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BAS-019

**B.Tech. AEROSPACE ENGINEERING
(BTAE)**

Term-End Examination

December, 2015

BAS-019 : AIRCRAFT INSTRUMENTS

Time : 3 hours

Maximum Marks : 70

*Note : Attempt any **seven** questions. All questions carry equal marks. Use of scientific calculator is permitted.*

1. (a) Explain the principle of operation of an instrument used for fuel flow measurement in an aircraft. 5
- (b) What does a pitot tube measure ? Explain the principle and construction of a pitot tube. 5
2. (a) With a neat labelled diagram, describe the working of an air speed indicator and state the two errors in indication of the air speed. 5
- (b) Draw the block diagram of air data system mentioning at least four outputs. 5

3. (a) Draw the block diagram of goniometer and explain it. 5
- (b) Explain the following in brief : 5
- (i) Altimeter
- (ii) Magnetic Compass
4. (a) What is a Gyroscope ? State two important properties of a gyroscope. 5
- (b) Draw a neat sketch of gyro horizon showing the aircraft in a level flight banking at 15° to the left. 5
5. Define the following terms : $5 \times 2 = 10$
- (a) True Air Speed
- (b) Indicated Air Speed
- (c) Equivalent Air Speed
- (d) Magnetic Equator
- (e) Isogonic Line
6. (a) Draw a labelled sketch of an RPM indicator. 5
- (b) What do you understand by "Stagnation" and "Fast Response" as applied to EGT? 5

7. (a) How is the position of an aircraft indicated with respect to a VOR station ? 5
- (b) Distinguish between Real drift and Apparent drift of a gyroscope. 5
8. (a) What is the ICAN standard atmosphere ? 5
- (b) What are the principal components of a basic electronic autopilot ? What is the need for a feedback system, for each correction command signal in the autopilot ? 5
9. (a) Describe a method of measurement of engine speed. 5
- (b) How are the effects of temperature on an alternating current tachometer compensated ? 5
10. What is the principle of a thermocouple ? Describe a typical thermocouple installation for measuring cylinder head temperature. 10
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