**EGR 310**

**February 2023**

**Midterm Email Version**

**Answer Key**

**3/2/23**

**Question 1**

A cash flow with an arithmetic gradient increases or decreases by a fixed percentage each time period. Select one (highlight or circle)

**F**

**Question 2**

When applying the economic decision-making process, one of the main reasons companies do not audit their results is because of the cost to do the audit. Select one (highlight or circle)

**T**

**Question 3**

The cost of raw material to produce your product is considered a variable cost. Select one (highlight or circle)

**T**

**Question 4**

The accuracy of a cost estimate increases as the cost of producing the cost estimate increases. Select one (highlight or circle)

**T**

**Question 5**

The Tax-Cut and Job Act (TCJA) of 2018 reduced the corporate tax rate to 21%. Select one (highlight or circle)

**T**

**Question 6**

A firm won a fixed price contract to install IT equipment for the county of San Diego. The firm's economic criterion for performing the contract should be: Select one (highlight or circle)

* minimize input
* maximize output
* maximize the difference between output and input

**Question 7**

You have been given a budget of $2,500 to put on a children's fair in your community. The economic criterion you should use is: Select one (highlight or circle)

* minimize input
* maximize output
* maximize the difference between output and input

**Question 8**

A philanthropist set up a trust to provide $10,000 scholarships annually to deserving students. How much needs to be deposited today at 5% interest to ensure the $10,000 scholarships are paid every year forever?

Enter your answer here:…$200,000…………

**Question 9**

WYSWYG manufacturing is deciding which of 2 pieces of equipment to invest. Both produce the same output quantity. Both pieces of equipment have a 5-year life. If the firm's interest rate is 6%, what is the present value of the cost of each alternative and which alternative has the lowest present value of the cost?

|  |  |  |
| --- | --- | --- |
| Alternative | A | B |
| Initial Cost | $8,000 | $10,000 |
| Annual Cost | $300 | $500 |
| Salvage Value after 5 years | $0 | $3,000 |

Enter your answer hereOption A has the lowest present cost of $9,264.……………

**Question 10**

A production facility can produce 1,000 units per year. Fixed costs are $60,000 per year and the variable cost is $3 per unit produced. If the facility produced 600 units, what is the average cost of producing the 600th unit?

Enter your answer here: $103………………

**Question 11**

What deposit needs to be made today at 8% annual nominal interest compounded monthly to ensure $1,000 is in the account 15 years from now?

Enter your answer here: $302…………………

**Question 12**

The maintenance cost of a machine is $150 after one year and increases by 6% each year. Using an interest rate of 6%, what is the present cost of maintenance if the machine is maintained for 10 years?

Enter your answer here: $2,415………………

**Question 13**

A young woman plans to retire in 30 years. She intends to contribute the same amount of money at the end of each year to her retirement fund. The fund earns 10% compounded annually. She would like to withdraw $100,000 each year for 20 years, starting 1 year after the last contribution is made. Approximately how much money should she contribute to her retirement fund each year?

Enter your answer here: $851.36………………

**Question 14**

Kathy needs to replace the 1,000-ft2 heat exchanger she purchased 6 years ago with a 3,000-ft2 heat exchanger . If she purchased the 1,000-ft2 heat exchanger for $5,000 six years ago, estimate the cost of the 3,000-ft2 heat exchanger today if the power sizing exponent is 0.6 and the cost index for compressors 6 years ago was 150 and today it is 210.

Enter your answer here:… $13,532………………

**Question 15**

A bank pays a nominal annual interest rate of 12% compounded quarterly. What is the effective interest rate?

Enter your answer here:………………

**Question 16**

In your own words, what are life cycle costs.

Enter your answer here:12.6%…………………

**Question 17**

Present worth analysis is a technique to compare multiple economic alternatives by converting current and future cash flows of each alternative into an equivalent current amount of money. Select one (highlight or circle)

**T**

**Question 18**

A cash flow diagram illustrates the timing and sign of the cash

**F**

**Question 19**

A pharmaceutical company has invested $3,000,000 the past 3 years in a new drug to slow the advancement of memory loss. The $3,000,000 is an example of: Select one (highlight or circle)

* opportunity cost
* book cost
* sunk cost
* none of the above

**Question 20**

A cruise ship charges $4000 per person for an all-inclusive week-long trip in the Caribbean. The weekly operations, maintenance and fuels costs for the ship are $80,000 and the weekly staff wages are $60,000. The food and support costs are $1500 per week per passenger. How many passengers are required for the ship to break even?

Enter your answer here: 56………………

**Question 21**

A trust will pay you $50,000 per year for 30 years starting 1 year from now. Assuming an interest rate of 5% compounding annually, what is the present value of these cash flows worth?

Enter your answer here: $768,600……………………

**Question 22**

A 40-year-old consulting engineer wants to set up a retirement fund to be used starting at age 65. $20,000 is invested now and an additional $4000 per year every year until retirement at 6% compounded annually. Approximately how much money will be in the fund at retirement?

Enter your answer here: $305,296……………………