SAINIK SCHOOL CHITTORGARH (RAJ)

Autumn Vacations Home Work (physics) Class –X B

1. Define reflection of light and give the laws of reflection of light.
2. If a mirror is rotated at an angle Θ, keeping the incident ray same, prove that the reflected ray gets rotated by 2Θ.
3. What are the spherical mirrors? Define the focus and focal length. Also prove for a spherical mirror of small aperture F=R/2.
4. For a concave mirror & real image, prove that 1/v-1/u=1/f.Where the symbols have their usual meanings.
5. Draw all the ray diagrams for convex and concave mirror when the object is placed at
   (i) Infinity (ii) 2F (iii) between 2F and F (IV) F (V) between F and pole
6. What is the total internal reflection? Also write the conditions of TIR hence explain the formation of rainbow.
7. Explain the following defects in Vision. (i) Myopia (ii) Hypermetropia (iii) Presbyopia (iv) Astigmatism. Also explain, how these defects can be corrected?
8. Why rising and setting Sun appears as Red?
9. Why Sky appears blue in colour?
10. Define dispersion of light .Why ray of red colour bends least towards the base?

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SAINIK SCHOOL CHITTORGARH (RAJ)

Autumn vacation 2018-19 Home work(PHYSICS) Class XI

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1. What is the relation between bar and torr?
2. Can the relative velocity of two bodies be greater than the absolute velocity of either?
3. Name the quantity that remains conserved in rocket propulsion.
4. Why do we prefer to use a wrench with a long arm?

5. The time of oscillations (t) of a small drop of liquid under surface tension depends upon the density ρ, radius r and surface tension σ .Prove dimensionally that $t \propto \sqrt{\rho r^3/\sigma}$.

6.A physical quantity Q is given by $Q=A^2B^{3/2}/C^4D^{1/2}$ .The percentage errors in A, B, C and D are 1%,2%,4% and 2% respectively. Find the percentage error in Q.

7. What is an elastic collision? What will happen, when?
   (i) a heavy body collides with a light mass at rest.
   (ii) a light body collides with a heavy mass at rest.
8. State theorem of parallel axes of moment of inertia. Also write its mathematical expression.
9. Discuss the variation of 'g' with depth. What happens to g at the centre of earth?
10. The bob of a simple pendulum is a ball full of water .If a fine hole is made in the bottom of the ball, what will be its effect on the time period of the pendulum?
11. The displacement (in metres) of a particle moving along x- axis is given by $x=18t+5t^2$. Calculate:
    (i) the instantaneous velocity at t=2s.
    (ii) average velocity between t=2s and t=3s, and
    (iii) instantaneous acceleration
12. A projectile is fired with velocity u, at an angle Θ with the horizontal. Calculate the following:
    (i) Equation of its trajectory and (ii) Velocity at any instant.
13. Determine a unit vector perpendicular to both A=2i+j-k and B=i-j+2k

14.Define the term relative velocity. Two particles are moving with velocities v_1 and v_2 in the same direction on a straight road. Draw the position time graphs for the following conditions.

(i)If $v_1=v_2$ (ii) $v_2>v_1$. Particle moving with velocity v_2 is ahead of particle moving with velocity v_1

15. State Newton's Second law of motion. Prove that second law is the real law of motion.
16. Derive expression for velocity of a car on a banked road having coefficient of friction. Hence write the expression for optimum velocity.
17. A helicopter of mass 1000 kg rises with a vertical acceleration of $15ms^{-2}$. The crew and passengers weigh300 kg. Give the magnitude and direction of the (a) force on the floor by the crew and passengers
    (b) action of the rotor of the helicopter on the surrounding air.
    (c) force on the helicopter due to the surrounding air.
18. What is escape velocity? Obtain the expression for the escape velocity on earth. Why is it that there is no atmosphere on the moon? Explain.
19. Find moment of inertia of a thin uniform rod about an axis perpendicular to it and passing through its mid point. Also write its radius of gyration about the same axis.
20. Manu went to railway station to see off his uncle. At the platform, he saw that an old coolie was carrying heavy load on his head. Suddenly the coolie tripped and a baggage fell off his head. The owner of the bag started shouting at the old man. Manu couldn't tolerate this .He went to the old man, helped him in picking up the baggage and offered to carry some load for him.
    (i)What does this tell you about the nature of Manu?
    (ii) A man weighing 55 kg supports a body of 20kg on his head. Calculate work done by him if he moves a distance of 20m.
    (a) On horizontal road (b) upon a smooth incline plane of 1/5 ($g=10ms^{-2}$).
    (iii)When is the work done is negative?

21.Define the following terms (i) Specific Heat (ii) Latent Heat (iii) Heat Capacity.
22.Calculate the amount of heat required to change 10g of ice at -10^0C to 100^0C of vapour.
23.What are mechanical waves? Also explain longitudinal and transverse waves by drawing their graphs.
24.What is the physical significance of moment of Inertia?
25.Why girders are made of I shape?

SAINIK SCHOOL CHITTORGARH (RAJ)

Autumn Vacation 2018-19 Assignment Class XII (PHYSICS)

Make working model mentioned against your name. Also prepare a file pertaining the details of your experiment.

S.NO	SCHOOL ROLL NO	NAME OF CADET	NAME OF PROJECT
1	5113	Sunil Rathi	OR and AND gate
2	5114	Surendra Choudhary	Formation of Eddy current
3	5115	Rahul Singh Bhati	Half wave Rectifier
4	5119	Ravinder Kumar	Full Wave Rectifier
5	5121	Rahul Daharan	NOT Gate
6	5124	Ritesh Kumar	NAND and NOR Gate
7	5128	Nilesh Choudhary	Clap switch
8	5139	Priyanshu Kumar	Rain Alarm
9	5143	Manish Kumar	Fire Alarm
10	5144	Somveer Kumar	Open Electric Motor
11	5152	Umesh Meena	Total internal reflection
12	5157	Raushan Kumar	Interference of light
13	5158	Robin Patel	Production and detection of plane polarized light
14	5159	Anshu Kumar	Automatic Street light switch
15	5160	Jiya lal	Electric current detector
16	5161	Ankit Pandey	Transistor as a switch
17	5162	Anurag Yadav	Diffraction of light
18	5163	Abhinav Kumar	Mutual Induction
19	5164	Alok Anand	Effect of Eddy current
20	5171	Ujjawal Bijarnia	Intensity of light in terms of current
21	5174	Lokesh	Full Wave rectifier
22	5175	Akash Singh	Clap Switch
23	5418	Ayush pusp	Mutual Induction
24	5422	Pankaj Kumar	Total Internal reflection
25	5428	Abhishek Gurjjar	XOR Gate

(ONKAR SINGH)
PGT PHYSICS