	In system identification
a)	The values of the input signals are known
b)	Functions that describe the object's response are known
c)	The object's response is to be found
d)	The model is assumed to be deterministic
	The Maximum Likelihood principle was first implemented by
a)	Daniel Bernoulli
b)	Sir Ronald Aylmer Fisher
c)	Karl Åström and Torsten Bohlin
d)	Rudolf Kalman
	Time vector method
a)	Is a graphic method
b)	Is based on manual selection of estimate values by the operator
c)	Requires calculation of the magnitude and phase for individual degrees of freedom
d)	Allows for the estimation of all unknown model parameters
	Frequency sweep
a)	Is a sinusoidal excitation with changing frequency
b)	Is characterized by a short duration
c)	Allows several control surfaces to be deflected at the same time
d)	Is particularly often used to identify helicopters
	3-2-1-1 input
a)	Is easy to apply
b)	Is one of the Multi-step excitations
c)	Is designed for the assumed a-priori model of the examined aircraft
d)	Has 50% of its energy located in a bandwith of 1:3
	When designing multisine excitations
a)	Knowledge of the a-priori model of the tested aircraft is required
b)	Individual harmonics are assigned to different control surfaces
c)	The power spectrum is used to determine the amplitudes for individual harmonics
d)	The phase shift angles are intended to maximize the signal energy for the smallest possible range of excitations
	Marchand method
a)	Is used to design frequency sweep excitations
b)	Involves determining the identifiability ranges for stability and control derivatives
c)	Requires the drawing of amplitude and phase characteristics
d)	Is one of the optimal methods used for experiment design
	The D-optimal criterion is:
a)	Minimizing the trace of the inverse matrix of the Fisher Information Matrix
b)	Maximizing the determinant of the Fisher Information Matrix
c)	Maximize the smallest eigenvalue of the Fisher Information Matrix
d)	Minimizing the volume of the estimator uncertainty ellipsoid
	To record the flight control deflection angle, one can use
a)	Accelerometers
b)	Potentiometric sensors
c)	Rate gyroscopes
d)	FADS system
	Triaxial accelerometer
a)	Uses Newton's first law of motion
b)	Enables direct measurement of linear accelerations
c)	Is usually placed at the centre of mass
d)	Requires to remove noise from the measured signal

	Differential-pressure tube
a)	Is mounted on a boom that is located in front of the aircraft
b)	Requires calibration
c)	Has five holes in its head and numerous static pressure ports on its side
d)	Allows to measure the angle of attack, slip angle and linear speed of an aircraft
	Ordinary least squares (OLS)
a)	Allows identification of linear models only
b)	Does not require a-priori values of the model parameters
c)	Can be used to estimate unstable systems
d)	Allows to obtain estimates in a single step
	To take into account the uneven dispersion of residuals (w.r. t. independent variables) it is required to
a)	Apply the Weighted Least Squares method
b)	Apply the Total Least Squares method
c)	Introduce Instrumental Variables
d)	Conduct mixed estimation
	When using data partitioning in equation error methods
a)	Time windows (in which estimates have the same values) are selected from a long-lasting manoeuvre
b)	It is necessary to estimate the biases for each time window
c)	A non-linear least squares method must be applied
d)	Estimation must be performed in the frequency domain
	Regression analysis for model structure determination can be done by using
a)	Forward selection
b)	Backwards elimination
c)	Stepwise regression
d)	Relative Peak Factor
	Output error method
a)	Can only be applied for linear models
b)	Requires initial values
c)	Allows to take into account both: process noise and measurement noise
d)	Allows to identify unstable systems in time domain
	Maximum Likelihood Principle
a)	Maximizes the conditional probability of observing estimates for given measurements
b)	Is usually used for the multivariate Student's t-distribution
c)	Leads to the minimization of the negative log-likelihood function
d)	Results in the need to implement an optimization algorithm for cost function minimization
	Maximum Likelihood Principle in the frequency domain
a)	Allows to analyze linear systems only
b)	Allows to estimate biases
c)	Allows to select the frequencies to be analyzed if the Chirp-Z transformation is used
d)	It is formulated in the same way as in the time domain
	Filter error method
a)	Allows to take into account process noise only
b)	Allows to estimate unstable systems
c)	May cause problems when several maneuvers are analyzed simultaneously
d)	Is an extension of the output error method, which is done by including state estimation
	Kalman filter in system identification
a)	Can only be used for linear models
b)	Consists of two stages - prediction and correction
c)	Requires a-priori knowledge also of the process noise
d)	Causes the uncertainty of the state estimator to increase relative to the state prediction and measurement

	Extended Kalman filter
a)	Does not require a-priori values of estimated model parameters
b)	Allows the identification of nonlinear models
c)	It consists of three stages - prediction, correction and evaluation
d)	It uses state and output matrices obtained by linearization around the equilibrium point
	Recursive least squares method
a)	Allows for online identification
b)	Uses all collected measurement points
c)	Can only be used to identify nonlinear models
d)	It can be used in both the time and frequency domain
	In Recursive Weighted Least Squares
a)	All measurement points are used
b)	A weighting factor is introduced to describe the significance of previous measurements
c)	The oldest measurement points are removed from the data set
d)	The least important measurement points are removed from the data set
	Unscented Kalman Filter
a)	Can be used for online identification
b)	Can only be used for linear systems
c)	Uses sigma points for mean and covariance transformations
d)	Consists of three stages - prediction, correction and evaluation
	Artificial neural networks
a)	Are based on algorithms that reproduce the movement of insects in a swarm
b)	Allow for direct identification of phenomenological models
c)	Can be used to identify highly nonlinear phenomena
d)	Require the use of a training set
	The equivalent of an axon hillock in an artificial neural network is
a)	Input signal
b)	Summation block
c)	Activation function
d)	Output signal
	Training an artificial neural network for system identification
a)	Is used to determine weights
b)	Involves selecting weights that minimize, for example, the square of the output error
c)	Can take into account the moment of inertia to improve learning speed
d)	Must be done at a learning speed greater than 10
	Signal windowing
a)	Is carried out after transformation into the frequency domain
b)	Takes longer if the windows overlap less
c)	Iteratively reduces spectrum leakage to sidelobes
d)	None of the above
	Inputs conditioning in identification from frequency responses
a)	Allows to obtain estimates for the whole frequency range
b)	Leads to an estimate for a system with many inputs and one output
c)	Requires integration of the state equations
d)	Requires integration of the observation equations
	Identification of a parametric model in identification from frequency responses
a)	Requires an a-priori model
b)	Is an iterative process
c)	Is related to minimizing the error for the gain factor and phase shift
d)	Is not possible for models with strongly nonlinear parameters

	For unstable aircraft with stability augmentation systems
a)	Identification is usually performed in a closed feedback loop
b)	The stabilization system limits the amount of information present in the aircraft response
c)	The quality of the estimates can be improved by applying inputs before the stability augmentation system
d)	Identification can only be performed in the frequency domain
	To directly identify unstable systems in the time domain, it is possible to use
a)	Error Equation Methods
b)	Output Error Methods
c)	Filter Error Methods
d)	Artificial neural networks
	For unstable objects, the time-domain output error method can be applied
a)	by using measurements of state variables causing instabilities as input signals
b)	by transforming signals at the complex plane
c)	by introducing an artificial stabilization matrix
d)	by dividing the integration interval into subintervals and including continuity conditions
	For behavioral models
a)	model parameters have physical significance
b)	simulation is time-consuming
c)	a-priori knowledge is embedded in the model
d)	the applicability range is limited
	White-box model
a)	Is a phenomenological model
b)	Is a behavioral model
c)	Combines features of phenomenological and behavioral models
d)	None of the above
	A non-parametric model can be given in the form of
a)	State variables
b)	Transfer functions
c)	Impulse response
d)	Amplitude- and phase-frequency characteristics
	Fisher Information Matrix can be used to determine
a)	Standard deviations of estimated parameters
b)	Time delays of signals to synchronize them
c)	Correlation coefficients between output signals
d)	All answers are correct
	Cost function value in system identification
a)	Does not depend on the number of output signals
b)	Does not depend on the units of the output signals
c)	May assume a low value for a model described by too many parameters
d)	Is low only when the estimates have high precision
	Thiel Inequality Coefficient
a)	Is an indicator of the identification accuracy for each estimated parameter
b)	Ranges from zero to one
c)	Can be decomposed into three components
d)	Can be used to validate both linear and non-linear models
	To check whether the residuals are described with white noise, it is possible to use
a)	Autocorrelation of residuals
b)	Fisher Information Matrix
c)	Covariance matrix of the estimates
d)	Power spectral density of the residuals

	Proof-of-match
a)	Allows to determine the predictive capabilities of the model
b)	Is carried out for the data set used in the estimation process
c)	Is based on comparisson between simulation and recorded responses
d)	Is carried out for a predetermined tolerance level
	When validating the estimated aircraft in the frequency domain, tolerance
a)	Defines the limits for a LOES equivalent system
b)	Is expressed only for magnitude
c)	Is determined from minimum unnoticeable dynamics of the aircraft
d)	Allows to determine the applicability range for the estimated model
	To perform system identification, one can use the following software
a)	CIFER
b)	FITLAB
c)	ROTFL
d)	SIDPAC