B.TECH. (AEROSPACE ENGINEERING) (BTAE)

Term-End Examination

June, 2013

BAS-007 : CNS - ATM SYSTEMS

Time : 3 hours   *Maximum Marks : 70*

Note : *Answer **seven** questions in total. Question **1** and **2** are **compulsory**.*

1. What do the following terms stand for ?   1x12=12

   (a) DGCA

   (b) ADF

   (c) TSI

   (d) TACAN

   (e) ILS

   (f) GLONASS

   (g) IFR

   (h) DME

   (i) IMC

   (j) VORTAC

   (k) GPS

   (l) RADAR

2. Explain *any six* of the following :   3x6=18

   (a) Radial

   (b) Altitude

   (c) Morse code

   (d) Clutter

   (e) Cardioid pattern

   (f) Arrester barrier

   (g) Way point

   (h) Airfield apron

3. (a) Explain the functioning of a basic   4
       communication system with the help of a
       block diagram.

   (b) What is the modulation index of an FM   4
       signal whose modulating frequency is 2kHz
       and maximum deviation 10kHz ?

4. What are the six basic flight instruments in a   8
   cockpit ? State the function of each.

5. Write short notes on *any four* of the following :

   (a) NDB   2x4=8

   (b) FM modulation index

   (c) Secondary radar

   (d) Differential navigation

   (e) ATM components

6. (a) What are the terrain conditions for siting a CVOR ?   **4**

(b) What are the sources of error in GPS ?   **4**

7. (a) Derive the radar range equation.   **4**

(b) Calculate the maximum range of a radar system which operates at 3cm with a peak pulse power of 500 kW, if its minimum receivable power is 10^{-13} W, the capture area of the antenna is $5m^2$ and the radar cross sectional area of target is $20m^2$.   **4**

8. With the help of a diagram, explain the operation of TACAN.   **8**

9. (a) What is AAI ? What are the functions of AAI ?   **4**

(b) Name the various types of scopes used in ATC.   **4**