Name: **Enrolment No:**	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2020

Programme Name: B.Tech- ASEA | **Semester : VIII**
Course Name : Navigation and Guidance | **Time : 03 hrs**
Course Code : AVEG 451 | **Max. Marks : 100**
Nos. of page(s) : 02
Instructions:

SECTION A
All the questions in this section are compulsory

S. No.		Marks	
Q 1	a. The update step of the Kalman Filter increases the variance/covariance of the Gaussian state estimate. True or False? b. The propagation step of the Kalman Filter reduces the uncertainty of the state estimate. True or False? c. Applying Bayes' rule with a Gaussian prior and a Gaussian measurement likelihood always results in a Gaussian posterior. True or False? d. The Kalman Filter is a good choice for problems where the distribution of your state estimate can be multimodal, i.e. in cases where there are multiple hypotheses that are equally likely, or more generally, multiple local maxima in the posterior distribution. True or False?	**5**	
Q 2	List the components in radio compass receiver.	**5**	
Q 3	a. The VOR operates in LF bend between ____ and ____ frequency. b. What is the difference between TCAN and DME? c. The ILS comprises of _____ and _____ units d. The glide slope system in ILS operates in the band _____ and _____.	**5**	
Q 4	The essential elements in inertial navigation system are _____ and _____	**5**	
Q 5	List the equipment used in VOR receiver.	**5**	
Q 6	Enumerate the advantages of MLS over the ILS.	**5**	

SECTION B
Answer all the questions in this section are compulsory

Q 7	The following indications appear on the cross-pointer indicator using ILS for approach and landing: a. The horizontal indicator is above the horizontal line b. The vertical needle is to the left of the central line Indicate what action the pilot has to take.	**10**	

	Or In ILS Explain the technique by which same frequency is used for guidance in the vertical plane, horizontal plane. Back azimuth and flare.		
Q 8	Explain the phenomena of gimbal lock.	**10**	
Q 9	Explain the overall accuracy of Doppler navigation system used in Missile guidance and Navigation	**10**	
Q 10	Explain the effect of the gravity on the accelerometer output when placed horizontally on the table, vertically on the table and during the free fall	**10**	
Q 11	What are the advantages of using autocorrelation function to determine the exact delay in GPS?	**10**	
	SECTION-C **Answer any two**		
Q 12	One form of error in pseudo range is associated with the electromagnetic wave propagation through atmosphere. Briefly describe the reason for this error and describe the methods adopted to reduce it. **Or** What is the difference between pseudo range and geometric range? If the receiver clock has a bias, how many more transmitters are needed to locate the receiver co-ordinates?	**20**	