SENSORS

TD2

Inertial Sensor Parameters

(1) A 2D gyroscope based sensor detects
(a) rotation velocity in the terrestrial coordinate system
(b) absolute acceleration
(c) the projection of the absolute rotation velocity in the body coordinate system
(d) rotation velocity in the body coordinate system

(2) The gyros in INS system are used to
(a) sense the absolute rotation velocity of the platform.
(b) using the solver to orient the stabilized platform by angular corrections about the roll axes, pitch and azimuth via the torquers
(c) maintaining the "platform" coordinate system (X, Y, Z) parallel to the navigation coordinate system (NED/ENU).
(d) maintaining the "platform" coordinate system (X, Y, Z) parallel to the inertial coordinate system.

(3) During a flight from Paris to Madrid, the pilot follows the segment 1-2 INS interface shows: HDG = 180°; DSRTK = 198°; DA = 10°R; XTK = 6R; TKE is:
(a) 6°R
(b) 8°R
(c) 8°L
(d) 4°L

(4) During a flight from Paris to Beijing, the pilot follows the segment 1-2 INS interface shows HDG = 80°; DSRTK = 85°; DA = 10°L; XTK = 3R; TKE is:
(a) 10°R
(b) 5°R
(c) 15°L
(d) 40°L

(5) During a flight from Paris to New York, the pilot follows the segment 4–5 INS interface shows: HDG = 300°; DSRTK = 305°; TKE = 30°L; XTK = 12L; DA is:
(a) 10°R
(b) 55°R
(c) 25°L
(d) 40°L

(6) During a flight from Beijing to Hong-Kong, the pilot follows the segment 3–4 INS interface shows: HDG = 160°; DSRTK = 168°; DA = 3°R; XTK = 6R; TKE is:

(a) 6°R
(b) 18°L
(c) 5°L
(d) 10°R

(7) During a flight from Beijing to Paris, the pilot follows the segment 5–6 INS interface shows: HDG = 270°; DSRTK = 275°; DA = 10°L; XTK = 3R TKE is:
(a) 10°R
(b) 5°R
(c) 15°L
(d) 40°L

(8) During a flight from Beijing to Los Angeles, the pilot follows the segment 4–5 INS interface shows: HDG = 120°; DSRTK = 135°; TKE = 5°L; XTK = 4L, DA is:
(a) 10°R
(b) 15°R
(c) 15°L
(d) 20°L

(9) The IRS is an inertial “strip down” that
(a) uses Earth's magnetic field measurements
(b) uses motor parameter measurements
(c) comprises a computer, 3 accelerometers and 3 gyros
(d) answers a, b, and c are false

(10) The three accelerometers in IRS are used to measure
(a) the absolute acceleration in navigation coordinate system
(b) the specific force in navigation coordinate system
(c) the projection of the non-gravitational absolute acceleration in the body coordinate system (body frame)
(d) the non-gravitational absolute acceleration in the Earth coordinate system

(11) An accelerometer is in free fall, the input axis is oriented along the ascending vertical, the output is
(a) +g
(b) -g
(c) 0
(d) +2g

(12) During the alignment stage, the accelerometer measurements are used to determine
(a) true north
(b) the local horizon
(c) magnetic north

(d) the terrestrial gravitational field

(13) In calculating the baro-inertial V/S
(a) barometric vertical speed provide stability
(b) the inertial vertical speed provides precision
(c) barometric vertical speed provides precision
(d) the inertial vertical velocity provides stability

(14) The RLG actually measures
(a) the phase difference between the two beams
(b) the OPD between the two beams
(c) frequency difference between the two beams
(d) Intensity difference between the two beams

(15) Compared to RLG and conventional gyros, the MEMS gyros are
(a) smaller in size, cheaper in price
(b) better bias stability
(c) easier to be employed by digital circuit
(d) better resolution

(16) The dimension of a ring laser gyro are as follows: L = 30 cm, A =87 cm^2, λ = 0.63 μm, the resolution of this RLG is: