Name:

Enrolment No:

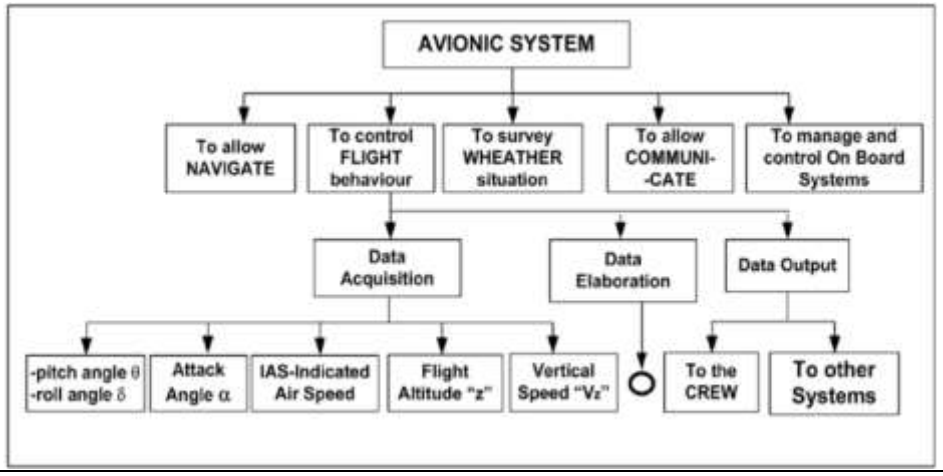
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2022

Course: Avionics System Design **Semester: VIII**
Program: ASE+AVE **Time : 03 hrs.**
Course Code: AVEG 4007 **Max. Marks: 100**

Instructions:

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Define the term sampler in Avionics system design	**4**	**CO1**
Q 2	Discuss order of the system used for design problems	**4**	**CO2**
Q 3	List out the factors affecting the system design operations	**4**	**CO3**
Q 4	How to check system stability on S-plane	**4**	**CO4**
Q 5	Importance of Root Locus and Polar diagram for system modelling	**4**	**CO4**
	SECTION B **(4Qx10M= 40 Marks)**		
Q 6	What are the various Mathematical models used for system design. Describe in detail.	**10**	**CO2**
Q 7	A unity feedback system has a open loop transfer function of $(s) = \frac{10}{(s+1)(s+2)}$. Determine the steady state error for unit step input.	**10**	**CO3**
Q 8	The characteristic polynomial of the system is , $s^7 + 9s^6 + 24s^5 + 24s^4 + 24s^3 + 24s^2 + 23s + 15 = 0$, Determine the location of the roots on s- plane and hence the stability of the system.	**10**	**CO 4**
Q 9	A unity feedback system has a open loop transfer function of $G(s) = \frac{20(s+3)}{s(s+0.1)(s+3)}$. Determine the steady state error for parabolic input.	**10**	**CO4**
	SECTION-C **(2Qx20M=40 Marks)**		
Q 10	Consider Routh array and determine the stability of the system represented by the characteristic equation $s^5 + s^4 + 2s^3 + 2s^2 + 3s + 5$. Comment on the location of roots of the characteristic equation.	**20**	**CO1**
Q 11	Describe each blocks mentioned in the Figure below	**20**	**CO 3**


AVIONIC SYSTEM
To allow NAVIGATE
To control FLIGHT behaviour
To survey WHEATHER situation
To allow COMMUNI--CATE
To manage and control On Board Systems
Data Acquisition
Data Elaboration
Data Output
-pitch angle θ
-roll angle δ
Attack Angle α
IAS-Indicated Air Speed
Flight Altitude "z"
Vertical Speed "Vz"
To the CREW
To other Systems