B.Sc. DEGREE EXAMINATION, NOVEMBER 2010

Aircraft Maintenance Science

AVIATION LEGISLATION—II

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. Explain in brief Flight data Recorder (FDR)

2. Explain the categories of Licensing of Aircraft personnel.

3. Explain " Fitness for Flight" Certificate.

4. Describe evaluation of climb performance.

5. Explain RTR Licence.

6. What are the test equipments used in Aircraft.

7. Explain Flight manual.

8. Explain preparation of weight schedule.

Part - B (5 × 12 = 60)

Answer any **five** questions.

9. (a) Explain the requirements for different type of aircraft operations.

(*Or*)

(b) Explain Cockpit Voice Recorder (CVR) and emergency Locater Transmitter (ELT).

10. (a) Explain the conditions for issue/renewal of licence to pilots and their privileges.

(*Or*)

(b) Explain the issue, renewal of approval of certificate of competency.

11. (a) Explain the documentation regarding defect recording, rectification analysis and investigation of an aircraft.

(*Or*)

(b) What are the different types of aircraft maintenance, and how and when they are carried out.

12. (a) Explain "test flight" and its requirements.

(*Or*)

(b) Explain the qualification and experience of pilots carrying out test flights and why is it done ?

13. (a) Explain the function of Airport Fire station.

(*Or*)

(b) Explain the reporting and investigation of aircraft incidents and accidents.

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B.Sc., DEGREE EXAMINATION, NOVEMBER 2010

Aircraft Maintenance Science

ENGLISH

Time : 3 Hours | Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. What was the effect that the Niagara Falls made on Dickens ?

2. What makes water a unique resource ?

3. What is 'that one talent' the poet refers to in the poem "On his blindness" ?

4. Comment on the diction in "The Village School Master".

5. What is the central theme of "Mother's day" ?

6. Write a letter to your friend that must contain the information of your recent tour to Delhi.

7. Why does the poet feel that the Belle has no mercy in her heart ?

8. Write a note on 'note-making' while reading.

Part - B (5 × 12 = 60)

Answer **all** questions.

9. (a) What does Mrs. Pakletide convey through the essay "Mrs. Pakletide's tiger" ?

(Or)

(b) What was the effect that the penny-post made in the art of letter writing ?

10. (a) How does Shelly convey the message that 'decline of all leaders are inevitable', through the poem "Ozymandies" ?

(Or)

(b) Why is Ulysses very ambitious ?

11. (a) How does Lady Gregory portray the Irish freedom in "The Rising of the Moon" ?

(Or)

(b) What is the role played by fate in "Riders to the Sea" ?

12. (a) Develop the following hints:

Dowry ——— sustained evil ——— in ancient times the girl's share of property given —— today it has become a status symbol ——— greed of the groom's family ——— atrocities committed on women ——— helps perpetutate caste system ——— responsible for corruption, black money, inflation ——— law alone cannot check.

(Or)

(b) Why does Wordsworth want the passers-by to stop or to go silently ?

13. (a) How can one develop his communication skill by developing his listening skill ?

(Or)

(b) Write a presentation note to the project that you have made.

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B.Sc., DEGREE EXAMINATION, NOVEMBER 2010

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MATHEMATICS

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** Questions.

1. Resolve into partial fractions $\frac{3x+4}{x^2-3x+2}$.

2. Find the general term in the expansion of $(1+x)^{3/2}$.

3. Find the modulus and amplitude of $1-\sqrt{3}\,i$.

4. Simplify : $\frac{(\cos 2\theta - i\sin 2\theta)^4(\cos 4\theta + i\sin 4\theta)^{-5}}{(\cos 3\theta + i\sin 3\theta)^2(\cos 5\theta - i\sin 5\theta)^{-2}}$.

5. If $y = (\sin^{-1}x)^2$, show that $(1 - x^2)\, y_2 - xy_1 - 2 = 0$

6. If $u = \dfrac{xy}{x+y}$, show that $x\dfrac{\partial u}{\partial x} + y\dfrac{\partial u}{\partial y} = u$.

7. Evaluate : $\int \dfrac{\sin(\log x)}{x}\, dx$.

8. Solve $p = \log(px - y)$.

Part - B (5 × 12 = 60)

Answer **all** questions.

9 (a) Resolve into partial fractions $\dfrac{1}{(x^2+1)^2(x+3)}$.

(*Or*)

(b) Find the sum of the series to infinity

$$\frac{1\cdot 4}{5\cdot 10}-\frac{1\cdot 4\cdot 7}{5\cdot 10\cdot 15}+\frac{1\cdot 4\cdot 7\cdot 10}{5\cdot 10\cdot 15\cdot 20}+\ldots$$

10. (a) (i) If n is positive integer, prove that $(1+i)^n + (1-i)^n = (\sqrt{2})^{n+2}\cos\left(\frac{n\pi}{4}\right)$.

(8)

(ii) Prove that $\left[\frac{1+\sin\theta+i\cos\theta}{1+\sin\theta-i\cos\theta}\right]^n$.

$$=\cos\left(\frac{n\pi}{2}-n\theta\right)+i\sin\left(\frac{n\pi}{2}-n\theta\right)$$

(4)

(*Or*)

(b) (i) Expand $\sin^4\theta \cdot \cos^2\theta$ in a series of cosines of multiple of θ.

(8)

(ii) If $\frac{\sin\theta}{\theta} = \frac{5045}{5046}$, show that $\theta = 1^o 58'$

(approximately).

(4)

11 (a) If $y = \sin(m \sin^{-1}x)$, prove that $(1-x^2)y_2 - xy_1 + m^2y = 0$ and $(1-x^2)y_{n+2} - (2n+1)\,xy_{n+1} + (m^2-n^2)\,y_n = 0$.

(*Or*)

(b) Find n^{th} differential coefficient of

$$y = \frac{3}{(x+1)(2x-1)}.$$

12. (a) Evaluate : $\int \frac{3x-2}{\sqrt{4x^2-4x-5}}\,dx$

(*Or*)

(b) Evaluate : $\int \frac{x}{\sqrt{x^2+x+1}}\,dx$.

13. (a) Solve : $y + px = p^2x^4$.

(*Or*)

(b) Solve $y^2 \log y = xyp + p^2$.

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B.Sc. DEGREE EXAMINATION, NOVEMBER 2010

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BASIC ELECTRICITY

Time : 3 Hours | Maximum : 75 Marks

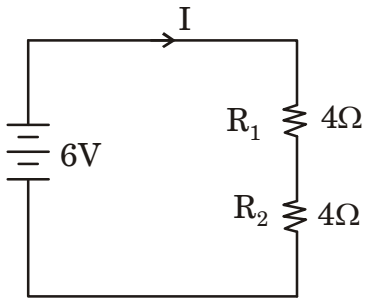
Section - A (5 × 3 = 15)

Answer any **five** questions.

1. Give the electron theory of current.

2. Distinguish diamagnet from paramagnet.

3. Find the voltage accross R_1 and R_2 and the current in the following circuits.



4. Explain how a Zener diode is used as voltage regulator ?

5. Explain why an ammeter is connected in series and voltmeter in parallel in circuits.

6. Distinguish AC generator from DC generator.

7. Find the impedance of an inductance.

8. Explain power factor.

Section - B (5 × 12 = 60)

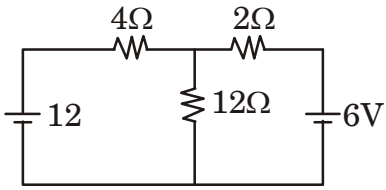
Answer **all** questions.

9. (a) Give the characteristics of ferromagnet. Give the theory of ferromagnetism.

(*Or*)

(b) Explain self inductance and mutual inductance. What are the factors affecting the inductance between two coils ?

10. (a) Explain Thevenin's theorem. make use of Thenvenin's theorem to find the current in the 12Ω resistor of the circuits given below.



(*Or*)

(b) Give the principle of working of transformer. Explain different types of transformers.

11. (a) Give the principle, construction and working of multimeter.

(*Or*)

(b) Give the principle, construction and working of AC motor.

12. (a) Explain A.C. waveform. Find its RMS value. What does RMS value signify ?

(*Or*)

(b) Find the phase difference between the AC voltage and current in an inductance and capacitance.

13. (a) Give the theory of a series resonance R-L-C circuit.

(*Or*)

(b) A coil having L = 0.14 H and R = 9.43 Ω is connected across a 50 Hz, 135 V supply. Compute

(i) X_L.

(ii) Z.

(iii) I.

(iv) power factor and

(v) Power absorbed.

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Aircraft Maintenance Science

PRINCIPLES OF ELECTRONICS AND ELECTRONIC CIRCUITS

Time : 3 Hours | Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. Explain the series and parallel connections of a capacitors.

2. What is meant by *p*-type semiconductor ?

3. Define α, show that it is always less than unity.

4. How does SCR work as a switch ?

5. What is JFET ? Give its symbol. Explain about biasing a JFET.

6. Explain the function of class - A power amplifier.

7. What is Barkhausen criterion ? Explain it.

8. Differentiate between Hartley and Colpitt Oscillators.

Part - B (5 ×12 = 60)

Answer **all** questions.

9. (a) How do you explain the construction of a fixed resistor ? Also determine the tolerance and value of it using colour coding.

(*Or*)

(b) What is variable capacitor ? Give its important uses. Explain the dissipation factor for a capacitor.

10. (a) Discuss the differences between Conductor, Intrinsic semiconductor and Extrinsic semiconductor with relevant examples.

(*Or*)

(b) Explain the input and output characteristics of Common emitter connection with a neat diagram.

11. (a) Describe the working of FET amplifier with neat circuit diagram. Also derive an expression for its voltage gain.

(*Or*)

(b) Discuss some applications of SCR.

12. (a) Explain class A and class B power amplifier with a neat diagram.

(*Or*)

(b) With neat circuit diagram, explain the working of a Colpitt oscillator.

13. (a) Explain the principle and circuit operation of phase shift oscillator with neat diagram.

(*Or*)

(b) What are the initial conditions for a Wien's oscillator ? Explain the voltage gain and phase shift with respect to the frequencies in Wien's Oscillator.

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APPLIED PHYSICS

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. Explain the formation of Newton's rings.

2. What is a diffraction grating ?

3. What is double refraction ?

4. State Lorentz transformation.

5. What is an echo ?

6. What do you mean by NDT ?

7. Explain population inversion.

8. Give the applications of optical fibers.

Part - B (5 × 12 = 60)

Answer **all** questions.

9 (a) Obtain an expression for the radius of curvature of Newton's rings.

(*Or*)

(b) Discuss Fraunhofer diffraction of a single slit.

10. (a) Distinguish between Polariser and Analyser. Explain polarization by reflection.

(*Or*)

(b) What is length contraction and time dilation ? Explain them.

11 (a) What are the good acoustical characteristics of a good hall ? Explain.

(*Or*)

(b) How are ultrasonic waves produced ? Give their properties and uses.

12 (a) Distinguish between Spontaneous and Stimulated emission of radiation. Give an account on semiconductor lasers.

(*Or*)

(b) Give an account on different types of fibers.

13 (a) What are Miller indices ? How are they used to specify crystal planes ? Explain with examples.

(*Or*)

(b) Discuss the various defects associated with crystals.

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Aircraft Maintenance Science

STRENGTH OF MATERIALS AND APPLIED MECHANICS

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. Differentiate Statics and Dynamics.

2. Define Force. Give its unit.

3. What is elastic limit ? Explain.

4. State the principle of a beam.

5. Define Safty factor.

6. Give the uses of springs.

7. Name any three fasteners used in Aircrafts.

8. Define a Rigid body.

Part - B (5 × 12 = 60)

Answer **all** the questions.

9. (a) (i) Explain scalar and vector with examples.

(ii) Name the fundamental units and explain how the derived units obtained from it.

(*Or*)

(b) (i) State and explain parallelogram law of forces.

(ii) Define Moment of force. Explain with example.

10. (a) (i) Explain the different types of stresses and give its applications.

(ii) Explain Hook's Law.

(*Or*)

(b) (i) Describe the types of stresses in nuts and bolts.

(ii) Discuss the stress-strain relationship in materials.

11. (a) Explain SFD and BMD of beams in various types.

(*Or*)

(b) Discuss the theories of failures of structures.

12. (a) Describe the design requirements of shafts. Discuss its uses.

(*Or*)

(b) What is Rivetting ? What are its uses ? Explain rivetting procedure.

13. (a) Explain the various types of fasteners used in aircrafts.

(*Or*)

(b) Describe the working of gear drive. Compare it with belt drive.

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Aircraft Maintenance Science

FUNDAMENTALS OF THERMODYNAMICS

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. Explain Thermodynamic equilibrium.

2. Define Specific heat and Latent heat.

3. Differenciate Heat and Work.

4. What is Enthalpy ? Explain.

5. State the stagnation properties of a compressible fluids.

6. What is Reynold number. Give its importance.

7. Explain the principle of dual cycles.

8. State the different types of Air Conditioning.

Part - B (5 × 12 = 60)

Answer **all** the questions.

9. (a) Explain the various thermodynamic process with example.

(*Or*)

(b) State First law of thermodynamics, and Explain how it applied for flow process.

10. (a) State and explain the second law of thermodynamics. Mention its applications.

(*Or*)

(b) Derive an equation for the ideal gas.

11. (a) Explain the one dimensional steady isentropic flow of liquids.

(*Or*)

(b) Describe the adiabatic flow with and without friction with respect to an aero foil.

12. (a) Explain the three different heat transfer process.

(*Or*)

(b) Describe the principle and working of Heat exchangers.

13. (a) With necessary diagram, explain the working of an ottocycle. How it differ from diesel cycle ?

(*Or*)

(b) Explain the process of Liquefaction of gases. Give its importance.

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B.Sc. DEGREE EXAMINATION, NOVEMBER 2010

Aircraft Maintenance Science

MECHANICS OF FLIGHT AND AIRCRAFT PERFORMANCE

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. What is the significance of troposphere ?

2. What is Bernoulli's principle ?

3. Define Symmetric airfoil.

4. Define Turbulent boundary layer ?

5. Write the fundamental equation of drag and its abbreviation.

6. What is slat ?

7. Define Longitudinal stability.

8. Define Takeoff distance.

Part - B (5 × 12 = 60)

Answer **all** questions.

9. (a) Describe about the various atmospheric layers.

(*Or*)

(b) Write down the application of Newton's law of motion.

10. (a) Write short notes on :

(i) Skin friction drag.

(ii) Induced drag.

(*Or*)

(b) What is angle of attack ? What is its significance with proper sketch ?

11. (a) Briefly describe about the L/D ratio.

(*Or*)

(b) Write short notes on :

(i) Fowler flap.

(ii) Double slotted flap.

(iii) Plain flap.

12. (a) Explain about the various methods of thrust production.

(*Or*)

(b) Write the functions of :

(i) Aileron.

(ii) Rubber with neat sketch.

13. (a) What are the factors affecting takeoff and climb ?

(*Or*)

(b) Explain longitudinal stability and factors contributing to longitudinal stability .

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FLIUD MECHANICS

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. Define specific gravity. Give its unit.

2. State Newton's law of viscosity.

3. Explain Laminer and turbent flow.

4. Water is flowing through a pipe of 5 cm diameter under a pressure of 29.43 N/cm^2 (gauge) and with mean velocity of 2.0 m/s. Find the total head or total energy per unit weight of the water at a cross-section, which is 5 m above the datum line.

5. Deduce Bernoulli's equation of motion from Euler's equation of motion.

6. What are the factors influencing the pressure rise due to water hammer.

7. Define hydraulic efficiency.

8. Write a short note on "direct acting hydraulic lift".

Part - B (5 × 12 = 60)

Answer **all** the questions.

9. (a) Define surface tension. Prove that the relationship between surface tension and pressure inside a droplet of liquid in excess of outside pressure is given by $p = 4\sigma/d$.

(*Or*)

(b) (i) Explain the term kinematic viscosity.

(ii) With the help of a neat diagram, explain the working of U-tube manometer and differential manometer.

10. (a) Define the following and give one practical example for each :

(i) Laminer flow.

(ii) Turbulent flow.

(iii) Steady flow and

(iv) Uniform flow.

(*Or*)

(b) The water is flowing through a pipe having diameters 20 cm and 10 cm at Sections 1 and 2 respectively. The rate of flow through pipe is 35 litres/s. The Section 1 is 6 m above datum and Section 2 is 4m above datum. If the pressure at Section 1 is 36.24 N/cm^2, find the intensity of pressure at Section 2.

11. (a) A syphon of diamete 150 mm connects two reservoirs having a difference in elevation of 15 m. The length of the siphon is 400 m and summit is 4.0 m above the water level in the upper reservoir. The length of the pipe from upper reservoir to the summit is 80 m. Determine the discharge through the siphon and also pressure at the summit. Neglect minor losses. The co-efficient of friction, $f = 0.005$.

(*Or*)

(b) (i) Define and explain the terms hydraulic gradient line and total energy line.

(ii) What do you mean by equivalent pipe ? Obtain an expression for equivalent pipe.

12. (a) Show that the angle of swing of a vertical hinged plate is given by $\sin\theta = \rho a v^2 / w$, where v = velocity of the jet striking the plate, a = area of the jet, and w = weight of the plate.

(*Or*)

(b) (i) Define the terms impact of jets and jet propulsion.

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

13. (a) Explain with neat sketch, the working of different hydraulic lift. Mention its advantages.

(*Or*)

(b) Differentiate between hydraulic ram and centrifugal pump. Obtain an expression for the efficiencies of the hydraulic lift.

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AIRCRAFT MATERIALS AND NON-DESTRUCTIVE TESTS

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. List down the various physical properties of materials.

2. Enumerate the alloys of nickel with their chemical composition.

3. Explain "Austempering".

4. What is veneer ? Where it is used ?

5. Why NDI is important in Aircraft maintenance ?

6. Describe various locking devices used for nuts and bolts.

7. Describe the purpose of titanium.

8. Name four methods used for determining the hardness of metals.

Part - B (5 × 12 = 60)

Answer **all** questions.

9. (a) Explain in detail about impact tests.

(*Or*)

(b) Write short notes on :

(i) Yield point.

(ii) Density.

(iii) Normalizing.

(iv) Tensile strength.

10. (a) Explain the properties of Aluminium and its alloy.

(*Or*)

(b) Explain how the SAE Steel numbering system help for identifying metals.

11. (a) What is annealing ? And what is the effect of it on metal ?

(*Or*)

(b) What is "Carburizing" ? Explain.

12. (a) How wood can be bended ? Explain.

(*Or*)

(b) Describe the classification of plastic and explain.

13. (a) Describe the radiography (X-ray) inspection.

(*Or*)

(b) Explain Magnetic Particle inspection in detail.

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Aircraft Maintenance Science

AIRFRAME STRUCTURE AND SYSTEMS

Time : 3 Hours Maximum : 75 Marks

Draw suitable diagrams if necessary.

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. Define structural and Non-Structural member with examples.

2. What are shimmy dampers ? Name its types.

3. What are slats and how do they work ?

4. Define :

   (a) Datum. (b) Moment.

   (c) Empty Weight.

5. Write a short note on Fuel Crossfeed system.

6. Define “Fail Safe” design.

7. Explain honeycomb construction and mention its advantages.

8. Define :

   (a) Flash Point.

   (b) Fire Point.

Part - B (5 × 12 = 60)

Answer **all** questions.

9. (a) Briefly explain location numbering system of aircraft and the location designation typical of those used by many manufacturers.

(*Or*)

(b) Describe the hydraulic retraction system of Landing gear.

10. (a) Explain control around longitudinal axis.

(*Or*)

(b) Briefly explain "Fly by Wire" system and its advantages.

11. (a) How incidence angle of wing is checked ?

(*Or*)

(b) How will you calculate the Empty Weight Centre of Gravity (EWCG) of various aircrafts ?

12. (a) List out the advantages and disadvantages of Pneumatic system over Hydraulic system.

(*Or*)

(b) What are the precautions to be observed while handling hydraulic fluid ? Also explain reasons for contamination of hydraulic fluid.

13. (a) Explain light aircraft pressure feed fuel system.

(*Or*)

(b) Write short notes on :

(i) Fuel Heater.

(ii) Vane Type Fuel Pump.

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PISTON ENGINE AND PROPELLER

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. What is Reciprocating Engine ?

2. Write the functions of crankcase.

3. Write the functions of piston rings in Reciprocating Engine.

4. Define :

   (a) Boyle's Law.

   (b) Charle's Law.

5. What is volumetric efficiency ?

6. Name the parts of Valve operating Machanism.

7. What are the functions of lubrication system in piston engine ?

8. Name the different types of propellers.

Part - B (5 × 12 = 60)

Answer **all** questions.

9. (a) Write in details about the factors affecting engine performance.

(*Or*)

(b) What is indicated horsepower and explain formula in details ?

10. Write in details :

(a) (i) Piston of Reciprocating engine.

(ii) VALVES of Reciprocating engine.

(*Or*)

(b) (i) Mechanical efficiency.

(ii) Thermal efficiency.

11. Explain in details :

(a) (i) Reciprocating engine induction system.

(ii) Inline and Radial engine aircooling system.

(*Or*)

(b) (i) Purpose of supercharger and constructional details.

(ii) Purpose of turbo charger and constructional details.

12. (a) Explain the principle of operation of pressure injection types carburettor.

(*Or*)

(b) (i) Definition of wet-sump and dry-sump lubrication system.

(ii) Explain dry-sump lubrication system of Reciprocating engine.

13. (a) What are the forces acting on the propeller inflight and explain each force.

(*Or*)

(b) Discuss briefly :

(i) Tractor propeller.

(ii) Pusher propeller.

(iii) Angle of attack.

(iv) Effective pitch.

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TURBINE ENGINE

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. Describe the basic operation of a gas turbine engine.

2. Describe the effect of temperature on thrust.

3. Describe the principle of operation of a centrifugal compressor.

4. Describe the function of fuel cooled oil cooler.

5. Describe the function of magnetic chip detector.

6. Describe the function of Glow Plug ignition system.

7. Describe the function of a gas turbine starter.

8. Describe with simple diagram fixed turbine type power conversion in a turbo prop engine.

Part - B (5 × 12 = 60)

Answer **all** questions.

9. (a) Describe briefly the events of the Brayton cycle with Volume verses Pressure and Temperature verses Pressure diagrams.

(*Or*)

(b) Define Gross thrust, Net thrust and equation for net thrust for choked nozzle.

10. (a) Describe briefly the changes in airflow through divergent and convergent ducts, supersonic airflow through a convergent divergent nozzle.

(*Or*)

(b) Describe the construction and operation of a Axial flow compressor.

11. (a) Describe briefly Compressor stall and Stall control with diagrams.

(*Or*)

(b) Describe construction and operation of turbine in a gas turbine engines.

12. (a) Describe the principle of fuel control unit.

(*Or*)

(b) Describe the function of fuel system in a gas turbine engines.

13. (a) Describe the reduction gear assembly and operation of torquemeter of a turboprop engine.

(*Or*)

(b) Describe the lubrication system for a turbo fan engine.

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INSTRUMENTS AND COMPASS

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. What do you understand by the term "ISA" ? State also the assumptions made.

2. Define the two fundamental properties of a gyroscope, and state the factors on which they depend.

3. Why is it necessary to install a number of sensing probes in a fuel tank system ?

4. What do you understand by the terms "Stagnation" and "Rapid response" as applied to EGT sensing probes ?

5. What do you understand by "hard-iron" and "soft iron" magnetism of an aircraft ?

6. What is meant by "transport wander", and does it have the same effects on horizontal-axis and vertical-axis gyroscopes ?

7. Why is the speed of turbine engines measured as a percentage ?

8. Why a Machmeter is required when an airspeed indicator is already there in a high speed aircraft ?

Part - B (5 × 12 = 60)

Answer **all** questions.

9. (a) Explain how rotors of gyroscopes are driven and also state the advantages and disadvantages of each.

(*Or*)

(b) Describe the construction and operation of a tacho-generator type of rpm-indicating system.

10. (a) Name the materials most commonly used for variable resistance type sensing elements, and describe the construction of a typical element.

(*Or*)

(b) With the aid of a diagram, explain the operating principle of a VSI.

11 (a) Explain the operating principle of a capacitor and state the factors on which it depend. How this principle is used in fuel quantity indicating system ?

(*Or*)

(b) Describe the operation of an electrical method of "Cold Junction' compensation in EGT system.

12. (a) How are alternative sources of pitot and static pressure normally provided for, and connect to appropriate instruments ?

(*Or*)

(b) How are the spin axes of gyroscopes arranged for the detection of pitch and roll attitude changes, and for establishing directional references ?

13. (a) Describe how temperature changes can cause variations in the properties of substances. Which of these variations are utilized for the measurement of temperature ?

(*Or*)

(b) Briefly explain the principle of super charging, and how the increase in induction manifold pressure is measured.

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B.Sc. DEGREE EXAMINATION, NOVEMBER 2010

Aircraft Maintenance Science

AIRCRAFT ELECTRICAL SYSTEM

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. Define the routing charts.

2. What is battery capacity rating ?

3. How cells are assembled in the battery ?

4. What is the purpose of yoke in D.C. Generator ?

5. Write the purpose of Transistor.

6. Define “Bus bar”.

7. What is the purpose of anti-collision lighting ?

8. Define "Breaker".

Part - B (5 × 12 = 60)

Answer **all** questions.

9. (a) Describe about the static chargers.

(*Or*)

(b) Explain about the logic circuits and diagrams.

10. (a) Describe about the construction of lead-acid battery.

(*Or*)

(b) Briefly explain about the battery connections.

11. (a) Explain about the carbon pile regulator.

(*Or*)

(b) Describe about the reverse current circuit breaker.

12. (a) Describe about the "Bus bar".

(*Or*)

(b) Explain about the routing of wires and cables.

13. (a) Write the principle of internal lighting .

(*Or*)

(b) Write short notes about :

(i) Emergency lights.

(ii) Cockpit lighting.

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B.Sc. DEGREE EXAMINATION, NOVEMBER 2010

Aircraft Maintenance Science

FUNDAMENTALS OF COMPUTER AND OFFICE AUTOMATION

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. Name different types of Computers.

2. Write three different logic gates and draw their diagram.

3. Convert the decimal number 1010 to binary.

4. Explain the contents of Edit Menu in Word.

5. Name any three tool bars in Word and write their purpose.

6. How will you enter the following formula in Excel ?

$$a^2 b^2 + c / b$$

7. Write steps to add and delete a slide in power point.

8. What is meant by Query in Access ? Give an example.

Part - B (5 × 12 = 60)

Answer **all** questions.

9. (a) Describe the components and their functions of a computer.

(*Or*)

(b) Explain about any one input and output units.

10. (a) Explain the structure and functions of an Operating System.

(*Or*)

(b) Explain different memories used in a computer.

11 (a) Explain how page elements are formatted in different ways.

(*Or*)

(b) Explain the commands and their use in Table Menu.

12. (a) Explain various elements on an Excel worksheet window.

(*Or*)

(b) Explain the commands of Data Menu and their use.

13. (a) Explain the steps in creating and formatting slides of a presentation showing pages for advertising a product.

(*Or*)

(b) Describe the steps in creating a database and a data entry form for it.

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B.Sc. DEGREE EXAMINATION, NOVEMBER 2010

Aircraft Maintenance Science

AVIATION LEGISLATION—I

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. Explain the rules relating to registration of aircraft under Indian Aircraft Act 1934.

2. What are the importance of quality control ?

3. Explain the procedure for change of ownership.

4. List down the fueling equipments of aircraft organisation.

5. What are the Precautions to be carried out before fueling ?

6. Bring out the significance of airworthiness certificate.

7. Explain the importance of log book.

8. What are the responsibilities of Vendors in connection with fuel and oil ?

Part - B (5 × 12 = 60)

Answer **all** questions.

9. (a) Explain the rules relating to registration, Maintenance and operation of air-craft.

(*Or*)

(b) State the procedure for issue and revision of certificate.

10. (a) Describe the different types of certificate and approval relating to operations of air-craft.

(*Or*)

(b) Explain the category, and procedure for registration of aircraft.

11 (a) Briefly explain provisions relating to civil aviation.

(*Or*)

(b) What are the minimum requirements for grant of approval of organsation ?

12. (a) Explain the procedure for quality control and documentation.

(*Or*)

(b) Evaluate the methods of quality control during storage and supply.

13. (a) Explain the recent trends in an aircraft organisation.

(*Or*)

(b) Briefly explain the maintenance and operation of aircraft.

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B.Sc., DEGREE EXAMINATION, NOVEMBER 2010

Aircraft Maintenance Science

AVIATION MAINTENANCE PRACTICES

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** Questions.

1. What are the major effects of lightning strike ?

2. Define maintenance manual.

3. What is the purpose of shuttle valve in brake system ?

4. What is the purpose of spark plug ?

5. Write the functions of oil system filter and its types.

6. What is static balance of propeller ?

7. What is the significance of propeller control unit (PCU) ?

8. Define corrosion.

Part - B (5 × 12 = 60)

Answer **all** Questions.

9. (a) Describe the special tools used for good maintenance practices.

(*Or*)

(b) Describe the procedure for preparations for maintenance schedules.

10. (a) Explain about the hydraulic landing gear system with neat sketch.

(*Or*)

(b) Describe about the low pressure brake assembly system used in aircraft.

11 (a) What is the purpose of boroscope and its applications ?

(*Or*)

(b) Write short notes on (i) Cylinder compression check (ii) Testing of ignition harness.

12. (a) Describe about the periodic inspections for variable pitch propeller.

(*Or*)

(b) What are the periodic maintenances for wooden propeller ?

13. (a) Explain about the protection treatment of chromium plating.

(*Or*)

(b) Describe about the anodizing process.

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B.Sc., DEGREE EXAMINATION, NOVEMBER 2010

Aircraft Maintenance Science

EXECUTIVE COMMUNICATION

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. Briefly explain the significance of communication for management.

2. What are the various types of Oral communication ?

3. Write note on Dyadic communication.

4. What are merits of written communication ?

5. What is a resolution ?

6. What are the points to be considered in organisinig seminars and conferences ?

7. What are the demerits of Report writing ?

8. How do you write an Effective Business Letter ?

Part - B (5 × 12 = 60)

Answer **all** questions.

9 (a) What do you mean by communication ? Explain the important barriers to communication.

(*Or*)

(b) What are the principles of effective communication ?

10. (a) Explain the norms of writing Business Letters.

(*Or*)

(b) Explain the procedure for Organising seminars and conferences.

11 (a) Explain the different types of Business Letters.

(*Or*)

(b) Briefly explain the norms of including exhibits and appendices in Research Reports.

12 (a) How will you prepare agenda, minutes and resolution of meetings ?

(*Or*)

(b) Explain the methods used to convey non-verbal communication.

13 (a) What are the methods to evaluate oral presentation ?

(*Or*)

(b) Discuss the merits of different kinds of Business Letters.

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B.Sc. DEGREE EXAMINATION, NOVEMBER 2010

Aircraft Maintenance Science

HELICOPTER CONFIGURATION AND MAINTENANCE

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. Define Pitch angle.

2. What is the coriolise effect ?

3. What are the reasons for airfoil stall ?

4. What is the Bell method ?

5. What are the advantages of bonded construction in metal rotor blades ?

6. Write short on "Free wheeling unit".

7. Explain Anti-icing system in Turbo shaft engine.

8. What is the universal joint ?

Part - B (5 × 12 = 60)

Answer **all** questions.

9. (a) Describe the blade tip stall.

(*Or*)

(b) What are the merits and de-merits of semi rigid rotor and fully articulated rotor ?

10. (a) Describe the metal rotor blades.

(*Or*)

(b) Describe Main rotor blade tracking.

11. (a) Explain Mast assembly of Bell 47 helicopter.

(*Or*)

(b) Describe stabilizer bar of a Bell helicopter.

12 (a) Describe compressor damage in a turbo shaft engine.

(*Or*)

(b) Explain Auto rotation Landing of a helicopter.

13. (a) Describe Tail rotor gear box.

(*Or*)

(b) Explain the procedure of Tail rotor rigging of Bell 212 helicopter.

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B.Sc. DEGREE EXAMINATION, NOVEMBER 2010

Aircraft Maintenance Science

COMMUNICATION AND NAVIGATION SYSTEM

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. What are the advantages of superheterodyne receiver ?

2. What is band reject filter ?

3. What are the directional characteristics of loop antenna ?

4. What are the functions of CDI used in connection with VOR ?

5. What are the different types of Market Beacons provided in the airport ?

6. What are the different modes of ATC transponders used in the aircraft ?

7. Write short notes on DME.

8. Write short notes on Radar altimeter.

Part - B (5 × 12 = 60)

Answer **all** questions.

9. (a) Draw a block diagram of a superheterodyne receiver and explain.

(*Or*)

(b) Describe about various types of filters used in the electronic circuits.

10. (a) Draw a block diagram of a VHF transceiver and explain.

(*Or*)

(b) Describe Satellite Communication System.

11. (a) Explain the operators of the ADF with suitable diagram.

(*Or*)

(b) Explain the operation of VOR ground station.

12. (a) Explain the operation of Inertial Navigation System.

(*Or*)

(b) Explain the operation of Doppler Navigation system.

13. (a) Explain the operation of ELT.

(*Or*)

(b) Explain the operation of analog Radar system with simplified block diagram.

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B.Sc. DEGREE EXAMINATION, NOVEMBER 2010

Aircraft Maintenance Science

PRODUCTION AND MAINTENANCE MANAGEMENT

Time : 3 Hours Maximum : 75 Marks

Part - A (5 × 3 = 15)

Answer any **five** questions.

1. What do you mean by standardization ?

2. What is Economic order quantity ?

3. What is DFM (Design for manufacturing) ?

4. What are the objectives of Maintenance ?

5. What are the types of stores ?

6. What is a Quality Circle ?

7. What do you mean by Ergonomics ?

8. What is Reliability of machines ?

Part - B (5 × 12 = 60)

Answer **all** questions.

9. (a) Explain various types of production systems.

(*Or*)

(b) Explain the process of product design.

10. (a) Explain the components of an aggregate forecast plan ?

(*Or*)

(b) Explain the concept and calculations in enterprise resource planning.

11. (a) Compare and contrast method study with time study.

(*Or*)

(b) Enumerate the classifications of quality control techniques.

12. (a) Explain the advantages and limitations in implementing computerised information system.

(*Or*)

(b) Explain the various types of maintenance with their advantages and disadvantages.

13. (a) Explain various inventory control methods.

(*Or*)

(b) Explain the roles of a purchase manager.

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