Unit 13 - Week 11: Risk-Neutral Pricing in Continuous-Time (Part 1)

Assignment

Due on 2019-10-16, 23:59 IST.

1. In the classical BSM model (with given parameters $a$, $r$, and $o$), which of the following statements are true?

The stock price process $(X_t)$ is a martingale under the risk-neutral probability measure $\mathbb{P}$.

\[ E(X_t) = 2a - r, \quad \text{for } T > 0 \text{ (under the actual probability measure $\mathbb{P}$).} \]

\[ V_t = \frac{a}{2} + r, \quad \text{for } 0 \leq t \leq T \text{ (under the actual probability measure $\mathbb{P}$).} \]

The risk-neutral probability measure $\mathbb{P}$ can be obtained by taking any constant value for $\theta$ in the Girsanov theorem.

No, the answer is incorrect.

Score: 0

Accepted Answers:

No, the answer is incorrect.

Score: 0

Accepted Answers:

2. State whether the following statement is TRUE or FALSE.

The classical BSM model (with given parameters $a$, $r$, and $o$) if

$K_T = \frac{1}{2} \ln T$ is the continuously compounded rate of return per annum realized between times $0$ and $T$, then $K_T - X_t$ under the real-world probability measure $\mathbb{P}$.

TRUE

No, the answer is incorrect.

Score: 0

Accepted Answers:

No, the answer is incorrect.

Score: 0

Accepted Answers:

3. State whether the following statement is TRUE or FALSE.

The classical BSM model (with given parameters $a$, $r$, and $o$), if the mean rate of return of the stock is twice that of the return on the riskless asset, $a = 20\%$ and the market price of risk equals 0.4, then the riskless rate of return (as an annualized return) equals $\alpha$.

TRUE

No, the answer is incorrect.

Score: 0

Accepted Answers:

No, the answer is incorrect.

Score: 0

Accepted Answers:

4. State whether the following statement is TRUE or FALSE.

In the classical BSM model (with given parameters $a$, $r$, and $o$), if $X_t$ is a European derivative with payoff

\[ V_t = \frac{1}{3} - \frac{1}{3} S_t, \quad \text{for } 0 \leq t \leq T \]

is a path independent derivative.

TRUE

No, the answer is incorrect.

Score: 0

Accepted Answers:

No, the answer is incorrect.

Score: 0

Accepted Answers:

5. State whether the following statement is TRUE or FALSE.

In the classical BSM model (with given parameters $a$, $r$, and $o$), if $X_t$ is a European derivative with payoff $V_t = \frac{1}{3} - \frac{1}{3} S_t$, then $\frac{dS_t}{S_t} = \alpha dt + o dW_t$ is a martingale under both $P$ and $\mathbb{P}$.

TRUE

No, the answer is incorrect.

Score: 0

Accepted Answers:

No, the answer is incorrect.

Score: 0

Accepted Answers:

6. State whether the following statement is TRUE or FALSE.

In the classical BSM model (with given parameters $a$, $r$, and $o$), if $X_t$ is a European derivative with payoff $V_t = \frac{1}{3} - \frac{1}{3} S_t$, then $\frac{dS_t}{S_t} = \alpha dt + o dW_t$ is a martingale under both $P$ and $\mathbb{P}$.

TRUE

No, the answer is incorrect.

Score: 0

Accepted Answers:

No, the answer is incorrect.

Score: 0

Accepted Answers:

7. State whether the following statement is TRUE or FALSE.

In the classical BSM model (with given parameters $a$, $r$, and $o$), if $X_t$ is a European derivative with payoff $V_t = \frac{1}{3} - \frac{1}{3} S_t$, then $\frac{dS_t}{S_t} = \alpha dt + o dW_t$ is a martingale under both $P$ and $\mathbb{P}$.

TRUE

No, the answer is incorrect.

Score: 0

Accepted Answers:

No, the answer is incorrect.

Score: 0

Accepted Answers:

8. State whether the following statement is TRUE or FALSE.

In the classical BSM model (with given parameters $a$, $r$, and $o$), if $X_t$ is a European derivative with payoff $V_t = \frac{1}{3} - \frac{1}{3} S_t$, then $\frac{dS_t}{S_t} = \alpha dt + o dW_t$ is a martingale under both $P$ and $\mathbb{P}$.

TRUE

No, the answer is incorrect.

Score: 0

Accepted Answers: