Unit 12 - Week 9: Optimal Portfolio and Consumption- II

Assignment 9

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-11-18, 23:59 IST.

1) If the gBm model is given by $S(t)=S(0)e^{\left(\mu-\frac{1}{2}\sigma^2\right)t+\sigma h(t)}$, then which of the following is/are true? *1 point*

- $h(t)$ follows normal distribution with mean 0 and variance 1
- $h(t)$ follows normal distribution with mean 0 and variance $\sqrt{t}$
- $h(t)$ follows normal distribution with mean 0 and variance t
- $h(t)$ follows normal distribution with mean 0 and variance $\sigma^2 t$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$h(t)$ follows normal distribution with mean 0 and variance t

2) If the stock and the bond follow $dS(t)=\mu S(t)dt+\sigma S(t)dW(t)$ and $dB(t)=\mu B(t)dt$, respectively, then which of the following gives the model for a portfolio, where an amount of π out of $X(t)$ is invested in stocks and $X(t)-\pi$ is invested in bonds. *1 point*

- $dX(t)=(rX(t)+\pi(\mu-r))\,dt+\pi\sigma dW(t)$
- $dX(t)=(\mu X(t)+\pi(\mu-r))\,dt+\pi\sigma dW(t)$
- $dX(t)=(\mu X(t)+\pi(\mu-r))\,dt+r\sigma dW(t)$
- $dX(t)=\mu X(t)dt+\pi\sigma dW(t)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$dX(t)=\mu X(t)dt+\pi\sigma dW(t)$

3) If $\mu=r$, then the HJB equation reduces to which of the following : *1 point*

- $V_t+\frac{\theta^2}{2}\frac{V_x^2}{V_{xx}}+rxV_x=0$
- $V_t-\frac{\theta^2}{2}\frac{V_x^2}{V_{xx}}+rxV_x=0$
- $V_t+rxV_x=0$
- $V_t+\frac{\theta^2}{2}\frac{V_x^2}{V_{xx}}=0$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$V_t+rxV_x=0$

4) If the stock follows the price process $dS(t)=3S(t)dt+2S(t)dW(t)$ and the bond follows the price process $dB(t)=B(t)dt$, then the HJB equation is given by : *1 point*

- $V_t-\frac{V_x^2}{V_{xx}}+xV_x=0$
- $V_t-\frac{1}{2}\frac{V_x^2}{V_{xx}}+xV_x=0$
- $V_t-\frac{V_x^2}{V_{xx}}+\frac{1}{2}xV_x=0$
- $V_t-\frac{1}{2}\frac{V_x^2}{V_{xx}}+\frac{1}{2}xV_x=0$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$V_t-\frac{1}{2}\frac{V_x^2}{V_{xx}}+xV_x=0$

5) If the stock follows the price process $dS(t)=3S(t)dt+2S(t)dW(t)$ and the bond follows the price process $dB(t)=1.5B(t)dt$, and the investor has log utility, then the optimal portfolio of wealth $\widehat{\pi}$ at time $t=0$ (up to time $t=1$), invested in stock equals :

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 0.35,0.40

1 point

6) If the stock follows the price process $dS(t)=3S(t)dt+2S(t)dW(t)$ and the bond follows the price process $dB(t)=1.5B(t)dt$, and the investor has the utility $U(x)=1-e^{-2x}$, then the optimal portfolio of wealth $\widehat{\pi}$ at time $t=0$ (up to time $t=1$), invested in stock equals :

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 0.035,0.045

1 point

7) If we consider the HJB framework for an investor with log utility, then the optimal consumption at time $t=0$ with wealth $X(0)=1000$, up to time $t=1$, equals :

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 499,501

1 point

8) If $\widetilde{Z}(1):=\frac{3}{2}\frac{U'(\widehat{X}(1))}{E[U'(\widehat{X}(1))]}$, then $E\left[\frac{1}{6}\widetilde{Z}(1)\right]$ equals :

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 0.245,0.255

1 point