APOLLO

FBISE Physics Class 10
Topical workbook - Volume 3 of 3

96 questions arranged by official framework topic.
National Curriculum 2022-23; supported examinations from 2027.

APOLLO

Electricity and Magnetism

Domain E: Electricity and Magnetism

First Annual 2026 | Section B Q2(vi) | 3 marks

(vi)	Why is alternating current preferred for domestic use? Give three reasons. گھریلو استعمال کے لیے آلٹرنیٹنگ کرنٹ کو کیوں ترجیح دی جاتی ہے؟ تین وجوہات لکھیں۔	1x3

First Annual 2026 | Section B Q2(vii) OR | 3 marks

How can a charged insulator be discharged by placing it on a flame? Explain briefly. کسی چارجڈ انسولیٹر کو شعلے کے اوپر رکھنے سے وہ کیسے ڈسچارج ہو سکتا ہے؟ وضاحت کریں۔	03

First Annual 2026 | Section B Q2(viii) | 3 marks

Enlist any six regions of electromagnetic spectrum in correct order (Higher to lower) of their wave lengths. الیکٹرومیگنیٹک سپیکٹرم کے کوئی سے چھ ریجن کی زیادہ سے کم ویولینتھ کی ترتیب میں فہرست	03

First Annual 2026 | Section B Q2(viii) OR | 3 marks

State Ohm's law. A potential difference of 12 V produces a current of 3 A in a conductor. Calculate its resistance. اوہم کا قانون بیان کریں۔ اگر 12 وولٹ کا پوٹینشل ڈیفرنس کسی کنڈکٹر میں 3 ایمپیئر کرنٹ	1+2

First Annual 2026 | Section B Q2(xi) OR | 3 marks

Briefly state the particle nature of light. Also mention its one application. لائٹ کی پارٹیکل نیچر مختصراً بیان کریں۔اس کی ایک ایپلیکیشن بھی بتائیں۔	2+1

First Annual 2026 | Section C Q5 | 5 marks

a	How mutual induction is involved in the working of a transformer? Explain. Also draw diagram.	3+2
b	Describe the energy transformation that occurs in a transformer.	
	ڈ انفیوژن ... کر کام کر ... ہے ... ضح کر ...	
	draw diagram.	3+2
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	ڈ انفیوژن ... کر کام کر ... ہے ... ضح کر ...	

Make truth table of following gates
AND, OR, NAND, NOR, NOT.

First Annual 2026 | Section C Q6 | 5 marks

Describe the operation of an electric motor, including the action of split-ring, commutator and brushes. Also draw a neat sketch. الیکٹرک موٹر کا آپریشن بیان کریں۔ اپنے جواب میں سپلٹ رنگ، کموٹیٹر اور برشز کا ایکشن،	4+1

First Annual 2026 | Section A Q1 | 1 mark

A diode is commonly used as a:	Resistor	Transformer	Rectifier	Capacitor

First Annual 2026 | Section A Q3 | 1 mark

3. An object becomes negatively charged when it:	Gains neutrons	Loses electrons	Gains protons	Gains electrons

First Annual 2026 | Section A Q4 | 1 mark

If both inputs of a NAND gate are HIGH, the output will be:	Same as input	HIGH	Undefined	LOW

First Annual 2026 | Section A Q6 | 1 mark

The force on a current-carrying conductor in a magnetic field is maximum when the conductor is placed:	Along the current direction	Parallel to the field	At any angle	Perpendicular to the field

First Annual 2026 | Section A Q7 | 1 mark

Correct formula of electric current is: برقی کرنٹ کی درست مساوات کون سی ہے؟	I = Q / t	I = t / Q	I = Q × t	Q = I / t

First Annual 2026 | Section A Q11 | 1 mark

If the split-ring commutator is removed, the motor will:	Produce electrical energy	Rotate faster	Stop after half rotation	Continue rotating smoothly

First Annual 2026 | Section B Q2(ii) | 3 marks

What is meant by electric field? Write two characteristics of an electric field. الیکٹرک فیلڈ سے کیا مراد ہے؟ الیکٹرک فیلڈ کی دو خصوصیات لکھیں۔	1+2

First Annual 2026 | Section B Q2(ii) OR | 3 marks

Describe the working of a diode under forward bias. Also draw diagram. فارورڈ بائس (Forward Bias) کی حالت میں ڈائیوڈ کے عمل کی وضاحت کریں۔ ڈائیگرام بھی بنائیں۔	1.5 + 1.5

First Annual 2026 | Section B Q2(iii) OR | 3 marks

Calculate the total e.m.f of two cells of 3V when they are connected in: 3V کے دو سیلز کی ٹوٹل e.m.f معلوم کریں جب وہ جڑے ہوں: **a** In series سیریز میں **b** In parallel پیرالل میں	1.5 + 1.5

First Annual 2026 | Section B Q2(iv) | 3 marks

Calculate the electricity bill for using a 2 kW electric iron for 3 hours if the cost per unit is Rs. 25. اگر 2 کلوواٹ کی برقی استری 3 گھنٹے استعمال کی جائے اور فی یونٹ قیمت 25 روپے ہو تو بجلی کا	1x3

First Annual 2026 | Section B Q2(v) OR | 3 marks

An appliance uses 220 V and draws a current of 1 A. Calculate the energy consumed in 5 s. کوئی آلہ 220 وولٹ پر 1 ایمپیئر کرنٹ لیتا ہے۔ 5 سیکنڈ میں استعمال ہونے والی توانائی معلوم	03

First Annual 2026 | Section B Q2(v) | 3 marks

State Lenz's law. Explain with an example how Lenz's law obeys the law of conservation of energy. لینز کا قانون بیان کریں۔ لینز کا قانون انرجی کی کنزرویشن کے قانون کی کیسے پیروی کرتا ہے؟	1+2

First Annual 2026 | Section B Q2(vi) | 3 marks

Briefly describe direct current (d.c) and alternating current (a.c). Give one advantage of each. اے سی (a.c.) اور ڈی سی (d.c.) کرنٹ کی مختصر وضاحت کریں۔ ہر ایک کا ایک فائدہ	1.5 + 1.5

First Annual 2026 | Section B Q2(vii) OR | 3 marks

Why does heating help an insulator lose its charge? گرم کرنے سے انسولیٹر اپنا چارج کیوں کھو دیتا ہے؟ وضاحت کریں۔	03

First Annual 2026 | Section B Q2(viii) | 3 marks

Write the correct order of electromagnetic waves from radio waves to gamma rays. الیکٹرومیگنیٹک ویوز کو ریڈیو ویوز سے گاما ریز تک درست ترتیب میں لکھیں۔	03

First Annual 2026 | Section B Q2(viii) OR | 3 marks

State Ohm's law. Calculate the current through a resistor of 6 Ω when a voltage of 12 V is applied. اوہم کا قانون بیان کریں۔ اگر 6 اوہم کے ریزسٹر کو 12 وولٹیج دی جائے تو اس میں گزرنے والا	1+2

First Annual 2026 | Section B Q2(xi) OR | 3 marks

Why does the color of the sky change during sunset? Name the phenomenon and explain briefly. غروبِ آفتاب کے وقت آسمان کا رنگ کیوں تبدیل ہو جاتا ہے؟ مظہر کا نام بتائیں۔ اور مختصراً	1+2

First Annual 2026 | Section C Q5 OR | 5 marks

a. Derive the formula for equivalent resistance of two resistors connected in parallel.

b. Calculate the total resistance when two identical resistors of 10 Ω are connected in parallel.

Explain the working of burglar alarm. Also draw its circuit diagram.

First Annual 2026 | Section C Q6 | 5 marks

a.	Explain the step-up and step-down transformers.	
b.	A step-down transformer converts 240 V into 12V. If there are 2000 turns on the primary coil, then find the number of turns on the secondary coil.	**3+2**

FBISE model paper | Section A Q6 | 1 mark

6.	A current of 1 ampere is drawn by a filament of bulb. Number of electrons passing through a cross-section of the filament in 16 seconds would be:	10^{20}	10^{19}	10^{-20}	10^{-19}

FBISE model paper | Section B Q2(ii) OR | 3 marks

OR	What is meant by biasing of a diode? What are types of biasing?	03

FBISE model paper | Section B Q2(xi) OR | 3 marks

OR	Why does the sky appear blue during the day?	03

Q.1 Consider the series combination of resistances:

i. Draw and label a circuit diagram of two resistors connected in series along with all necessary circuit components. (02)

ii. Copy and complete the following table. All the measurements are taken in SI units. (03)

No. of Obs.	Voltmeter Reading		Resistance		Equivalent Resistance R_e	Total Voltage V	Net Current I	Resistance by Ohm's law R	Difference R_e-R
SI Units	(---)		(---)		(---)	(---)	(---)	(---)	(---)
	V_1	V_2	R_1	R_2					
	2	10	10	50					
	6	10	60	100					
	4.8	12	80	200					

iii. What will be effect on the equivalent resistance of the circuit (mentioned in the table) if another

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	2	10	10	50					
	6	10	60	100					
	4.8	12	80	200					

iii. What will be effect on the equivalent resistance of the circuit (mentioned in the table) if another resistance is added in series with it? (01)

FBISE PBA model | Section B Q6(i) | 2 marks

Q.6 A student studies the relationship between the potential difference across a wire of uniform resistance R and its length L, keeping the current constant.

i. Draw the labelled circuit diagram used for this experiment. (2)

FBISE PBA model | Section B Q6(ii) | 2 marks

Q.6 A student studies the relationship between the potential difference across a wire of uniform resistance R and its length L, keeping the current constant.

i. Draw the labelled circuit diagram used for this experiment. (2)

ii. Copy and complete the following table. (2)

No. of observations	Length L (cm)	Potential difference V (volts)	Current I (A)	Resistance R=V/I (Ω)
1	25	0.5	0.1	
2	50	1.0	0.1	
3	75	1.5	0.1	
4	100	2.0	0.1	

First Annual 2026 | Section A Q6 | 1 mark

6. Two resistors 12 Ω and 6 Ω are connected in parallel. What will be the combined resistance?
دو ریزسٹنسز 12Ω اور 6Ω کو اگر متوازی جوڑا جائے، تو ٹوٹل ریزسٹنس کتنی ہوگی؟

0.25 Ω | 4 Ω | 6 Ω | 18 Ω

In $E = UBS\sin\theta$, E is maximum when:

First Annual 2026 | Section A Q7 | 1 mark

7.	In $F_B = ILBSin\theta$, F_B is maximum when: $F_B = ILBSin\theta$ میں F_B کب میکسیمم ہوتی ہے؟	$\theta = 0°$	$\theta = 180°$	$\theta = 45°$	$\theta = 90°$
	What happens to the atomic number of an	Increases by		Decreases by	Decrease

First Annual 2026 | Section B Q2(i) OR | 3 marks

OR	What is electroscope? Write its uses. الیکٹروسکوپ کیا ہے؟ اس کے استعمالات لکھیں۔	2+1

First Annual 2026 | Section B Q2(ii) OR | 3 marks

1.5		
1+2	OR	Describe the difference between electron flow and conventional current flow. Which one is used in circuit diagrams? الیکٹران کے بہاؤ اور کنونشنل کرنٹ کے بہاؤ میں کیا فرق ہے؟ سرکٹ ڈائیگرام میں کون سا استعمال ہوتا ہے؟

First Annual 2026 | Section B Q2(iii) OR | 3 marks

OR	How a changing current in the primary coil induces an emf in the secondary coil? Explain briefly. پرائمری کوائل میں کرنٹ کے بدلنے سے سکنڈری کوائل میں emf کیسے پیدا ہوتی ہے؟ مختصراً واضح کریں۔	03

First Annual 2026 | Section B Q2(iv) | 3 marks

(iv)	What is electrostatic potential? Give its formula and unit. الیکٹرسٹیٹک پوٹینشل کیا ہے؟ اس کا فارمولا اور یونٹ لکھیں۔	1x3	OR	Calculate the time period and wavelength of a wave travelling at 340 m/s with frequency of 170 Hz. ایک ویو کا ٹائم پیریڈ اور ویولینگتھ معلوم کریں جب کہ اس ویو کی ولاسٹی 340m/s ہے اور	1+2

First Annual 2026 | Section B Q2(ix) OR | 3 marks

OR	Draw schematic diagram of working DC motor. ڈی سی موٹر کے کام کے اصول کی ڈائیگرام بنائیں۔	1+2

First Annual 2026 | Section B Q2(v) | 3 marks

(v)	A bulb operates on 12 V and draws a current of 2 A for 5 minutes. Calculate the electrical energy consumed by the bulb. ایک بلب 12 وولٹ پر چلتا ہے اور 5 منٹ تک 2 ایمپیئر کرنٹ استعمال کرتا ہے۔ بلب کی استعمال شدہ الیکٹریکل انرجی معلوم کریں۔	03	OR	What is meant by the quality of sound? How does quality helps to distinguish between two sounds having the same pitch and loudness? ساؤنڈ کی کوالٹی سے کیا مراد ہے؟ جن ساؤنڈز کی پچ اور لاؤڈنیس ایک جیسی ہو، ان کو ایک دوسرے سے الگ ساؤنڈز سننے میں کوالٹی کیسے مدگار ہے؟

First Annual 2026 | Section B Q2(vi) | 3 marks

(vi)	A transformer steps up volage from 140V to 210V. If there are 400 turns in primary coil how many turns will be there in secondary coil?	03	OR	Draw a labelled ray diagram of a simple microscope showing the object, convex lens, and the final magnified virtual image.	03

First Annual 2026 | Section B Q2(vii) | 3 marks

State what happens to a current-carrying coil when it is placed in a magnetic field. Why does this effect occur?	1+2	OR	Draw circuit symbol and truth table of AND gate.	1+2

First Annual 2026 | Section B Q2(vii) OR | 3 marks

OR	Draw circuit symbol and truth table of AND gate. اینڈ گیٹ کا سرکٹ سمبل اور ٹرتھ ٹیبل بنائیں۔	1+2

First Annual 2026 | Section B Q2(viii) | 3 marks

(viii)	Differentiate between digital and analogue electronics. ڈیجیٹل اور اینالاگ الیکٹرونکس میں فرق بیان کریں۔	1.5 + 1.5	OR

First Annual 2026 | Section B Q2(xi) | 3 marks

(xi)	Why is the fuse used in an electric circuit? ایک الیکٹرک سرکٹ میں فیوز کیوں استعمال ہوتا ہے؟	03	OR	A bar magnet is falling towards a metallic ring wire. What is the direction of induced current when observed from top surface? Which rule is used to determine the direction? ایک بار میگنٹ ایک دائرہ نما شکل والے تار کی طرف گر رہا ہے۔ N S	2+1

First Annual 2026 | Section B Q2(xi) OR | 3 marks

03	OR	A bar magnet is falling towards a metallic ring wire. What is the direction of induced current when observed from top surface? Which rule is used to determine the direction? ایک بار میگنٹ ایک دائرہ نما شکل والے تار کی طرف گر رہا ہے۔ N S

Explain the principle of electromagnetic induction. How is this principle applied in a simple A.C. generator to produce alternating current? Draw schematic diagram.

First Annual 2026 | Section C Q5 | 5 marks

Q.5	Sketch the V–I graph of a filament lamp. How increasing current affects the resistance of the filament? Why the graph becomes non-linear? Give reason. فلامنٹ لیمپ (Filament Lamp) کا وولٹیج---کرنٹ (V–I) گراف بنائیں۔ کرنٹ

FBISE model paper | Section A Q1(1) | 1 mark

Q.1 Fill the relevant bubble for each part. All parts carry one mar

(1) In vacuum, all electromagnetic waves have the same:

A. Speed B. Amplitude

C. Frequency D. Wavelength

FBISE model paper | Section A Q1(11) | 1 mark

(11) Describe Ohm's law and its limitations.

FBISE model paper | Section A Q1(12) | 1 mark

(11) Describe Ohm's law and its limitations.

(12) Identify that a transformer works on the principle of mutual induction betweentwo coils.

FBISE model paper | Section A Q1(6) | 1 mark

Q.1 Fill the relevant bubble for each part. All parts carry one mark.

(1) In vacuum, all electromagnetic waves have the same:

A. Speed B. Amplitude
C. Frequency D. Wavelength

(2) The relationship between speed, frequency and wavelength of a wa knownas:

A. Wave equation B. Frequency equation
C. SHM equation D. Wavelength equation

(3) Which of the following forms of wave is "sound"?

A. Electrical B. Longitudinal
C. Transverse D. Magnetic

(4) If a ray of light in a glass is incident on an air surface at an angle gr thecritical angle, the ray will:

A. Refract only B. Reflect only
C. Partially reflect & refract D. Diffract only

(5) According to Coulomb's law, if distance between charges increases force ofattraction:

A. Will be increased B. Will be decreased
C. Will be unchanged D. Will become repulsion

(6) When we apply more voltage to an ohmic conductor, we get:

A. More resistance B. More flow of current
C. Decrease in power D Less flow of current

FBISE model paper | Section A Q1(7) | 1 mark

(6) Describe Ohm's law and its limitations.

(7) Explain by describing an experiment that an electric current in a conductorproduces a magnetic field around it.

(8) Describe the principle of heating

FBISE model paper | Section A Q1(8) | 1 mark

(8) Describe the simple uses of logic gates.

FBISE model paper | Section A Q1(9b) | 1 mark

(9) Explain briefly the transmission of
   a. electric signals through wires
   b. radiowaves through air

FBISE model paper | Section A Q7 | 1 mark

(7) Electromagnetism is the study of:

A.	Magnetic effect of current	B.	Flow of protons
C.	Flow of electrons	D.	Flow of neutrons

FBISE model paper | Section A Q8 | 1 mark

(8) Logic gates are used in:

A.	LDRs	B.	DC circuits
C.	Analogue circuits	D.	House safety

FBISE model paper | Section A Q9 | 1 mark

(9) Which one of the following is the most suitable means of reliable continuouscommunication between an orbiting satellite and Earth?

A.	Microwaves	B.	Radio waves
C.	Sound waves	D.	Any light wave

FBISE model paper | Section A Q11 | 1 mark

(11) What is the voltage across a 6 Ω resistor when 3A of current passes through it?

A.	2 V	B.	9 V
C.	18 V	D.	36 V

(12) If the turn ratio of a step-up transformer is 10. It means:

FBISE model paper | Section A Q12 | 1 mark

If the turn ratio of a step-up transformer is 10. It means:

A. $I_s = 10\ I_p$ B. $N_s = \frac{Np}{10}$

C. $N_s = 10\ N_p$ D. $V_p = 10V_s$

FBISE model paper | Section B Q2(iii) | 3 marks

iii. How can a body be negatively charged by electrostatic induction?

FBISE model paper | Section B Q2(v) | 3 marks

v. Will two wires carrying current in the same direction repel or attract each other?Give reason. Show it by a diagram.

FBISE model paper | Section B Q2(vi) | 3 marks

Define capacitance and its unit.

vi. How is an ammeter connected with a device to measure current? Support youranswer with reason.

OR

FBISE model paper | Section B Q2(vi) OR | 3 marks

youranswer with reason.

OR

Draw the symbols truth table of NOR gate.

FBISE model paper | Section B Q2(vii) | 3 marks

vii. What do you understand by digital and analogue quantities?

FBISE model paper | Section B Q2(viii) | 3 marks

viii. An electric kettle is rated as 2.5 kW, 230 V. Determine a suitable current rating of the fuse to put in the three-pin plug. Choose from 1A, 5 A, 13 A, 30 A and briefly explain.

FBISE model paper | Section B Q2(viii) OR | 3 marks

OR

What is CRO? Write its working principle and one use.

FBISE model paper | Section B Q2(x) OR | 3 marks

OR

How can we find the direction of magnetic field of a current carrying conductor?

FBISE model paper | Section B Q2(x) | 3 marks

x. Why is an electron beam deflected when passes through a magnetic field?

OR

FBISE model paper | Section C Q4 | 5 marks

Q.4 An electric bulb is marked with 220 V, 50 W. Find the resistance of the filamentof the bulb. If the bulb is used 5 hours daily, find the energy in kilowatt-hour consumed by the bulb in one month (30 days). (2+3)

OR

the Sun in one month (30 days). (2 × 5)

OR

A transformer is used to produce an output of 6V from 220V main supply. Primary coil of the transformer has 2000 turns. Calculate the number of turns in the secondary coil. (5)

OR

Discuss the main features of parallel combination of resistors. (1+2+2)

Q.1 Consider the series combination of resistances:

i. Draw the labelled circuit diagram for two resistors in series with all circuit components. (02)

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ii. Copy and complete the following table. All the measurements are taken in SI units. (03)

No. of Obs	Voltmeter Reading		Resistance		Equivalent Resistance R_e	Total Voltage V	Net Current I	Resistance by Ohm's law R	Difference R_e-R
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Q.1 Consider the series combination of resistances:

iii. What will be effect on the equivalent resistance of the circuit (mentioned in the table) if another resistance is added in series with it? (01)

APOLLO

Experimentation Skills (PBA Skills)

Domain N: Experimentation Skills (PBA Skills)

Q.2 Recall the experiment "motion of a ball rolling down an angle iron" and answer the following questions:

3	160	3.9	3.3		
4	140	3.2	3.1		
5	120	2.8	2.6		
6	100	2.5	2.0		

i. Why is the angle of inclination kept constant throughout the experiment? (01)

Q.2 Recall the experiment "motion of a ball rolling down an angle iron" and answer the following questions:

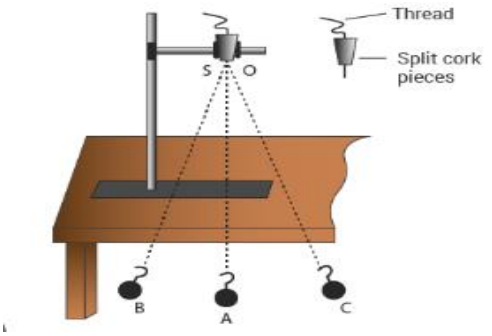
3	160	3.9	3.3		
4	140	3.2	3.1		
5	120	2.8	2.6		
6	100	2.5	2.0		

ii. Copy and complete the given table. (02)

	Distance (cm)	**Time (s)**			**Velocity (cm/s)**
		t_1	t_2	Mean time t	
1	200	4.4	4.6		
2	180	4.1	4.0		

FBISE PBA model | Section A Q3(i) | 3 marks

Q.3 A student is investigating the relationship between length of a simple pendulum and its time period. The diameter of the bob of pendulum is **1.6 cm**. He displaces bob slightly to set it into a steady swing and records the the time **t** taken for 20 complete oscillations. The experiment is repeated for different lengths of the pendulum.

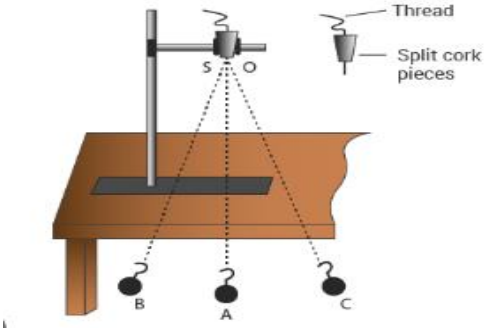


the total

i. Copy and complete the following table. (03)

FBISE PBA model | Section A Q3(ii) | 1 mark

Q.3 A student is investigating the relationship between length of a simple pendulum and its time period. The diameter of the bob of pendulum is **1.6 cm**. He displaces bob slightly to set it into a steady swing and records the the time **t** taken for 20 complete oscillations. The experiment is repeated for different lengths of the pendulum.

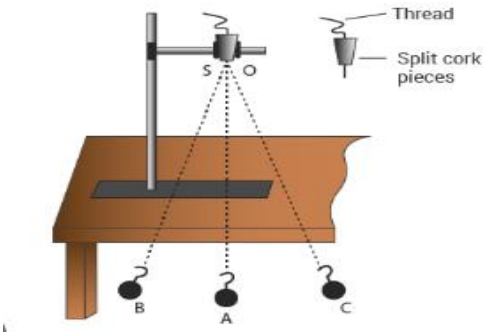


the total

ii. Name one control variable that must be kept constant in this experiment? (01)

FBISE PBA model | Section A Q3(iii) | 1 mark

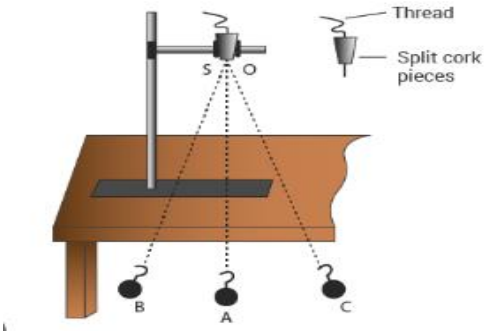
Q.3 A student is investigating the relationship between length of a simple pendulum and its time period. The diameter of the bob of pendulum is **1.6 cm**. He displaces the bob slightly to set it into a steady swing and records the total the time **t** taken for 20 complete oscillations. The experiment is repeated for different lengths of the pendulum.



iii. What should be the shape of the graph between L and T^2? (01)

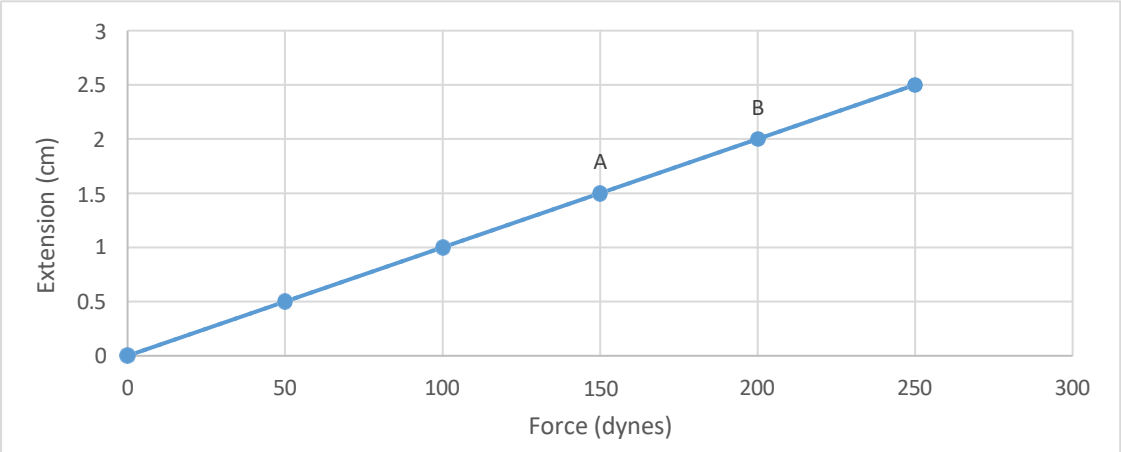
FBISE PBA model | Section A Q3(iv) | 1 mark

Q.3 A student is investigating the relationship between length of a simple pendulum and its time period. The diameter of the bob of pendulum is **1.6 cm**. He displaces the bob slightly to set it into a steady swing and records the total the time **t** taken for 20 complete oscillations. The experiment is repeated for different lengths of the pendulum.



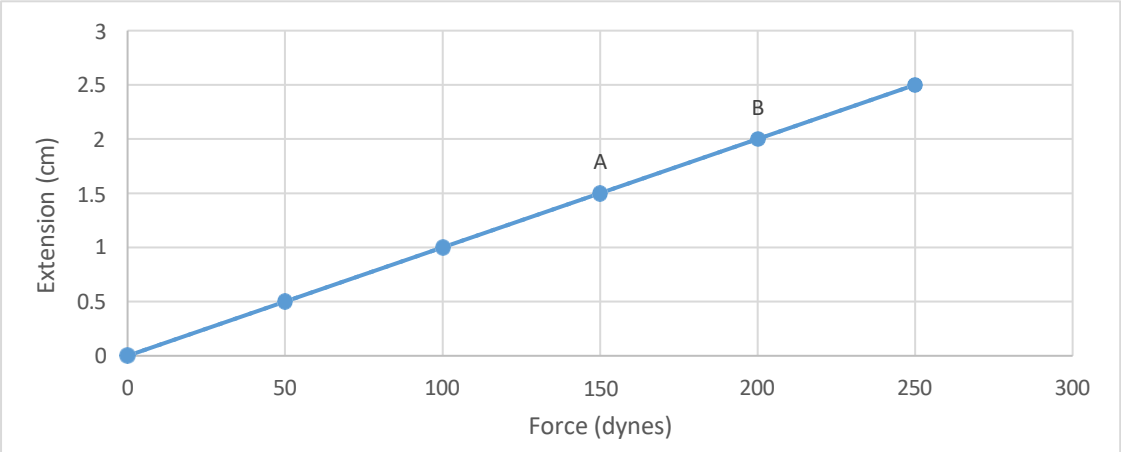
iv. How can the value of g be determined from the graph? (01)

Q.5 The given graph shows the extension in the helical spring by increasing the attached load.



i. Name the dependent variable and independent variable used in above graph. (01)

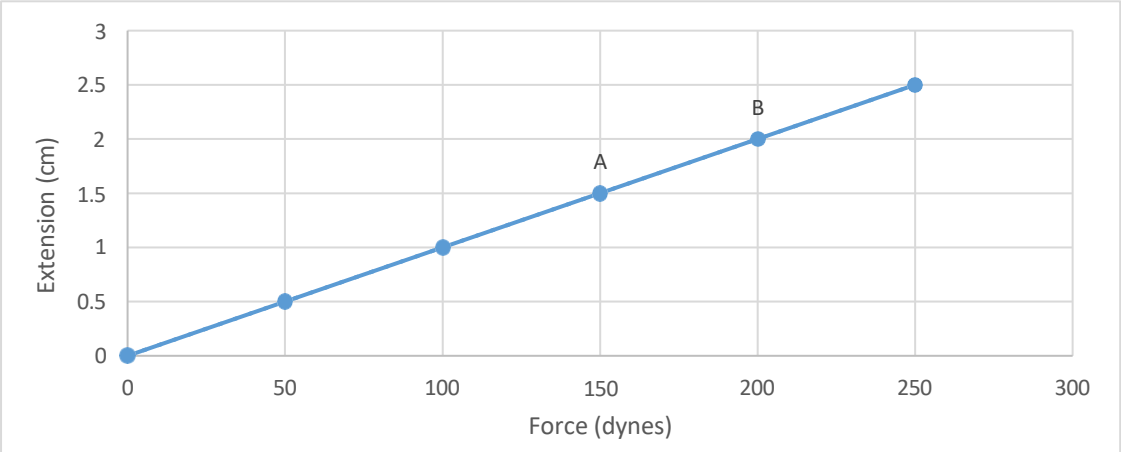
Q.5 The given graph shows the extension in the helical spring by increasing the attached load.



ii. Calculate the slope from force-extension graph by taking points A and B. (02)

FBISE PBA model | Section B Q5(iii) | 1 mark

Q.5 The given graph shows the extension in the helical spring by increasing the attached load.



iii. Which quantity is represented by the slope of force-extension graph? (01)

FBISE PBA model | Section A Q2(i) | 1 mark

Q.2 Recall the experiment "motion of a ball rolling down an angle iron" and answer the following questions:

3	160	3.9	3.3		
4	140	3.2	3.1		
5	120	2.8	2.6		
6	100	2.5	2.0		

i. Write down apparatus which is required to study the motion of a ball rolling down an angle iron? (01)

Q.2 Recall the experiment "motion of a ball rolling down an angle iron" and answer the following questions:

3	160	3.9	3.3		
4	140	3.2	3.1		
5	120	2.8	2.6		
6	100	2.5	2.0		

ii. Copy and complete the given table. (02)

No. of Obs	**Distance (cm)**	**Time (s)**			**Velocity (cms^{-1})**
		t_1	t_2	Mean time t	
1	200	4.4	4.6		
2	180	4.1	4.0		

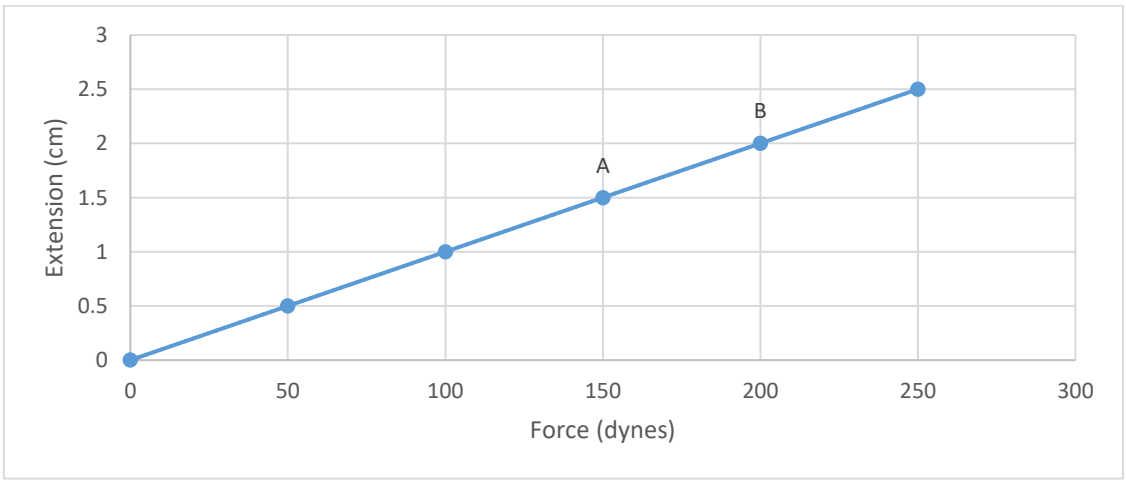
Q.2 Recall the experiment "motion of a ball rolling down an angle iron" and answer the following questions:

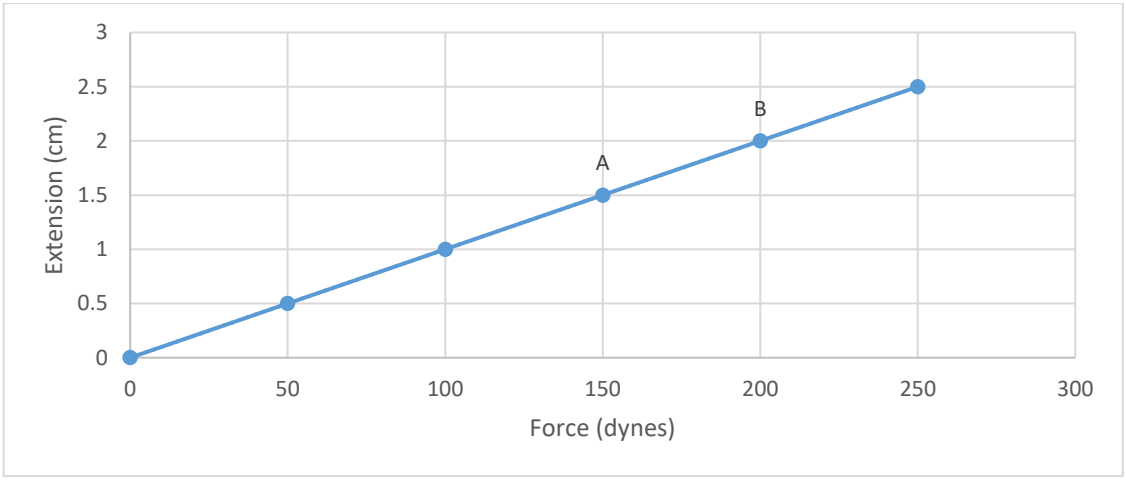
3	160	3.9	3.3		
4	140	3.2	3.1		
5	120	2.8	2.6		
6	100	2.5	2.0		

3	160	3.9	3.3		
4	140	3.2	3.1		
5	120	2.8	2.6		
6	100	2.5	2.0		

iii. Draw distance-time graph by using values from above table. (02)

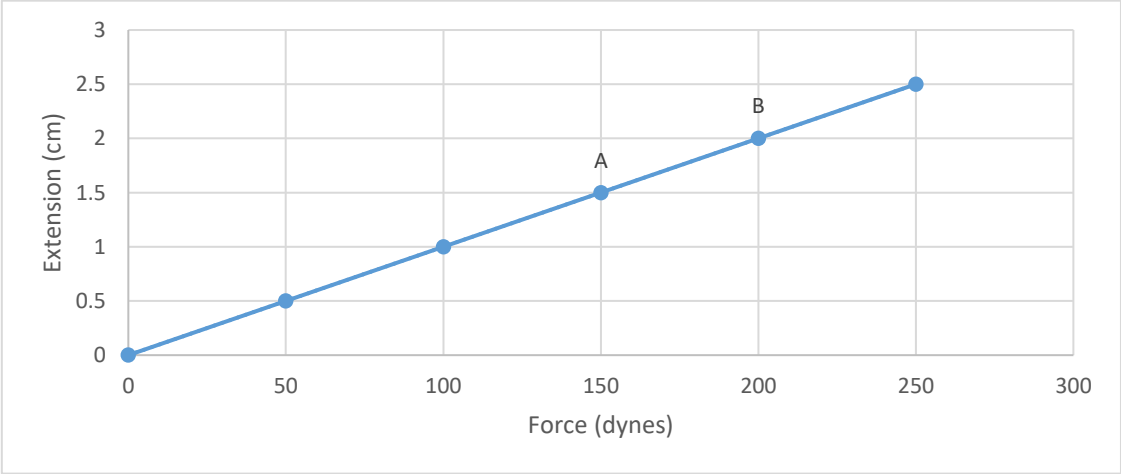
Q.4 The given graph shows the extension in the helical spring by increasing load.





i. Name the dependent variable and independent variable used in above graph. (01)

Q.4 The given graph shows the extension in the helical spring by increasing load.

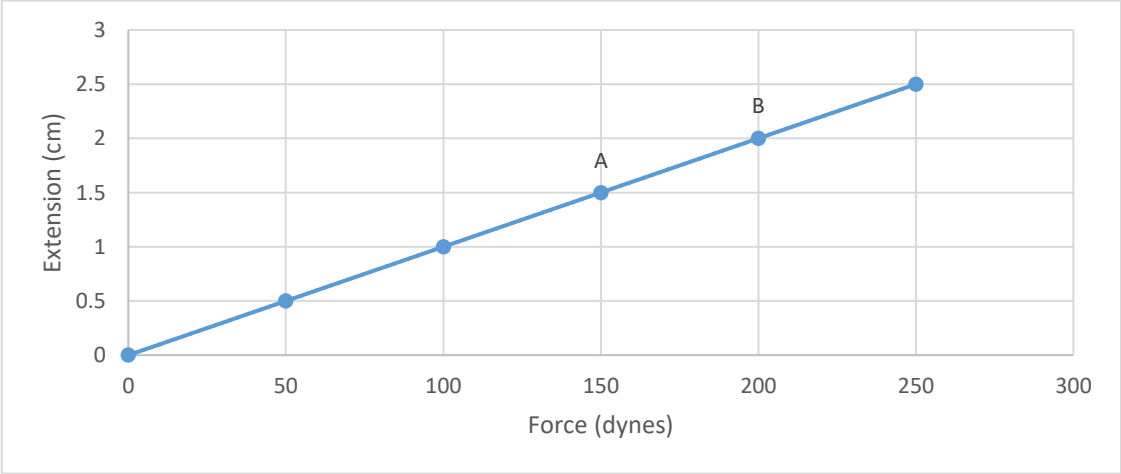


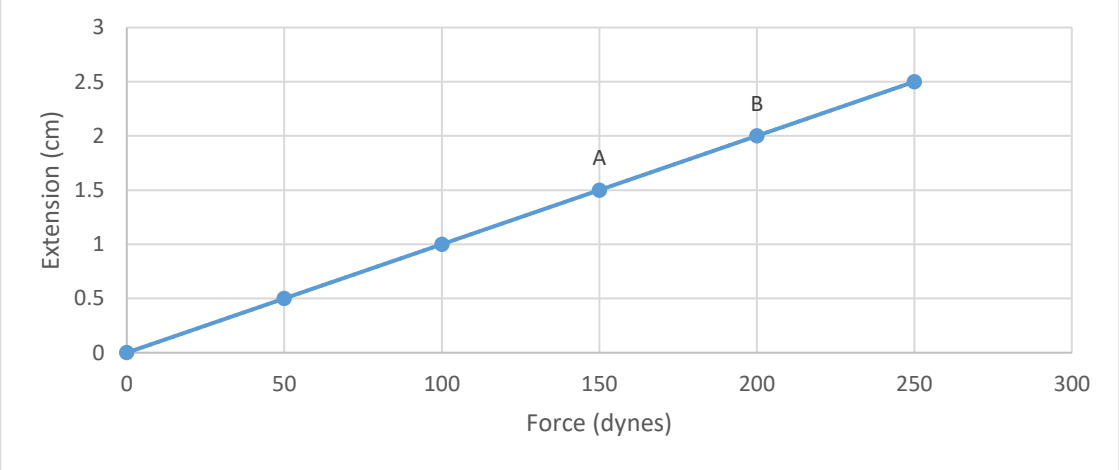
Extension (cm)
Force (dynes)
A
B
0
0.5
1
1.5
2
2.5
3
0
50
100
150
200
250
300

i. Name the dependent variable and independent variable used in above graph. (01)

ii. Calculate the slope from force-extension graph by taking points A and B. (02)

Q.4 The given graph shows the extension in the helical spring by increasing load.





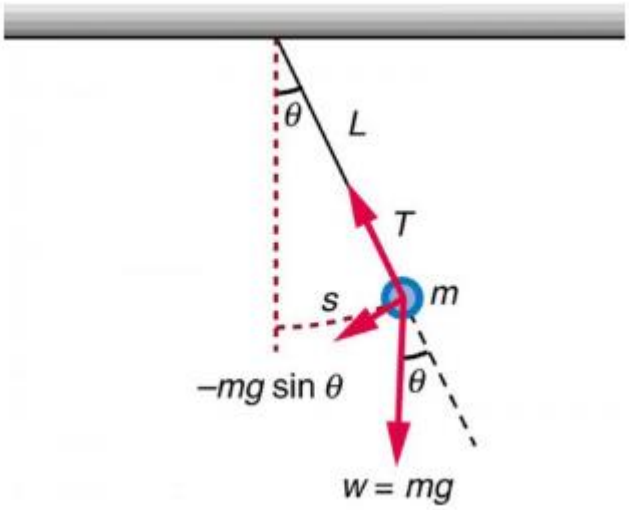
i. Name the dependent variable and independent variable used in above graph. (01)

ii. Calculate the slope from force-extension graph by taking points A and B. (02)

iii. Which quantity is represented by the slope of force-extension graph? (01)

Q. NO. 1

A student investigates the time period of a simple pendulum for calculation of value of 'g' (gravitational acceleration). Figure shows the apparatus.



i. Student measured the time of 10 vibrations of different lengths of thread and recorded the observations in the following table. Complete the table. (4 marks)

Radius of metallic bob = r = 2.26 cm

ii. Calculate the mean value of 'g'? (1 mark)

_____

_____

_____

Serial #	Length of thread l (cm)	Length of Simple Pendulum L = l + r (cm)	Time for 10 vibrations		Mean Time t (s)	Time Period T = t/10 (s)	$g = \frac{4\pi^2}{T^2}L$ (cms^{-2})
			t_1 (s)	t_2 (s)			
1	80 cm		18.23	18.22			
2	90 cm		19.17	19.15			
3	100 cm		20.01	20.11			

iii. Find the percentage error in the calculated value of 'g' (from the table) (1 mark)

_____

_____

_____