

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

**Term-End Examination**

**December, 2013**

**BAS-019 : AIRCRAFT INSTRUMENTS**

*Time : 3 Hours*

*Maximum Marks : 70*

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

1. Describe any five in brief from the followings. 5x2=10
  - (a) turnion
  - (b) thermal Relief valve
  - (c) isogonic line
  - (d) turn and blank indicators
  - (e) meggar
  - (f) RMI
  
2. Draw a circuit of a typical capacitor - type fuel- quantity indicating system explain the operating principle. 10
  
3. (a) Define Mach number. How  $\frac{(P_s - P_t)}{P_s}$  is measured in Mach meter 5
  - (b) Describe Tachometer (rpm indicator) operation with figure. 5

4. (a) Explain the principle of Pitot Pressure Measurement and how the  $\frac{1}{2} \rho v^2$  law is derived. 6
- (b) Define the law to which current types of airspeed indicator are calibrated. 4
- OR**
- (a) Describe black box recorder of an aircraft in details. 5
- (b) Describe speed control system in automatic flight system of an aircraft. 5
5. (a) With the aid of sketch, describe the construction of a vertical speed indicator. 6
- (b) Explain why a vertical speed indicator is unaffected by pressure error. 4
6. (a) Explain in brief flight director system in automatic flight system of an aircraft. 6
- (b) What do you understand by "FAST RESPONSE" as applied to EGT? 4
7. (a) Calculate the distance between two points. LATITUDE and LONGITUDE are given as follows : 6
- lat1 = 50° 21' 55"N
- long1 = 004° 09' 25"W
- lat2 = 42° 21' 04"N
- long2 = 71° 02' 27"W.
- (b) What is the difference between Magnetic Heading and True heading? 4

8. (a) How are the gyroscopic properties utilized in flight instrumentation ? 5
- (b) What is meant by "apparent" precession ? 5
9. (a) Explain how the wheatstone bridge circuit may be utilized for the measurement of temperature 7
- (b) Would the circuit be in balanced at each temperature ? 3
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