



**ARMY PUBLIC SCHOOL, DHAULA KUAN**  
**EXAMINATION: PERIODIC TEST- 1 YEAR: 2025- 2026**  
**CLASS : IX SET: A SUBJECT: SCIENCE**

DURATION: 1.5 HRS

M.M.: 40

**GENERAL INSTRUCTIONS:**

- (i) The question paper has five sections and 19 questions. All questions are compulsory.  
(ii) Section-A has 8 MCQs and 2 assertion-reason type of 1 mark each; Section-B has 3 questions of 2 marks each; and Section-C has 2 questions of 3 marks each; Section-D has 2 questions of 5 marks each; Section-E has 2 case based question of 4 marks.  
(iii) Internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.  
(iv) For case study questions in section E, there is one choice in one subpart, with 3 questions based per case study.

**SECTION A (MCQs)**

Q1	The process in which solid is directly converted to vapours state is called a) vapourisation (b) solidification (c) condensation (d) sublimation	1M
Q2	A few substances are arranged in the increasing order of 'forces of attraction' between their particles. Which one of the following represents a correct arrangement? (a) Water, air, wind (b) Air, sugar, oil (c) Oxygen, water, sugar (d) Salt, juice, air	1M
Q3	Cell theory was proposed by: a) Schleiden and Schwann b) Watson and crick c) Schleiden, Schwann and Robert Hooke d) Davson and Daniell	1M
Q4	You expect RBCs to burst when they are placed in a) Hypotonic solution. b) hypertonic solution. c) isotonic solution d) all of these	1M
Q5	Dry ice is solid form of (a) Carbon dioxide. (b) Sodium chloride. (c) Nitrogen. (d) Potassium Permanganate	1M
Q6	Living cells were discovered by a) Robert Hooke b) Purkinje. c) Robert Brown. d) Leeuwenhock	1M
Q7	Which of the following conditions is most favourable for converting gas into liquid? (a) High pressure, low temperature (b) Low pressure, low temperature (c) Low pressure, high temperature (d) High pressure, high temperature	1M
Q8	Which one of the following is not a unicellular organism? a) Amoeba b) Paramecium c) Chlamydomonas d) Fungi	1M
Q9 to Q10 are assertion-reasoning based questions. These consist of two statements - Assertion (A) and Reason (R). Answer these questions selecting the appropriate options given below: (a) Both A and R are true and R is the correct explanation of A. (b) Both A and R are true but R is not the correct explanation of A. (c) A is true but R is false. (d) A is false but R is true.		
Q9	Assertion: A cell swells up when present in a hypotonic solution. Reason: More water molecules enter the cell than they leave.	1M

- P Q10 Assertion: When an object is moving along a straight line at a variable speed, it is said to be in non-uniform motion.  
Reason: In uniform motion the velocity of the object changes at a uniform rate.



### SECTION B

Q11 to Q13 are very short answer questions

- B Q11 a) Why is a cell called a structural and functional unit of life?  
b) The shape and size of cells are related to the specific function they perform. Justify this statement by giving two examples. 2M

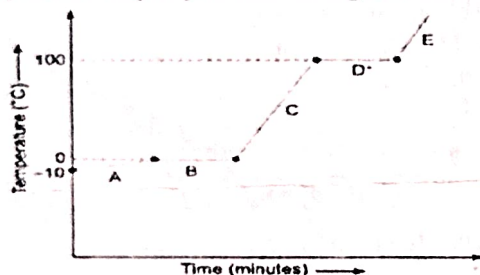
- Q12 The diagram below shows the burning of an oil lamp. Draw the arrangement of particles of position 'X' and 'Y'. 2M



OR

OR

- Q12 Analyse the temperature versus time graph of water, given below. Which part of graph represent only liquid state and gaseous state and why?

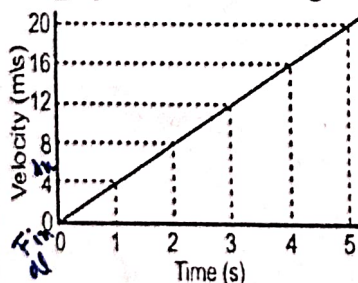


- Q13 Which characteristic of particles of matter is illustrated by the following: 2M  
a) An incense stick lighted in one corner of the room can be smelled from the other corner.  
b) A diver is able to cut through water in a swimming pool. [2X1 = 2]

### SECTION C

Questions 14-15 are short question

- Q14 The graph shows the change in the velocity of a motorbike with time. 3M



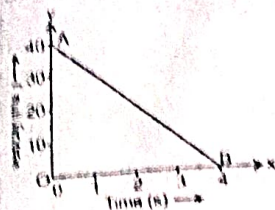
- i) Calculate the acceleration of the motorbike from the graph.  
Is the acceleration positive or negative?  
ii) What does the area under the graph represent?

OR

OR



Physics - 4  
B.C.D. - 8



- i) What is the velocity of the motorbike at the end of 4s?  
 ii) Calculate the acceleration of the motorbike from the graph. Is the acceleration negative or positive?

$$\begin{array}{r} 275 \\ + 300 \\ \hline 575 \\ 3M \end{array}$$

- Q15 B a) What is plasmolysis?  
 b) What will be the consequences if a cell contains higher water concentration than the surrounding medium? Draw diagram to show the changes.

OR

- Q15 B a) What is endocytosis?  
 b) Write two examples of osmosis.

**SECTION D Q16 to Q17 are long answer questions**

- Q16 (a) Alka was making tea in a kettle. Suddenly she felt intense heat from the puff of steam gushing out of the spout. She wondered whether the temperature of the steam was higher than that of the water boiling in the kettle. Comment.  
 (b) Define the term 'Latent Heat of Fusion'.  
 (c) Convert 573 K to Celsius scale.  
 (d)  $N_2$  is a gas. Write any 2 properties to justify this statement.

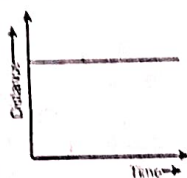
$$[2+1+1+1=5]$$

OR

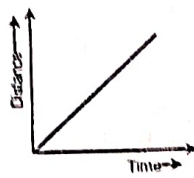
- Q16 (a) Which is a more effective cooling agent, ice or water at 273 K and why?  
 (b) Draw a neat labelled diagram showing the effect of change of temperature on a liquid.  
 (c) Convert  $74^\circ\text{C}$  to Kelvin scale.

$$[2+2+1=5]$$

- Q17 i) (a) Which one of the distance-time graphs given below represent uniform motion?



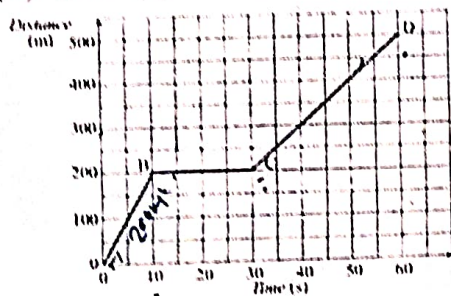
A



B

- (b) Define uniform motion.

ii) The distance-time graph given below shows Urmila's trip from her home(A) to the market(D). She stopped on the way to talk to her friend (B).



1. How much distance did Urmila walk before she met her friend?  
 2. For how many seconds did she stop on the way?  
 3. How far is the market from Urmila's home?

### SECTION E

Q17 to Q18 are case-based / data-based questions with 2 to 3 short sub-parts.  
Internal choice is provided in one of these sub-parts

Q18	CASE BASED (There is an internal choice in sub-part 18(c) )	4M
<p>When we consider objects moving along a straight line, different objects may take different times to cover a given distance and the rate at which objects move can be different. One simple way of measuring the rate of motion of an object is to find out the distance travelled by the object in unit time and this quantity is referred to as speed. The rate of motion of an object can be more comprehensive if we specify the direction of motion along with its speed. The quantity that specifies both these aspects is called velocity.</p>		
18(a)	Write the formula and the SI unit of speed.	
18(b)	Under what condition will the distance travelled by an object be equal to its displacement?	
18(c)	Write two differences between speed and velocity.	
OR	OR	
18(c)	An athlete completes one round of a circular track of radius 70m in 55 s. Calculate his speed.	
Q19	CASE BASED (There is an internal choice in sub-part 19 (c) )	4M
<p>All cells must take up and turn out materials through the cell membrane. The plasma membrane acts as physical barrier between the cell and its surrounding environment. The cell membrane is not freely permeable i.e it does not allow movement of all kinds of substances across it. It is selectively permeable. Cell wall is non-living and freely permeable and is secreted by the cell itself for the protection of its plasma membrane and cytoplasm. If the exchange of substances occurs in the direction of the gradient, that is, in the direction of decreasing potential, there is no requirement for an input of energy from outside the system; if, however, the transport is against the gradient, it will require the input of energy</p>		
19(a)	Name two processes involved in transport of materials.	
19(b)	Differentiate between plasma membrane and cell wall on the basis of their composition.	
19(c)	Write any two functions of plasma membrane.	
OR	OR	
19(c)	How can cells of plants, fungi and bacteria withstand greater changes in environment as compared to animal cell?	

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**ARMY PUBLIC SCHOOL, DHAULA KUAN**  
**EXAMINATION: PERIODIC TEST- 2 YEAR: 2025-2026**  
**CLASS : IX SET: A SUBJECT: SCIENCE**

DURATION: 1.5 HRS

M.M.: 40

**General Instructions:**

- (I) This question paper consists of 19 questions in 3 sections. Section A is Biology; Section B is Chemistry and Section C is Physics.
- (II) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- (III) Q4 and Q16 are Assertion – Reason based questions. The questions consist of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:  
 Option A – Both A and R are true, and R is the correct explanation of A.  
 Option B – Both A and R are true, and R is not the correct explanation of A.  
 Option C – A is true but R is false.  
 Option D – A is false but R is true.

**SECTION - A (BIOLOGY)**

Q1	Which of the following cells are found in the bony tissue of the body? (a) Monocytes (b) chondrocytes (c) osteocytes (d) lymphocytes	1
Q2	Tissue found below the skin and between internal organs is (a) Areolar tissue (b) adipose tissue (c) epithelial tissue (d) all of these	1
Q3	Cartilage is not found in (a) Nose (b) ear (c) kidney (d) trachea	1
Q4	<b>Assertion (A) :</b> Cartilage is a type of connective tissue that can bend easily. <b>Reason (R) :</b> It has a very tightly packed matrix and cells.	1
Q5	(a) Why is blood called a connective tissue? (b) Give one difference between tendon and ligament.	2
Q6	<b><u>Attempt either option A or B.</u></b> A. (i) Draw a well labelled diagram of a striated muscle. Write its two characteristics. (ii) Why are they called striated muscles? <b>OR</b> B. (i) Draw a well labelled diagram of a neuron. (ii) Write the function of neuron.	3
Q7	<b>Case Study (internal choice in sub-part- iii )</b> In multicellular organisms there are millions of cells. Most of these cells are specialized to carry out a few functions. Each specialised function is taken up by a different group of cells or tissues that carry a particular function very efficiently. (i) Name the tissue that forms the lining of our mouth. (ii) Write the function of an areolar tissue. (iii) Differentiate between bone and cartilage on the basis of their composition. <b>OR</b>	4



(iii) How is simple squamous epithelium different from the stratified squamous epithelium?

### SECTION - B (CHEMISTRY)

- Q8** An element X is trivalent cation and another element Y is monovalent anion. The compound formed by these two elements will be;  
 (a) XY (b) ~~XY<sub>3</sub>~~ (c) X<sub>3</sub>Y (d) XY<sub>4</sub>  

$$\begin{array}{c} X^+ \quad Y^- \\ 3^+ \quad 1^- \\ \hline X_3Y \end{array}$$
- Q9** The correct symbol of element Potassium is  
 (a) P (b) Pt (c) ~~K~~ (d) S
- Q10** The ratio by mass of C and O in Carbon Dioxide is  
 (a) ~~3:8~~ (b) 12:16 (c) 1:2 (d) 1:3
- Q11** Identify the correct pair of monoatomic molecules of element pairs from the given choices.  
 (a) Oxygen and Chlorine (b) Phosphorus and Sulphur  
 (c) Nitrogen and Hydrogen (d) ~~Helium and Neon~~
- Q12** Attempt either option A or B.  
 A. Write the formulae of: (i) Aluminium oxide (ii) Ammonium chloride.  

$$\begin{array}{cc} Al_2O_3 & NH_4^+ Cl^- \\ \text{OR} & \end{array}$$
  
 B. Define valency and give one example each of (i) Polyatomic Cation and (ii) Polyatomic molecule of an element.
- Q13** (i) In a sample of a compound, two elements carbon and hydrogen are present as 40%, 60% respectively. Calculate the amount of each element that will be present in 2g of the sample compound.  
 (ii) Write the names of the elements present in Hydrochloric acid.
- Q14** Attempt either option A or B.  
 A. A metal X is an important component of our bones and teeth. It has atomic mass of 40.  
 (a) Write the ionic form of metal X.  
 (b) Give the chemical formula of its hydroxide and calculate its molecular mass. (Given O=16, H=1)  
 (c) In a given chemical reaction 2.8g of lead nitrate is reacted with Y g of potassium iodide to give a yellow precipitate of lead iodide equal to 3g and 2.2g of soluble potassium nitrate.  
 Compute the value of Y and define the law used.  

$$\text{OR}$$
  
 B. The most remarkable concept of Dalton's theory was that of the atomic mass.  
 (a) Define atomic mass unit.  
 (b) Write the correct symbol and atomic mass of element sodium.  
 (c) Calculate the total number of atoms present in a  $SO_4^{2-}$  ion?  
 (d) How many grams of calcium are needed to react with 40g of oxygen if the ratio of calcium to oxygen by mass is 5:2. Define the law used.

### SECTION - C (PHYSICS)

- Q15** A ship made of iron and steel floats on water because:  
 (a) its average density is more than that of water



	(b) its average density is less than that of water. (c) its average density is equal to that of water. (d) none of the above.		
Q16	<p><b>Assertion (A):</b> A man is sitting in a boat which floats on a pond. The boat floats as there is a buoyant force acting in upward direction on the boat which is more than the weight of the boat.</p> <p><b>Reason (R):</b> The buoyant force acting on the boat is greater than the weight of the water displaced by the boat.</p>	1	
Q17	<p><u>Attempt either option A or B.</u></p> <p>A. (i) Write the two conditions for the work to be done according to science. (ii) What is the work done by the force of gravity in the following cases-  <del>(a)</del> Satellite moving around the earth in a circular orbit of radius 35000 km.            (b) A stone of mass 250 g is thrown up through a height of 2.5 m. Take <math>g=10 \text{ m/s}^2</math></p> <p>OR</p> <p>B. (i) State one Joule of work done. (ii) A coolie is walking on a levelled railway platform with a load of 27 kg on his head. What is the amount of work done by him? (iii) Calculate the work done by a force if this force changes the speed of an object of mass 10 kg from 10 m/s to 5 m/s.</p>	3	<p>FMS</p> <p>2) <math>2500 \times 2.5</math></p>
Q18	<p>(a) Give reason -  <del>(i)</del> Camels can walk easily on desert sand but we are not comfortable walking on the sand.  <del>(ii)</del> Why is it easier to swim in sea water than in river water? -</p> <p><del>(b)</del> (i) Define the SI unit of pressure.            (ii) How much force should be applied on an area of <math>10,000 \text{ cm}^2</math> to get a pressure of <math>15 \text{ Pa}</math> ?</p> <p>(c) Which out of the following will cause maximum apparent loss in weight of a body and why—mustard oil or water?</p>	5	
Q19	<p><b>Case Study (internal choice in sub-part- c )</b></p> <p>A moving object can do work. An object moving faster can do more work than an identical object moving relatively slow. A moving bullet, blowing wind, a rotating wheel, a speeding stone can do work. A bullet can pierce the target. The wind moves the blades of a windmill. Objects in motion possess energy. We call this energy kinetic energy. Thus, the kinetic energy possessed by an object of mass <math>m</math>, and moving with a uniform velocity <math>v</math>, is <math>KE = \frac{1}{2}mv^2</math>. The energy possessed by an object is thus measured in terms of its capacity of doing work. The unit of energy is, therefore, the same as that of work, that is, Joule (J).</p> <p><del>(a)</del> Calculate the kinetic energy of a body of mass 2 kg moving with a velocity of 0.1 m/s. 1m  <del>(b)</del> Is kinetic energy scalar or vector? Justify your answer. 1m            (c) (i) A light and a heavy body have equal kinetic energy. Which one is moving fast? 1m            (ii) If the velocity of a body is doubled, what will happen to its kinetic energy? 1m</p> <p>OR</p> <p>(c) Find the velocity of a body of mass 100 g having a kinetic energy of 20 J. 2m</p>	4	

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**EXAMINATION: PERIODIC TEST- 2 YEAR: 2025-2026**  
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**SECTION - A (BIOLOGY)**

Q1	Which of the following cells are found in the bony tissue of the body? (a) Monocytes (b) chondrocytes (c) osteocytes (d) lymphocytes	1
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Q4	<b>Assertion (A) :</b> Cartilage is a type of connective tissue that can bend easily. <b>Reason (R) :</b> It has a very tightly packed matrix and cells.	1
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Q6	<u><b>Attempt either option A or B.</b></u> A. (i) Draw a well labelled diagram of a striated muscle. Write its two characteristics. (ii) Why are they called striated muscles? <b>OR</b> B. (i) Draw a well labelled diagram of a neuron. (ii) Write the function of neuron.	3
Q7	<b>Case Study (internal choice in sub-part- iii )</b> In multicellular organisms there are millions of cells. Most of these cells are specialized to carry out a few functions. Each specialised function is taken up by a different group of cells or tissues that carry a particular function very efficiently. (i) Name the tissue that forms the lining of our mouth. (ii) Write the function of an areolar tissue. (iii) Differentiate between bone and cartilage on the basis of their composition. <b>OR</b>	4



(iii) How is simple squamous epithelium different from the stratified squamous epithelium?

### SECTION - B (CHEMISTRY)

Q8	An element X is trivalent cation and another element Y is monovalent anion. The compound formed by these two elements will be; (a) XY (b) XY <sub>3</sub> (c) X <sub>3</sub> Y (d) XY <sub>4</sub>	1
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Q10	The ratio by mass of C and O in Carbon Dioxide is (a) 3:8 (b) 12:16 (c) 1:2 (d) 1:3	1
Q11	Identify the correct pair of monoatomic molecules of element pairs from the given choices. (a) Oxygen and Chlorine (b) Phosphorus and Sulphur (c) Nitrogen and Hydrogen (d) Helium and Neon	1
Q12	<u>Attempt either option A or B.</u> A. Write the formulae of: (i) Aluminium oxide (ii) Ammonium chloride. OR B. Define valency and give one example each of (i) Polyatomic Cation and (ii) Polyatomic molecule of an element.	2
Q13	(i) In a sample of a compound, two elements carbon and hydrogen are present as 40% , 60% respectively. Calculate the amount of each element that will be present in 2g of the sample compound. (ii) Write the names of the elements present in Hydrochloric acid.	2
Q14	<u>Attempt either option A or B.</u> A. A metal X is an important component of our bones and teeth. It has atomic mass of 40. (a) Write the ionic form of metal X. (b) Give the chemical formula of its hydroxide and calculate its molecular mass. (Given O=16, H=1) (c) In a given chemical reaction 2.8g of lead nitrate is reacted with Y g of potassium iodide to give a yellow precipitate of lead iodide equal to 3g and 2.2g of soluble potassium nitrate. Compute the value of Y and define the law used. OR B. The most remarkable concept of Dalton's theory was that of the atomic mass. (a) Define atomic mass unit. (b) Write the correct symbol and atomic mass of element sodium. (c) Calculate the total number of atoms present in a SO <sub>4</sub> <sup>2-</sup> ion? (d) How many grams of calcium are needed to react with 40g of oxygen if the ratio of calcium to oxygen by mass is 5:2. Define the law used.	5

### SECTION - C (PHYSICS)

Q15	A ship made of Iron and steel floats on water because: (a) Its average density is more than that of water	1
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	(b) its average density is less than that of water. (c) its average density is equal to that of water. (d) none of the above.	
Q16	<p><b>Assertion (A):</b> A man is sitting in a boat which floats on a pond. The boat floats as there is a buoyant force acting in upward direction on the boat which is more than the weight of the boat.</p> <p><b>Reason (R):</b> The buoyant force acting on the boat is greater than the weight of the water displaced by the boat.</p>	1
Q17	<p><u>Attempt either option A or B.</u></p> <p>A. (i) Write the two conditions for the work to be done according to science. (ii) What is the work done by the force of gravity in the following cases- (a) Satellite moving around the earth in a circular orbit of radius 35000 km. (b) A stone of mass 250 g is thrown up through a height of 2.5 m. Take <math>g=10 \text{ m/s}^2</math></p> <p style="text-align: right;"><i>note <math>W = mgh = 250 \times 10 \times 2.5</math> <math>W = 250 \times 25</math></i></p> <p>OR</p> <p>B. (i) State one Joule of work done. (ii) A coolie is walking on a levelled railway platform with a load of 27 kg on his head. What is the amount of work done by him? (iii) Calculate the work done by a force if this force changes the speed of an object of mass 10 kg from 10 m/s to 5 m/s.</p> <p style="text-align: right;"><i>0.1 x 0.1 0.1 + 0.0 x 0.0 x 5</i></p>	3
Q18	<p>(a) Give reason - (i) Camels can walk easily on desert sand but we are not comfortable walking on the sand. (ii) Why is it easier to swim in sea water than in river water?</p> <p>(b) (i) Define the S I unit of pressure. <i>PAS K E L</i> (ii) How much force should be applied on an area of <math>10,000 \text{ cm}^2</math> to get a pressure of <math>15 \text{ Pa}</math>?</p> <p>(c) Which out of the following will cause maximum apparent loss in weight of a body and why—mustard oil or water?</p> <p style="text-align: right;"><i>0.1 x 0.1 0.1 + 0.0 x 0.0 x 5</i></p>	
Q19	<p><b>Case Study (internal choice in sub-part- c )</b></p> <p>A moving object can do work. An object moving faster can do more work than an identical object moving relatively slow. A moving bullet, blowing wind, a rotating wheel, a speeding stone can do work. A bullet can pierce the target. The wind moves the blades of a windmill. Objects in motion possess energy. We call this energy kinetic energy. Thus, the kinetic energy possessed by an object of mass <math>m</math>, and moving with a uniform velocity <math>v</math>, is <math>KE = \frac{1}{2}mv^2</math>. The energy possessed by an object is thus measured in terms of its capacity of doing work. The unit of energy is, therefore, the same as that of work, that is, Joule (J).</p> <p>(a) Calculate the kinetic energy of a body of mass 2 kg moving with a velocity of 0.1 m/s. 1m</p> <p>(b) Is kinetic energy scalar or vector? Justify your answer. 1m</p> <p>(c) (i) A light and a heavy body have equal kinetic energy. Which one is moving fast? 1m (ii) If the velocity of a body is doubled, what will happen to its kinetic energy? 1m</p> <p>OR</p> <p>(c) Find the velocity of a body of mass 100 g having a kinetic energy of 20 J. 2m</p>	4

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$$\begin{array}{r}
 1 \\
 2 \\
 250 \\
 \times 25 \\
 \hline
 1250 \\
 5000 \\
 \hline
 7500
 \end{array}$$



P-7

**PERIODIC TEST - II**  
**(2025-2026) CLASS 9TH**

**Subject: Mathematics**

**Maximum Marks: 40****Time: 90 minutes****General Instructions:**

- 1) The question paper contains FIVE SECTIONS A, B, C, D and E
- 2) Section A consists of 10 multiple choice questions of 1 mark each.
- 3) Section B consists of 3 questions of 2 marks each
- 4) Section C consists of 2 questions of 3 marks each
- 5) Section D consists of 2 questions of 5 marks each.
- 6) Section E consists of 2 CASE STUDY QUESTIONS of 4 marks each.
- 7) All questions are compulsory.

**SECTION A (MCQS) ( 10 X 1 =10 )**

1	A linear equation have (a) one (b) two (c) no solution (d) infinite many solutions	1
2	Axioms are assumed (a) universal truths in all branches of Mathematics (b) universal truths specific to Geometry (c) Theorems (d) Definitions	1
3	Euclid belongs to the country: (a) Babylonia (b) Egypt (c) Greece (d) India	1



If  $PQ \parallel ST$ ,  $\angle PQR = 110^\circ$  and  $\angle RST = 130^\circ$  Then find the value of  $\angle QRS$ .

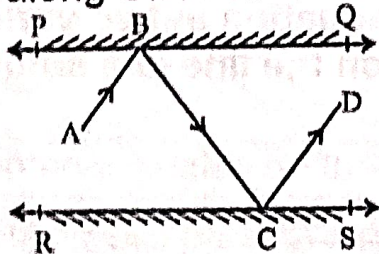
13 Find any four solution for the linear equation  $2x-4y+8=0$ , Also plot all the points on graph.

**SECTION C (2X3=6)**

14 Which of the following statements are true and which are false? Give reasons for your answers

- (i) Only one line can pass through a single point
- (ii) If two circles are equal, then their radii are equal
- (iii) There are infinite number of lines which pass through two distinct points.

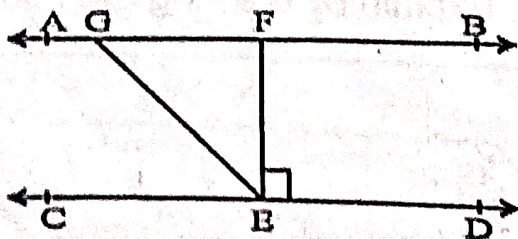
15 In the adjoining figure, PQ and RS are two mirrors placed parallel to each other. An incident ray AB strikes the mirror PQ at B, the reflected ray moves along the path BC and strikes the mirror RS at C and again reflects along CD. Prove that  $AB \parallel CD$ .



(OR)

In below figure, if  $AB \parallel CD$ ,  $EF \perp CD$  and  $\angle GED = 126^\circ$ , find

$\angle AGE$ ,  $\angle GEF$  and  $\angle FGE$ .





**SECTION D ( 2X5 =10)**

16

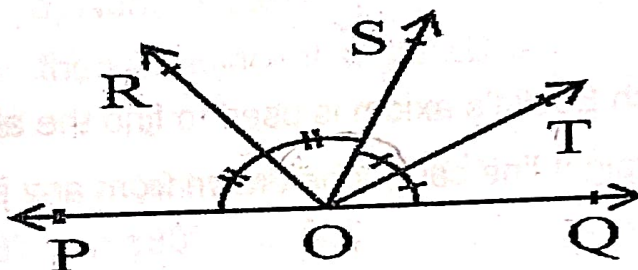
Draw the graph of the equations  $x+y=6$  and  $2x-y=4$ .  
Find the point of intersection.

5

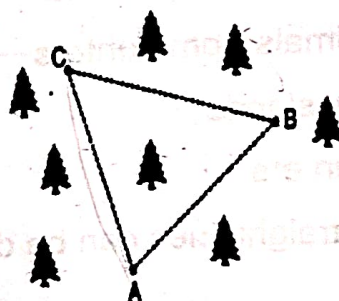
17

In the given figure, ray OS stands on a line POQ.  
Ray OR and ray are angle bisectors of  $\angle POS$  and  $\angle SOQ$ , respectively. If  $\angle POS = x$ , find  $\angle ROT$ .

5

**SECTION E ( CASE STUDY QUESTIONS ) 2X4 = 8**

18





**CLASS-IX**  
**PT-2 EXAMINATION**  
**MATHEMATICS**

Time- 1hr 30mins

MM-40

**General Instructions:**

1. This Question Paper has 5 Sections A-E.
2. Section A has 7 MCQs carrying 1 mark each
3. Section B has 3 questions carrying 02 marks each.
4. Section C has 3 questions carrying 03 marks each.
5. Section D has 2 questions carrying 05 marks each.
6. Section E has 2 case-based questions (04 marks each) with subparts of the values of 1,1,2 marks each respectively.

**SECTION-A**

(7 X 1 = 7)

1. A hemispherical bowl is made of steel 0.25 cm thick. If the inner radius of the bowl is 3.25 cm, then the outer curved surface area of the bowl is  
(a)  $154 \text{ cm}^2$                       (b)  $77 \text{ cm}^2$                       (c)  $38.5 \text{ cm}^2$                       (d)  $115.5 \text{ cm}^2$
2. The diagonals AC and BD of a parallelogram ABCD intersect each other at the point O. If  $\angle DAC = 32^\circ$  and  $\angle AOB = 70^\circ$ , then  $\angle DBC$  is equal to  
(a)  $24^\circ$                       (b)  $86^\circ$                       (c)  $38^\circ$                       (d)  $32^\circ$
3. Which of the following is not true for a parallelogram?  
(a) Opposite sides are equal  
(b) Opposite angles are equal  
(c) Opposite angles are bisected by the diagonals  
(d) Diagonals bisect each other
4. In a cone, radius is doubled and slant height is halved, then curved surface area will be  
(a) halved                      (b) doubled                      (c) same                      (d) four times
5. If  $AB = QR$ ,  $BC = PR$  and  $CA = PQ$ , then  
(a)  $\triangle ABC \cong \triangle QRP$                       (b)  $\triangle CBA \cong \triangle PRQ$   
(c)  $\triangle BAC \cong \triangle RQP$                       (d)  $\triangle PQR \cong \triangle BCA$
6. In  $\triangle ABC$ , if  $AB = AC$  and  $\angle B = 50^\circ$ , then  $\angle C$  is equal to  
(a)  $40^\circ$                       (b)  $50^\circ$                       (c)  $80^\circ$                       (d)  $130^\circ$
7. The ratio of the radii of two spheres whose surface areas are in the ratio 64:9 is  
(a) 4:3                      (b) 3:4                      (c) 8:3                      (d) 3:8

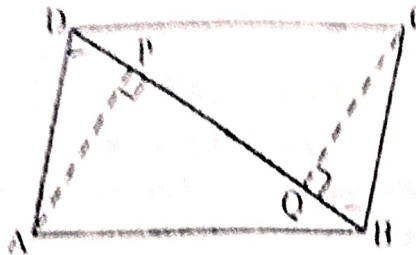


**SECTION-B**

(3 × 2 = 6)

8. Prove that angles opposite to equal sides of an isosceles triangle are equal.  
 9. ABCD is a parallelogram and AP and CQ are perpendiculars from vertices A and C on diagonal BD. Show that

- (i)  $\triangle APB \cong \triangle CQD$   
 (ii)  $AP = CQ$

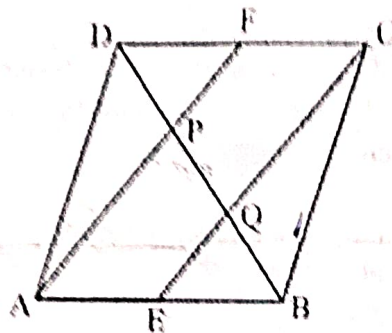


10. Find the radius of a sphere whose surface area is  $616 \text{ cm}^2$

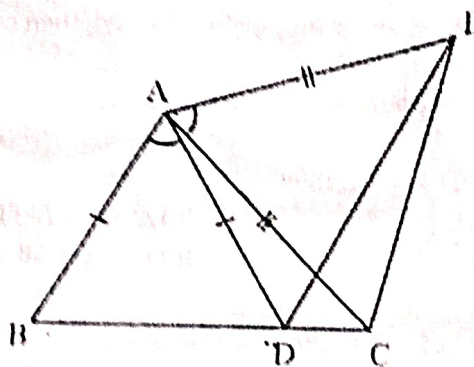
**SECTION-C**

(3 × 3 = 9)

11. In a parallelogram ABCD, E and F are the mid-points of sides AB and CD respectively. The line segments AF and EC intersect the diagonal BD at P and Q respectively. Show that  $PQ = \frac{1}{3} BD$ .



12. In Fig,  $AC = AE$ ,  $AB = AD$  and  $\angle BAD = \angle EAC$ . Show that  $BC = DE$ .



13. A hemispherical dome of a building needs to be painted. If the circumference of the base of the dome is  $17.6 \text{ m}$ , find the cost of painting it, given the cost of painting is Rs 100 per  $\text{m}^2$

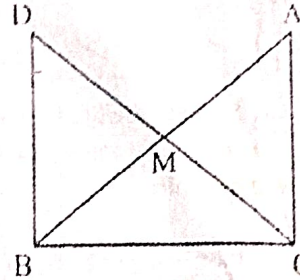


SECTION-D

(2 x 5 = 10)

14. In right triangle ABC, right angled at C, M is the mid-point of hypotenuse AB. C is joined to M and produced to a point D such that  $DM = CM$ . Point D is joined to point B. Show that:

- (i)  $\triangle AMC \cong \triangle BMD$
- (ii)  $\angle DBC$  is a right angle.
- (iii)  $\triangle DBC \cong \triangle ACB$

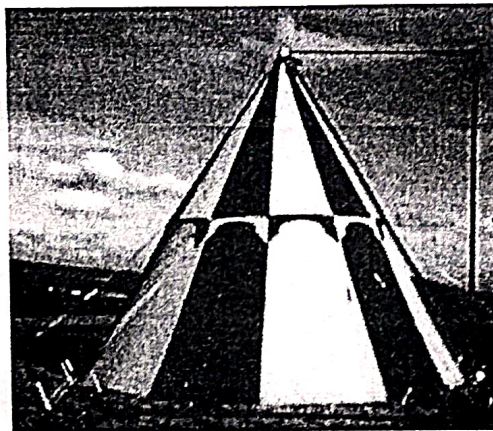


15. Show that the bisectors of angles of a parallelogram form a rectangle.

SECTION-E

(2 x 4 = 8)

16. Once four friends Rahul, Arun, Ajay and Vijay went for a picnic at a hill station. Due to peak season, they did not get a proper hotel in the city. The weather was fine so they decided to make a conical tent at a park. They were carrying  $300m^2$  of cloth with them. As shown in the figure they made the tent with height 6 m and radius 8 m. The remaining cloth was used for the floor.



CSA or TSA

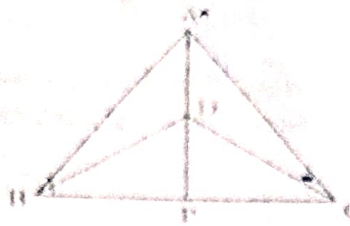
- i) How much cloth was used for the tent (excluding the floor)? ( $\pi = 3.14$ )
- ii) How much cloth was left with them?
- iii) If the cost of cloth per  $m^2$  is ₹150, then find the total cost for making the tent (excluding the floor)?

OR

- iii) If the cost of cloth per  $m^2$  is ₹100, then find the total cost of the remaining piece of cloth?

17. Sunil is a farmer who is having a triangular plot. As the land is limited with him, so he decided to divide his land in four parts so that he can use multiple cropping method in which fields are growing with different seeds. The field is divided as shown below.





$\triangle ABC$  and  $\triangle DBC$  are two isosceles triangles on the same base  $BC$  and vertices  $A$  and  $D$  are on the same side of  $BC$ . Line  $AD$  is extended to intersect  $BC$  at  $P$ . Based on above information answer the following question

1. By which congruency rule,  $\triangle ABD \cong \triangle ACD$ .
2. By which congruency rule,  $\triangle ABP \cong \triangle ACP$ .
3. In  $\triangle BDC$ , if  $\angle BDC = 70^\circ$ , then find the measure of  $\angle DBC$ .

OR

3. In  $\triangle ABC$ , if  $\angle ABC = 100^\circ$ , then find the measure of  $\angle ACB$ .





ARMY PUBLIC SCHOOL, DHAULA KUAN  
HALF YEARLY EXAMINATION (2025-26)

CLASS : IX

MATHEMATICS Set 2 B

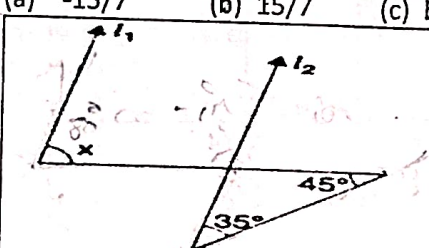
DURATION: 3hr

M.M. : 80

GENERAL INSTRUCTIONS:

1. This question paper has 5 sections A , B , C , D and E .
2. Section A has 20 multiple choice questions (MCQs) carrying 1 mark each.
3. Section B has 5 short Answer-I (SA-I) type questions carrying 02 marks each.
4. Section C has 6 short Answer-II (SA-II) type questions carrying 03 marks each.
5. Section D has 4 long Answer (LA) type questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with subparts of the values 1, 1 and 2 marks each respectively.
7. All questions are compulsory. However, an internal choice in 2 questions of 2 marks, 2 questions of 3 marks and 2 questions of 5 marks has been provided. An internal choice has been provided in the 2 marks questions of section E.
8. Draw neat figures wherever required.

SECTION A ( 1 MARK EACH )

1. How many lines can pass through a given point  
(a) two (b) one (c) infinitely many (d) none of these
2. If (2,0) is a solution of the linear equation  $2x + 3y = k$  then the value of k is  
(a) 4 (b) -4 (c) 5 (d) 2
3. In an isosceles right angled triangle ABC, if  $\angle A = 90^\circ$ , then measure of  $\angle C$  is  
(a)  $90^\circ$  (b)  $60^\circ$  (c)  $45^\circ$  (d)  $30^\circ$
4. The value of  $249^2 - 248^2$  is  
(a) 1 (b) 477 (c) 487 (d) 497
5. If A(-4,3) and B(-3,5) are two given points then (abscissa of A) - (abscissa of B)  
(a) -2 (b) -1 (c) 1 (d) 2
6. If  $(30-x)^\circ$  is supplement of  $(125+2x)^\circ$  then x is  
(a)  $50^\circ$  (b)  $60^\circ$  (c)  $80^\circ$  (d)  $25^\circ$
7. The distance of the point P(4,3) from the origin is  
(a) 4 (b) 3 (c) 5 (d) 75
8. If the point  $(2k-3, k+2)$  lies on the line  $2x + 3y + 15 = 0$ , then the value of k is  
(a)  $-15/7$  (b)  $15/7$  (c) both are correct (d) none of these
9.  In fig  $l_1 \parallel l_2$ , the value of x is  
a.  $80^\circ$   
b.  $100^\circ$   
c.  $110^\circ$   
d.  $70^\circ$
10. Decimal representation of a rational number cannot be:  
A. terminating B. non-terminating  
C. non-terminating and repeating D. non-terminating and non-repeating
11. If  $p(x) = 3x^2 - 1$ , then  $p(-1/\sqrt{3})$  is  
(a) 0 (b) 1 (c)  $4\sqrt{2}$  (d) -1

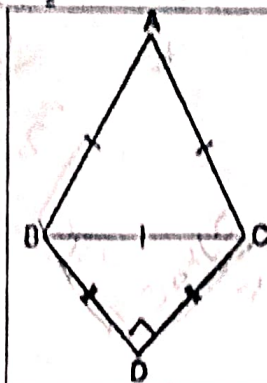


12. Mirror image of the point (0, 3) about x-axis is  
 (a) (-3, 0) (b) (0, 3) (c) (0, -3) (d) (0, 0)

13.  $\frac{1}{\sqrt{9} - \sqrt{0}}$  is equal to

- (a)  $\frac{1}{2} (3 - 2\sqrt{2})$  (b)  $\frac{1}{3 + 2\sqrt{2}}$  (c)  $3 - 2\sqrt{2}$  (d)  $3 + 2\sqrt{2}$

14.



In fig, ABC is an equilateral triangle and BDC is an isosceles right triangle right angled at D,  $\angle ABD$  is

- a.  $45^\circ$   
 b.  $60^\circ$   
 c.  $105^\circ$   
 d.  $120^\circ$

15. A proof is required for  
 (a) Postulate (b) Axiom (c) Theorem (d) none of these

16. An exterior angle of a triangle is  $110^\circ$  and its two interior opposite angles are equal, measure of these equal interior angles are  
 (a)  $55^\circ$  (b)  $60^\circ$  (c)  $50^\circ$  (d)  $90^\circ$

17. Graph of  $x=2$  and  $y=-1$  intersect at  
 (a) (-1, 2) (b) (2, -1) (c) (1, 2) (d) (2, 1)

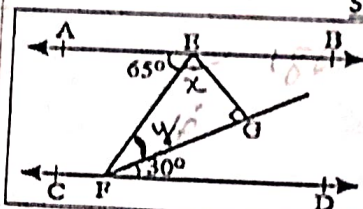
18. The point O(0,0) A(6,0) and B(0,4) forms a  
 (a) Right angled triangle (b) Right angled Isosceles Triangle  
 (c) Isosceles Triangle (d) Equilateral Triangle

In each of the questions given below, there are two statements marked as Assertion (A) and Reason (R). Choose the correct option.

- a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).  
 b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).  
 c. Assertion (A) is true but Reason (R) is false.  
 d. Assertion (A) is false but Reason (R) is true.
19. Assertion (A) : There can be infinite number of lines that can be drawn through a single point.  
 Reason (R) : Through two distinct points there can be only one line that can be drawn.
20. Assertion (A) : A polynomial may have more than one zero.  
 Reason (R) : The number of zeroes of the polynomial is equal to the degree of the polynomial.

#### SECTION B ( 2 MARKS EACH )

21.



For what value of  $x$  is  $AB \parallel CD$  and  $y$

22. If  $a+b+c = 9$  and  $ab+bc+ca = 40$ , then find the value of  $a^2+b^2+c^2$   
 OR

23. The side of a cube is  $(3a + 4b)$  units. What is its volume?  
 If  $a = 1 + \sqrt{7}$ , find the value of  $-6/a$

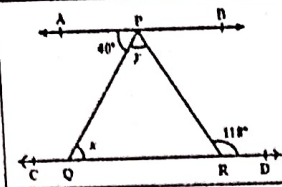


24. Find the solution of the linear equation  $x + 2y = 8$  when it touches  
 (a) x-axis and  
 (b) y-axis.

OR

Find the value of p and q, if the graph of the line represented by  $3x - y = 4$  passes through the point (p, -4) and (3, q)

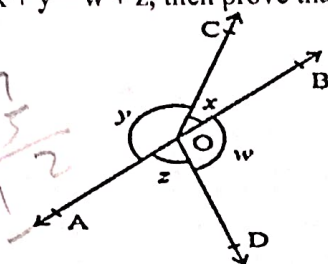
25.



In the given figure, if  $AB \parallel CD$ ,  $\angle APQ = 40^\circ$  and  $\angle PRS = 118^\circ$ , find x and y.

### SECTION C ( 3 MARKS EACH )

26. Write the coordinates of the point  
 (a) Origin  
 (b) Whose abscissa is 5 and which lies in x-axis.  
 (c) Whose abscissa is three times the ordinate.
27. If  $x + y = w + z$ , then prove that AOB is a straight line.



OR

In a  $\triangle ABC$ ,  $2\angle A = 3\angle B = 6\angle C$ , then find  $\angle A$ ,  $\angle B$  and  $\angle C$ .

28. Triangle ABC is an isosceles triangle such that  $AB = AC$ , side BA is produced to D, such that  $AD = AB$ , show that  $\angle BCD$  is a right angle.

29. Find the product using suitable identity

$$\left(x - \frac{1}{x}\right)\left(x + \frac{1}{x}\right)\left(x^2 + \frac{1}{x^2}\right)\left(x^4 + \frac{1}{x^4}\right)$$

OR

If  $x + y + z = 0$ , show that  $x^3 + y^3 + z^3 = 3xyz$  ✓

30. The value of the polynomial  $p(x) = x^2 - kx + 14$  at  $x = -2$  is 20. What is the value of the same polynomial at  $x = -1$

31. If  $x = 1$ ,  $y = 2$  is a solution of the equation  $a^2x + ay = 3$ , then find the value of a.

### SECTION D ( 5 MARKS EACH )

32. (a) Find 4 different solutions of  $5x + 2y = 27$ . ✓  
 (b) Express  $3y - 5x = 7(x - 2y) - 5$  in the form  $ax + by + c = 0$  ✓

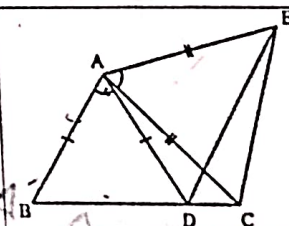
33. Represent  $\sqrt{5.7}$  geometrically

OR

If  $a = \frac{2^{x-1}}{2^{x-2}}$ ,  $b = \frac{2^{-x}}{2^{x+1}}$  and  $a - b = 0$ , find the value of x.

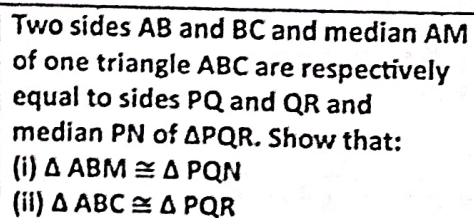
34.

In the given figure,  $AC = AE$ ,  $AB = AD$  and  $\angle BAD = \angle EAC$ . Prove that  $BC = DE$

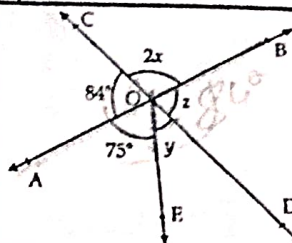


OR





35. In the given figure, line AB and CD intersect each other at O. Find the value of  $x$ ,  $y$  and  $z$ .



SECTION E ( CASE BASED 1 + 1 + 2 )

36. Jessica and Oliver were preparing the topic Number System for their Unit Test. Their tutor gives them some questions to revise the topic. Prepare the answer key for the following
- (i) Find the value of  $4\sqrt{6} + 4\sqrt{6} - \sqrt{6}$

- (i) Find the value of  $4\sqrt{8} + 4\sqrt{2} - 3\sqrt{2}$
- (ii) Express  $\frac{2\sqrt{5}}{\sqrt{6} + \sqrt{5}}$  with rational denominator
- (iii) Find the value of  $x$ , if  $2^{x-7} \cdot 5^{x-4} = 1250$

OR

## Factorise $12x^2 - 7x + 1$

37. A school organises a Mathematical Quiz Competition for Class IX. Four cards were made with four different statements written on them. Ankur, Sayed, Soham and Divyansh participate in the quiz. Each participant picks only one card.

Following are the statements written on the card:

Card 1 – Coefficient of  $x$  in the polynomial  $(x - 3)(x + 4)$  is?

Card 3 – For what value of  $k$  is  $3x^2 + kx + 5$  a perfect square?

Card 3 - For what value of  $k$  is  $x^3 - 2kx^2 + 16$  divisible by  $x + 2$ ?

Card 4  $\frac{x}{y} + \frac{y}{x} = 2$ , find the value of  $(x-y)$ .

Based on the above information answer the following questions:

- (i) Ankur pics card 1. What is the possible answer given by Ankur?  
(ii) What is the answer given by Soham, if he pics Card 3?  
(iii) Soham pics card 2, what is his response  
OR  
(iii) Divyansh takes Card 4, what is the answer given by him?

38. Two friends are playing in a circular field whose radius is 3 units and whose centre lies on the origin

- (i) Write the coordinate of two points on the circle which lies on Y-axis.  
(ii) The point in which abscissa and ordinate have different sign will lie in which quadrant(s).  
(iii) If  $(x+3, 2-y) = (2, 5)$  then find the value of  $x$  and  $y$ .

OR

- (iii) Find the distance of the point P(6,8) from the origin.

[illegible]



## PERIODIC TEST - 2 (2025-26)

## CLASS IX

## Subject: Mathematics (SET2)

Maximum Marks: 40Time: 90 minutes

## General Instructions:

- 1) The question paper contains FIVE SECTIONS A, B, C, D and E.
- 2) Section A consists of 10 multiple choice questions of 1 mark each.
- 3) Section B consists of 3 questions of 2 marks each.
- 4) Section C consists of 2 questions of 3 marks each.
- 5) Section D consists of 2 questions of 5 marks each.
- 6) Section E consists of 2 CASE STUDY QUESTIONS of 4 marks each.
- 7) All questions are compulsory.

SR NO	SECTION-A MCQ 10*1=10 MARKS	MARKS
Q.1	The number of dimensions, a solid has: (A) 1 (B) 2 <del>(C) 3</del> (D) 0	1
Q.2	A linear equation has degree (A) 1 (B) 2 (C) 3 (D) 0	1
Q.3	Which of the following needs a proof ? (A) Theorem (B) Axiom (C) Definition (D) Postulate	1
Q.4	The angle which is four times its complement is (a) $60^\circ$ (b) $30^\circ$ (c) $45^\circ$ (d) $15^\circ$	1
Q.5	Two adjacent angles on a straight line are in the ratio 5 : 4. then the measure of each one of these angles are (a) $100^\circ$ and $80^\circ$ (b) $75^\circ$ and $105^\circ$ (c) $90^\circ$ and $90^\circ$ (d) $60^\circ$ and $120^\circ$	1
Q.6	Two lines PQ and RS intersect at O. If $\angle POR = 50^\circ$ , then value of $\angle ROQ$ is	1

$$5x + 4x = 180$$

$$9x = \frac{180}{9} = 20$$

$$100^\circ, 80^\circ$$



## SECTION-C

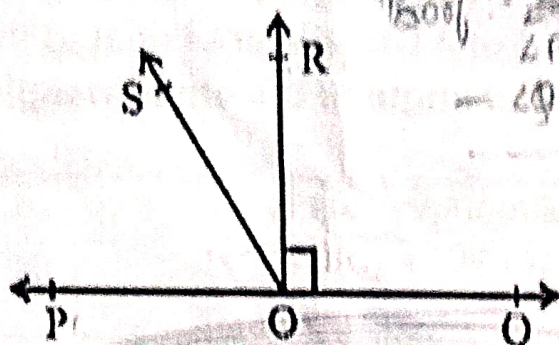
2\*3=6 MARKS

Q.14. If A, B and C are three points on a line, and B lies between A and C, then prove that  $AB + BC = AC$ .

3

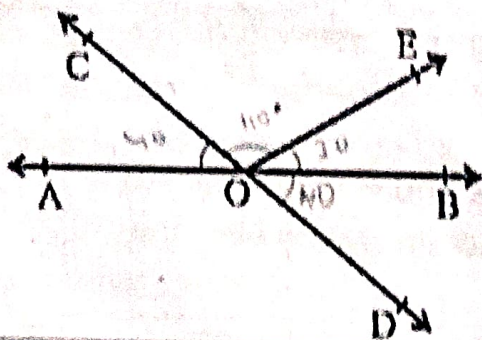
Q.15. In Fig. POQ is a line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that  $\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$ .

3



OR

In Fig., lines AB and CD intersect at O. If  $\angle AOC + \angle BOE = 70^\circ$  and  $\angle BOD = 40^\circ$ , find  $\angle BOE$  and reflex  $\angle COE$ .



## SECTION-D

2\*5=10 MARKS

Q.16. If a transversal intersects two lines such that the bisectors of a pair of corresponding angles are parallel, then prove that the two lines are parallel.

5

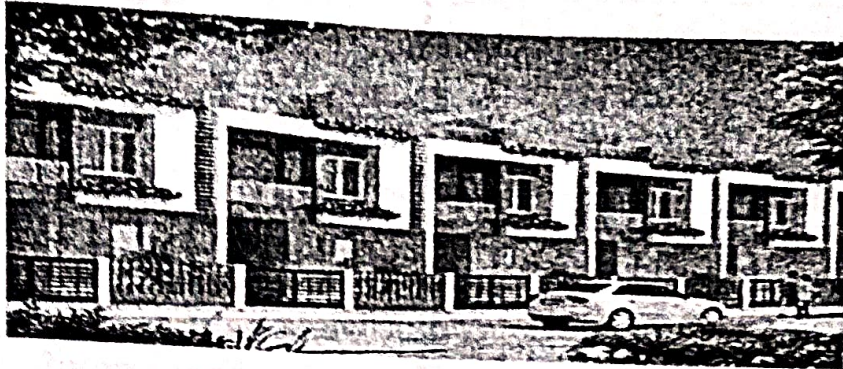
Q.17. Find any three solutions for equations  $x - 2y = 6$ , and  $2y + x = 8$  and also Draw the graph of equation.

5



SECTION-E  
2\*4=8 MARKS

Q.18.



Three friends Jeniee, Maggie and Sam live in the houses which are in one row. Jeniee lives in the first house, Maggie in the fifth house and Sam in the ninth house.

J				M				S
---	--	--	--	---	--	--	--	---

Jeniee

Maggie

Sam

- (i) If all the houses are alike and if  $JM = MS$  then what is the relation between  $JM$  and  $JS$ ?  
 (a)  $JM = JS$   
 (b)  $JM = \frac{1}{2} JS$   
 (c)  $JM = \frac{2}{3} JS$   
 d) none of these.
- (ii) When all the houses lie in a row, what do you call them?  
 (a) Coplanar  
 (b) coincident  
 (c) concurrent  
 (d) collinear
- (iii) A new friend Tinny (T) started to live in the new house no 13.

If  $JM = MS$  and  $MS = ST$  then is  $JM = ST$ ? By which



axiom?

J				M				S				T
---	--	--	--	---	--	--	--	---	--	--	--	---

OR

Given three collinear points J, M, S. name all the line segments.

Q.19. Euclid's geometry is based on \*\*definitions, axioms (or postulates), and theorems.

Axiom – A statement accepted as true without proof.

Example: "Things which are equal to the same thing are equal to one another."

2. Postulate– Axiom relating to geometry. Example: "A straight line may be drawn from any one point to any other point."

Q1. Euclid is called the father of:

- a) Algebra
- b) Geometry
- c) Trigonometry
- d) Arithmetic

Q2. Which of the following is Euclid's first postulate?

- a) A circle can be drawn with any centre and any radius.
- b) A terminated line can be produced indefinitely.
- c) A straight line may be drawn from any one point to any other point.
- d) All right angles are equal.

Q3. Which of the following is an axiom?

- a) Things which are equal to the same thing are equal to one another.
- b) If equals are added to equals, the wholes are equal.
- c) If equals are subtracted from equals, the remainders are

equal.

d) All of these.

1

Q4. According to Euclid's postulates, how many straight lines can be drawn through two distinct points?

a) None

b) One

c) Two

d) Infinitely many