

# Amrit Public School, Malan



**Class- 12(PCM)**

# **Holiday Homework**

Roll No.:.....

Name:.....

Class Teacher's Sign

Co-Ordinator Sign

# Physics

1. Find the radius of curvature of the convex surface of a plane convex lens, whose focal length is 0.3m and the refractive index of the material of the lens is 1.5?
2. Show that the limiting value of the angle of prism is twice its critical angle? Hence define critical angle?
3. A convex lens made up of refractive index  $n_1$  is kept in a medium of refractive index  $n_2$ . Parallel rays of light are incident on the lens. Complete the path of rays of light emerging from the convex lens if
  - (i)  $n_1 < n_2$
  - (ii)  $n_1 = n_2$
  - (iii)  $n_1 > n_2$
4. Drive the expression for the angle of deviation for a ray of light passing through an equilateral prism of refracting angle  $A$ ?
5. Derive the relation  $\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2}$  Where  $f_1$  are  $f_2$  focal lengths of two thin lenses and  $F$  is the focal length of the combination in contact.
6. A converging lens of focal length 6.25cm is used as a magnifying glass if near point of the observer is 25cm from the eye and the lens is held close to the eye. Calculate (1) Distance of object from the lens. (2) Angular magnification and (3) Angular magnification when final image is formed at infinity.
7. A convex lens has a focal length 0.2m and made of glass is immersed in water, find the change in focal length of the lens?
8. An object of size 3.0 cm is placed 14 cm in front of a concave lens of focal length 21 cm. Describe the image produced by the lens. What happens if the object is moved further away from the lens?
9. Define total internal reflection of light? Hence write two advantages of total reflecting prisms over a plane mirror?
10. An equi-convex lens of radius of curvature  $R$  is cut into two equal parts by a vertical plane, so it becomes a plano-convex lens. If  $f$  is the focal length of equi-convex lens, then what will be focal length of the plano-convex lens?

# Chemistry

1. Mention the conditions required to maximize the yield of ammonia.
2. What happens when  $H_3PO_3$  is heated?
3. How is  $O_3$  estimated quantitatively?
4. How is the presence of  $SO_2$  detected?
5. Mention three areas in which  $H_2SO_4$  plays an important role.
6. Write the conditions to maximize the yield of  $H_2SO_4$  by Contact process.
7. Illustrate how copper metal can give different products on reaction with  $HNO_3$ .
8. Give the resonating structures of  $NO_2$  and  $N_2O_5$ .
9. Nitrogen exists as diatomic molecule and phosphorus as  $P_4$ . Why?
10. Why is dioxygen a gas but sulphur a solid?

# Mathematics

1. In a school there are 1000 students, out of which 430 are girls. It is known that out of 430, 10% of the girls study in class XII. What is the probability that a student chosen randomly studies in class XII given that the chosen student is a girl?
2. A die thrown three times. Events A and B are defined as below.  
A : 4 on the third throw  
B : 6 on the first and 5 on the second throw.  
Find the probability of A given that B has already occurred.
3. Mother, father and son line up at random for a family picture  
E : Son on one end  
F : Father in middle  
Find  $(E | F)$
4. An instructor has a question bank consisting of 300 easy True / False questions, 200 difficult True / False questions, 500 easy multiple choice questions and 400 difficult multiple choice questions. If a question is selected at random from the question bank, what is the probability that it will be an easy question given that it is a multiple choice question?
5. Box of oranges is inspected by examining three randomly selected oranges drawn without replacement. If all the three oranges are good, the box is approved for sale, otherwise, it is rejected. Find the probability that a box containing 15 oranges out of which 12 are good and 3 are bad ones will be approved for sale.
6. A fair coin and an unbiased die are tossed. Let A be the event head appear on the coin and B be the event 3 on the die. Check whether A and B are independent events or not.
7. In a hostel 60% of the students read Hindi news paper, 40% read English news paper and 20% read both Hindi and English news papers. A student is selected at random. (a) Find the probability that she reads neither Hindi nor English news papers. (b) If she reads Hindi news paper, find the probability that she reads English news paper. (c) If she reads English news papers, find the probability that she reads Hindi news paper.
8. Three cards are drawn successively, without replacement from a pack of 52 well shuffled cards. What is the probability that first two cards are kings and the third card drawn is ace.
9. Find the probability distribution of number of doublets in three throws of a pair of dice.
10. Find the variance of the number obtained on a throw of an unbiased die.

## हिंदी

- शोपिंग मॉल का मायाजाल विषय पर एक फीचर लिखें।
- यात्रा में रेलकर्मचारी के अशुद्ध व्यवहार की शिकायत पर रेल अधिकारी को एक पत्र लिखें।

## Physical Education

- Make a knock out fixture for 21 team.
- How many types of posture? Explain them.
- Types of training? Explain Fart let training.

## Informatics Practices

1. Discuss and compare various types of networks?
2. Explain mostly used topologies.
3. What are hubs? What are its types?
4. What is the role of a switch in a network?
5. Discuss repeater.
6. What are common threats to network security?
7. What are denial of services attacks?
8. How can you prevent/ counter threats of network security?
9. When do you think, ring topology becomes the best choice for a network?





