

B.E. DEGREE EXAMINATIONS: APRIL / MAY 2009

Fourth Semester

AERONAUTICAL ENGINEERING

U07AR402 Aircraft Systems and Instrumentations

Time: Three Hours

Maximum Marks: 100

Answer ALL the Questions:-

PART A (20 x 1 = 20 Marks)

- 1) Rate of disturbance is equal to rate of correction is the principle of
a) Auto pilot system b) ILS c) FBW system d) MLS
- 2) For effective efficient engineering control, modern aircrafts are equipped with
a) ILS b) FADEC c) Throttle control d) FCU
- 3) ILS provides horizontal direction reference through
a) Glide slope b) Outer marker c) Inner marker d) Localizer
- 4) Controlling of aircraft by the present day electronics is called
a) EEC b) Active control technology c) FADEC d) FCU
- 5) Filters are classified by
a) Filter element used b) Degree of filtration
c) Type of fluid used d) Diameter of pipeline
- 6) The advantage of pneumatic system is
a) No leak b) Pressure last for long time
c) No return pipeline d) No storage bottle
- 7) In emergency landing gear retraction [HYDRAULIC] systems the value used to supply pneumatic power is
a) Shuttle valve b) Control valve c) NRV d) Sequence valve
- 8) In a landing gear retraction system opening and closing of landing gear actuating cylinders and doors at appropriate time is ensured by
a) Selector valve b) Uplock c) Sequence valve d) Down lock
- 9) Spark plug is used for the ignition system of
a) Turbo jet b) Turbo fan
c) Turbo prop. d) Reciprocating engine

- 10) All the modern GTE fuel system employs
 a) Gravity field b) Booster field c) Pressure field d) Cross field 21. a
- 11) Fuel used for GTE is
 a) Jet fuels b) Kerosene c) AVGAS d) MOTGAS 21. b
- 12) The purpose of heaters in fuel system is
 a) Heat the fuel b) Increase fuel pressure 22. a
 c) Increase SFC d) Prevent ice formation
- 13) Refrigerant used in vapour cycle cooling system is
 a) Nitrogen b) Freon 12 c) CO₂ d) Halon 1301 22. b
 23. a
- 14) In oxygen system, LOX systems are limited to
 a) Civil aircraft b) Private aircraft c) Military aircraft d) Commercial aircraft 23. b
- 15) Thermocouple detection system also called as
 a) Spot detector b) Rate of rise system
 c) Continuous loop system d) Closed loop system
- 16) A perforated air duct called a piccolo is used in
 a) Mechanical deicing b) Probe anti icings 24. a
 c) Thermal anti icings d) Wind shield ice control 24. b
- 17) One of the most essential devices for the navigation of aircraft
 a) Gyroscope b) Air speed indicator
 c) Multimeter d) Encoding altimeter
- 18) A meter which is used in new aircraft during test flights to measure the acceleration loads on the aircraft structure is
 a) ASI b) Accelerometer c) VSI d) Mac Meter 25. a
- 19) An instrument that combines the information of rate of turning and quality of turn of aircraft is
 a) HSI b) Turn and bank indicator c) CDI d) ASI 25. b
- 20) An engine instrument used to measure the engine RPM is
 a) EPR b) EGT c) Tachometer d) EEC

PART B (16 x 5 = 80 Marks)

21. a). Schematically explain digital Fly-by-wire system.

(OR)

21. b) State the various components used in an ILS system and explain the system with an appropriate sketches.

22. a) What are the components of the pneumatic system .Explain the system with appropriate neat sketches

(OR)

22. b) Name the various hydraulically operated services. Explain the system schematically

23. a) Explain briefly the jet engine fuel system with a neat sketch.

(OR)

23. b) Write short notes on

- i. Lubrication system (4)
- ii. Battery ignition system (4)
- iii. Jet engine starting system (4)
- iv. Pressure feed fuel system (4)

24. a) Explain briefly the vapour cycle system with a neat sketch.

(OR)

24. b) Write short notes on

- i. Boot-strap air cycle system (4)
- ii. Oxygen system (4)
- iii. Fire protection system (4)
- iv. Ice protection system. (4)

25. a) State the purpose of air speed indicator. Explain the principle and operation of the ASI with a neat sketch.

(OR)

25. b) Write Short notes on

- i) Flight and Navigation instruments (8)
- ii) Power plant (engine) instruments (8)
