Auctions

1. In a second-price (Vickrey) auction, the winner ...
   (a) pays the average of all bids
   (b) is the highest bidder and pays the second-highest bid
   (c) is chosen at random
   (d) is the highest bidder and pays their own bid
2. In a second-price auction, bidding your true value is ...
   (a) the same as bidding zero
   (b) a weakly dominant strategy
   (c) never optimal
   (d) only optimal if you know the others' values
3. A Bayesian Nash equilibrium is a strategy profile in which ...
   (a) the seller chooses the winner
   (b) all players bid the same amount
   (c) each player maximises expected utility given their type and correct beliefs about others
   (d) every player knows everyone else's value
4. In a first-price auction, a rational bidder usually ...
   (a) shades their bid below their true value
   (b) always bids zero
   (c) bids their true value
   (d) bids above their true value
5. The revenue equivalence theorem says that ...
   (a) first-price and second-price auctions raise the same expected revenue (under its conditions)
   (b) the winner always pays the same as the loser
   (c) the seller always prefers a first-price auction
   (d) revenue is always zero
6. Because truthful bidding is dominant, the second-price auction is ...
   (a) always more profitable for the seller
   (b) impossible to run with sealed bids
   (c) only suitable for two bidders

(d) efficient: the highest-value bidder wins

7. An auction game is specified by ...

   (a) a single payoff matrix

   (b) a discount factor

   (c) the bidders' value distributions, an allocation rule and a payment rule

   (d) a list of stable matchings

8. In a first-price auction, the winner pays ...

   (a) nothing

   (b) the average bid

   (c) their own bid

   (d) the second-highest bid

9. A bidder's type in an auction is ...

   (a) their private value for the item

   (b) their bid

   (c) the reserve price

   (d) the number of other bidders

10. In a first-price auction with N bidders whose values are uniform on $[0, 1]$, the equilibrium bid is ...

    (a) $v/2$ for all N

    (b) $\frac{N-1}{N}v$

    (c) v

    (d) 0

11. A bidder's utility in an auction is ...

    (a) always zero

    (b) $v_i q_i - p_i$: value times allocation, minus payment

    (c) their bid

    (d) the seller's revenue

12. Revenue equivalence requires that the auction ...

    (a) always gives the item to the highest-value bidder and gives a zero-value bidder zero surplus

    (b) has exactly two bidders

    (c) charges a reserve price

(d) uses sealed bids

13. In a second-price auction the winner's surplus is ...

    (a) the second-highest value

    (b) zero

    (c) their value minus their own bid

    (d) their value minus the second-highest value

14. Truthful bidding being a dominant strategy means that in a second-price auction ...

    (a) impossible to run sealed-bid

    (b) bidders need not guess others' values to bid optimally

    (c) only suitable for one bidder

    (d) more profitable than any other auction

15. The second-price auction is efficient because ...

    (a) the seller earns the most

    (b) no one ever wins

    (c) everyone pays the same

    (d) the bidder who values the item most wins it

16. For N values drawn independently and uniformly on $[0, 1]$, the expected maximum is ...

    (a) $\frac{1}{N}$

    (b) $\frac{1}{2}$

    (c) $\frac{N-1}{N+1}$

    (d) $\frac{N}{N+1}$

17. In a first-price auction with N uniform bidders bidding $\frac{N-1}{N}v$, the seller's expected revenue is ...

    (a) $\frac{N-1}{N+1}$

    (b) $\frac{N}{N+1}$

    (c) $\frac{1}{N}$

    (d) $\frac{1}{2}$

18. In a second-price auction with N uniform bidders, the seller's expected revenue equals ...

    (a) the expected second-highest value, $\frac{N-1}{N+1}$

    (b) the expected highest value, $\frac{N}{N+1}$

    (c) $\frac{1}{2}$

(d) zero

19. A bidding strategy in an auction game is a map $b_i : V_i \to B_i$ that sends ...

    (a) a bid to a payment

    (b) a valuation to a payment

    (c) a bidder's valuation to a bid

    (d) a bid to an allocation

20. The allocation rule q of an auction maps the profile of bids to ...

    (a) the probability with which each bidder receives the good

    (b) the amount each bidder pays

    (c) each bidder's private valuation

    (d) the seller's reserve price