Test 1

Q1. Which of the following statements about bonds and stocks is/are correct?

A. Both bonds and stocks are kinds of debt instruments
B. Both bonds and stocks usually have a constant return rate
C. Both bonds and stocks holders have the voting right to shape the issuing company's policy
D. A bank can issue both bonds and stocks in raising funding. Moreover, bonds are more common than stocks

Suggested Reason

A bank can issue bonds and stocks in raising funding, but stocks options are less common because it is more sensitivities to release voting right to stock holder of a bank.

Q2. Which of the following(s) is(are) qualified as a financial intermediary?

A. Virtual Banks
B. Insurance Companies
C. Supermarket
D. Disneyland

Suggested Reason

Supermarket and Disneyland are just trading activities of products or services with the customers. There is no borrow/loan activities between them.

Q3. In your own words, describe two functions of a financial market system with the help of examples.

Open book answers, may refer to notes as reference.

Q4. If we want to access the next block's information in a Blockchain, which of the following way(s) can be used?

A. Block index
B. Block hash
C. Nonce
D. No of the above

Suggested Reason

Block chain will not provide index to the next block information. It will only have index pointing to the previous block.

Q5. How many SHA-512 hashes must be computed to obtain the Merkle root of 15 transactions?

Please show your steps in the text box below

Suggested solution

There are 5 levels of hashing:

1st level: 15

2nd level: 7 + 1 = 8

3rd level: 4

4th level: 2

5th level: 1

Total number of hash operation = 15 + 8 + 4 + 2 + 1 = 30

Please refer to https://youtu.be/fB41w3JcR7U

Q6. Refer to the link: https://www.hkgb.gov.hk/en/news/press_20220124.htmlLinks to an external site.

Discuss if you would consider **Silver Bond** a debt instrument in your own words. You should base on the terms of Silver Bond offered to present your argument.

Suggested solution

Yes, it offers three debt properties.

1) Fixed loan principal
2) Know maturity 3 years, due at 2024
3) Pre-determined formula of interests rate : 3.5% + floating rate (based on **based Composite Consumer Price Index)**

Q7. Refer to the link: https://www.hkgb.gov.hk/en/greenbond/institutionaloutstanding.htmlLinks to an external site.

What are the maturity and annual coupon of the Institutional Green Bond (HKEX Stock code: 4238)?

Hence, estimate the Yield to Maturity of this Bond per HK$10,000. You may assume its coupon interest is paid once every six months. Show all the values used in your calculation steps.

Suggested solution

Maturity = 5 years

Coupon = 2.5% p.a , i.e. 1.25% per half year

PV = 10000

Use numpy_financial package to calculate future value

Program:

```
!pip install numpy_financial

import numpy_financial as npf

# Face value

pv = 10000

# total sum received at maturity of the bond

fsum = abs(npf.fv(0.0125, 10, 0, 10000)) = 11322.7083

# Yield-to-maturity

YTM = fsum – pv = 1322.7083
```

Q8. There are three major security concepts (steps) related to "**proof and ownership**" to carry out a task or complete a digital transaction or process. The concepts are (1) Identification, (2) Authentication, and (3) Authorization.

Explain how the three steps mentioned above are implemented in the situation below.

A student submits an EE4017 quiz assignment through CANVAS before the deadline.

Suggested solution

(1) Identification – the student needs to input its EID to identify the user

(2) Authentication – he needs to input his password

(3) Authorization – the student can only allow to submit his quiz before the available date. Besides, he cannot see other student's quizzes. This can only be done by the course teacher.