





- Q.3 100.0 grams of sucrose ( $C_{12}H_{22}O_{11}$ , mol. wt. = 342.3 g/mol) is dissolved in 1.50 L of water. What is the molality?
- Q.4 49.8 grams of KI is dissolved in 1.00 kg of solvent. What is the molality?
- Q.5 Determine the molal concentration of a solution in which 320 grams of glucose  $C_6H_{12}O_6$  are dissolved in 4000 grams of water.
- Q.6 How many grams  $MgCl_2$  will be needed to prepare 3000 grams of a 0.8 molal solution?
- Q.7 Find the mass percent of sodium acetate ( $CH_3COONa$ ) in each of the following solutions:
- 5.00g of sodium acetate in 25.0 g of water
  - 10.0g of sodium acetate in 25.0 g of water
- Q.8 Calculate the mass, in grams, of NaCl present in each of the following solutions.
- 11.5g of 6.25% NaCl solution
  - 6.25 g of 11.5% NaCl solution
  - 54.3 g of 0.91% NaCl solution
- Q.9 For a 15.0% (by mass) NaCl solution, calculate:
- the mass of NaCl in 150g of the solution
  - the amount of solution needed to obtain 35.0g NaCl
  - the mass of NaCl needed to make 1000. g of the solution
- Q.10 Concentrated aqueous sulphuric acid is 98%  $H_2SO_4$  by mass and has a density of  $1.84g\ cm^{-3}$ .
- Calculate the molarity of the solution.
  - What volume of this concentrated acid is required to make 5.0 L of 0.5 M  $H_2SO_4$  solution.

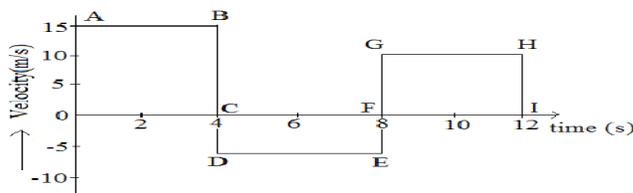
**PHYSICS****SUBMISSION DATE : 7.7.17**

Complete the following assignment in physics notebook

- Two balls of different masses are thrown vertically upward with same initial speed. Which one will rise to a greater height?



2. Draw displacement- time graph and velocity-time graph for uniformly accelerated motion. What is its shape?
3. Sameer went on his bike from Delhi to Gurgaon at a speed of 60km/hr and came back at a speed of 40km/hr. what is his average speed for entire journey.
4. A particle is moving along a straight line and its position is given by the relation  $x = (t^3 - 6t^2 - 15t + 40)m$   
Find (a) The time at which velocity is zero.  
(b) Position and displacement of the particle at that point.  
(c) Acceleration for the particle at that line.
5. Velocity time graph of a moving particle is shown. Find the displacement (1) 0 – 4 s (2) 0 – 8 (3) 0- 12 s from the graph.



6. A particle is thrown upwards. It attains a height (h) after 5 seconds and again after 9s comes back. What is the speed of the particle at a height h?
7. Establish the relation  $S_{nth} = u + a(2n - 1)$  where the letters have their usual meanings.
8. Under what condition the displacement and the distance of a moving object will have the same magnitude?
9. A balloon is ascending at the rate of 4.9m/s. A packet is dropped from the balloon when situated at a height of 245m. How long does it take the packet to reach the ground? What is its final velocity?
10. A car moving on a straight highway with speed of 126km/hr. is brought to stop within a distance of 200m. What is the retardation of the car (assumed uniform) and how long does it take for the car to stop?
11. Define (i)  $v = u + at$  (ii)  $v^2 - u^2 = 2as$  by calculus method
12. If the errors involved in the measurements of a side and mass of a cube are 3% and 4% respectively, what is the maximum permissible error in the density of the material ?
13. Show dimensionally that the frequency  $n$  of transverse waves in a string of length  $l$  and mass per unit length  $\mu$  under a tension  $T$  is given by  $n = \frac{K}{l} \sqrt{\frac{T}{\mu}}$



14. The velocity of sound waves 'v' through a medium may be assumed to depend on :  
(i) the density of the medium 'd' and (ii) the modulus of elasticity 'E'. Deduce by the method of dimensions the formula for the velocity of sound.
15. (a) What can be the maximum and minimum values of  $(\vec{A} + \vec{B})$  and  $(\vec{A} - \vec{B})$ ?  
(b) If two vectors of equal magnitude added to each other gives magnitude of one of them. What is the angle between them?
16. Find the value of 60 W on a system having 100 g, 20 cm and 1 minute as the fundamental units.
17. If displacement of a body  $s = (200 \pm 0.5)$  m and time taken by it is  $t = (20 \pm 0.2)$  s, then find the percentage error in the calculation of velocity.
18. Magnitude of force F experienced by a certain object moving with speed v is given by  $F = kv^2$ , where k is a constant. Find the dimensions of k.
19. A balloon is ascending at the rate of 4.9 ms<sup>-1</sup>. A package is dropped from the balloon, when situated at a height of 245 m. How long does it take the package to reach the ground ? What is its final velocity ?
20. A ball is thrown vertically upwards with a velocity of 29.4 ms<sup>-1</sup>. After 3 s another ball is thrown upwards from the same point with a velocity of 19.6 ms<sup>-1</sup>. When and at what height will the two balls collide?

**MATHEMATICS**
**SUBMISSION DATE : 7.7.17**

1. Write the following sets in the roster form.
  - (i)  $A = \{x \mid x \text{ is a positive integer less than } 10 \text{ and } 2x - 1 \text{ is an odd number}\}$
  - (ii)  $C = \{x : x^2 + 7x - 8 = 0, x \in \mathbb{R}\}$
2. State which of the following statements are true and which are false. Justify your answer.
  - (i)  $37 \notin \{x \mid x \text{ has exactly two positive factors}\}$
  - (ii)  $28 \in \{y \mid \text{the sum of the all positive factors of } y \text{ is } 2y\}$
  - (iii)  $7,747 \in \{t \mid t \text{ is a multiple of } 37\}$
3. Use the properties of sets to prove that for all the sets A and B,  $A - (A \cap B) = A - B$ .



4. For all sets A, B and C, is  $(A - B) \cap (C - B) = (A \cap C) - B$ ? Justify your answer.
5. From 50 students taking examinations in Mathematics, Physics and Chemistry, each of the student has passed in at least one of the subject, 37 passed Mathematics, 24 Physics and 43 Chemistry. At most 19 passed Mathematics and Physics, at most 29 Mathematics and Chemistry and at most 20 Physics and Chemistry. What is the largest possible number that could have passed all three examination?
6. A, B and C are subsets of Universal Set U. If  $A = \{2, 4, 6, 8, 12, 20\}$ ,  $B = \{3, 6, 9, 12, 15\}$ ,  $C = \{5, 10, 15, 20\}$  and U is the set of all whole numbers, draw a Venn diagram showing the relation of U, A, B and C.
7. Out of 100 students; 15 passed in English, 12 passed in Mathematics, 8 in Science, 6 in English and Mathematics, 7 in Mathematics and Science; 4 in English and Science; 4 in all the three. Find how many passed (i) in English and Mathematics but not in Science (ii) in Mathematics and Science but not in English (iii) in Mathematics only (iv) in more than one subject only.
8. A survey shows that 63% of the people watch a News Channel whereas 76% watch another channel. If x% of the people watch both channel, then  
 a)  $x = 35$    b)  $x = 63$    c)  $39 \leq x \leq 63$    d)  $x = 39$ . Justify your choice.
9. Prove by the Principle of Mathematical Induction that  
 (i)  $1 \times 1! + 2 \times 2! + 3 \times 3! + \dots + n \times n! = (n + 1)! - 1$  for all natural numbers n.  
 (ii)  $n^3 - 7n + 3$  is divisible by 3, for all natural numbers n.  
 (iii)  $3^{2n} - 1$  is divisible by 8, for all natural numbers n  
 (iv)  $1 + 5 + 9 + \dots + (4n - 3) = n(2n - 1)$  for all natural numbers n.
10. Prove by the Principle of Mathematical Induction :  $1 + 2 + 2^2 + \dots + 2^n = 2^{n+1} - 1$  , for all natural numbers n.



**COMPUTER SCIENCE AND INFORMATICS PRACTICES**

**SUBMISSION DATE : 10.7.17**

Complete the following project and submit in a CD.

**Project Work**

**Do the case study of the project of your given topic:**

**A Journey 'FROM ABACUS TO PENTIUM'**

**It should include the following:**

- Updation taking place in:
  - ✓ Hardware
  - ✓ Software
  - ✓ Operating System
- Generations of computers
- People Behind for the updations

**You can do any one of these:**

- PPT
- WEBSITE
- MOVIE

**BIOLOGY**

**SUBMISSION DATE : 5.7.17**

- I Complete the project on the given topic (typed and printed).
- II Update the practical file.(procedure not to be written)
- III Do the following in your notebook :-
  1. Differentiate between the structure of organelles responsible for cell division and motility respectively.
  2. The acrosome in a human sperm head is made from which organelle, state its other functions also.
  3. Name the two organelles which are called semi-autonomous and why?
  4. What will be the chromosome number in a skin cell, sperm and liver cell if  $2n=16$ .
  5. State an important difference between Anaphase 1 & Anaphase 2.



6. What are the different types of proteins & their arrangement in a Fluid mosaic model of plasma membrane?
7. When you observe mitosis under a microscope, you observe one of the cells in cytoplasmic division stage. How will you determine whether cytokinesis is taking place in a plant or an animal cell ?
8. Describe the structure of silk & haemoglobin.
9. What is the nature of digestive enzymes and how do they work?

## **ECONOMICS**

**SUBMISSION DATE : 6.7.17**

As a part of your assessment for the final term, a research work has to be submitted .You may choose to do research work on any of the topic suggested in the list. The research work must have a title page, main content and references. It should be typed in font size 12 (Times Roman) and should be of 20-25 pages excluding tables, diagrams and references. You may work individually or form a team with a partner. (Each team has at most 2 students).

### **Suggested topics:**

- Link between poverty and crime in India.
- Green revolution and its impact on agricultural output and productivity.
- India's government spending on education and health and GDP growth.
- Link between IT sector and employment.
- Globalization and its impact on Indian economy.

## **PHYSICAL EDUCATION**

**SUBMISSION DATE : 10.7.17**

Complete the following assignment in Physical Education practical file in the same order as listed below.

1. Explain in detail about any two Athletics events – Sprints and Jumps. (The events must be other than from those administered under Physical Fitness Test).

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2. Write benefits of Medicineball, Thera Tube and Pilates.
3. Draw a neat diagram of Standard Track with all its specifications. Mention all the Track and Field Events.
4. Measure BMI of ten members from family or neighbourhood and show graphical representation of the data.

*Happy Holidays!*