expression and units followed for given below.

(i) Density

(ii) Weight density

(iii) Specific volume.

12. (a) Compute the horizontal and vertical components of the total force acting on a curved surface AB, which is the form of a quadrant of a circle of radius 2m. Take the width of the gate as unity.



Or

(b) Explain stable, unstable, neutral equilibrium for floating body.

13. (a) Explain about orifice meter with suitable sketch and write the equations to find the discharge through orifice.

Or

(b) Write in detail about the equations of motions.

14. (a) Derive the expression for force exerted on flat vertical plate moving in the direction of jet.

Or

(b) Explain about jet propulsion with suitable examples and applications.

15. (a) Write in detail about the hydraulic intensifier.

Or

(b) Write in detail about the suspended hydraulic lift with suitable diagrams.

Part C $(3 \times 10 = 30)$

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

16. (a) (i) What do you mean by pressure?

(ii) What are the types of pressure?

(iii) Write about the mechanical pressure gauges.

Or

(b) Derive the continuity equation.

17. (a) Find the head lost due to friction in a pipe of diameter 300 mm and length 50 m through which water is flowing at a velocity of 3m/s using (i) Darcy formula (ii) Chezy's formula. Take C = 60.

Or

(b) Derive the expression for velocity potential function.

18. (a) Explain in detail about hydraulic power plant.

Or

(b) Define :

(i) Buoyancy

(ii) Center of buoyancy

(iii) Meta center

(iv) Meta centric height.

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C–3198	Sub. Code 11834

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCES

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Third Semester

AERODYNAMICS AND HELICOPTER THEORY

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is an airfoil?
2. What is dynamic pressure?
3. Define Downwash.
4. What are the forces acting in aircraft in flight?
5. What is blade droop?
6. Define pitch angle.
7. What do you understand by blade alignment?
8. Define tracking.
9. What is the purpose of tail rotor system?
10. What is the function of clutch mechanism?

Part B (5 × 5 = 25)

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

11. (a) Describe an airfoil and explain its nomenclature.

Or

(b) Explain how Bernoulli's principle used in aircraft.

12. (a) Explain the various secondary control surfaces used in aircraft.

Or

(b) Discuss about the various power plants used in aircraft.

13. (a) Explain in detail about blade flapping and conning of a helicopter.

Or

(b) Discuss in detail about the gyroscopic precession and torque.

14. (a) Write short notes on semi rigid motor head.

Or

(b) Explain the construction of rotor mast assembly.

15. (a) Describe in detail about tail rotor system.

Or

(b) Explain in detail about engine transmission of helicopter.

Part C (3 × 10 = 30)

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

16. (a) Explain the meaning of NACA 2412 and NACA 23012.

Or

(b) Discuss in detail about the lateral stability of an aircraft.

17. (a) Discuss the functions of aileron, elevator and rudder.

Or

(b) Explain the following :

(i) Coriolis effect

(ii) Translational lift.

18. (a) Explain in detail about the various methods used in static and dynamic balance of main rotor head.

Or

(b) Write short notes on :

(i) Drive shaft

(ii) Free wheeling unit.

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C–3199	Sub. Code 11835

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCES

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Third Semester

AIRCRAFT CONSTRUCTION

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define load factor.
2. Explain waterline and buttline.
3. What is friese aileron?
4. What is the function of flaps?
5. What is trunnion?
6. How will you classify aircraft landing gear?
7. What is the importance of aircraft balance?
8. What is TEMAC and LEMAC?
9. Define washin and washout.
10. Define aircraft rigging.

Part B (5 × 5 = 25)

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

11. (a) Explain in detail about the aircraft station number and aircraft zoning.

Or

(b) Describe the semi monocoque fuselage construction with neat sketch.

12. (a) How will you done the inspection and maintenance of control system?

Or

(b) Explain with neat sketch of fly by wire system.

13. (a) Explain in detail about the various components of aircraft landing gear.

Or

(b) Give some guidelines for wheel assembly of an aircraft.

14. (a) How will you calculate the EWCG of a conventional aircraft?

Or

(b) List out the weighing procedures of an aircraft.

15. (a) Briefly in explain about the leveling of an aircraft.

Or

(b) Write short notes on fuselage alignment check.

Part C (3 × 10 = 30)

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

16. (a) Differentiate between 'safe life' and 'fail safe' in structural design philosophy. Describe the sandwich construction in detail.

Or

(b) Explain in detail about the balancing of control surfaces.

17. (a) Explain the electrical retraction system of aircraft in landing gear.

Or

(b) With neat sketch, explain the operation of a power boost brake system.

18. (a) Enumerate the various aircraft weighing equipments in detail.

Or

(b) Explain in detail about the flight control surface rigging.

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C–3200	Sub. Code 11842

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Fourth Semester

AIRCRAFT SYSTEMS

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Hydraulic system.

2. Define :
   (a) Flash point
   (b) Fire point.

3. State the purpose of pneumatic relief valve.

4. Why the flexible hoses are used in aircraft fluid system?

5. What is the necessity of pressurizing the cabin?

6. What are the emergency controls in pressurization system?

7. What is the ice protection systems used in Aircraft?

8. Differentiate De-icing and Anti-icing.

9. Describe fuel vent system.

10. What is volatility of fuel?

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

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

11. (a) Describe various types of accumulators.

Or

(b) Describe the viscosity characteristic of hydraulic fluid.

12. (a) Write short note on :

(i) Pneumatic check valve

(ii) Relief valve.

Or

(b) Write short note on pneumatic high pressure system.

13. (a) Describe cabin pressurization, limiting factors and pressurization problems.

Or

(b) Describe the five basic requirements for the successful functioning of cabin pressurization and air-conditioning system.

14. (a) Describe the Deicer boot and its maintenance.

Or

(b) Briefly explain Thermal anti-icing system.

15. (a) Describe properties of gasoline.

Or

(b) Briefly explain rigid removable fuel tank.

Part C (3 × 10 = 30)

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

16. (a) Briefly explain various Hydraulic seals.

Or

(b) With the help of schematic diagram explain basic power driven hydraulic system.

17. (a) Briefly explain a typical pneumatic system.

Or

(b) Briefly explain the Air cycle System.

18. (a) Describe pressure feed fuel system of a light aircraft.

Or

(b) What is icing on aircraft? Explain its effects and methods for prevent or control it with examples.

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C–3201	Sub. Code 11843

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Fourth Semester

AIRCRAFT INSTRUMENTS

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is the significance of Graduation marks on aircraft instruments?

2. Name the flight instruments that comprise the basic T layout.

3. What is the function of static vent?

4. What are the Altimeter Q code settings?

5. Explain the three degrees of freedom of a gyroscope.

6. Define Gyroscopic Precession and Rigidity.

7. How the temperature of Cylinder Head is measured?

8. What adjustments are normally provided in a capacitance type fuel quantity indication system?

9. Define magnetic deviation.

10. Write down the laws of magnetism.

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

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

11. (a) Explain the construction, principle and its operation of Altimeter.

Or

(b) What are the layers of ISA and state its assumptions?

12. (a) What is position error in Pitot static tube and how is it corrected?

Or

(b) Explain the construction, principle and its operation of Vertical Speed Indicator.

13. (a) Explain the construction and operation of Turn and Slip Indicator.

Or

(b) Explain the construction and operation of Rate Gyroscope.

14. (a) Describe the construction of a fuel flow meter indicator and explain basic principle of operation.

Or

(b) List out the EGT types of probe and its location.

15. (a) What are the errors in DR compass and its causes?

Or

(b) What are the methods for calibration of DR Compass?

Part C (3 × 10 = 30)

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

16. (a) Briefly explain the working principle of Barometer. State the advantages and disadvantages of Barometer.

Or

(b) Explain the construction and working principle of Air Speed Indicator.

17. (a) List out and explain the error of accelerating and turning of gyroscope.

Or

(b) Explain the principle and operation of Torque Pressure Indicator.

18. (a) Describe the operation of capacitance type fuel quantity indication system.

Or

(b) Explain the operating principles of remote reading compass.

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C–3202	Sub. Code 11844

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Fourth Semester

AIRCRAFT MATERIALS, HARDWARES AND NDT

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define ferrous metals.

2. Write any four types of heat treatment process.

3. Write short notes on Annealing for Ferrous metals.

4. Define corrosion. Write various types of corrosion.

5. Write the various types of Hardware component in aircraft.

6. Note on Aramid Fiber.

7. Advantages and disadvantages of composite material.

8. What are the types of glues using in aircraft structure?

9. Define impact test. Write any two types Impact test?

10. What is mean by NDT?

Part B (5 × 5 = 25)

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

11. (a) Explain the general properties of Non ferrous metals. Write the advantages.

Or

(b) Explain any two heat treatment processes.

12. (a) Write the cause of corrosion. Explain any three types of corrosion.

Or

(b) Explain chromate treatment.

13. (a) Note on :

(i) Glue

(ii) Dope in Aircraft Construction.

Or

(b) Explain about Bolts and Screw in Aircraft.

14. (a) Write the difference between Glass and Carbon Fibre.

Or

(b) Explain about Honey comb construction.

15. (a) Explain with neat sketch about Rockwell Hardness Test.

Or

(b) Notes on Eddy Current Inspection (with diagram).

Part C (3 × 10 = 30)

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

16. (a) Explain various Heat treatment process of Ferrous metals.

Or

(b) List out any four Ferrous and Non Ferrous metals. Explain in detail about their properties.

17. (a) Explain any two corrosion prevention method (with diagram).

Or

(b) Explain in detail about thermoplastics and thermosetting plastics with example.

18. (a) Manufacturing process of Composite material.

Or

(b) Explain about :

(i) Fatigue test

(ii) Radiography inspection.

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C–3203	Sub. Code 11851

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Fifth Semester

AIRCRAFT RULES AND AIRWORTHINESS REGULATIONS

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Airworthiness.

2. Write the significance of Type Certificate.

3. Write the validity of certificate of airworthiness.

4. What is exit row seat?

5. Define Major Defect.

6. Write the types of documents to be carried on board aircraft.

7. What is Cockpit voice recorder?

8. What is first aid kit?

9. What is the significance of Labelling and Colour Coding?

10. What is the purpose of lubricants?

Part B (5 × 5 = 25)

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

11. (a) Explain the Carriage of Log Books on-board aircraft.

Or

(b) Write the significance of type Certificate.

12. (a) Write the two categories of certificate of Registration.

Or

(b) List out the conditions for Cancellation of Certificate of Airworthiness.

13. (a) Write the requirements for special flight permit.

Or

(b) List out the specified documents on board aircraft.

14. (a) Write the contents of the test flight report.

Or

(b) Write the role of Flight Data Recorder.

15. (a) Write short notes on Fuelling Equipment.

Or

(b) Explain the importance of Floating Suction Check.

Part C (3 × 10 = 30)

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

16. (a) Write short notes on :

(i) General Requirements of log book

(ii) Preservation of Log Book.

Or

(b) List out the requirements for renewal of Certificate of Airworthiness.

17. (a) Describe about the procedure for renewal of AME licence.

Or

(b) Explain about the procedure for special flight permit.

18. (a) Describe about the refuelling procedure and its precautions.

Or

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

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C–3204	Sub. Code
	11852

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Fifth Semester

PISTON ENGINE AND PROPELLER

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Draw P-V and T-s diagram of Otto cycle.

2. Write the engine firing order of horizontally opposed-4 cylinder engine.

3. What is the purpose of super charger?

4. Write the significance of fins in the cylinder head.

5. List out the types of fuel injection system.

6. What are the types of aviation fuels?

7. Write the types of magnetos used in piston engine.

8. What is the significance of spark plug?

9. List out the force acting on the propeller.

10. What is wooden propeller?

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

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

11. (a) Describe the importance of firing order of piston engine.

Or

(b) What is the difference between two stroke and four stroke engine?

12. (a) Describe about the crankshaft components and its functions.

Or

(b) Write short notes on propeller Reduction Gear.

13. (a) List out the characteristics of aviation gasoline.

Or

(b) Write short notes on Carburetor Icing.

14. (a) Discuss about the procedure of ignition shielding and wiring.

Or

(b) Explain the maintenance aspects of engine starter motor.

15. (a) Explain about the pitch change mechanism.

Or

(b) What is propeller theory and its significance?

Part C (3 × 10 = 30)

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

16. (a) List out the classification piston engine and its characteristics.

Or

(b) Discuss about the accessory section of piston engine.

17. (a) Explain about the operation of float type carburetor.

Or

(b) Write short notes on :

(i) Magnetos type

(ii) Ignition Switch

(iii) Characteristics of lubricating oil.

18. (a) Discuss about the general description of fixed pitch propeller.

Or

(b) Explain about the Engine starter Motor.

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C–3205	Sub. Code
	11853

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Fifth Semester

GAS TURBINE ENGINE

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. State Newton's first Law and Second law of Motion.

2. Differentiate Jet Propulsion and Aerodynamics propulsion.

3. Describe Cyclic Efficiency.

4. What is Gross Thrust?

5. What you understand by Thrust Specific Fuel Consumption?

6. What is the purpose of variable Inlet Guide Vanes?

7. Where the Front Main Bearing is located?

8. List out the part of the Axial-flow compressor with its function.

9. Describe the purpose of magnetic chip detector.

10. List out the any four types of engine starting system.

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

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

11. (a) Describe the Brayton's cycle with PV diagram.

Or

(b) Describe functions of Rocket engine.

12. (a) Write short notes on Combustion chamber of GTE.

Or

(b) Write short notes on Thrust reversers of Gas Turbine engine.

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

Or

(b) Briefly explain the construction features of turbo prop engine.

14. (a) Briefly describe the properties of jet fuel.

Or

(b) Write short notes on :

(i) Fuel pump

(ii) Fuel cooled oil cooler.

15. (a) Briefly explain the care in handling synthetic lubricants.

Or

(b) Describe the Electric Starter system.

Part C (3 × 10 = 30)

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

16. (a) Briefly explain the principles of Gas Turbine engine.

Or

(b) Briefly explain the Exhaust nozzle.

17. (a) Briefly explain the FADEC system.

Or

(b) Briefly explain the Noise and method of reduction of noise.

18. (a) Briefly explain the Air starter system.

Or

(b) Briefly explain the different types of gas turbine engine.

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C–3206	Sub. Code 11854

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Fifth Semester

AIRCRAFT ELECTRICAL SYSTEM

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is solenoid?
2. What is the purpose of equalizing circuit?
3. What is the use of vent cap?
4. What are the different types of switches used in aircraft?
5. What is residual magnetism?
6. What are the difference between fuse and circuit breaker?
7. What is purpose of reverse current cutout relay?
8. What is bonding and shielding?
9. What is inverter?
10. What is compensating winding?

Part B (5 × 5 = 25)

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

11. (a) Draw a diagram of relay and explain.

Or

(b) Explain vicious cycling.

12. (a) Explain constant voltage charging.

Or

(b) Explain the maintenance procedure of Nickel Cadmium battery.

13. (a) Explain wire identification number.

Or

(b) Explain routing of electric wire bundles.

14. (a) Discuss electrical load analysis.

Or

(b) Explain parallel electrical system.

15. (a) Explain the general requirements for inspection and maintenance of electrical installation.

Or

(b) Explain Navigation light circuits.

Part C (3 × 10 = 30)

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

16. (a) Explain the theory of Lead Acid battery.

Or

(b) Explain Anti Skid brake system.

17. (a) Explain operation of vibrator type of voltage regulator with the help of a diagram.

Or

(b) Explain construction of Nickel Cadmium battery.

18. (a) Explain the parts of DC generators.

Or

(b) Explain landing gear actuation and indicating circuit.

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C–3207	Sub. Code 11855

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCES

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Fifth Semester

INDUSTRIAL MANAGEMENT

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define management.

2. What are the objectives of planning?

3. Classify organisation structure.

4. Define training.

5. What are the types of motivation?

6. What is the purpose of communication?

7. Name some techniques of time management.

8. Define filing.

9. What is inventory management?

10. Write some advantages of work study.

Part B (5 × 5 = 25)

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

11. (a) Explain the various managerial skills.

Or

(b) Explain the trends and challengers of Management in global scenerio.

12. (a) Write short notes on line and staff authority.

Or

(b) Discuss the various types of selection interviews.

13. (a) Explain in detail about the steps in the decision making process.

Or

(b) Write down the roles and duties of a supervisor.

14. (a) What is office correspondence? Explain its importance.

Or

(b) Explain the structure of production planning and control.

15. (a) What are the functions of inventories?

Or

(b) What is work study? Explain the two techniques used in work study.

Part C (3 × 10 = 30)

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

16. (a) Define MBO. Describe the benefits and weakness of MBO and ways to overcome them.

Or

(b) Discuss the characteristics, functions and importance of an organisation.

17. (a) Explain in detail about the barriers to effective communication.

Or

(b) Explain Mc Gregor's theory X and theory Y.

18. (a) Define time management. Explain the various ways of managing time.

Or

(b) What is inventory control and its objectives and how to achieve them?

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C–3208	Sub. Code
	11861

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Sixth Semester

AIRCRAFT MAINTENANCE, GROUND HANDLING AND SUPPORT EQUIPMENTS

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define the term maintenance.
2. What is Airworthiness?
3. Define special inspection.
4. What is the function of strut?
5. Differentiate rivet pitch and rivet space.
6. What is the functions of aircraft spar?
7. What is difference between taxing and towing?
8. What is meant by Material safety data sheet?
9. What is the purpose of air starter?
10. What is meant by Heat Exchanger?

Part B (5 × 5 = 25)

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

11. (a) Explain about the pre flight inspection.

Or

(b) Write a short note on post flight inspection.

12. (a) Explain the inspection of landing gear.

Or

(b) Write short notes on lightening strike.

13. (a) Write short notes on safety tools.

Or

(b) Briefly describe about the sheet metal bend.

14. (a) Explain taxing signals.

Or

(b) Explain about precautions against wind storm damage.

15. (a) Write note on various aircraft jacks.

Or

(b) Explain about the pre oiling equipment.

Part C (3 × 10 = 30)

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

16. (a) Explain 100 hrs inspection procedure in detail.

Or

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

17. (a) Explain inspection and maintenance of landing gear in detail.

Or

(b) Explain Aircraft jacking procedure in detail.

18. (a) Describe Aircraft fueling procedure in detail.

Or

(b) Discuss maintenance of ground support equipment.

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C–3209	Sub. Code 11862

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Sixth Semester

AERO ENGINE MAINTENANCE

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is the function of carburetor?
2. Define TDC.
3. What is propeller blade tracking?
4. Differentiate fixed pitch and variable pitch propeller.
5. What is the functions of inlet guide vanes?
6. What is difference between stator and rotor?
7. What is meant by FOD?
8. What is over speed inspection?
9. Distinguish between turbo prop and turbo fan engine.
10. What is Engine pressure ratio?

Part B (5 × 5 = 25)

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

11. (a) Explain operation of piston engine based on four stroke.

Or

(b) Write a short note on visual inspection.

12. (a) Explain the inspection of propeller mounts.

Or

(b) Write short notes on propeller blade damage and oil leak.

13. (a) Explain safety precautions to be followed during ground run.

Or

(b) Briefly describe about the acceleration check.

14. (a) Explain the foreign object damage.

Or

(b) Explain about inspection of exhaust section.

15. (a) Write note on various engine parameters indicators.

Or

(b) Explain the engine full throttle checks.

Part C (3 × 10 = 30)

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

16. (a) Explain non destructive inspection carried out during an overhaul.

Or

(b) Explain classification of gas turbine engine. Explain the working of turbine engine.

17. (a) Explain propeller balancing and propeller blade tracking.

Or

(b) Explain various types of propeller used in aircraft. Also explain the inspection of governor and pitch change mechanism.

18. (a) Describe the engine shut down procedure and post sopping procedure.

Or

(b) Write short notes on :

(i) Scheduled maintenance

(ii) Unscheduled maintenance

(iii) Special inspection.

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C–3210	Sub. Code
	11863

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Sixth Semester

AIRCRAFT COMMUNICATION AND NAVIGATION SYSTEM

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define sky wave and space wave.
2. What is the basic principle of INS?
3. What is sampling frequency?
4. Define Doppler Navigation.
5. What are the major drivers in avionic systems?
6. What is the purpose of CVR?
7. What is DR navigation system?
8. Define Course Deviation Indictor.
9. What are the advantages of MLS?
10. What is primary and secondary radar?

Part B (5 × 5 = 25)

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

11. (a) Justify the need for communication system in civil transport aircraft.

Or

(b) Explain various modulation technique in aircraft communication.

12. (a) Explain satellite communication with an example.

Or

(b) Explain testing procedure of a communication system.

13. (a) Explain GPS in detail with necessary diagrams.

Or

(b) Explain the working of ILS with a neat sketch.

14. (a) Explain CVR.

Or

(b) Explain the functions of ELT.

15. (a) Derive Radar Range equation.

Or

(b) Explain aircraft weather radar system.

Part C (3 × 10 = 30)

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

16. (a) Explain the needs for avionics system.

Or

(b) Describe the theory and operations of ADF.

17. (a) Explain Aircraft Collision avoidance system.

Or

(b) What is the purpose of ELT? Explain its basic principles.

18. (a) Describe the operation of Instrument Landing System.

Or

(b) Describe the Operation of Microwave Landing System.

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C–3211	Sub. Code 11864

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Sixth Semester

AIRPORT AND AIR TRAFFIC SERVICES

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What are the objectives of ICAO?
2. Define Aerodrome Reference Point.
3. Define Landing Distance Available (LDA).
4. Differentiate stop way and clear way.
5. What are the functions of an airport?
6. What is difference between terminal and gate?
7. How do you identify aerodrome beacon?
8. What does aerodrome reference temperature refer to?
9. Distinguish between VFR and IFR.
10. What is RNP?

Part B (5 × 5 = 25)

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

11. (a) Explain about Air freedom rights.

Or

(b) Write a short note on different types of Airports.

12. (a) Explain about Taxiway marking.

Or

(b) Write a short note on Primary and Secondary runway.

13. (a) Explain about basic Layout of Airport.

Or

(b) Briefly describe about the function of Ground Support Equipment.

14. (a) Explain about the purpose of X-rays Units in Airport.

Or

(b) Explain about runway lighting system.

15. (a) Write note on NDB and VOR.

Or

(b) Explain the altimeter setting procedure.

Part C (3 × 10 = 30)

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

16. (a) Explain objectives, parts and scope and provision of ATS service.

Or

(b) Explain the classification of ATS airspaces with neat diagrams.

17. (a) Explain the markings in runway, give schematic diagram of airport.

Or

(b) Discuss the following :

(i) Identification beacons.

(ii) Emergency and other service.

18. (a) Describe the establishment, designation and identification of units providing ATS.

Or

(b) Write short notes on :

(i) Aerodrome data

(ii) Basic terminology

(iii) Aerodrome reference code.

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C–3212	Sub. Code 11865

B.Sc. DEGREE EXAMINATION

AERONAUTICAL SCIENCE

APRIL 2021 EXAMINATION

&

APRIL 2020 ARREAR EXAMINATION

Sixth Semester

TRAVEL AND TOUR MANAGEMENT

(2016 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What are the roles of principal service providers?
2. What is ground Operator and state its roles?
3. State the importance of travel industry sectors.
4. What is the need for foreign exchange?
5. Mention few importance of Itinerary planning.
6. Explain special Interest Tours (SITs).
7. Mention few source of Income for Travel agency.
8. What is MICE?
9. Explain the term TAAI.
10. Explain the term IHRA.

Part B (5 × 5 = 25)

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

11. (a) Explain about Thomas cook company and its growth.

Or

(b) Explain about Wholesale and retail travel agency.

12. (a) Explain the importance of Travel Insurance.

Or

(b) Explain the role of Accommodation sector.

13. (a) Explain the need for Gravel formalities.

Or

(b) Explain the types of Tour packages.

14. (a) Explain about the functions of travel agency.

Or

(b) Explain about diversification business in travel agencies.

15. (a) Explain the ITDC and its role.

Or

(b) What are the trends in tourism?

Part C (3 × 10 = 30)

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

16. (a) Explain in detail about the types of Tour Operators.

Or

(b) Explain the Ancillary services in detail.

17. (a) Explain the meaning, importance and types of Itinerary.

Or

(b) Discuss the following :

(i) Tour formulation and designing process.

(ii) Component of tour packages.

18. (a) Explain the accreditation procedures and why is it important.

Or

(b) Explain the roles and Responsibilities of

(i) IAAI

(ii) WTTC.

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