

Instructions: This test is divided into two parts. Part A is entitled short answer questions where you are to pick the best word, phrase or choice of answers which best answers or, in some cases, defines the statement. Part B is entitled longer answer questions. Make your answers clear and concise. If you need more room turn over the test paper and continue on the back, but please write "over" on the test. For problems, it is the procedure that will be checked, not only the answer so please try to make it clear. Be sure to include units in answering problems (such as we've done in class). Point weighing is indicated in parentheses. So for this, the first test of the summer poets' course, Good Luck!

A. Short Answer Questions

1. (6) Choose from the physical quantities which we have discussed - length, area, volume, time, mass, speed, acceleration, and force to answer the following:

- _____ a) "How long" something is can be given by its ?.
- _____ b) The amount of space occupied by an object is a 3 dimensional measurement called ?.
- _____ c) The quantity of "matter" contained by an object is called ?.
- _____ d) A measure of how much an object speeds up is called ?.
- _____ e) A measure of how fast an object is moving is given by the ?.
- _____ f) Weight is a ?.

2. (12) Choose from the list of physical quantities listed in question 1 to identify the quantities listed below taken from various problems.

- | | | |
|-----------------------------------|----------------------------------|-------------------------------|
| _____ a) 6.3 ft | _____ e) 9.8 ft ³ | _____ i) 3.9 slug |
| _____ b) 5.2 N | _____ f) 2.75 (ft/sec)/sec | _____ j) 2.7 lb |
| _____ c) 2.92 kg m/s ² | _____ g) 4.7 square meters | _____ k) 2.77 ft ² |
| _____ d) 3.62 s | _____ h) 3.62 m/sec ² | _____ l) 2.25 H |

3. (3) Write the following in Scientific Notation.

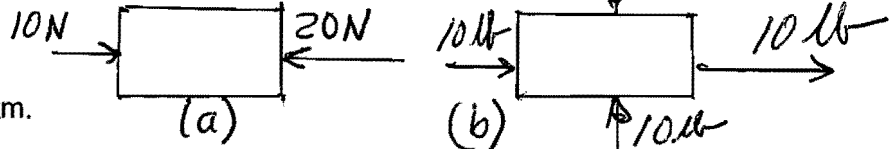
- _____ a) .00000902 kg
- _____ b) 25,100,000,000 miles
- _____ c) .5002 m

4. (3) Write the following in ordinary notation.

- _____ a) 3.21×10^{-4} m
- _____ b) 5.21×10^4 m
- _____ c) 7.002×10^{-1} kg

_____ 5. (2) A box measuring 2 m by 0.5 m by 4 m contains ? m³ and also contains ? cm³.

_____ (a) 6. (2) Find the net force for
_____ (b) each of the following:



_____ 7. (2) There are ? m in 1 km.

_____ 8. (3) At an average speed of 88 ft/s, how far will a motorist travel in 1 min?

_____ 9. (3) The distance from Minneapolis to Chicago is about 400 mi. How long will this trip take if you average 50 mi/hr?

_____ 10. (2) If you're traveling at 60 mi/H and look to the side for 2 s, how many feet are traveled during this inattentive period? (Note: 88 ft/s = 60 mi /H)

_____ 11. (2) Fill in the blanks: (a) ? in² = 3 ft²

_____ (b) ? in³ = 2 ft³

_____ 12. (2) Note the prefix Mega "M": 5 Ms = ? s.

_____ 13. (2) An object speeds up from rest to 60 m/s in 5 s. Its acceleration is ?. (Be sure to include units.)

_____ 14. (2) There are ? cubic mm in one cubic m.

_____ 15. (3) If 1.6 km = 1 mi, how far away in mi is 80 km?

_____ 16. (3) If cotton cost \$5 per square ft, the cost of a 2 yd wide by 6 yd long piece of cotton is ?. (Note: 3 ft = 1 yd.)

_____ 17. (2) 720 square in equals ? square ft.

_____ 18. (1 2) A famous scientist known as the "father" of experimental science is ?.

_____ 19. (1 2) A famous scientist who underwent a trial to give up his "heretical" beliefs contained in a book that he wrote which contained results of his astronomical findings from his newly invented telescope.

_____ 20. (1 2) A famous scientist who is given credit for discovery and development of the calculus, but who was a very paranoid, non-social individual.

_____ 21. (1 2) A famous scientist who discovered the "Universal" Law of Gravitation and formalized three major laws of motion.

_____ 22. (1) If an object is moving at a constant speed with **no** increase or decrease in that speed, then the acceleration of that object is ?.

B. Longer Answer Questions

1. (2) If an object travels at constant speed, does it also have a constant velocity? Explain.

2. (4) A car travels a distance of 100 ft in 5 sec.

(a) Find the average speed of the car:

(b) Find the distance traveled:

(i) After 1 sec:

(ii) After 2 sec:

(iii) After 4 sec:

3. (4) A dragster speeds up from rest to 100 ft/s in 5 s.

(a) What is the acceleration of the car?

(b) Find the speed of the car

(i) After 1 s:

(ii) After 2 s:

(iii) After 4 s:

4. (3) Discuss the significance of Galileo's famous "Tower of Pisa" experiment. How did the results of this experiment compare to the ideas of the Greeks?

5. (6) Convert 30 mi/H to cm/s. A string of conversion factors or a fraction is quite satisfactory; you need not multiply out the numbers to get full credit.

NOTE: 12 in = 1 ft
60 sec = 1 min
60 min = 1 H
5280 ft = 1 mi
1 mi = 1.6 km
2.54 cm = 1 in

6. An object is given an initial velocity of 192 ft per sec straight up into the air at $t = 0$ sec. Use the acceleration due to gravity as 32 ft/sec^2 or 9.8 m/sec^2 . Neglect air friction.

(a) Find its velocity at the following times:

_____ (1)(i) $t = 1 \text{ sec}$

_____ (1)(ii) $t = 3 \text{ sec}$

_____ (1)(iii) $t = 5 \text{ sec}$

_____ (1)(iv) $t = 7 \text{ sec}$

(b)(1) How long does the object take to return to the thrower's hand?

(c)(2) How high did the object go?

(d)(1) The acceleration at the top of the path is what?

7. (4) State Newton's First Law and give an example of each case mentioned in the first law.

8. (4) State and give two examples of Newton's Second Law

9. (4) (a) An object accelerates from rest to 20 m/s in 5 s. Find the acceleration.

(b) If the mass of the object is 100 kg, find the net force necessary to give it the acceleration of part (a)