UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2019

Course: Navigation and Guidance   Semester: VIII
Program: B.Tech ASE+AVE   Time 03 hrs.
Course Code: AVEG 451   Max. Marks: 100

Instructions:

SECTION A

S. No.		Marks	CO
Q 1	Describe the term Navigation, navigation sensors, and surveillance position reporting	4	CO1
Q 2	Explain "terrain-matching navigation" for the modeling of the altitude map.	4	CO 2
Q 3	What is ground based direction finder?	4	CO 3
Q 4	Draw GPS system configurations, and list out the different segments	4	CO 4
Q 5	Discuss static and total pressure for the measuring the total speed.	4	CO 4

SECTION B

Q 6	Explain how the Airborne UHF/VHF direction finder works with schematic diagram.	10	CO3
Q 7	Discuss the principle of operation of LORAN with the schematic diagram.	10	CO4
Q 8	Explain low visibility operation Landing of the Aircraft	10	CO2
Q 9	Elaborate the Integrated Avionics Subsystems, define each components involved in it. **OR** How Design tradeoffs are useful in tracking the position of the aircrafts. How many design trade-offs are used for the fundamental navigational techniques?	10	CO1

SECTION-C

Q 10	Explain Microwave Landing System (MLS). Discuss its basic principle of operations, How it is different from Instrument Landing System (ILS)? **OR** Define the term "automated landing system". Discuss guidance and control requirement by Federation of Aviation Authority (FAA), Flare and Lateral Guidance, ILS guidance rules and its operation for the approach landing under safety zone.	20	CO3
Q 11	Discuss the fundamental principle of Doppler's effect. Write down the various cases for the Electromagnetic/speech signal transmissions from the source to observer. Derive the relative velocity for the moving target under radial manner. Develop the algorithms for the same under the various categories.	20	CO 4

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SECTION A

S. No.		Marks	CO
Q 1	Define "take-off" navigation for the positioning calculations	4	CO1
Q 2	Explain "terrain-matching navigation" for the modeling of the altitude map.	4	CO 2
Q 3	Explain airborne direction finder and adaptors.	4	CO 3
Q 4	Draw GPS system configurations, and list out the different segments	4	CO 4
Q 5	Discuss "air data systems" for the navigation measurements	4	CO 4

SECTION B

Q 6	Discuss Terrain-matching navigation for the estimation of the terrain in the topographic analysis.	10	CO3
Q 7	Explain in detail, the system of WASS with schematic diagram.	10	CO4
Q 8	How dead-reckoning computations could be carried out? Explain in detail with the help of schematic diagram	10	CO 2
Q 9	What is basic satellite navigation system? Write down the basic relation to estimate the geometry and position of the target in space. **OR** How DME and VORs are different for the measurement of an aircraft's coordinates?	10	CO 1

SECTION-C

Q 10	Define the basic principle of Doppler's effect. Write down the various cases for the Electromagnetic/speech signal transmissions from the source to observer. Derive the relative velocity for the moving target under radial manner. Develop the algorithms for the same under the various categories.	20	CO4
Q 11	Define the term "automated landing system". Discuss guidance and control requirement by Federation of Aviation Authority (FAA), Flare and Lateral Guidance, ILS guidance rules and its operation for the approach landing under safety zone. **OR** Explain Microwave Landing System (MLS). Discuss its basic principle of operations, How it is different from Instrument Landing System (ILS)?	20	CO 3