

**Pre Evaluation Scientific Visualization 2005**

Directions For Numbers 1-25 : Read each of the following multiple-choice items and the possible answers carefully. Mark the letter of the correct answer on your answer sheet or as instructed by your teacher. Remember: Make no marks on this test.

1

What is the study of how a product will be used and how it effects people?

- A Utilities
- B Cyronomics
- C Ergonomics
- D Someone else's problem

2

The maximum density for a building material should be no greater than 200 kg per cubic meter. This is a design:

- A Control.
- B Criteria.
- C Refinement.
- D Constraint.

3

Before they can be solved, technological problems must be:

- A Constrained.
- B Graphically communicated.
- C Documented.
- D Researched.

4

Design problems usually have:

- A Multiple solutions.
- B Only one possible solution.
- C Clear solutions.
- D Quantified solutions.

5

An engineer must design a booster rocket system capable of launching a load 3.7 times the mass of the space shuttle. This is an example of a design:

- A Control.
- B Criteria.
- C Refinement.
- D Constraint.

6

Requirements of a design such as criteria, constraints, and efficiency:

- A Never conflict.
- B Are independent of each other.
- C Always conflict.
- D Sometimes conflict.

7

Communication systems allow information to be:

- A Transferred.
- B Edited.
- C Understood.
- D Prototyped.

8

What is the first step in the design process?

- A Refine the solution.
- B Communicate the results.
- C Define the problem.
- D Identify the criteria.

Pre Evaluation Scientific Visualization 2005**9**

A conceptual model:

- A Is a scientific way to describe work, force, and power.
- B Explains an idea that cannot be easily described by written text.
- C Is a visual technique using only three dimensions.
- D Has at least one dependent and one independent variable.

10

Graphic communication systems involve the design, development, and production of what?

- A Written text
- B Machines
- C Visual images
- D Procedures

11

Scientific visualization can be:

- A Conceptual.
- B Data-driven.
- C Both conceptual and data-driven.
- D Neither conceptual or data-driven.

12

What is the last step in the design process?

- A Refine the solution.
- B Communicate the results.
- C Define the problem.
- D Identify the criteria.

13

A product's design needs to be continually:

- A Built upon.
- B Observed.
- C Checked and critiqued.
- D Manufactured.

14Design problems are almost **NEVER**:

- A Difficult.
- B Clearly defined.
- C Solvable.
- D Addressed by a group.

15

What is a prototype?

- A Single-cell organism
- B Design style
- C Working model
- D 2-D model

16

If the mechanical advantage of a machine is 1, then:

- A The machine does not work.
- B The machine does not multiply force.
- C The machine is 100% efficient.
- D The work output is greater than the work input.

17

What is the definition of power?

- A Work times time
- B Force times time
- C Work divided by time
- D Distance divided by force

18

What is the definition of work?

- A Force times distance
- B Power times distance
- C Efficiency divided by force
- D Power divided by force

Pre Evaluation Scientific Visualization 2005

- 19** What is the definition of force?
- A Work times distance
 - B Mass times acceleration
 - C Effort times mass
 - D Mass times time
- 20** (Fill in the blank) _____ is how many times the effort force is multiplied.
- A Resistance
 - B Efficiency
 - C Power
 - D Mechanical advantage
- 21** The effort force on a lever being used to move a rock is 700 N. This force is applied through a distance of 0.8 m. What is the work input in Joules?
- A 420
 - B 560
 - C 780
 - D 875
- 22** The effort force on a lever being used to move a rock is 700 N. This force is applied through a distance of 0.8 m. What is the work output in Joules?
- A 420
 - B 560
 - C 780
 - D 875
- 23** On a pulley, if the input work is 5000 J and the resistance distance (how far something is moved) is 0.5 m, what is the resistance force?
- A 100
 - B 1,000
 - C 10,000
 - D 100,000
- 24** If the resistance force applied by an object being moved is 3000 N, what is the object's mass in kilograms? (Using $a = 10 \text{ m/s}^2$)
- A 300
 - B 600
 - C 1200
 - D 6000
- 25** The amount of output work required to lift a crate with a pulley system is 2200 J. The effort force on the pulley is 40 N. What is the effort distance in meters?
- A 35
 - B 55
 - C 72
 - D 250

Pre Evaluation Scientific Visualization 2005

?	⊙	Answer/ Scale	Objective	?	⊙	Answer/ Scale	Objective
1	1	C	SV17.03 Technology	14	14	B	SV17.03 Technology
2	2	D	SV17.03 Technology	15	15	C	SV17.03 Technology
3	3	D	SV17.03 Technology	16	16	B	SV17.02 Science
4	4	A	SV17.03 Technology	17	17	C	SV17.02 Science
5	5	B	SV17.03 Technology	18	18	A	SV17.02 Science
6	6	D	SV17.03 Technology	19	19	B	SV17.02 Science
7	7	A	SV17.03 Technology	20	20	D	SV17.02 Science
8	8	C	SV17.03 Technology	21	21	B	SV17.01 Math
9	9	B	SV17.03 Technology	22	22	B	SV17.01 Math
10	10	C	SV17.03 Technology	23	23	C	SV17.01 Math
11	11	C	SV17.03 Technology	24	24	A	SV17.01 Math
12	12	B	SV17.03 Technology	25	25	B	SV17.01 Math
13	13	C	SV17.03 Technology				

Minimum points
required to achieve
mastery category

Total questions on test: 25

Objectives measured: 3	Items	Points	●	◐	Questions measuring this objective
SV17.03 Technology	15	15	11	10	1 2 3 4 5 6 7 8 9 10 11
SV17.03 Technology					12 13 14 15
SV17.02 Science	5	5	4	3	16 17 18 19 20
SV17.01 Math	5	5	4	3	21 22 23 24 25
Totals		25	19	16	

SV17

? = Test Question Number ⊙ = line on GP Form

Pre Evaluation Scientific Visualization 2005

Items used in test

?	Item name	?	Item name	?	Item name
1	SV17.03.00.07	10	SV17.03.00.10	18	SV17.02.00.02
2	SV17.03.00.12	11	SV17.03.00.15	19	SV17.02.00.05
3	SV17.03.00.09	12	SV17.03.00.02	20	SV17.02.00.01
4	SV17.03.00.04	13	SV17.03.00.11	21	SV17.01.00.01
5	SV17.03.00.13	14	SV17.03.00.03	22	SV17.01.00.02
6	SV17.03.00.05	15	SV17.03.00.06	23	SV17.01.00.03
7	SV17.03.00.08	16	SV17.02.00.03	24	SV17.01.00.04
8	SV17.03.00.01	17	SV17.02.00.04	25	SV17.01.00.05
9	SV17.03.00.14				

SV17

? = Test Question Number ● = line on GP Form