No. of Printed Pages : 2

BAS-019

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B.Tech. (AEROSPACE ENGINEERING) (BTAE)

Term-End Examination

June, 2014

BAS-019 : AIRCRAFT INSTRUMENTS

Time : 3 Hours *Maximum Marks : 70*

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

1. Describe the construction of a fuel flowmeter indicator and explain the basic principle of operation. **10**

2. Define the following term : (**any five** in brief) **5x2=10**
   (a) Pressure altitude and indicated altitude
   (b) Mach No. and Critical Mach No.
   (c) Aircraft horizon
   (d) Magnetic compass
   (e) VOR
   (f) TACAN

3. Describe how rate gyro may be utilized to sense both banking and rate of turn. **10**

4. (a) Explain quantitative displays and name instruments in which there are used. **5**
   (b) Give the relationship between Celsius, Fahrenheit and absolute (Kelvin) temperature. Convert 40°C into Fahrenheit Scale and Absolute Scale. **5**

5. (a) Describe the construction and working of an altimeter. 5

(b) Define the $\frac{1}{2}pv^2$ law as it is applied to airspeed indicator. 5

6. (a) Find the distance between Bangalore and New Delhi. 6
Bangalore $(\phi_m, \lambda_m) = (12.9833°N, 77.5833°E)$
New Delhi $(\phi_c, \lambda_c) = (28.6667°N, 77.2167°E)$

(b) Draw a block diagram of INS. 4

7. (a) Draw the block diagram and describe a typical integrated flight system. 5

(b) Describe aircraft fuel quantity indicator in brief with the help of a neat diagram. 5

8. (a) Describe a method of measurement of engine speed. 5

(b) How are the effects of temperature on an alternating current tachometer compensated ? 5

9. (a) Define the following : 5
(i) Magnetic meridian
(ii) Magnetic variation
(iii) Isogonal lines
(iv) Agonal lines

(b) Explain briefly the principle of a directional gyro. 5