| BAS-007 |

B.Tech. AEROSPACE ENGINEERING (BTAE)
Term-End Examination
00220   June, 2017

BAS-007 : CNS – ATM SYSTEMS

Time : 3 hours   *Maximum Marks : 70*

Note : *Answer **seven** questions in all. All questions carry equal marks. Make suitable assumptions, if needed.*

1. (a) Explain the functioning of a basic communication system with the help of a block diagram.   6

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

2. (a) Explain Doppler effect. How is it used to obtain relative velocity of a target ?   5

    (b) Calculate the average power of a radar with peak transmitted power of 100 kW and duty cycle 0·0005.   5

BAS-007   1   P.T.O.

3. (a) What is DGCA ? What are its functions ? 5

(b) What actions are to be taken by ATS ground control in case of air to ground communication failure ? 5

4. (a) Explain the functioning of the Glide slope system in ILS. 6

(b) Explain with a diagram, the functioning of ADF. 4

5. (a) What are the terrain conditions for siting a CVOR ? What are squitter or filler pulses ? 5

(b) Explain radar clutter. What are the sources of error in GPS ? 5

6. Write short notes on any *two* of the following : 2×5=10

(a) VASI

(b) Secondary Radar

(c) NDB

(d) Differential Navigation

7. What is a goniometer ? Explain its working with the help of a diagram. 10

8. (a) How does TACAN provide nine times higher accuracy ? 5

(b) Explain with a diagram, the functioning of DME interrogator. 5

9. (a) Derive the radar range equation. 5

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

———