Indian National Physics Olympiad (INPhO) – 2024

Answer Sheet

Roll Number: ☐☐☐☐ - ☐☐☐☐ - ☐☐☐☐ Date: 4th February 2024

Duration: **Three Hours** Maximum Marks: 80

Please Note:

- Please write your roll number on top of this page in the space provided.
- This booklet contains 23 number of pages excluding this coverpage.
- Strike out any rough work that you do not want to be considered for evaluation. You may also use the space on the Question Paper for rough work – this will NOT be evaluated.
- Page 2-6 of this booklet is a Summary answersheet and the remaining pages are for writing detailed answers/rough work.
- In the Summary Answersheet write the final answer for each question in the left box and indicate in the right box the page number(s) where the detailed answer is shown.
- Marks will be awarded on the basis of what you write on both the Summary Answer Sheet and the Detailed Answer Sheets in the Answer Booklet. Simple short answers and plots may be directly entered in the Summary Answer Sheet. In some cases required explanations for answered questions should be given in Detailed Answer sheet. Marks may be deducted for the absence of detailed work in questions involving longer calculations.
- Use only black or blue pen (and pencil for diagrams) in this answersheet.
- Adequate space has been provided in the answersheet for you to write/calculate your answers. In case you need extra space to write, you may request additional blank sheets from the invigilator. Remember to write your roll number on the extra sheets and get them attached to your answersheet.
- **This answersheet must be returned to the invigilator**.

Student Signature: Place:

Invigilator Signature: Date:

(Do not write anything below this line)

Q No	**1**	**2**	**3**	**4**	**5**	**6**	**Total**
Maximum Marks	8	18	14	11	18	11	80
Score							

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Rough work

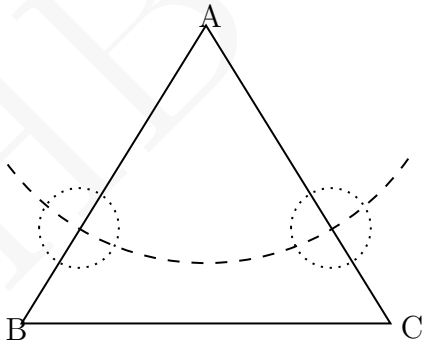
Q. no. Summary Answers Page nos for detailed answer

1. **An electrifying experiment**

Experiment No	Measurement
1	
2	
3	
4	

2. **A Potpourri of Prism Problems**

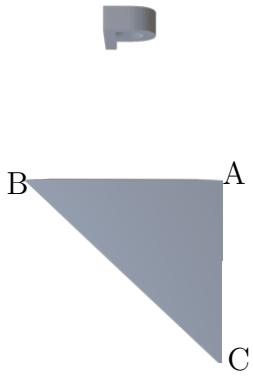
(a)



(b) Draw the image:

(c)

Ray diagram Image



(d)

Viewer should be facing the face _____

Coordinates of the prism A'B'C'D'E'F' are

A'-_____ ; B'-_____ ; C'-_____ ;

D'-_____ ; E'-_____ ; F'-_____ ;

(e)

Expression of $\beta =$

Expression of $\delta =$

β (in degrees) = δ (in degrees) =

3. **Chandrayaan-3**

(a)

Plot of v_r as function of θ:

	Plot of v_t as function of θ:	
(b)	$E =$	
(c)	Plot of KE:	
(d)	T (in hr)=	
(e)	Δv=	
(f)	$\Delta v'$=	

4. **Mag-Grav Tussle**

(a) $x(t) =$

(b) Plot of $x(t)$ vs t:

5. **Thermal Tussle**

(a) $v_p =$

. $T_c =$; Value of T_c(in K) =

(b) $f(u) =$

(c) Plot of $\frac{dT}{dt}$ vs T:

(d)	$t =$;$v_p =$	

6. **Sonic Sleuth**

(a)	Expression of $c_s =$	
(b)	x-axis label =	
	y-axis label =	
	slope =	
	intercept =	
	c_s=	
	Q=	
	Graph on page number:	