CP–8543

Sub. Code
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B.Sc. DEGREE EXAMINATION, APRIL 2018

Second Semester

Aircraft Maintenance Science

PRINCIPLE OF ELECTRONICS AND ELECTRONIC CIRCUITS

(Upto 2015 batch)

Time : 3 Hours Maximum : 75 Marks

Part A (5 × 3 = 15)

Answer any **five** questions.

1. Give the colour code for the following resistors :
   (a) $330k\Omega \pm 10\%$
   (b) $22k\Omega \pm 20\%$
   (c) $100\Omega \pm 10\%$.
2. Define Mutual inductance of a pair of coils.
3. What do you mean by depletion layer?
4. Define current amplification factor "β"
5. Define "Peak reverse voltage" in SCR.
6. List some applications of DIAC.
7. What is class C operation in amplifiers?
8. Why phase shift oscillator is called so?

Part B (5 × 12 = 60)

Answer **all** questions.

9. (a) Obtain the equivalent capacitance of two capacitors connected in

   (i) Series

   (ii) Parallel

   Or

   (b) Define inductance of the coil. What is meant by inductive reactance. Also calculate the energy stored in an inductor.

10. (a) Explain how *p* and *n* type semiconductors are produced. Hence discuss the formation *pn* junction diode.

    Or

    (b) Describe the construction and operation of PNP transistor.

11. (a) With necessary sketches, explain the constructional and V-I characteristics of SCR.

    Or

    (b) Describe the construction and V-I characteristics of UJT.

12. (a) With a neat circuit diagram, explain the operation of class-B push pull amplifier.

    Or

    (b) Give an account of the following amplifiers

    (i) Class AB

    (ii) Class C.

13. (a) Draw the circuit diagram of a phase shift oscillator and describe its working.

Or

(b) With necessary circuit diagram, explain the operation of colpitts oscillator.

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B.Sc. DEGREE EXAMINATION, APRIL 2018

Second Semester

Aircraft Maintenance Science

APPLIED PHYSICS

(Upto 2015 Batch)

Time : 3 Hours Maximum : 75 Marks

Part A (5 × 3 = 15)

Answer any **five** questions.

1. Define resolving power of lens.

2. Define Fraunhover diffraction at a single slit.

3. Define Newton's rings.

4. Define Polarization.

5. Define Mass-Energy equivalence.

6. Mention various reference frames.

7. Mention various acoustic materials used in aviation maintenance.

8. Mention various applications of Ultrasonics.

Part B (5 × 12 = 60)

Answer **all** questions.

9. (a) Explain the formation of Newton's rings through interference.

Or

(b) What few applications of Newton's rings of interference?

10. (a) Explain the phenomenon of diffraction of light waves.

Or

(b) Explain polarizer and analyzer.

11. (a) Explain length contraction and time dilation in relativity.

Or

(b) Explain Galilean Transformation.

12. (a) Explain spontaneous and stimulated emission.

Or

(b) Explain propagation of light through cladded fibre.

13. (a) Explain various defects due to reflected sound.

Or

(b) Explain any three types of optical fibres.

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CP–8545

Sub. Code
23

B.Sc. DEGREE EXAMINATION, APRIL 2018

Second Semester

Aircraft Maintenance Science

STRENGTH OF MATERIALS AND APPLIED MECHANICS

(Upto 2015 batch)

Time : 3 Hours Maximum : 75 Marks

Part A (5 × 3 = 15)

Answer any **five** questions.

1. Define moment of force.

2. State Hook's law of elasticity.

3. Define riveting.

4. Define stress and strain.

5. State triangle law of forces.

6. Explain composition of forces.

7. Define factor of safety.

8. How do you specify fasteners?

Part B (5 × 12 = 60)

Answer **all** questions.

9. (a) Moment of force, parallelogram law of forces.

Or

(b) Explain classification of forces, resultant and composition of forces.

10. (a) Explain Stresses in nuts and bolts.

Or

(b) Write short note on :

(i) Tensile Stress

(ii) Elasticity.

(iii) Compressive stress

(iv) Moment of force

11. (a) Explain various types of trusses.

Or

(b) Explain the shear force and bending moment diagrams for the cantilever of length 'I' carrying a concentrated load 'w' at the tree end.

12. (a) Explain design requirement of shafts.

Or

(b) Explain various bearing materials and types of bearing.

13. (a) Briefly explain the types of Gear drive.

Or

(b) Explain various types of fasteners used in aviation maintenance.

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CP–8546

Sub. Code
24

B.Sc. DEGREE EXAMINATION, APRIL 2018

Second Semester

Aircraft Maintenance Science

FUNDAMENTAL THERMODYNAMICS

(Upto 2015 batch)

Time : 3 Hours Maximum : 75 Marks

Part A (5 × 3 = 15)

Answer any **five** questions.

1. Explain adiabatic process.

2. Define PXdv (displacement) work.

3. Define perpetual motion machine of second unit.

4. Define internal energy.

5. Mention various critical properties.

6. Define heat transfer. Mention various types of heat transfer.

7. Mention various stages of carnot cycle.

8. Define Air conditioning.

Part B (5 × 12 = 60)

Answer **all** questions.

9. (a) Explain various types of thermodynamic equilibrium.

Or

(b) Explain various properties of air.

10. (a) Write short notes on homogeneous system and Hetero geneous system.

Or

(b) Explain the principle of work transfer.

11. (a) Explain the various of pressure pulse in the fluid.

Or

(b) Explain Adiabatic flow without friction in compressible fluid flow.

12. (a) Explain three modes of heat transfer.

Or

(b) Explain the working of carnot cycle with (P-V) and (T-S) diagrams.

13. (a) Explain the cycle for jet propulsion.

Or

(b) Explain the working of Otto cycle with (P-V) and (T-S) diagrams.

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B.Sc. DEGREE EXAMINATION, APRIL 2018

Fourth Semester

Aircraft Maintenance Science

PISTON ENGINE AND PROPELLER

(Upto 2015 batch)

Time : 3 Hours Maximum : 75 Marks

Part A (5 × 3 = 15)

Answer any **five** questions.

1. Define Stroke, compression ratio and Bore.

2. Write a note on performance number and octane number of gasoline.

3. What is E gap?

4. Write crank shaft and its importance.

5. What is the purpose of carburetor and its type?

6. Write the significance of compression ratio in 4 stroke cycle.

7. What is ignition Harness?

8. Define

   (a) Propeller blade angle

   (b) Propeller blade station.

Part B (5 × 12 = 60)

Answer **all** questions.

9. (a) Describe the simple induction system with diagram.

Or

(b) Describe about the various basic components of piston engine.

10. (a) Write notes on.

(i) Crank case

(ii) Connecting rod.

Or

(b) Write the construction detail of various crank shafts.

11. (a) Describe the maintenance details about the fuel injection system.

Or

(b) What are the characteristics required for aircraft lubricating oil? Explain in brief.

12. (a) Explain about the engine starter motor.

Or

(b) Briefly explain about the pressure testing of spark plug.

13. (a) Describe in detail about various propeller clearances.

Or

(b) Write down the types of propeller and explain any three of them.

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Sub. Code
42

B.Sc. DEGREE EXAMINATION, APRIL 2018

Fourth Semester

Aircraft Maintenance Science

TURBINE ENGINE

(Upto 2015 batch)

Time : 3 Hours Maximum : 75 Marks

Part A (5 × 3 = 15)

Answer any **five** questions.

1. Differentiate “Gross thrust’ and “Net Thrust’.

2. What are the effects of air inlet icing?

3. Name the basic parts of a gas turbine engine.

4. Describe the effects of altitude on thrust.

5. Explain different types of jet fuels.

6. What is meant by ‘Dry sump’ oil system?

7. Describe volatility of fuel.

8. Explain principle of jet propulsion.

Part B (5 × 12 = 60)

Answer **all** questions.

9. (a) Describe the process of air flow through the gas turbine engine.

Or

(b) Describe briefly the events of Brayton Cycle with volume vs. Pressure and temperature vs. pressure diagram.

10. (a) Describe various types of combustion chambers in gas turbine engine.

Or

(b) Describe the function and types of thrust reversers commonly by being used on aircraft.

11. (a) Explain about the principle operation of different types of Fuel spray nozzles.

Or

(b) Describe the principles of fuel control unit.

12. (a) Briefly explain the ignition system for a turbine engine.

Or

(b) Write down the operational checks and removal procedure of igniter plug.

13. (a) Explain four categories of Gas turbine engine.

Or

(b) Compare the power section of a turbo prop engine with that of a turbo-prop engine with that of a 'turbo Jet engine'.

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43

B.Sc. DEGREE EXAMINATION, APRIL 2018

Fourth Semester

Aircraft Maintenance Science

INSTRUMENTS AND COMPASS

(Upto 2015 batch)

Time : 3 Hours Maximum : 75 Marks

Part A (5 × 3 = 15)

Answer any **five** questions.

1. Describe high range and long range display.

2. Write the instrument panels and light.

3. What are aneroid principle and its advantages?

4. Describe the basic 'T' method of grouping of flight instruments.

5. What are the conditions to select a compass swinging Rose?

6. What are the dissimilar metals used to make thermocouple leads?

7. Write about kew barometer.

8. Describe the thermo- emf system.

Part B (5 × 12 = 60)

Answer **all** questions.

9. (a) State errors in airspeed indicator and its correction.

Or

(b) With a schematic diagram state the operation of vertical speed indicator during level flight, climb and dive.

10. (a) State the basic principle, construction and operation of CHT gauge.

Or

(b) What do you understand by torque pressure indicating system?

11. (a) What are the occasions to calibrate the aircraft compass?

Or

(b) Describe the purpose, construction and operation of pneumatically operated erection mechanism in artificial horizon.

12. (a) Briefly explain construction and operation of integrated fuel flow meter.

Or

(b) What is torque pressure? Explain construction and operation of a torque pressure indicator?

13. (a) What are the errors in magnetic compass and state its causes?

Or

(b) What do you understand by direct reading compass and remote reading compass? Explain briefly.

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B.Sc. DEGREE EXAMINATION, APRIL 2018

Fourth Semester

Aircraft Maintenance Science

AIRCRAFT ELECTRICAL SYSTEM

(Upto 2015 Batch)

Time : 3 Hours Maximum : 75 Marks

Part A (5 × 3 = 15)

Answer any **five** questions.

1. What are the different types switches used in aircraft?
2. Write about the separator used in Nickel Cadmium battery.
3. What is starter generator?
4. Describe commutator.
5. What is flashing?
6. Write the importance of anti-collision lights.
7. What is static discharger?
8. What is the purpose of hydrometer test?

Part B (5 × 12 = 60)

Answer **all** questions.

9. (a) Explain the construction of Lead acid battery.

Or

(b) Explain the operation of carbon pile voltage regulator.

10. (a) Explain armature reaction.

Or

(b) Explain the principle of operation of Nickel Cadmium battery.

11. (a) Explain the procedure for routing of electrical wire bundles.

Or

(b) Describe the aircraft power distribution system.

12. (a) Draw a diagram of reverse current cutout relay and explain.

Or

(b) Draw a diagram of equalizing circuit and explain.

13. (a) Describe spilt-bus system.

Or

(b) Explain electrical load analysis.

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Sub. Code
61

B.Sc. DEGREE EXAMINATION, APRIL 2018

Sixth Semester

Aircraft Maintenance Science

HELICOPTER CONFIGURATION AND MAINTENANCE

(Upto 2015 batch)

Time : 3 Hours Maximum : 75 Marks

Part A (5 × 3 = 15)

Answer any **five** questions.

1. Discuss in brief about fully articulated rotors.

2. What do you know about helicopter main rotor blades (wooden)? Discuss.

3. How do you carry out main rotor blade alignment process by telescopic method? Briefly explain.

4. Explain in brief the process of carrying out balancing of rotor blades. (Dynamic Balancing method).

5. Discuss in brief about Tracking of rotor blades by stick method.

6. What do you mean by blade sweeping process? Explain in brief.

7. Write short notes on stabilizer bar used in helicopters.

8. Explain in brief about 'clutch mechanism' used in helicopter.

Part B (5 × 12 = 60)

Answer **all** questions.

9. (a) What are the routine maintenance works carried out on main rotor head?

Or

(b) How balancing of rotor blades is done? Explain about the process of static balancing of rotor blades.

10. (a) Explain in brief about:

(i) Swash plate assembly.

(ii) Elastomeric dampers.

Or

(b) Discuss in detail about the process of rigging of cyclic pitch control.

11. (a) Discuss in detail about the constructional features of composite rotor blades.

Or

(b) Explain the process of alignment of main rotor blades.(String method and telescopic method).

12. (a) Discuss in detail about the constructional features of Main rotor blades (metal).

Or

(b) Explain the process of tracking of main rotor blades (flag method).

13. (a) What are the maintenance works carried out control system on helicopter?

Or

(b) Discuss about collective pitch control and its lay out.

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Sub. Code
62

B.Sc. DEGREE EXAMINATION, APRIL 2018

Sixth Semester

Aircraft Maintenance Science

COMMUNICATION AND NAVIGATION SYSTEM

(Upto– 2015 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (5 × 3 = 15)

Answer any **five** questions.

1. Write short note on antenna and its type.

2. What is modulation and explain its various types?

3. What is the purpose of ATC transponder? Explain.

4. What the significance of Aircraft VHF communication system?

5. What is wave guide and explain its function?

6. What is ADF system and mention its purpose?

7. Write short notes on Marker beacon system.

8. What are the advantages of microwave landing system?

Part B (5 × 12 = 60)

Answer **all** questions.

9. (a) Draw the block diagram of radio transmitter and explain its functions.

Or

(b) What are the functions of a radio receiver and explain the radio receiver with block diagram?

10. (a) Explain with neat sketch the Aircraft Instrument Landing System.

Or

(b) Explain

(i) 'SATCOM' system.

(ii) Radome and radar safety in weather radar system.

11. (a) Explain the principle and operation of INS.

Or

(b) Write short notes on.

(i) Cockpit voice recorder.

(ii) Radio Magnetic Indicator.

12. (a) Describe in detail the analog radar system with block diagram.

Or

(b) Describe three modes of transponder used in aircraft.

13. (a) Explain the aircraft inertial Navigation system in brief.

Or

(b) Explain

(i) About installation features of Radio equipments.

(ii) The procedure of testing a communication Radio system.

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B.Sc. DEGREE EXAMINATION, APRIL 2018

Sixth Semester

Aircraft Maintenance Science

AVIATION LEGISLATIONS — II

(upto 2015 batch)

Time : 3 Hours Maximum : 75 Marks

Part A (5 × 3 = 15)

Answer any **five** questions.

1. What do you mean by Certificate of Competency?

2. Define :
   (a) Mandatory Modification
   (b) Empty Weight
   (c) Scheduled Aircrafts.

3. What is the purpose of Ground Proximity Warning System (GPWS)?

4. What is the meaning of test flight of an air craft?

5. What do you mean by calibration of an instrument or equipment? Why it is important?

6. Write short notes on :
   (a) Journey Log Book
   (b) Cockpit Check List.

7. What are the instruments and equipments to fit in aircraft during high altitudes Flight?

8. Write short note on Emergency Locator Transmitter (ELT).

Part B (5 × 12 = 60)

Answer **all** questions.

9. (a) Give in detail the number of First Aid Kits and Physicians Kit on a aircraft carrying more than 200 Passengers and content of First Aid Kit and Physicians Kit.

Or

(b) Explain in detail about various types of Flight Data Recorder (FDR) with parameters recorded in each type.

10. (a) Explain the safety precautions and procedure for loading of an aircraft.

Or

(b) What are the various subjects/papers related to AME license examination and explain each in brief.

11. (a) Explain the following terms.

(i) Approved Organization

(ii) Major Repair

(iii) Scheduled operator

(iv) Aerial work

(v) Commercial Operations

(vi) Light Aircraft.

Or

(b) Write down the inspection procedure (Annual Inspection) to carried out of Flight Recording System.

12. (a) What are the instruments and equipments to be equipped in aircrafts when operated under Visual Flight Rules (VFR)?

Or

(b) List out the instruments and equipments fitted in aircraft operated Under Instruments Flight Rules (IFR).

13. (a) What are the documents to be carried board by Indian Registered Aircraft?

Or

(b) Write down the procedure for defect recording, reporting, investigation, rectification and analysis?

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64

B.Sc. DEGREE EXAMINATION, APRIL 2018

Sixth Semester

Aircraft Maintenance Science

PRODUCTION AND MAINTENANCE MANAGEMENT

(Upto 2015 Batch)

Time : 3 Hours Maximum : 75 Marks

Part A (5 × 3 = 15)

Answer any **five** questions.

1. Define Production. What are the types of production system?

2. What is Strategic Management?

3. What is Master Production Schedule?

4. What is Method Study?

5. Define Process Capability.

6. What is Ergonomics?

7. What are the objectives of maintenance?

8. What is reliability?

Part B (5 × 12 = 60)

Answer **all** questions.

9. (a) Explain Standardization and Simplification of production.

Or

(b) Explain the process of new product design in production management.

10. (a) Explain the graphical method of Aggregate Planning.

Or

(b) Briefly explain the concept of production planning and control.

11. (a) Explain the need and scope of TQM.

Or

(b) Explain the various Quality Control Techniques.

12. (a) Explain the types of Maintenance System.

Or

(b) Explain in detail about Failure Mode Effects and Analysis (FMEA).

13. (a) Write the brief descriptions of any three models of inventory.

Or

(b) Explain the various components of materials management.

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