TOPIC 7 REVIEW QUESTIONS

Questions 1 – 4 relate to the following information.

Consider a product of quality *q*. Suppose the seller values the product at $\theta_S q$ and the potential buyer values it at $\theta_B q$. Assume $\theta_B = \frac{5}{2}$ and $\theta_S = 2$.

The seller knows *q*, but the buyer does not. The buyer knows θ_S.

The potential buyer has prior beliefs about *q* represented by a uniform distribution on the interval [3, 12].

1. If the product is offered for sale at price *p*, what is the conditional expected quality of the good as perceived by the buyer?

A. $\hat{q}(p) = \dfrac{3p+3}{4}$

B. $\hat{q}(p) = \dfrac{p}{4} + \dfrac{3}{2}$

C. $\hat{q}(p) = \dfrac{3p}{8}$

D. $\hat{q}(p) = \dfrac{2p}{3} + 3$

2. The highest price that the buyer is willing to pay for a product offered for sale is

A. 8

B. 10

C. 12

D. 3

3. The highest quality product that could be traded in this market is

A. 5

B. 7.5

C. 8

D. 12

4. The average quality of a product traded in this market is

A. 3

B. 6

C. 2

D. 4

Questions 5 – 8 relate to the following information.

Consider a product of quality *q*. Suppose the seller values the product at $\theta_S q$ and the potential buyer values it at $\theta_B q$. Assume $\theta_B = 3$ and $\theta_S = 2$.

The seller knows *q*, but the buyer does not. The buyer knows θ_S.

The potential buyer has prior beliefs about *q* represented by a uniform distribution on the interval [1, 10].

5. If the product is offered for sale at price *p*, what is the conditional expected quality of the good as perceived by the buyer?

A. $\hat{q}(p) = \frac{p+3}{4}$

B. $\hat{q}(p) = \frac{2p}{5}$

C. $\hat{q}(p) = \frac{p}{4} + \frac{1}{2}$

D. $\hat{q}(p) = \frac{3p}{2} + \frac{1}{2}$

6. The highest price that the buyer is willing to pay for a product offered for sale is

A. 8

B. 6

C. 4

D. 3

7. The highest quality product that could be traded in this market is

A. 3

B. 5.5

C. 4

D. 8

8. The average quality of a product traded in this market is

A. 4

B. 3

C. 6

D. 2

Questions 9 – 13 relate to the following information.

Consider a situation where a worker obtains education level e and demands wage w from the employer. The firm accepts or refuses the demanded wage. Assume that education has no productivity effect.

The worker is one of two types: high productivity (H) or low productivity (L). The firm knows the true population distribution of workers. In particular, a fraction α of workers are of type L, and a fraction $1-\alpha$ are of type H.

For the worker, the cost of obtaining education level e is correlated with her productivity. In particular, the effort cost of education level e is

$$c = \frac{e}{\lambda + t}$$

where $t = L$ or $t = H$, and $\lambda \geq 0$ is a parameter common to both types. The net payoff to a worker of type *t* who obtains education level *e* and receives wage *w* is

$$u = w - \frac{e}{\lambda + t}$$

Assume that $H = 5$, $L = 2$ and $\lambda = 2$.

9. The payoff to the *H* type in a pooling equilibrium is

A. $u^P = 3 - 2\alpha$

B. $u^P = 5$

C. $u^P = 5 - 3\alpha$

D. $u^P = 2$

10. The payoff to the *H* type in a separating equilibrium in which she chooses education level *e* is

A. $u^H = 2 - \frac{e}{3}$

B. $u^H = 5 - \frac{e}{7}$

C. $u^H = 2 - \frac{e}{3\alpha}$

D. $u^H = 5 - \frac{e}{3\alpha}$

11. The incentive compatibility condition for the *L* type is

A. $\frac{e}{4} - 3 \geq 0$

B. $3 - \frac{e}{7} \geq 0$

C. $w \geq 2$

D. $w - e \geq 2$

12. The smallest value of *e* with which the *H* type can signal her true productivity is

A. $\hat{e} = 21$

B. $\hat{e} = 12$

C. $\hat{e} = 8$

D. $\hat{e} = 3$

13. The *H* type will choose to signal her true productivity if and only if

A. $\alpha < \frac{2}{3}$

B. $\alpha > \frac{2}{5}$

C. $\alpha < \frac{3}{7}$

D. $\alpha > \frac{4}{7}$

Questions 14 – 18 relate to the following information.

Consider a situation where a worker obtains education level *e* and demands wage *w* from the employer. The firm accepts or refuses the demanded wage. Assume that education has no productivity effect.

The worker is one of two types: high productivity (*H*) or low productivity (*L*). The firm knows the true population distribution of workers. In particular, a fraction α of workers are of type *L*, and a fraction $1-\alpha$ are of type *H*.

For the worker, the cost of obtaining education level *e* is correlated with his productivity. In particular, the effort cost of education level *e* is

$$c = \frac{e}{\lambda + t}$$

where $t = L$ or $t = H$, and $\lambda \geq 0$ is a parameter common to both types. The net payoff to a worker of type *t* who obtains education level *e* and receives wage *w* is

$$u = w - \frac{e}{\lambda + t}$$

Assume that $H = 3$, $L = 2$ and $\lambda = 1$.

14. The payoff to the *L* type in a pooling equilibrium is

A. $u^P = 3 - 2\alpha$

B. $u^P = 3 + \alpha$

C. $u^P = 2 - \alpha$

D. $u^P = 3 - \alpha$

15. The payoff to the *H* type in a separating equilibrium in which he chooses education level *e* is

A. $u^H = 2 - \frac{2e}{3}$

B. $u^H = 3 - \frac{e}{4}$

C. $u^H = 5 - \frac{e}{3\alpha}$

D. $u^H = 7 - \frac{e}{3\alpha}$

16. The incentive compatibility condition for the *L* type is

A. $\frac{e}{3} - 1 \geq 0$

B. $3 - \frac{e}{2} \geq 0$

C. $\frac{e}{2} - 1 \geq 0$

D. $2 - \frac{e}{3} \geq 0$

17. The smallest value of *e* with which the *H* type can signal his true productivity is

A. $\hat{e} = 10$

B. $\hat{e} = 8$

C. $\hat{e} = 3$

D. $\hat{e} = 2$

18. The *H* type will choose to signal his true productivity if and only if

A. $\alpha > \frac{3}{4}$

B. $\alpha < \frac{2}{3}$

C. $\alpha < \frac{3}{4}$

D. $\alpha > \frac{1}{2}$

Questions 19 – 22 relate to the following information.

Suppose an agent has wealth m in the good state, and wealth $m - L$ if an accident occurs (the bad state). Let $\pi(e)$ denote the probability of an accident as a function of precautionary effort *e*:

$$\pi(e) = \frac{1}{1+e}$$

His indirect utility function is

$$v(m,e) = m^{\frac{1}{2}} - \delta e$$

where δe is the utility-cost of effort. Assume that $m = 10000$, $L = 1719$ and $\delta = \frac{1}{9}$.

19. If this agent has no insurance then he will choose effort level

A. $e^* = 2$

B. $e^* = 3$

C. $e^* = 4$

D. $e^* = 8$

20. If this agent has no insurance then his expected loss is

A. $\pi^* L = 191$

B. $\pi^* L = 343.8$

C. $\pi^* L = 429.75$

D. $\pi^* L = 573$

21. If this agent purchases full insurance with no deductible then the expected payout by the insurer is

A. 0

B. 573

C. 1719

D. 8281

22. The "second-best solution" to the moral hazard problem here is

A. no insurance.

B. full insurance at the actuarially-fair price.

C. co-insurance, where the insured agent pays a deductible in the event of a claim.****

D. full insurance but at a price higher than the actuarially-fair price.

Questions 23 – 25 relate to the following information.

Suppose an agent has wealth m in the good state, and wealth $m - L$ if an accident occurs (the bad state). Let $\pi(e)$ denote the probability of an accident as a function of precautionary effort e:

$$\pi(e) = \frac{1}{1+e}$$

Her indirect utility function is

$$v(m,e) = m^{\frac{1}{2}} - \delta e$$

where δe is the utility-cost of effort. Assume that $m = 10000$, $L = 2944$ and $\delta = \frac{1}{4}$.

23. If this agent has no insurance then she will choose effort level

A. $e^* = 1$

B. $e^* = 3$

C. $e^* = 7$

D. $e^* = 15$

24. If this agent has no insurance then her expected loss is

A. $\pi^* L = 184$

B. $\pi^* L = 368$

C. $\pi^* L = 736$

D. $\pi^* L = 1472$

25. If this agent purchases full insurance with no deductible then the expected payout by the insurer is

A. 368

B. 736

C. 1472

D. None of the above.

ANSWER KEY

1. B
2. B
3. A
4. D
5. C
6. B
7. A
8. D
9. C
10. B
11. A
12. B
13. D
14. D
15. B
16. A
17. C
18. A
19. D
20. A
21. C
22. C
23. C
24. B
25. D