Nash equilibrium

1. A Nash equilibrium is a strategy profile in which ...
   (a) no player ever randomises
   (b) every player's strategy is a best response to the others' strategies
   (c) every player plays a strictly dominant strategy
   (d) the sum of the players' payoffs is maximised

2. A strategy s^* for player i is a best response to the others if ...
   (a) it gives every player the same payoff
   (b) it is the strategy with the largest support
   (c) it gives player i at least as high a payoff as any other strategy, given the others
   (d) it strictly dominates every other strategy

3. In Rock-Paper-Scissors, the unique Nash equilibrium is for each player to ...
   (a) play each action with probability 1/3
   (b) copy the opponent's last move
   (c) always play Rock
   (d) there is no Nash equilibrium

4. The support of a mixed strategy is ...
   (a) the set of actions played with positive probability
   (b) the action with the highest payoff
   (c) the opponent's best response
   (d) the set of all of the player's actions

5. An action is strictly dominated if ...
   (a) it is never a best response in a pure equilibrium
   (b) the opponent also has a dominated action
   (c) it gives a lower payoff than some other action against at least one opponent strategy
   (d) some strategy gives a strictly higher payoff against every strategy of the opponents

6. By the best response condition, a mixed strategy is a best response if and only if ...
   (a) the opponent is also indifferent
   (b) all actions are played with equal probability
   (c) it places all weight on a single action
   (d) every action in its support yields the maximal expected payoff

7. A strictly dominant action for a player is one that ...
   (a) is a best response to at least one opponent strategy
   (b) maximises the combined payoff of both players
   (c) gives a strictly higher payoff than every other action, against every opponent profile
   (d) is played in some Nash equilibrium

8. A pure strategy is a special case of a mixed strategy in which ...
   (a) all the probability is placed on a single action
   (b) the player has only one action
   (c) the opponent is indifferent
   (d) every action is equally likely

9. Nash's theorem guarantees that every finite game has ...
   (a) no Nash equilibrium unless there is a dominant strategy
   (b) a Nash equilibrium only if it is zero sum
   (c) a unique Nash equilibrium
   (d) at least one Nash equilibrium, possibly in mixed strategies

10. A coordination game (such as choosing the same side of the road) typically has ...
    (a) infinitely many pure equilibria
    (b) no Nash equilibrium
    (c) a single dominant-strategy equilibrium
    (d) two pure equilibria and one mixed equilibrium

11. To find the mixed equilibrium of a 2x2 game you ...
    (a) eliminate the dominant strategy
    (b) maximise each player's own payoff
    (c) set both players to play uniformly
    (d) choose each player's mix so the other player is indifferent between their actions

12. A two-player game is non-degenerate if ...
    (a) the payoff matrices sum to zero
    (b) no strategy of support size k has more than k best response actions
    (c) every player has a strictly dominant strategy
    (d) it has a unique Nash equilibrium

13. An action that is weakly (but not strictly) dominated ...

(a) is never a best response

(b) can still be a best response against some opponent strategy

(c) is always played in equilibrium

(d) must be strictly dominated too

14. The support enumeration algorithm finds Nash equilibria by ...

(a) removing all dominated actions

(b) checking each possible pair of supports for the indifference and best response conditions

(c) simulating the game many times

(d) computing the value of the game

15. If a game has a strictly dominant strategy for each player, then ...

(a) there is no Nash equilibrium

(b) the equilibrium must be mixed

(c) the profile of dominant strategies is the unique Nash equilibrium

(d) there are many Nash equilibria

16. The existence of a Nash equilibrium in every finite game is proved using ...

(a) the central limit theorem

(b) the fundamental theorem of algebra

(c) Kakutani's fixed-point theorem applied to the best response correspondence

(d) linear programming duality

17. The map $\beta_i(s_{-i}) = \arg\max_{\sigma_i} u_i(\sigma_i, s_{-i})$ is called the ...

(a) payoff matrix

(b) best response correspondence

(c) replicator equation

(d) support

18. A mixed strategy for a player is ...

(a) a probability distribution over that player's actions

(b) a payoff value

(c) an ordering of the opponents

(d) a single chosen action

19. In the support enumeration algorithm, for a candidate pair of supports one solves equations making each player ...

(a) prefer their first action

(b) minimise the opponent's payoff

(c) indifferent between the actions in their own support

(d) play a pure strategy

20. Nash's theorem guarantees at least one equilibrium but ...

(a) never a mixed one

(b) always exactly one

(c) only in zero-sum games

(d) not necessarily a unique one