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MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

I SEMESTER M.TECH. (AVIONICS)

END SEMESTER EXAMINATIONS, FEB 2021

SUBJECT: FLIGHT INSTRUMENTATION AND DATA ACQUISITION

[AAE 5153]

REVISED CREDIT SYSTEM

(26/02/2021)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ❖ Answer **ALL** the questions.
- ❖ Missing data may be suitable assumed.

- 1A.** What do you mean by crew alerting systems? **(02)**
- 1B.** Give a brief overview on aircraft lighting systems. **(03)**
- 1C.** Explain the working principle of HUD with proper diagram. **(05)**
- 2A.** What are the functions of FMS? **(02)**
- 2B.** Explain the working of electrical tacho generator. **(03)**
- 2C.** Explain air data system in detail. **(05)**
- 3A.** Explain densitometer. **(05)**
- 3B.** With the help of a neat and labelled diagrams, explain the working of VHF Omnidirectional range. **(05)**
- 4A.** With the help of a neat and labelled diagram, describe the Selcal Decoder for an airliner. **(05)**
- 4B.** With the help of a neat and labelled diagrams, describe the ADF system and explain the operation of an ADF loop antenna. **(05)**
- 5A.** With the help of a neat and labelled diagram explain ACARS and its two modes of operation: Demand and Polled. **(05)**
- 5B.** With the help of neat and labelled diagram, explain the operation of Plastic Optical Fiber Elongation Sensor for strain measurement in aircraft structures. Also, if the refractive index of core is 1.47, operating wavelength is 740 nm and the phase difference between outputs of the **(05)**

two receivers is 42° , then determine the amount of elongation of the fiber.