Module I: Introduction and Motivation

[Lectures : 1]

Quiz I.1. What is not true about linear system?

a) They obey the principle of superposition
b) Their stability nature depends upon the initial conditions
c) They have unique solution for a given initial condition
d) Their stability nature depends on the parameter values

Quiz I.2. An example of time-varying linear system is:

a) $\dot{x} = (\sin t)x$
b) $\dot{x} = kx,$ where k is constant
c) $\dot{x} = x^2$
d) $\dot{x} = x$

Quiz I.3. Typically, which is not an objective of control design?

a) Regulation
b) Tracking
c) Disturbance rejection
d) Parameter identification

Module II: Review of Classical Control

[Lectures: 3, 4, 5, 6]

Quiz II.1. If poles of a system are purely imaginary, (excluding multiple poles at the same location), then the response is

a) constant.

b) decreases exponentially.

c) increases exponentially

d) oscillatory with constant amplitude.

Quiz II.2. Laplace transform of $\sin^2 t$ is

a) $\left(\frac{2}{s^2+1}\right)$

b) $\left(\frac{2}{s^3+4s}\right)$

c) $\left(\frac{1}{s^2+1}\right)^2$

d) None of these

Quiz II.3. Find the time constant of the system given by $G(s)=\frac{10}{s+5}$

a) 0.1

b) 0.2

c) 10

d) 5

Quiz II.4. The system given by $G(s) = \frac{1}{s^2 + 0.14s + 1}$ is

a) underdamped
b) overdamped
c) critically damped.
d) Undamped.

Quiz II.5. The closed loop system for $G(s) = \frac{10}{(s+5)(s+2)}$ with unity feedback is

a) stable.
b) unstable.
c) marginally stable.
d) cannot say.

Quiz II.6. The system with closed loop transfer function, $G(s) = \frac{10}{s^3 - 10s + 5}$ is

(Try to predict the system stability without finding the closed loop poles or preparing the Routh Hurwitz criterion)

a) stable.
b) unstable.
c) marginally stable.
d) cannot say.

Quiz II.7. Routh Hurwitz criterion gives information about

a) location of the poles.
b) the number of right /left half poles.
c) both (a) and (b).
d) cannot say anything about the marginal stability.

Quiz II.8. Given that the steady state error (SSE) of a system subjected to a step input is finite. What will be the SSE of the system for a ramp input? *(K_v is the velocity error constant)*

a) $\frac{1}{K_v}$

b) $\frac{1}{1+K_v}$

c) Infinite

d) Zero

Quiz II.9. Root locus gives the

a) location of poles of the closed loop transfer function for a particular gain, K.

b) information about the system stability as gain, K varies.

c) neither (a) or (b).

d) both (a) and (b)

Quiz II.10. The magnitude of $G(s)=\frac{(s+4)(s+1)}{(s+2)(s+3)}$ at $s=-1+j2$ is

a) 0.5

b) $\frac{\sqrt{8}}{2\sqrt{5}}$

c) $\frac{\sqrt{10}}{2\sqrt{5}}$

d) 2

Quiz II.11. Given $G(s)=\frac{K(s+2)(s-4)}{s(s+10)(s+3)}$, does there exist a root locus in the real line between the poles at -10 and -3?

a) Yes

b) No

Quiz II.12. The derivative feedback in PID control design philosophy helps to

a) improve the transient response.
b) reduce the steady state error.
c) reduce the gain margin.
d) none of the above.

Module III: Flight Dynamics

[Lectures: 7, 11, 12]

Quiz III.1. Steady and constant level flight with zero angle of attack is attained when the

a) lift balances the weight
b) thrust balances weight.
c) thrust balances the drag
d) (a) and (c)

Quiz III.2. Rolling motion is created by applying

a) symmetric deflection in the same direction of the ailerons.
b) differential force on the ailerons.
c) rotation about Z-axis due to rudder deflection.
d) none of the above.

Quiz III.3.. In tailless aircrafts the combination of elevator and ailerons is known as

a) rudder
b) spoiler
c) elevons
d) flaps

Quiz III.4. Coefficient of lift, C_L at zero angle of attack is zero for

a) cambered airfoil
b) symmetric airfoil
c) both (a) and (b)
d) neither (a) or (b)

Quiz III.5. Force balance equations give the

a) translational dynamics.
b) rotational dynamics.
c) longitudinal dynamics.
d) lateral dynamics.

Quiz III.6. Longitudinal motion is mainly controlled using

a) rudder.
b) elevators.
c) ailerons.
d) none of the above.

Quiz III.7. Directional motion is mainly controlled by

a) rudder and ailerons
b) rudder and elevators
c) rudder
d) flaps

Quiz III.8.3 Phugoid mode of a stable aircraft is typically

a) undamped
b) lightly damped
c) heavily damped
d) critically damped

Quiz III.9. Lateral dynamic instabilities are controlled by

a) rudder and elevator
b) ailerons and flaps
c) elevator and ailerons
d) rudder and ailerons

Quiz III.10. Choose the correct statement:

a) Moments about the aerodynamic centre is constant with varying angle of attack.

b) Moments about the centre of gravity is constant with varying angle of attack.

c) The centre of pressure location does not vary with angle of attack.

d) Both (a) and (c)

Quiz III.11. For longitudinal stability,

a) aircraft centre of gravity should be ahead of the aerodynamic centre.

b) aircraft centre of gravity should be behind the aerodynamic centre.

c) aircraft centre of gravity should lie on the aerodynamic centre.

d) location of the centre of gravity does not matter.

Module IV: Representation of Linear Systems

[Lectures: 8, 9, 10]

Quiz IV.1. Tick whichever is correct

a) State space is unique
b) The state variables are required to be independent and orthogonal
c) All the state variables are dependent
d) State variables are unique

Quiz IV.2. State space description gives

a) information only about the input-output relationship of the system.
b) information only about the internal behavior of the system.
c) information about the internal and input-output relationship of a system.
d) none of the above.

Quiz IV.3. In transfer function representation the initial conditions are assumed to be zero because

a) they obey the principle of superposition.
b) it is only for those system in which initial conditions are zero.
c) stability of linear system does not depend upon the initial conditions.
d) both (a) and (c).

Quiz IV.4. Transfer function and state space representation of the system is

a) unique for transfer function, and not unique for state space representation..
b) not unique for both the representations.
c) not unique for transfer function and unique for state space representation.
d) unique for both the representations.

Quiz IV.5. In Toeplitz first companion form, the matrix is

a) singular.
b) lower triangular.
c) lower triangular and nonsingular.
d) lower triangular and singular.

Module V: Review of the Matrix Theory

[Lectures: 13, 14, 15]

Quiz V.1. Eigen value is associated with

a) square matrix
b) matrix of any dimension.
c) row vector.
d) column vector.

Quiz V.2. Number of eigen vectors associated with every distinct eigen value is

a) one.
b) two.
c) infinite.
d) none of the above.

Quiz V.3. If a square matrix, $A_{n\times n}$ has repeated eigen values with less than n linearly independent eigen vectors, then it can be transformed (by similarity transformation) to

a) Diagonal Form
b) Jordan Form
c) Either (a) or (b)
d) None of the above

Quiz V.4. Equivalence transformation can be applied to

a) square matrix.
b) matrix of any dimension.
c) row/column vectors.
d) all of the above.

Quiz V.5. Singular value is characteristics of

a) square matrix.
b) matrix of any dimension.
c) row/column vector.
d) all of the above.

Quiz V.6. Singular value is always

a) positive.
b) negative.
c) zero.
d) complex.

Quiz V.7. Hessian matrix is always

a) symmetric.
b) skew-symmetric.
c) diagonal.
d) none of the above.

Quiz V.8. For a matrix $A_{m\times n}$, where $m>n$, the rank of A

a) cannot be more than n.
b) is between m and n.
c) is equal to m.
d) is always equal to n.

Quiz V.9. If the rank of matrix $A_{n\times n}$ is n then it implies that

a) $A_{n\times n}$ has n linearly independent columns.
b) $A_{n\times n}$ has n linearly independent rows.
c) None (a) or (b).
d) Both (a) and (b).

Quiz V.10. If one of the eigen values of a square matrix $A_{n\times n}$ is zero then it implies that

a) rank $(A_{n\times n}) < n$.

b) rank $(A_{n\times n}) = n$.

c) rank $(A_{n\times n})$ cannot be determined.

d) none of the above.

Quiz V.11. If matrix $A_{n\times n}$ has n distinct eigen values then its eigenvectors are

a) linearly independent.

b) linearly dependent.

c) either (a) or (b) depending on its elements.

d) none of the above.

Module VI: Review of Numerical Methods

[Lectures: 16]

Quiz VI.1. Numerical differentiation always leads to

a) amplification of noise.
b) reduction of noise.
c) none of the above.

Quiz VI.2. Numerical integration always leads to

a) amplification of noise.
b) reduction of noise.
c) noise is not affected.
d) none of the above.

Module VII: Linearization of Nonlinear Systems

[Lectures: 17]

Quiz VII.1. Choose the correct statement about linearization process:

a) Linearized system depends on the equilibrium point
b) Nonlinear system must operate close to the equilibrium point
c) Nonlinear system must operate close to the operating point
d) Both a) and b)

Module VIII: Time Response, Stability, Controllability and Observability of Linear Systems

[Lectures: 2, 18, 19, 20]

Quiz VIII.1.Principle of superposition holds for

a) linear homogeneous systems.
b) nonlinear systems.
c) linear non-homogeneous system.
d) all of the above.

Quiz VIII.2. If damping ratio of the second order system is increased, then its

a) peak overshoot decreases.
b) rise time increases.
c) neither (a) nor (b).
d) both (a) and (b).

Quiz VIII.3. If the real part of a pole is positive, then output response

a) grows towards infinity.
b) decreases towards zero.
c) remains constant
d) can be either (a) or (b) or (c)

Quiz VIII.4. $e^{(A+B)t} = e^{At}e^{Bt}$ if

a) A and B are scalars
b) $AB = BA$
c) A and B have same eigen values
d) both (a) and (b)

Quiz VIII.5. Consider the system, $\dot{X} = AX + BU$ where X is state vector, A is the system matrix, B is the input matrix and U is the input vector. Assume X as the initial state and t as the initial time. Then the solution of the system depends on

a) U, X, t, A

b) U, X, t, A, B

c) X, t, A, B

d) X, t

Quiz VIII.6. Choose the correct statement:

a) Stable systems are always controllable.

b) Stable systems are always observable.

c) Stable systems are always controllable and observable.

d) Stability is not necessary for controllability and observability.

Quiz VIII.7. Knowledge of complete state trajectory is must for determining system stability:

a) True for linear time invariant system.

b) Not always true for nonlinear system.

c) Both (a) and (b).

d) True for linear and nonlinear systems.

Quiz VIII.8. For stabilizable system:

a) Uncontrollable states are unstable.

b) Uncontrollable states are stable.

c) Unobservable states are stable.

d) Unobservable states are unstable.

Quiz VIII.9. Uncontrollable and unobservable states arise due to

a) redundant state variables.

b) physically uncontrollable system.

c) too much symmetry.

d) all of the above.

Module IX: Pole Placement, Controller and Observer Design of Linear Systems

[Lectures: 21, 22]

Quiz IX.1. Consider the following assumptions for the pole placement control design:

(1) The system is completely state controllable.

(2) The state variables are measurable and available for feedback.

(3) The system is observable.

(4) Control input is unconstrained.

Choose the correct ones,

a) (1), (2) and (3)

b) (1), (2) and (4)

c) (1), (3) and (4)

d) (2), (3) and (4)

Quiz IX.2. Which of the following conditions are required for observer design:

a) Observability condition must be satisfied.

b) Observability condition needs not be satisfied.

c) Controllability condition must be satisfied.

d) None of these.

Quiz IX.3. Which of the following is true for Separation principle:

a) Controller design and observer design may not be independent of each other.

b) Controller design and observer design always dependent on each other.

c) Controller design and observer design are independent of each other.

d) None of these

Quiz IX.4. Which of the following is NOT true for reduced-order observers:

a) Reduced-order observers are computationally efficient than full-order observer.

b) Reduced-order observers for LTI system are not satisfying the Separation principle.

c) Reduced-order observers may converge faster.

d) None of these.

Module X: Static Optimization

[Lectures: 23]

Quiz X.1. Which of the following is true for the sufficient condition for local maximum of $J(x)$ at $x = x^*$ is

a) $\left.\frac{dJ}{dx}\right|_{x=x^*} = 0$

b) $\left.\frac{d^2J}{dx^2}\right|_{x=x^*} > 0$

c) $\left.\frac{d^2J}{dx^2}\right|_{x=x^*} < 0$

d) None of these.

Quiz X.2. Which of the following is true for one of the necessary condition of Kuhn-Tucker condition to minimize $J(X)$ subject to $g_j(X) \le 0$ where λ_j is the Lagrangian multiplier

a) $\lambda_j \le 0$

b) $\lambda_j \ge 0$

c) $\lambda_j < 0$

d) None of these.

Quiz X.3. Which of the following is true for the sufficient condition of Kuhn-Tucker condition to maximize $J(X)$

a) $J(X)$ is strictly convex and all $g_j(x) \le 0$ is convex.

b) $J(X)$ is strictly concave and all $g_j(x) \le 0$ is convex.

c) $J(X)$ is convex and all $g_j(x) \le 0$ is convex.

d) None of these.

Module XI: Optimal Control Design

[Lectures: 24, 25, 26, 27, 28]

Quiz XI.1. Transversality conditions are zero when

a) final state is fixed.

b) final time is fixed.

c) final time is free.

d) both final time and final state are fixed.

Quiz XI.2. Choose the wrong statement:

a) State and costate have same dimension.

b) Optimal control solution demands the solution of two point boundary value problem.

c) Hamiltonian is constant along the optimal trajectory if it is explicit function of time, for fixed final time.

d) None of the above.

Quiz XI.3. Solution of LQR problem exists if

a) $\{A, B\}$ is controllable and $\left\{A, \sqrt{Q}\right\}$ is not detectable.

b) $\{A, B\}$ is controllable and $\left\{A, \sqrt{Q}\right\}$ is detectable.

c) $\left\{A, \sqrt{Q}\right\}$ is detectable.

d) $\{A, B\}$ is controllable.

Quiz XI.4. What is the minimum value of the cost function $J = \frac{1}{2}\int_{t_0}^{\infty}\left(X^T QX + U^T RU\right)dt$ for LQR design:

a) $J = 0$

b) $J = \frac{1}{2}X^T\left(t_0\right)PX\left(t_0\right)$

c) $J = \frac{1}{2}X^T\left(t\right)PX\left(t\right)$

d) None of these.

Quiz XI.5. The Riccati coefficient matrix P is positive definite if and only if

a) the system is completely observable.

b) the system is not completely observable.

c) the system is unstable.

d) none of these.

Quiz XI.6. The necessary condition for the existence of a stable closed-loop system is

a) only stabilizability condition.

b) only observability condition. Observable.

c) both stabilizability and observability conditions.

d) none of these.

Module XII: Linear Control Applications in Flight Control Design

[Lectures: 29, 30, 38]

Quiz XII.1. An airplane is said to be trimmed if

a) the moments about the centre of gravity is zero.
b) the moments about the aerodynamic centre is zero.
c) the centre of pressure aligns with the aerodynamic centre.
d) None of the above

Quiz XII.2. A combination of rolling and yawing oscillations leads to

a) directional divergence.
b) spiral divergence.
c) Dutch-roll oscillation.
d) longitudinal instability.

Quiz XII.3. Spiral divergence is due

a) Insufficient lateral stability.
b) Insufficient directional stability.
c) Insufficient longitudinal stability.
d) All the above

Quiz XII.4. Automatic flight control system which helps to maintain a certain pitch, roll and heading for an aircraft is known as

a) Landing aids.
b) Stability augmentation system.
c) Cruise control system.
d) Glide slope control system.

Quiz XII.5. Dutch roll oscillations are usually controlled using

a) Ailerons
b) Rudder
c) Elevator
d) Both (a) and (b)

Module XIII: Nonlinear System Analysis Using Lyapunov Theory

[Lectures: 33, 34, 35]

Quiz XIII.1. Lyapunov direct method gives

a) sufficient condition for stability of equilibrium point.
b) necessary condition for stability of equilibrium point.
c) both (a) and (b)
d) none of the above.

Quiz XIII.2. If the equilibrium point is convergent then

a) it is also globally stable.
b) it is also globally asymptotically stable.
c) it is asymptotically stable.
d) it may or may not be stable.

Quiz XIII.3. Unlike nonlinear system, all stable linear systems are

a) globally stable.
b) globally exponentially stable.
c) asymptotically stable.
d) None of the above.

Quiz XIII.4. In $\in$, ∂ definition of the stability:

a) $\in$ depends on ∂.
b) ∂ depends on $\in$.
c) both are independent.
d) $\partial > \in$.

Quiz XIII.5. Which of the following is Not true for the dynamical system $\dot{x} = f(x)$

a) Any trajectory is invariant set for autonomous system.
b) A limit cycle is an invariant set.
c) Any equilibrium point is an invariant set.
d) None of these.

Quiz XIII.6. Which of the following is Not true for LaSalle's theorem:

a) Lyapunov function $V(x)$ is continuously differentiable.
b) Lyapunov function $V(x)$ is necessarily positive definite.
c) $\dot{V}(x)$ is negative-semi definite in a compact invariant set $M \subset D$.
d) The LaSalle's theorem applies to equilibrium point and to limit cycles also.

Quiz XIII.7. Which of the following is Not true for the Variable Gradient method:

a) Lyapunov function $V(x)$ should be known.
b) Lyapunov function $V(x)$ is unknown.
c) The gradient of the Lyapunov function $V(x)$ is known up to some adjustable parameters.
d) The method is applicable to autonomous systems.

Quiz XIII.8. An equilibrium point is said to be asymptotically stable if

a) the equilibrium point is stable and not convergent.
b) the equilibrium point is convergent and not stable.
c) the equilibrium point is both stable and convergent.
d) None of these

Quiz XIII.9. Which of the following is Not true for global asymptotic stability of the equilibrium point $X = 0$ (let the Lyapunov function $V : D \to \mathbb{R}$):

a) $V(X) > 0$ in $D - \{0\}$

b) $\dot{V}(X) < 0$ in $D - \{0\}$

c) $\dot{V}(X) \leq 0$ in $D - \{0\}$

d) $V(X)$ is radially unbounded.

Quiz XIII.10. Which of the following is Not true for the global exponential stability of the origin $X = 0$:

a) All the conditions for asymptotically stability are satisfied.

b) All the conditions for asymptotically stability are not satisfied.

c) The origin $X = 0$ is exponentially stable.

d) All the above.

Quiz XIII.11. Which of the following is Not true for the domain of attraction:

a) Around any asymptotically stable equilibrium point, there is a domain of attraction.

b) Around any asymptotically stable equilibrium point, there may not be a domain of attraction.

c) We can estimate a domain of attraction for the asymptotically stable equilibrium point.

d) None of these.

Module XIV: Nonlinear Control Synthesis

[Lectures: 31, 32, 36, 37]

Quiz XIV.1. Scheduling variables must not be

a) slowly varying.
b) physically meaningful.
c) Both (a) and (b)
d) state variables.

Quiz XIV.2. Control solution with dynamic inversion

a) is easy to implement online.
b) does not require gain scheduling.
c) is nonlinear controller.
d) all the above.

Quiz XIV.3. If number of controllers of a system are less than the number of outputs then

a) it is overconstrained problem.
b) perfect tracking is possible.
c) it is underconstrained problem.
d) both (b) and (c)

Quiz XIV.4. Which of the following is Not true for the motivation of neuro-adaptive control design:

a) Unmodelled dynamics.
b) Inaccurate knowledge of system parameters.
c) Change of system parameters during operation.
d) Perfect system modeling.

Quiz XIV.5. Which of the following is true for the neuro-adaptive control design based on indirect adaptive control method:

a) It is a generic model-following design for robustifying any nominal controller.

b) It is a generic model-following design for robustifying only a special class of nominal controller.

c) It is valid only for square affine system problems.

d) It is valid only for non-square affine system problems.

Module XV: Nonlinear Observer and Kalman Filter Design

[Lectures: 39, 40]

Quiz XV.1. Which of the following assumption is Not true for the integrator Back-stepping method for the system dynamics $\dot{X} = f(X) + g(X)\xi$, $\dot{\xi} = u$:

a) $f(0) = 0$.

b) $f, g : D \to \mathbb{R}$ is smooth.

c) $f, g : D \to \mathbb{R}$ may not be smooth.

d) All the above.

Quiz XV.2. The necessary and sufficient condition for the existence of the observer gain:

a) The system should be controllable.

b) The system should not be controllable.

c) The system should not be observable.

d) The system should be observable.

Quiz XV.3. Which of the following is true for the Kalman filter:

a) Kalman filter is a band filter circuit.

b) Kalman filter is a high-pass filter circuit.

c) Kalman filter is a low-pass filter circuit.

d) Kalman filter is an algorithm.

Quiz XV.4. Kalman filter

a) can be applied only to stationary signals.

b) can be applied only to non-stationary signals.

c) can be applied to both stationary and non-stationary signals.

d) cannot be applied to both stationary and non-stationary signals.

Quiz XV.5. Which of the following assumption is Not true for the Kalman filter design of linear systems:

a) The initial condition of the state, process noise and measurement noise are mutually orthogonal.

b) The process noise and measurement noise are uncorrelated white noise.

c) The process noise covariance matrix is positive-semi definite.

d) The measurement noise covariance matrix is positive-semi definite.

Quiz XV.6. Which of the following is Not true for the continuous-discrete time Kalman filter design:

a) It works based on the continuous-time prediction and discrete-time correction mechanism.

b) It is practically useful because the measurement is available at discrete-time steps.

c) It facilitates only the usage of uniform time-step.

d) All the above.

Quiz XV.7. Which of the following is Not true for the Extended Kalman filter (EKF) design:

a) The EKF is a cure for every nonlinear system.

b) Linearization can introduce significant error.

c) The EKF is not truly optimum.

d) No general convergence is guaranteed.

Quiz XV.8. Which of the following is true for the Kalman filter (KF) design of nonlinear systems:

a) KF design of nonlinear systems works like the KF design of linear systems.

b) KF design of nonlinear systems (like EKF) is truly optimum.

c) The Gaussian input of the nonlinear system does not always produce a Gaussian output.

d) None of these.

Answers of Modules

Module I

Quiz I.1 b)

Quiz I.2 a)

Quiz I.3 d)

Module II

Quiz II.1 d)

Quiz II.2 b)

Quiz II.3 b)

Quiz II.4 a)

Quiz II.5 a)

Quiz II.6 b)

Quiz II.7 b)

Quiz II.8 c)

Quiz II.9 d)

Quiz II.10 a)

Quiz II.11 b)

Quiz II.12 a)

Module III

Quiz III.1 d)

Quiz III.2 b)

Quiz III.3 c)

Quiz III.4 b)

Quiz III.5 a)

Quiz III.6 b)

Quiz III.7 a)

Quiz III.8 b)

Quiz III.9 d)

Quiz III.10 a)

Quiz III.11 a)

Module IV

Quiz IV.1 a)

Quiz IV.2 c)

Quiz IV.3 c)

Quiz IV.4 a)

Quiz IV.5 c)

Module V

Quiz V.1 a)

Quiz V.2 c)

Quiz V.3 b)

Quiz V.4 d)

Quiz V.5 d)

Quiz V.6 a)

Quiz V.7 a)

Quiz V.8 a)

Quiz V.9 d)

Quiz V.10 a)

Quiz V.11 a)

Module VI

Quiz VI.1 a)

Quiz VI.2 b)

Module VII

Quiz VII.1 c)

Module VIII

Quiz VIII.1 a)

Quiz VIII.2 d)

Quiz VIII.3 a)

Quiz VIII.4 d)

Quiz VIII.5 b)

Quiz VIII.6 d)

Quiz VIII.7 b)

Quiz VIII.8 b)

Quiz VIII.9 d)

Module IX

Quiz IX.1 b)

Quiz IX.2 a)

Quiz IX.3 c)

Quiz IX.4 b)

Module X

Quiz X.1 c)

Quiz X.2 b)

Quiz X.3 b)

Module XI

Quiz XI.1 d)

Quiz XI.2 c)

Quiz XI.3 b)

Quiz XI.4 b)

Quiz XI.5 a)

Quiz XI.6 c)

Module XII

Quiz XII.1 a)

Quiz XII.2 c)

Quiz XII.3 a)

Quiz XII.4 c)

Quiz XII.5 d)

Module XIII

Quiz XIII.1 a)

Quiz XIII.2 d)

Quiz XIII.3 b)

Quiz XIII.4 b)

Quiz XIII.5 d)

Quiz XIII.6 b)

Quiz XIII.7 a)

Quiz XIII.8 c)

Quiz XIII.9 c)

Quiz XIII.10 b)

Quiz XIII.11 b)

Module XIV

Quiz XIV.1 d)

Quiz XIV.2 d)

Quiz XIV.3 a)

Quiz XIV.4 d)

Quiz XIV.5 a)

Module XV Quiz XV.1 c) Quiz XV.2 d) Quiz XV.3 d) Quiz XV.4 c) Quiz XV.5 d) Quiz XV.6 c) Quiz XV.7 a) Quiz XV.8 c)		