I-PRE BOARD EXAMINATION

SCIENCE PAPER-1

(Maximum Marks: 80)

(Time allowed: Two hours)

Answer to this paper must be written on the paper provided separately.

You will not be allowed to write during first 15 minutes.

This time must be spent in reading the question paper ..

The time given at head of this paper is the time allowed for writing the answers.

Section-A is compulsory. Attempt any four questions from Section-B.

The intended marks for the questions are given in the brackets [].

SECTION- Abigualos en T. aixa

(Attempt all questions from this section.)

East-West direction

of ice=336000 [kg*])

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isi

(d)

Question 1

[15]

Choose the correct answers to the questions from the given options.

(Do not copy the questions. Write the correct answers only.)

solenoid is disturbed so that it is free to revolve around the vertical

- (i) The ratio of SI to CGS unit of force is: 0 15 951 to g 000
- [1]

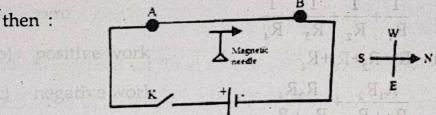
- (a) 10^5
- (b) 10⁶
- (c) 10^7
- (d) 10⁻⁵

(ii)	A si	ngly ionised helium atom is formed when:	[1]
	(a)	an alpha particle He gains one electron.	
	(b)	an alpha particle He2+ gains two electrons.	
	(c)	an alpha particle He ²⁺ gains one electron.	
	(d)	an alpha particle He looses one electron.	
(iii)	Sele	ct the example of isotones among the give options	[1]
s.	(a)	Na and 12 Mg ethor of bearolla ed ton llios wol	
	(b)	This time must be spent in reading 21 Mis and 12 Mis an	
		The time given at head of this paper is the time glove at head of this paper is the time glove at head of this paper is the time given at head of the time given at head of this paper is the time given at head of the ti	
ection-B.	(d)	Section-A is compulsory. Attempt any four questions from BM 21 bns aNa 11 gMg 21 bns and 12 gMg 21 bns	
(iv)	As	trong current is passed through a freely suspended solenoid.	Γhe
	sole	noid is disturbed so that it is free to revolve around the vertical	al
,	axis.	The solenoid will come to rest in:	[1]
	(a)	(North-south directionits all question All (North-south direction)	
	(b)	East-West direction I noiteeu Q	
ptions.	(c)90	Choose the correct answers to the questions with all	
	(d)	(Do not copy the questions. Write the consent to show	
(v)	200 8	g of ice at 0°C needs heat to melt. (specific latent heat	
'	of ice	e=336000 J kg ⁻¹)	[1]
	(a)	6720 J	1
	(b)	67200 J	
	(c)	672000 J	
	(d)	67.2 J	

This paper consists of 10 printed pages.

were

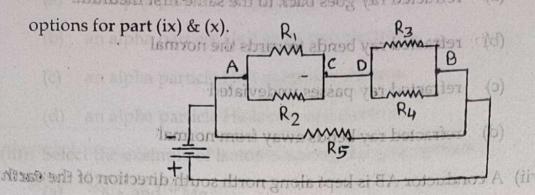
- (vi) During refraction, we get angle of deviation $\angle \delta = \angle i \angle r$ when: [1]
 - (a) refracted ray goes back to the same first medium.
 - (b) refracted ray bends towards the normal
 - (c) refracted ray passes undeviated
 - (d) refracted ray bends away from normal
- (vii) A conductor AB is kept along north south direction of the earth above a magnetic needle as sown in figure when the key is closed



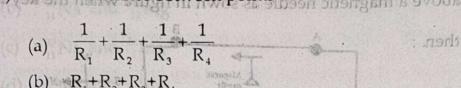
- (a) the needle will not show any deflection.
- (b) the needle will deflect towards west
- (c) the needle will deflect towards east
- (d) the needle will turn in opposite direction i.e. towards south (viii) In case of pure substances:
- ni mo 08 to (a) melting point > boiling point
 - (b) melting point < boiling point
 - (c) melting point = boiling point
 - (d) all above parts are correct

[1]

(vi) During retraction, we get angle of deviation 28 = 2i - 2r when? For given combination of resistors R₁, R₂, R₃, R₄ and R₅ select the correct



bear (ix) Total resistance between points 'A' and 'B' is:



(b) $R_1 + R_2 + R_3 + R_4$

- (c) $\frac{R_1R_2}{R_1+R_2} + \frac{R_3R_4}{R_3+R_4}$
 - (d) $\frac{R_1 + R_3}{R_1 R_2 \text{ include works to a like albeen entropy}} + \frac{R_2 + R_4}{R_2 R_2 R_4 \text{ included works to a like albeen entropy}}$
- (x) Potential difference is same across resistors: (d)
 - (a) R₁, R₃ and R₅ the needle will deflect towards east
 - (b) R_1 and R_3
- (d) the needle will turn in opposite direction i.e. towards south R, and R, (c)
 - (viii) In case of pure substances: (d) R₃ and R₄
 - A boy of mass 40 kg climbs up a flight of 30 steps each of 30 cm in (xi) 2 minutes and a girl of mass 30 kg does the same in 1.5 minutes.

Power developed by them will be in ratio:

- (a) 4:3(d) all above parts are correct
- (b) 1:1
- (c) 3:4
- (d) 2:3

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[1]

[1]

[1]

The (xii)	deviation produced by an equilateral prism does not depend on: [1]
e(a) compared	the angle of incidence of success and the success of the angle of incidence of success of the su
(b)	the material for the prismisland nuclei material for the prismisla
is measured in	ii) Torque and work both are mearing and fo axis and
(b)	Joules. Can torque be also measured in Joule? Why of the colour of the light used
ed on itself. (xiii) A co	oolie raises a load upwards against the force of gravity then work
	[1] What is its, new resistance?
(a)	(iv) Define couple. (iv) Define couple. (v) Can MA>VR? Why or why not?.
(d) w colour.	positive work whether the control of the control of the light of the l
h(2) 45° for	lo merculo de les than, equal to, or note to
(d)	none of these : see light (b) blue light?
(xiv) In the	he given graph of height v/s energy, line AB represents: [1]
(a)	kinetic energy Energy Trans B (B)
(b)	total energy spinoids revise form tollers (6) in each
(c)	potential energy A Height Emoitson (2)
k(b)t suitable f	floss in potential energy in lo seitregery available (i) a by
	ich of the following is not the unit of magnetic field: [1]
	(ii) A heater is marked 2.5 KW-250V. Calculate the rurn
	at the rate of Rs. 0.60 per unit.
plied to our	(iii) At what (i) voltage and (ii) frequency is the a.c. supp
(c)	weder/metre ² to the season
(d)	(iv) State energy change in the following:
Question 2	(a) rise in temperature on heating.
(i) (a)	What is the relation between angle of incidence and angle of
	refraction? [1]
	7-3
ray (b.	2022:ICSE
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(p) What is the other name of principle of method of that takes

	(b) What is the other name of principle of method of mixtures?	.T]
gend on : [(c) A radioactive nucleus emits a beta particle. Does the position	
	of daughter nucleus changes in a periodic table as compared	
	to the parent nucleus. In our laire tank out (d)	[1
ii)	Torque and work both are measured in N-m. Work is measured in	
,	Joules. Can torque be also measured in Joule? Why or why not?	[2]
(iii)	A wire of resistance 9Ω having length 30 cm is tripled on itself.	
ty then wo	Commence of the control of the contr	[2
(;-)	What is its. new resistance?	[2
(iv)	Define couple.	[2
(v)	Can MA>VR? Why or why not?	L
(vi)	The critical angle for glass-air is 45° for the light of yellow colour.	
	State whether it will be less than, equal to, or more than 45° for	
	(a) red light (b) blue light?	[2]
(vii)	Name the radiation which can be detected by	[2
	(a) Ra thermopile and the second second second (a)	
	(b) a solution of silver chloride vgrana later (d)	
Question 3	(c) potential energy	
(i)	Write two properties of ultrasonic waves which make it suitable for	
	their wide use. To time and ton as gui wollo? add to do the unit of (vx)	[2]
(ii)	A heater is marked 2.5 KW-250V. Calculate the running cost for 2 hr	s
		[2]
(iii)	At what (i) voltage and (ii) frequency is the a.c. supplied to our	
	houses? (c)	[2]
(iv)	State energy change in the following: (T) sleet (b)	
	(a) rise in temperature on heating.	
d angle of	(i) (a) What is the relation between angle of incidence and	[2
	id 2.3 faction?	

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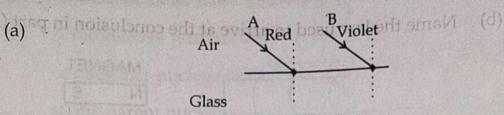
In what direction does the induced current flow in the coil? (a) [2] Name the law used to arrive at the conclusion in part (i). (b) Hwo do speeds of the rays differ in glass in adjacent SECTION-B noaser sviD Sees on (Attempt any four questions) (b) Draw a ray-diagram to show the refraction of a ray thr 4 noitesuO (a) The centre of gravity of a metre scale of mass 80 g lies at the 45 cm mark. It is pivoted at 60 cm mark. What weight should be suspended at its one end to keep the rule horizontal? Also draw a diagram of length 20 cm at a distance of 15 cm fr. memagnarra entroition and [3] (b) A pulley system with a velocity ratio 4 is used to lift a load of 300 kgf to a vertical height of 10 m by applying an effort of 100 kgf downwards. Draw the arrangement of pulley showing L, E and T in each [2] vibrations? Give one example of each. strand. Find the efficiency of the pulley system and the work done by (ii) [1] the effort. A ball of mass 10 g falls from a height of 5 m. It rebounds from the (c) (iii) amplitude ground to a height of 4m. Find: (c) A boy stands 60 m in front of a tell wall and claps. The boy continues the initial PE of the ball. to clap every time an echo is heard. Another boy finds that the time the KE of the ball just before striking the ground. ty-first clap is 18 sec. Calculate the speed of the KE of the ball after striking the ground. (iii) the loss in KE on striking the ground. (Take g=9.8 ms-2)

[2].

[3]

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121



Hwo do speeds of the rays differ in glass in adjacent (i) diagram? 8-MOITOJE

Are the two refracted rays parallel in glass? Give reason. [2] (ii)

Draw a ray-diagram to show the refraction of a ray through a prism (b) when it suffers minimum deviation. How is the angle of emergence [3] behindere and related to the angle of incidence in this position.

(c) An object of height 2 cm is placed in front of a convex lens of focal length 20 cm at a distance of 15 cm from it. Find the position and magnification of the image. What will be power of the lens?

to a vertical height of 10 m by applying an effort of 100 k 8 noits au Questical height of 100 k 8 noits au Questical heig

[8]

[2]

[1]

(a) What are damped vibrations? How do they differ from the free vibrations? Give one example of each.

[3] Write characteristics of sound associated with:

- (i) wave-form
- ent most about of mass 10 g falls from a height of a militable from the
 - (iii) amplitude
 - A boy stands 60 m in front of a tall wall and claps. The boy continues (c) e initial RE of the ball. to clap every time an echo is heard. Another boy finds that the time Co the ball just belore striking the ground between first and fifty-first clap is 18 sec. Calculate the speed of the KE of the ball after striking the ground. [4](iv) the loss in KE on striking the ground. (Take g=9.8 ms=)

ground to a height of 4m. Find

[1]

[4]

[3]

(c) Avessel of mass 100 g contains 150 g of water at 307 noitesuQuch lee	
lo lainstant (a) in (i) write one advantage of connecting electrical appliances	s in
vessel = 0.4] g-1 k-1, spanishment and spanishment of ice = 336] g-1.	[1]
(ii) What characteristics should a fuse wire have?	[1]
(iii) Which wire in power circuit is connected to the metalli	c body
of the appliance.	[1]
(b) (i) State polarities developed at the ends A and B in adjace	ent
(ii) What is meant by nuclear waste? ? margaib	[2]
(iii) Suggest one effective process for safe disposal of nuclear waster engamortosels sociated atomic number 92. (b) One isotope of uranium has a mass number 235 and atomic number 92.	t. [1]
(i) What is the thing of lectrons in the neutral atom of this	
isod ppe 11	
ati ni snort (c) l'In the adjacent circuit, calculate: ent si tanW (ii)	
(i) the resistance of the circuit when the key is open.	[1]
[1] sn(ii) the current drawn from the cell when the key is open	[1]
(iii) the resistance and the current when key is closed.	[2]
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
(ii) What is the approximate temperature required for the process	
of nuclear furience of nuclear furience of nuclear furience (1)	
[1] (a) Name the material of which calorimeter is made of. Give t	wo reasons
for using the material stated by you.	[3]
(b) (i) Heat supplied to a solid changes it in to a liquid. WI	nat is
this change in phase called ?	[3]
(ii) During the phase change, does the average kinetic e	nergy
of the molecules of substance increase?	
(iii) What is energy absorbed during phase change calle	d ?
0	

A vessel of mass 100 g contains 150 g of water at 30°C. How much ice (c) is needed to cool it to 5°C? Take specific heat capacity of material of vessel = $0.4 \text{ J g}^{-1} \text{ k}^{-1}$, specific latent heat of fusion of ice = 336 J g^{-1} , [4]specific heat capacity of water = 4.2 J g⁻¹ k⁻¹, Question 9 [3] (i) What is meant by radioactivity? (a) What is meant by nuclear waste? (ii) Suggest one effective process for safe disposal of nuclear waste. (iii) One isotope of uranium has a mass number 235 and atomic number 92: (b) What is the number of electrons in the neutral atom of this (i) [1] isotope? What is the number of protons and number of neutrons in its (ii) [1] nucleus? A thomas with a sanctaiger of the Do all isotopes have same number of neutrons. [1] (iii) Complete the following nuclear changes: (c)

(i) $X_1 \xrightarrow{\beta} X_2 \xrightarrow{\alpha} X_3 \xrightarrow{\infty}_{82}^{206} X_4$ [2]

(ii) What is the approximate temperature required for the process of nuclear fusion? [1]

(iii) complete the reaction [1]

 $_{1}H^{3}+_{1}H^{2}\longrightarrow_{2}He^{4}+_{0}n^{1}+.....$

During the phase change at os the average quietle energy

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