HiLCoE

School of Computer Science and Technology

CC140 Worksheet 1

I. CHOOSE

1. Which of the following measurement is most significant?

   A. 66.000cm C. 6.600cm

   B. 0.00066cm D. 6.6cm

2. The number of significant figures in 0.000090050mm diameter of spherical particle is

   A. 9 B. 2 C. 3 D. 5

3. Which of the following is not a vector quantity?

   A. Displacement C. Electric current

   B. Weight D. Electric field

4. Which one of the following experimental errors can be reduced by taking repeated measurement?

   A. Parallax error C. Random error

   B. Systematic err. D. Zero error

II. BLANK SPACE

5. The given vector $\vec{A}=0.3\hat{\imath}+0.4\hat{\jmath}+\beta\hat{k}$ is a unit vector. The value of β is ____.
6. What is the sum, difference and dot product of two vectors $\vec{A}=\hat{\imath}+\hat{\jmath}-\hat{k}$ and $\vec{B}=-\hat{\imath}+\hat{\jmath}+\hat{k}$?
7. The magnitude of the sum of vector $2\hat{\imath}+\hat{\jmath}+\hat{k}$ and $\hat{\imath}-4\hat{\jmath}+3\hat{k}$ is equal to_____.

8. The scientific notation representation of a number 91250000000 is_____.
9. The order number of a radius of hydrogen atom which has a value 53pm is_____

III. PROBLEMS

10. How many cubic meters are in 250,000 cubic centimeters?
11. Suppose the accepted value of gravity is $g = 9.80665\ m/s^2$. If the measured value is $g = 9.81\ m/s^2$, what is the:
    a) Absolute error,
    b) $Relative\ Error$ and
    c) $Percentage\ error$ of g?
12. The average body temperature of a house cat is 101.5^0F. What is this temperature inCelsius?
13. Let $\vec{A}=\hat{\imath} + 2\hat{\jmath} + 4\hat{k}$. Compute the magnitude and direction cosine of $\vec{A}$.
14. A CS student moves her figures 8mm to North and then 6mm at 37^0 East of North on her key board to draw diagrams using her personal computer. What is the displacement and direction of the girl's hand?
15. Vector $\vec{A}$ has magnitude of 8units and makes an angle of 45^0 with the positive x axis. Vector $\vec{B}$ also has the same magnitude of 8units and directed along the negative x-axis. Find the magnitude and direction of $\vec{A} + \vec{B}$?
16. Given the displacement vectors $\vec{A} = 6\hat{\imath} - 4\hat{\jmath} + 8\hat{k}$ $\vec{B} = 2\hat{\imath} + 4\hat{\jmath} - 14\hat{k}$ Find the magnitude and the unit vector of the vector $0.5\vec{A} + 0.5\vec{B}$
17. If $\vec{A} = 6\hat{\imath} - 8\hat{\jmath}$, $\vec{B}=-8\hat{\imath} + 3\hat{\jmath}$ and $\vec{C} = 26\hat{\imath} + 19\hat{\jmath}$, Find a and b Such that $a\vec{A} + b\vec{B} + \vec{C} = 0$

18. The following values are part of a set of experimental data: 34.7cm and 19.65mm. How many significant figures would be present in the product and ratio of these two figures?

19. Verify that the following relation is correct from the dimensionless factors.

    (a) $\Delta x = u_x t + \frac{1}{2} a_x t^2$

    (b) $E = \frac{1}{2} \in E^2$

20. A car speedometer has a 10.0% uncertainty. What is the :

    (a) range of possible speeds and

    (b) the fractional uncertainty when it reads 90km/h?

21. What is the angle between two vectors (**A**+**B)** and (**A**-**B**) if their resultant is $\frac{2}{\sqrt{2}}(A + B)^2$

22. Compute the projection of vector $\vec{A} = 3\hat{\imath} + 4\hat{\jmath} - 2\hat{k}$ along $\vec{r} = \hat{\imath} + 2\hat{\jmath} - 3\hat{k}$

23. A piece of paper is measured and found to be (8.64 ± 0.15)mm wide and (64.2 ± 0.7)mm long. What is the area of this piece of paper?

24. The following values are part of a set of experimental data: 34.7cm and 19.65mm. How many significant figures would be present in the ratio of these two figures?

25. Determine the mean free path of a nitrogen molecule at room temperature and one atmosphere is 59 nm.

26. Honda Fit weighs a bout 2500 lb. What is its equivalent in kg?

27. Calculate the area of a rectangular metal plate that is 9.357cm by 4.2cm.

28. What it the resultant vector of two velocity vector of magnitude 60m/s and 80m/s at an angle of 60^0.

29. What is the sum and difference of the vectors: **A**= 7i +3j-2k and **B**= -6i-2j+k. Calculate also the unit vectors in the direction of vector **A** and vector **B**
30. The resultant of two vectors 3F and 2F is R. If the first vector is doubled, the resultant vector also becomes doubled. Compute the angle between the vectors.

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