केन्द्रीय विद्यालय क्र 4, ओ एन जी सी, वडोदरा
शरद कालीन अवकाश गृहकार्य
विषय – हिन्दी

कक्षा – दशमी

1 द्वितीय आवधिक परीक्षा के प्रश्न-पत्र के सही उत्तर लिखिए ।

2 निम्नलिखित विषयों पर अनुच्छेद लिखिए –

(1)   वर्तमान समय में इंटरनेट की उपयोगिता
(2)   श्री अन्न हमारे स्वास्थ्य के लिए लाभकारक
(3)   योग का महत्व

3. अपने शहर की ट्रेफिक की समस्या के समाधान हेतु जिला कलेक्टर को एक पत्र लिखिए ।

4 टेलीविजन में आने वाले अश्लील विज्ञापनों को रोकने के लिए राजस्थान पत्रिका के संपादक को एक पत्र लिखिए ।

5 आपके मित्र ने राज्य स्तरीय वाद विवाद प्रतियोगिता में प्रथम स्थान प्राप्त किया है । उसे बधाई देते हुए एक पत्र लिखिए ।
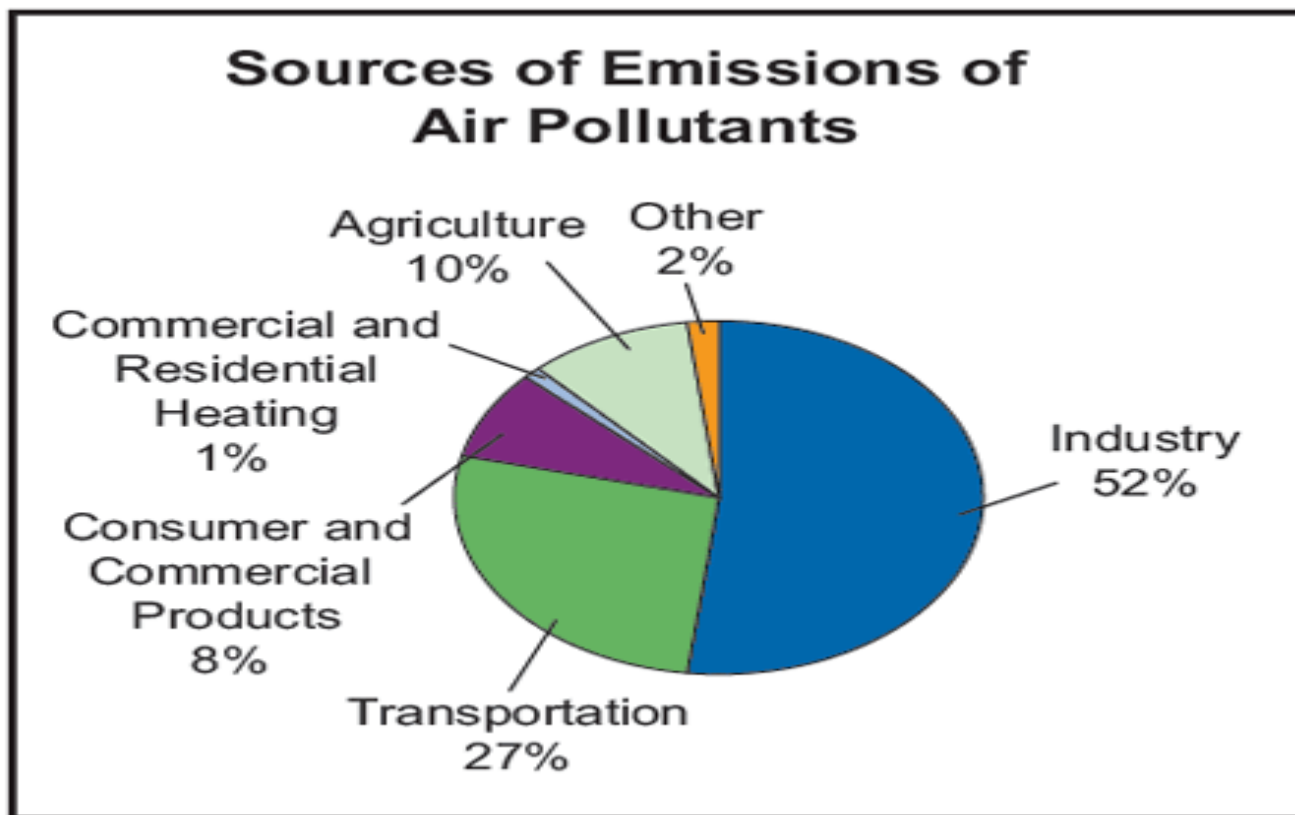
कक्षा -10

संस्कृत

1. संस्कृत प्रतिज्ञा लिखकर याद करे ।
2. अव्यय के 10 उदाहरण लिखे।
3. चित्र बनाकर उसका वर्णन संस्कृत में करे ।
4. विसर्ग सन्धि की परिभाषा लिखकर 10 उदाहरण लिखे
5. हिन्दी 10 वाक्यो को संस्कृत में अनुवाद करे ।

1. Observe the given pie-chart and write an analytical paragraph on the sources of Air pollution in about 100-120 words

Sources of Emissions of Air Pollutants

Agriculture 10%
Other 2%
Commercial and Residential Heating 1%
Consumer and Commercial Products 8%
Industry 52%
Transportation 27%

2. As the Captain of the school's Cultural Club, you have been asked to study the given itinerary provided by a tour-organizing vendor. A 3N/2D Educational Tour for the Senior School Students: Jabalpur and Ranha National Park (Vandhya Pradesh)

♣ Tour Travel & sightseeing by bus.

♣ Accommodation on quad sharing basis.

♣ One staff complimentary for every 20 students.

♣ Bottled mineral water throughout the tour.

♣Dance Party on 22 November.

♣ Insurance policy of ₹ 20,000/- per head.

♣ Provision of Tour Manager's assistance to all places.

Analyse this itinerary given below to either <u>approve or reject</u> the tour proposal, while focusing on the students' safety, interest, and physical wellness. Write this analytical paragraph in about 120 words, by selecting features that support your analysis.

You may begin like this : A thorough analysis of the itinerary provided by the tour organizing vendor reveals that the tour proposal should be accepted / rejected.

You may end like this: Therefore, the tour proposal for the educational trip should be approved / rejected.

Day	Estimated time of departure from	Estimated time of arrival	Sight-seeing Destination/ Activity	Time spent at the destination
22 Nov. 2023	8:49 am (Nagpur Junction)-8 hrs. 30 min	5:23 pm	Reporting at the hotel	
23 Nov. 2023	9:00am (hotel)	10:00am	Bhawartal Garden	1 hr.
	11:00am (garden)	11:40am	Bhedaghat Dhuandhar Falls	1hr.
	12:40pm (falls)	1:00pm	Lunch (nearby restaurant)	1 hr.
	2:00pm (restaurant)	2:15pm	Marble Rocks Cable car tour	1hr. 30 mins
	3:45pm (Marble Rocks)	4:45 pm	Rani Durgavati Museum	1 hr. 30 mins
	6:15pm (museum)	7:00pm	Back to the hotel	
24 Nov. 2023	5:30am (hotel)- 170 kms- 4 hrs. drive	9:30am	Ranha Tiger Reserve	7hrs.
	4:30pm (Tiger Reserve)	9:00pm	Back to the hotel	
25 Nov. 2023	7:54 am (Jabalpur Railway station)- 8 hrs. 45 min	4:21 pm	Nagpur Railway Junction	

3.As Armaan Khan, the School Literary Captain of Ujjwal Academy, Old City, Kiladerabad, you believe that languages can help bridge regional divides and promote unity. Write a letter to the Editor of a national daily, in about 120 words, suggesting the introduction of an online regional language learning programme managed and run by student councils and language clubs in the city. The programme aims to help residents who have recently relocated to a new region in picking up the local language organically. Share the importance and credibility of such a programme and suggest a feasible way to execute it along with possible activities.

4. You are Rakesh Mehta, Secretary of Rainbow Apartments, Marathalli, Bangalore. A major pipeline supplying water to your apartment complex burst recently. Repairs are expected to be time consuming and the available water is insufficient to meet the requirements of residents and Page 13 of 22 staff within the premises. Write a letter to the Area Development Officer, Marathalli Area, Bangalore, in not more than 120 words, requesting him to complete the repair work at the earliest, drawing attention to the difficulties faced by the people and the challenges of procuring water from outside.

Class- X   S.Sc

Autumn break home- work

1. Make a project on Consumer Rights

2. Assertion and reasoning questions

3. Map works of following.

(i) Indian national movement famous places- Chauri Chaura, Champaran, Jallianwala bagh, Madras, Surat, Sabarmati, Nagpur, Kolkata.

(ii) Dams- Salal dam, Rana Sagar dam, Tehri dam, Tungbhadara dam.

KENDRIYA VIDYALAYA NO 4 ONGC VADODARA

HOLIDAY HOMEWORK

(Autumn Break)

CLASS – X   AI

1. Learn difficult words from the chapters like entrepreneur, volatile, versatile, tangible, kinesics, nausea, fatigue, algorithm, linguistic, peripheral
2. Self Management Skills
3. Learn Domains of Artificial Intelligence.
4. Difference between AI, ML and DL.
5. Types of AI.
6. Difference between weak and strong AI.
7. Advantages and Disadvantages of AI.
8. Steps of AI Project Cycle.
9. Components of System Map
10. Rule based and Learning based.
11. Types of Learning.
12. MCQs till chapter (Entrepreneurial Skills)

CASE STUDY

ARITHMETIC PROGRESSION

1. India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year.

(a) Find the production during first year.

(b) Find the production during 8th year.

(c) In which year, the production is Rs 29,200.

<center>OR</center>

Find the difference of the production during 7th year and 4th year.

2. Your friend Veer wants to participate in a 200m race. He can currently run that distance in 51 seconds and with each day of practice it takes him 2 seconds less. He wants to do in 31 seconds.

(a) Write the AP for the situation given in this information.

(b) What is the minimum number of days he needs to practice till his goal is achieved

(c) If nth term of an AP is given by an = 2n + 3 then find the common difference of an AP.

<center>OR</center>

Find the value of x, for which 2x, x+ 10, 3x + 2 are three consecutive terms of an AP.

3. Your elder brother wants to buy a car and plans to take loan from a bank for his car. He repays his total loan of Rs 1,18,000 by paying every month starting with the first instalment of Rs 1000. If he increases the instalment by Rs 100 every month, answer the following:

(a) Find the amount paid by him in 30th instalment.

(b) If total instalments are 40 then amount paid in the last instalment?

(c) Find the amount paid by him in the 30 instalments.

<center>OR</center>

Find the ratio of the 1st instalment to the last instalment.

4. Reema being a plant lover decides to open a nursery and she bought few plants with pots. She wants to place posting such a way that number of pots in the first row is 3, in second row is 5 and third row is 7 and so on.

(a) How many pots are in the 8th row?

(b) If there are 6 rows, then how many pots will be needed?

(c) If Reema want to place 120 pots in total then find the total number of rows formed in this arrangement.

<center>OR</center>

Find the difference in the number of pots placed in 8th row and 3rd row?

5. In a potato race, a bucket is placed at the starting point, which is 4 m from the first potato, and the other potatoes are placed 3 m apart in a straight line. There are ten potatoes in the line.

A competitor starts from the bucket, picks up the nearest potato, runs back with it, drops it in the bucket, runs back to pick up the next potato, runs to the bucket to drop it in, and she continues in the same way until all the potatoes are in the bucket.

4 m   3 m   3 m
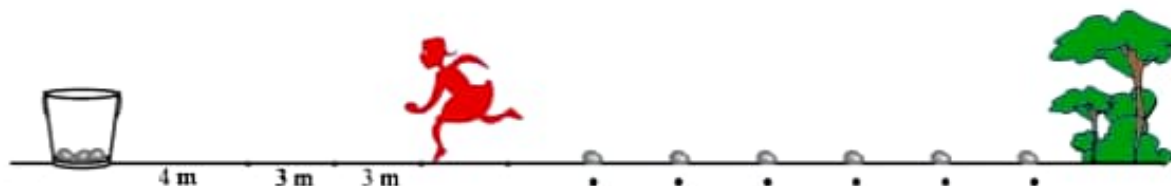
(a) Write the AP for the distance of the potatoes from the bucket?

(b) What is the distance of 5th potato from the bucket?

(c) What is the distance covered by the competitor in 8th potato?

OR

Total distance covered by the competitor to complete the distance.

6. Mena's mother start a new shoe shop. To display the shoes, she put 3 pairs of shoes in 1st row, 5 pairs in 2nd row, 7 pairs in 3rd and so on.

On the basis of this information, answer the following questions:_

(a) Find the pairs of shoes in 30th row.

(b) Find the total number of shoes in 5th and 8th row.

(c) If she puts a total of 120 pairs of shoes, then find the number of rows required.

OR

One next day, she arranges x pairs of shoes in 15 rows and y pairs of shoes in the 30th row, then find the difference of x and y.

7. The school auditorium was to be constructed to accommodate at least 1500 people. The chairs are to be placed in concentric circular arrangement in such a way that each succeeding circular row has 10 seats more than the previous one.

(a) If the first circular row has 30 seats, how many seats will be there in the 10th row?

(b) For 1500 seats in the auditorium, how many rows need to be there?

OR

If 1500 seats are to be arranged in the auditorium, how many seats are still left to be put after 10th row?

(c) If there were 17 rows in the auditorium, how many seats will be there in the middle row?

8. In the month of April to June 2022, the exports of passenger cars from India increased by 26% in the corresponding quarter of 2021–22, as per a report. A car manufacturing company planned to produce 1800 cars in 4th year and 2600 cars in 8th year. Assuming that the production increases uniformly by a fixed number every year.

Based on the above information answer the following questions.
(1) Find the production in the 1st year.
(2) Find the production in the 12th year.
(3) Find the total production in first 10 years.

OR

In which year the total production will reach to 15000 cars?

CO- ORDINATE GEOMETRY

1. Alia's and Shagun are friends living on the same street in Patel Nagar. Shagun's house is at the intersection of one street with another street on which there is a library. They both study in the same school and that is not far from Shagun's house.

Suppose the school is situated at the point O, i.e the origin, Alia's house is at A, Shagun's house is at B and library is at C.
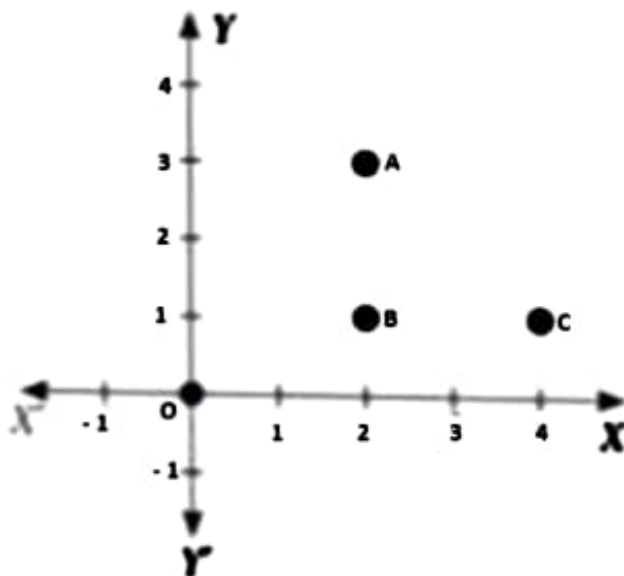
Based on the above information, answer the following questions.

(a) How far is Alia's house from Shagun's house?

(b) How far is the library from Alia's house?

OR

How far is the Alia's house from school?

(c) Name the triangle formed by Alia's house, Shagun's house and library.

2. In order to conduct Sports Day activities in your School, lines have been drawn with chalk powder at a distance of 1 m each, in a rectangular shaped ground ABCD, 100 flowerpots have been placed at a distance of 1 m from each other along AD, as shown in given figure below. Niharika runs 1/4 th the distance AD on the 2nd line and posts a green flag. Preet runs 1/5 th distance AD on the eighth line and posts a red flag.
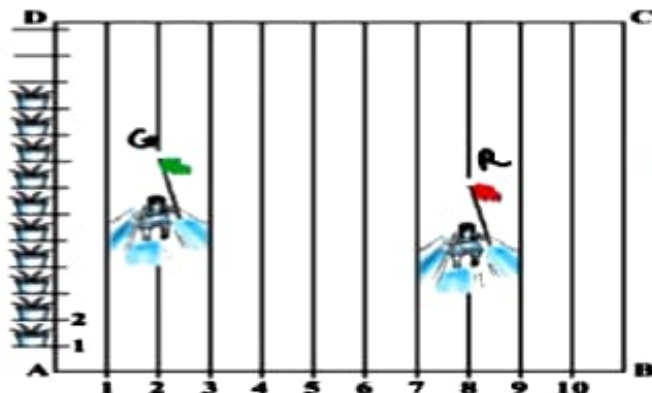
(a) Find the position of green and red flag.

(b) Find the distance between green and red flag.

OR

If Rashmi has to post a blue flag exactly halfway between the line segments joining the two flags, where should she post her flag?

(c) Find the ratio in which line segment joining the green and red flag is divided by x-axis.

3. In a cinema hall, people are seated at a distance of 1 m fom each other, to maintain the social distance due to CORONA virus pandemic. Let three peoples sit at points P, Q and R whose coordinates are (6, -2), (9, 4) and (10, 6) respectively.

Based on the above information, answer the following questions

(a) Find the distance between P and R.

(b) If a TC at the point I, lying on the straighe line joining Q and R such that it divides the distance between them in the ratio of 1 : 2, then find the coordinate of I.

OR

Find the ratio in which Q divides the line segment joining P and R.

(c) Name the triangle formed by the points P, Q and R.

4. The class X students school in Krishnagar have been allotted a rectangular plot of land for their gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1 m from each other. There is triangular grassy lawn in the plot as shown in the figure. The students are to sow seeds of flowering plants on the remaining area of the plot.
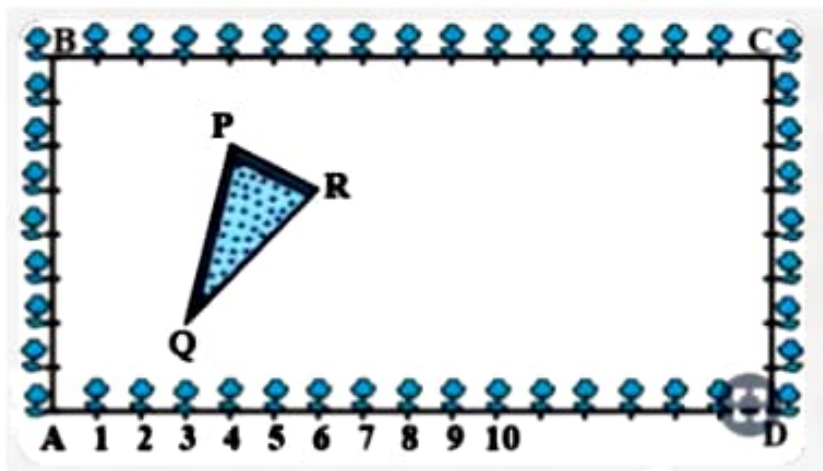
(a) Taking A as origin, find the coordinates of the vertices of P and R the triangle.

(b) What will be coordinates of the points P and Q if C is taken as origin?

(c) Find the length of the diagonals of the rectangular plot.

OR

If RP is the median of the triangle PQR, then find the length of RP.

5. A tiling or tessellation of a flat surface is the covering of a plane using one or more geometric shapes, called tiles, with no overlaps and no gaps. Historically, tessellations were used in ancient Rome and in Islamic art. You may find tessellation patterns on floors, walls, paintings etc. Shown below is a tiled floor in the archaeological Museum of Seville, made using squares, triangles and hexagons.

A craftsman thought of making a floor pattern after being inspired by the above design. To ensure accuracy in his work, he made the pattern on the Cartesian plane. He used regular octagons, squares and triangles for his floor tessellation pattern.

Use the above figure to answer the questions that follow:

(i) What is the length of the line segment joining points B and F?

(ii) The centre 'Z' of the figure will be the point of intersection of the diagonals of quadrilateral WXOP. Then what are the coordinates of Z?

(iii) What are the coordinates of the point on y axis equidistant from A and G?
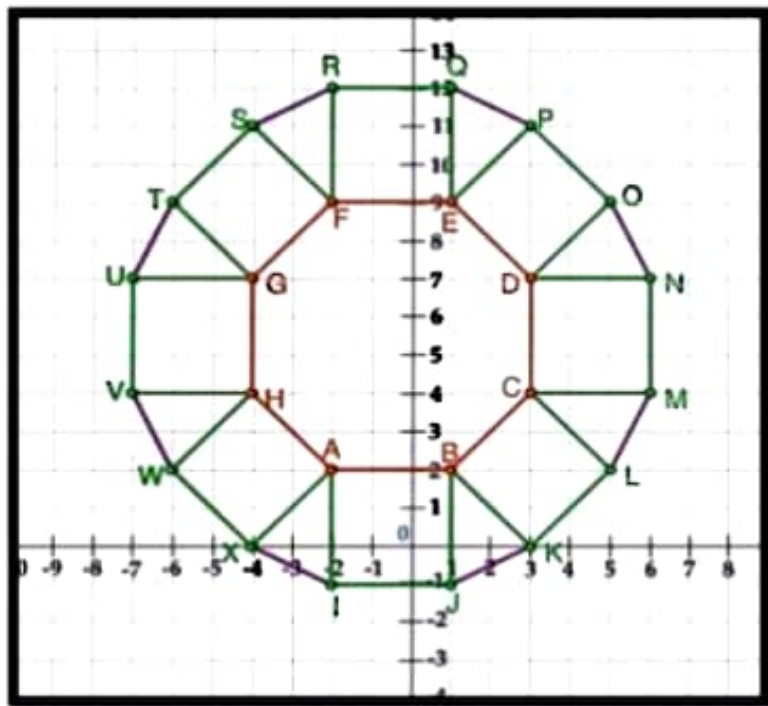
OR

What is the area of Trapezium AFGH?

7. In a satellite image of a colony, a particular house is pointe out by a flag which is situated at the point of intersection of x and y axis. if we go 2cm east and 3cm north from the house then we reach to a grocery store. If we go 4cm west and 6cm south from the house then we reach to an electrician's shop, if we got 6cm east and 8 cm south from the house then we reach to food cart, if we got 6cm west and 8cm north from the house then we reach to bus stand.

On X-axis:- 1 cm = 1 unit

On Y-axis:- 1 cm = 1 unit

Based on above information answer the following questions:

(a) Write the coordinates of grocery store, electrician's shop, food cart and bus stand.

(b) What is the distance of grocery store from food cart?

(c) If the grocery store and the electrician's shop lie on the line, the ratio of the distance of the house from the grocery store to that electrician's shop is?

OR

The co-ordinates of the position of the bus stand, grocery store, food cart and electricians shop cannot form a parallelogram. Why?

8. In a GPS, The lines that run east-west are known as lines of latitude, and the lines running north-south are known as lines of longitude. The latitude and the longitude of a place are its coordinates and the distance formula is used to find the distance between two places. The distance between two parallel lines is approximately 150 km.

A family from Uttar Pradesh planned a round trip from Lucknow (L) to Puri (P) via Bhuj (B) and Nashik (N) as shown in the given figure below.
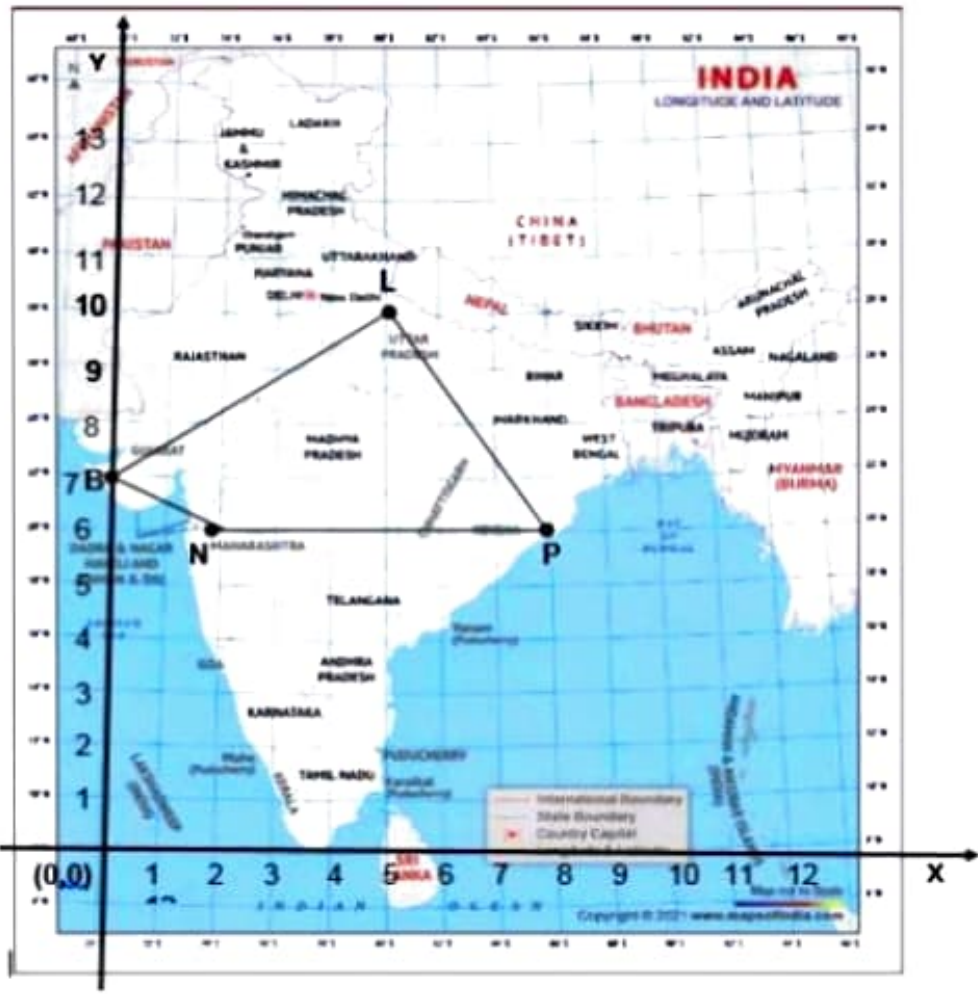
Based on the above information answer the following questions using the coordinate geometry.

(a) Find the distance between Lucknow (L) to Bhuj(B).

(b) If Kota (K), internally divide the line segment joining Lucknow (L) to Bhuj (B) into 3 : 2 then find the coordinate of Kota (K).

(c) Name the type of triangle formed by the places Lucknow (L), Nashik (N) and Puri (P)

OR

Find a place (point) on the longitude (y-axis) which is equidistant from the points Lucknow (L) and Puri (P).

HEIGHT AND DISTANCE

1. "Skysails" is that genre of engineering science that uses extensive utilization of wind energy to move a vessel in the sea water. The 'Skysails' technology allows the towing kite to gain a height of anything between 100 metres – 300 metres. The sailing kite is made in such a way that it can be raised to its proper elevation and then brought back with the help of a 'telescopic mast' that enables the kite to be raised properly and effectively.

(a) In the given figure, if $\tan\theta = \frac{\sqrt{3}}{3}$, then find the value of $\sin\theta$.

(b) Find the value of $\frac{1+\tan\theta}{\cot\theta}$.
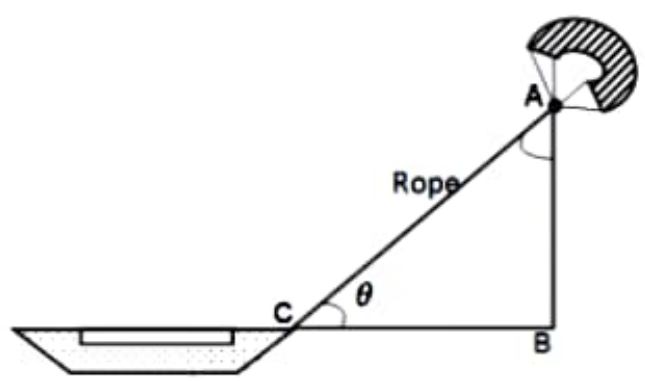
(c) What should be the length of the rope of the kite sail in order to pull the ship at the angle θ and be at a vertical height of 200m ?

OR

If $\cos A = \frac{1}{2}$, then find the value of $9\cot^2 A - 1$

14. In a village, group of people complained for an electric fault in their area. On their complained, an electrician reached village to repair an electric fault on a pole of height 5 m . She needs to reach a point 1.3 m below the top of the pole to undertake the repair work. (See the adjoining figure). She used ladder, inclined at an angle of θ to the horizontal such that $\cos \theta = 0.5$, to reach the required position.

(a) Find the value of .

(b) Find the length of the ladder. (Take $\sqrt{3} = 1.73$)

OR

How far from the foot of the pole should she place the foot of the ladder? (Take $\sqrt{3} = 1.73$)

(c) Find the value of $\sin^2 \theta + \tan^2 \theta$.
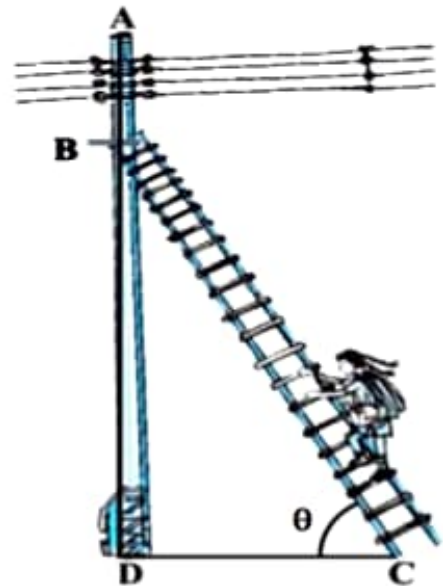
3. Trigonometry in the form of triangulation forms the basis of navigation, whether it is by land, sea or air. GPS a radio navigation system helps to locate our position on earth with the help of satellites.

A guard, stationed at the top of a 240 m tower, observed an unidentified boat coming towards it. A clinometer or inclinometer is an instrument used for measuring angles or slopes(tilt). The guard used the clinometer to measure the angle of depression of the boat coming towards the lighthouse and found it to be 30°.

(a) Calculate the distance of the boat from the foot of the observation tower.
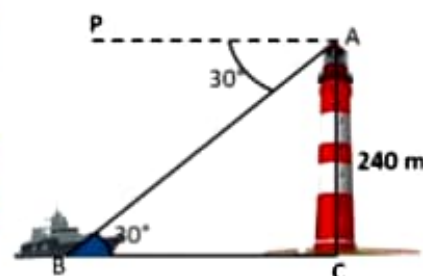
(b) Find the distance of B from A i.e AB.

(c) After10 minutes, the guard observed that the boat was distance from tower is reduced by approaching the tower and its $240 (\sqrt{3} - 1)$ m. He immediately raised the alarm. What was the new angle of depression of the boat from the top of the observation tower?

4. A group of students of class X visited India Gate on an education trip. The teacher and students had interest in history as well. The teacher narrated that India Gate, official name Delhi Memorial, originally called All-India War Memorial, monumental sandstone arch in New Delhi, dedicated to the troops of British India who died in wars fought between 1914 and 1919. The teacher also said that India Gate, which is located at the eastern end of the Rajpath (formerly called the Kingsway), is about 138 feet (42 metres) in height.

(a) What is the angle of elevation if they are standing at a distance of 42m away from the monument?

(b) They want to see the tower at an angle of 60°. So, they want to know the distance where they should stand and hence find the distance.

OR

If the altitude of the Sun is at 60°, then find the height of the vertical tower that will cast a shadow of length 20 m .

(c) The ratio of the length of a rod and its shadow is 1:1.Find the angle of elevation of the Sun.

5. A Satellite flying at height h is watching the top of the two tallest mountains in Uttarakhand and Karnataka, them being Nanda Devi(height 7,816m) and Mullayanagiri (height 1,930 m). The angles of depression from the satellite, to the top of Nanda Devi and Mullayanagiri are 30° and 60° respectively. If the distance between the peaks of the two mountains is 1937 km, and the satellite is vertically above the midpoint of the distance between the two mountains.
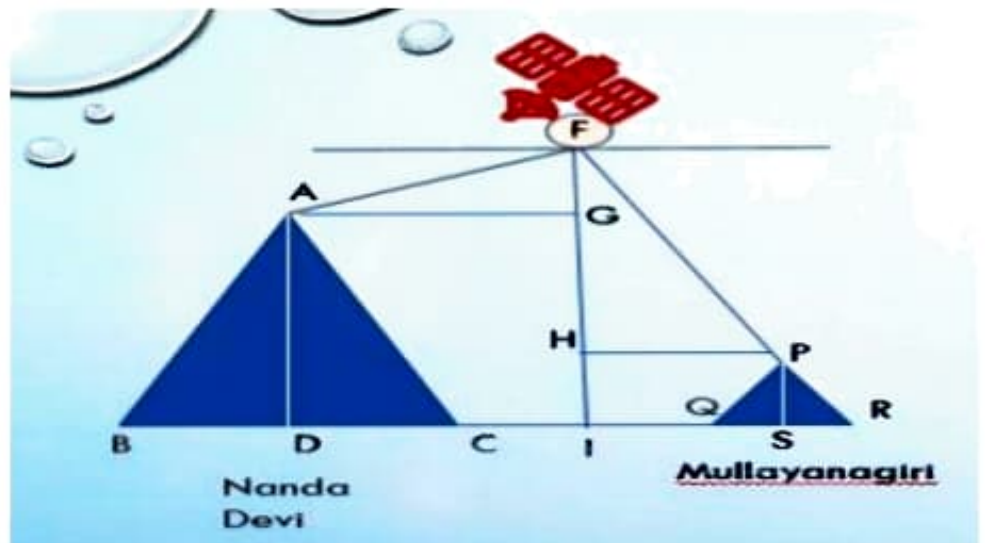
(a) Find the distance of the satellite from the top of Nanda Devi .

(b) Find the distance of the satellite from the top of Mullayanagiri.

(c) What is the angle of elevation if a man is standing at a distance of 7816m from Nanda Devi?

OR

If a mile stone very far away from, makes 45° to the top of Mullanyangiri Mountain. So, find the distance of this mile stone from the mountain.

6. A lighthouse is a tall tower with light near the top. These are often built on islands, coasts or on cliffs. Lighthouses on water surface act as a navigational aid to the mariners and send warning to boats and ships for dangers. Initially wood, coal would be used as illuminators. Gradually it was replaced by

candles, lanterns, electric lights. Nowadays they are run by machines and remote monitoring. Prongs Reef lighthouse of Mumbai was constructed in 1874-75. It is approximately 40 meters high and its beam can be seen at a distance of 30 kilometres. A ship and a boat are coming towards the lighthouse from opposite directions. Angles of depression of flash light from the lighthouse to the boat and the ship are 30 0 and 60 0 respectively.
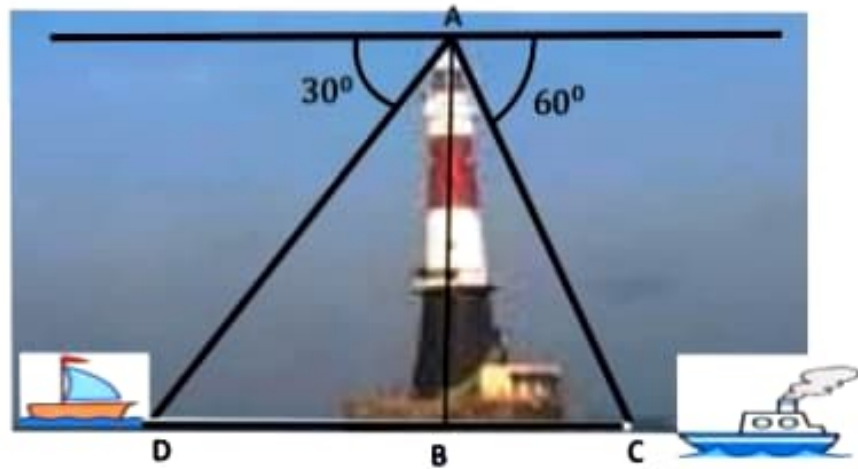
(a) Which of the two, boat or the ship is nearer to the light house. Find its distance from the lighthouse?

OR

Find the time taken by the boat to reach the light house if it is moving at the rate of 20 km per hour.

(b) Find the distance between ship and boat.

(c) Find the length of AD.

7. .Ram is watching the top and bottom of a lighthouse from the top of the building. The angles of elevation and depression of the top and bottom of a lighthouse from the top of a 60 m high building are 30° and 60° respectively.
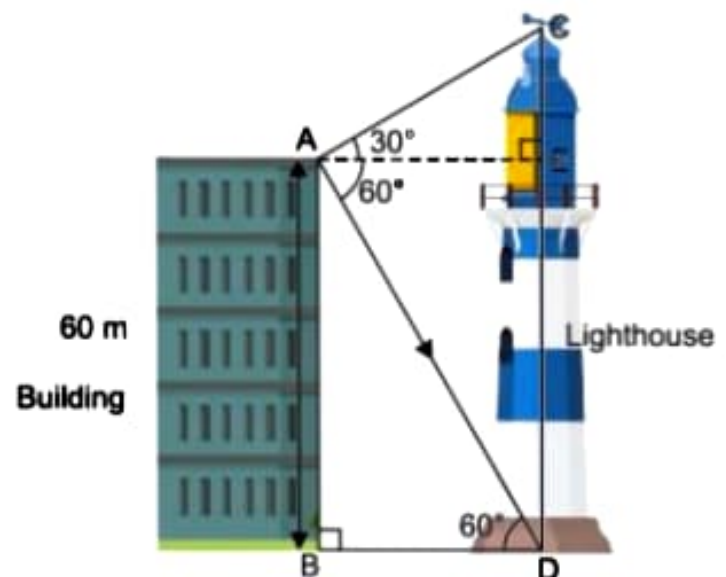
(a) Find the difference between the heights of the lighthouse and the building.

OR

Find the distance between the lighthouse and the building.

(b) Find the distance from the top of building to the top of light house.

(c) Find the height of the light house.

CBSE

ADDITIONAL PRACTICE QUESTIONS
Science (086)
Class X | 2023–24

Maximum marks: 80   **Time Allowed: 3 hours**

General Instructions:

i.   This question paper consists of 39 questions in 5 sections.
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. Section A consists of 20 objective type questions carrying 1 mark each.
iv. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
v.   Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
vi. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

Section A

Select and write the most appropriate option out of the four options given for each of the questions 1 - 20. There is no negative mark for incorrect response.
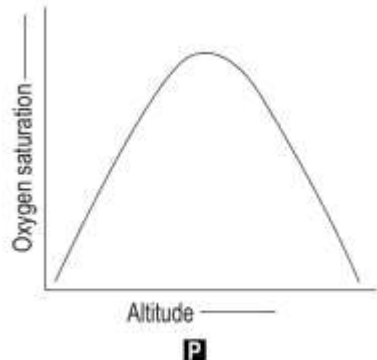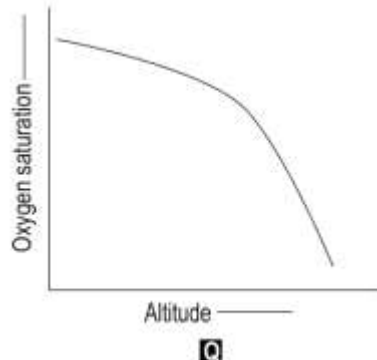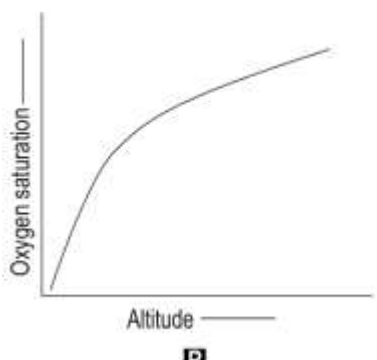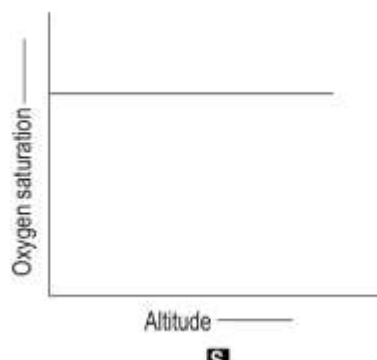
Q.Nos.	Questions	Marks
1	A single displacement reaction is represented below. PQ + R ----> PR + Q Which of the following is true about the reactants and products? | Option	Type of ion of R in product	Stability of PR as compared to PQ
---	---	---
A	cation	more stable
B	cation	less stable
C	anion	more stable
D	anion	less stable | (a) A (b) B	1

	(c) C (d) D	
2	Some types of chemical reactions are listed below. - decomposition - combination - displacement - double displacement Which two of the following chemical reactions are of the SAME type? P) $AgNO_3 + NaCl ---> AgCl + NaNO_3$ Q) $Mg + 2 HCl ---> MgCl_2 + H_2$ R) $CH_4 + 2 O_2 ---> CO_2 + 2 H_2O$ S) $2 KOH + H_2SO_4 ---> K_2SO_4 + H_2O$ (a) P and Q (b) Q and R (c) R and S (d) P and S	1
3	Neetu has two test tubes containing dilute hydrochloric acid and dilute sodium hydroxide solution, but they are not labeled. Adding which of the following solutions to the test tubes will help her visually identify the acidic and basic solution? (a) only vinegar (b) only baking soda (c) only sodium chloride (d) either vinegar or sodium chloride	1
4	Sonia has aqueous solutions of three salts, sodium acetate, sodium chloride and ammonium chloride in three test tubes. The test tubes are not labeled. On checking, she finds the pH of the solutions to be 4.6, 7.0 and 8.9. Which of the following correctly matches the salts with their respective pH?	1

	pH 4.6	pH 7.0	pH 8.9
A	sodium acetate	sodium chloride	ammonium chloride
B	sodium chloride	ammonium chloride	sodium acetate
C	ammonium chloride	sodium acetate	sodium chloride
D	ammonium chloride	sodium chloride	sodium acetate

(a) A
(b) B

	(c) C (d) D	
5	Galvanisation is a process of coating iron articles with a layer of zinc to prevent the iron from rusting. The iron is protected even if the zinc coating is scratched and iron is exposed. Which of the following is true about how zinc prevents the rusting of iron? P) A galvanised iron article does not undergo oxidation. Q) The zinc coating prevents contact of iron with air. R) Zinc undergoes corrosion more easily than iron. (a) only P (b) only Q (c) only P and Q (d) only Q and R	1
6	During purification of a metal by electrolysis, what happens at the negative electrode? (a) Metal ions lose electrons to become neutral atoms. (b) Neutral metal atoms gain electrons to become ions. (c) Neutral metal atoms lose electrons to become ions. (d) Metal ions gain electrons to become neutral metal atoms	1
7	Metals are lustrous and shine especially when their freshly cut surfaces are exposed. Salma cut pieces and compared the lustre of the freshly cut surfaces of the following metals. aluminium, sodium, copper, iron The freshly cut surface of which of these metals is likely to lose its lustre first on exposure to air? (a) aluminium (b) sodium (c) copper (d) iron	1
8	Which of the following statements is TRUE about the uptake of water in plants? (a) It occurs all the time due to diffusion. (b) Water enters the roots due to osmosis.	1

	(c) At night when transpiration is low, roots do not take up water. (d) The movement of water from roots to leaves is bidirectional.	
9	Oxygen saturation levels refer to the extent haemoglobin is bound to oxygen. As altitude increases, the atmospheric pressure decreases. Which of the following graphs correctly represents the oxygen saturation levels as altitude increases? (a) P (b) Q (c) R (d) S	1
10	Which of the following method/s are useful to prevent fertilisation even when ovulation occurs? P) surgical blocking of the fallopian tube Q) copper-T R) oral pills S) condom (a) only P (b) only Q and R	1

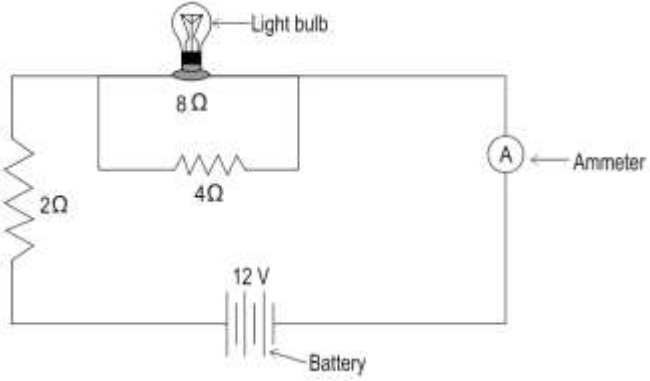|		
	(c) only P, Q and S (d) only Q, R and S	
11	In cattle, having horns is a recessive trait (h) to not having horns (H). When cattle with horns are crossed with cattle that do not have horns, the number of offspring having horns was equal to those not having horns. Which of the following is MOST LIKELY to be true? (a) Both parents are homozygous dominant. (b) One parent is homozygous dominant. (c) Both parents are heterozygous. (d) One parent is heterozygous.	1
12	Patient X was suffering from a pancreatic condition due to which the pancreas was not functioning adequately. Which of the following is a doctor likely to suggest to such an individual? (a) including a large amount of protein in the diet (b) eating a diet with low-fat content (c) eating only carbohydrates (d) including only liquid foods	1
13	When an object was kept at position X in front of a concave mirror, an enlarged and virtual image was formed. Which among the following identifies 'X' correctly? (a) anywhere between the centre of curvature and principal focus (b) anywhere between the pole and principal focus (c) exactly at the centre of curvature (d) exactly at the principal focus	1
14	The face of the moon that is visible to us is called as the near side and the face of the moon which is invisible to us is called as far side. What colour would the sky appear to an astronaut standing on the "far side" of the Moon and why? (a) blue, as the Moon's atmosphere scatters sunlight just like Earth (b) white, as the Moon's surface reflect all the light that falls on it (c) black, as there is no atmosphere on Moon to scatter sunlight (d) black, as sunlight does not fall on the far side of the Moon	1
15	Plants receive energy from the Sun which they utilise for several processes. The energy utilized for which of the following plant processes gets transferred to the next trophic level that consumes plants?	1

	(a) only growth (b) only respiration (c) only transport of substances and reproduction (d) all - growth, photosynthesis, respiration and transport of substances	
16	The action of which among the following is crucial to the formation of ozone? (a) humans (b) sunlight (c) carbon dioxide (d) chlorofluoro carbons	1

Question No. 17 to 20 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:
a) Both A and R are true, and R is the correct explanation of A.
b) Both A and R are true, and R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

17	Assertion (A): Zinc oxide can be reduced to zinc metal on heating with carbon. Reason (R): Carbon is less reactive than zinc.	1
18	Assertion (A): Variations always provide a survival advantage to an organism. Reasons (R): Variations can be caused due to incorrect DNA copying.	1
19	Assertion (A): Iron filings scattered around a straight current carrying conductor in a plane perpendicular to the length of the conductor, arrange themselves in concentric circles. Reason (R): Magnetic field has both magnitude and direction.	1
20	Assertion (A): Omnivores receive 10% of their energy from the trophic level below them. Reason (R): An omnivore is always in the trophic level just above herbivores.	1

Section B

Question No. 21 to 26 are very short answer questions

21	(a) Write the balanced chemical equation for the reaction that is prevented by storing potassium metal under kerosene. (b) Identify the type of chemical reaction that is prevented.	2
22	Ravi cultivated mustard, a plant with bisexual flowers, on his farm. His plants were diseased due to a gene defect and therefore had reduced yield. Ravi removed the stamens from the diseased plants and also planted fresh disease-	2

	free mustard plants where he removed the pistils. How will Ravi's strategy help in improving the yield of mustard?	
23	A plant X was enclosed in a glass jar with some lizards. A similar plant Y was enclosed in another glass jar but without lizards. Both the jars are kept under the same light conditions for a few hours. Which plant is likely to photosynthesize more and why? **OR** Proteinuria is a condition in which significant amounts of protein can be detected in urine. Which process in the nephron is likely to be affected causing proteinuria? Justify.	2
24	Search mirrors are mirrors that are used to look for hidden objects underneath the cars as shown. The hidden objects can be easily spotted as the mirror provides a wider field of view. (a) What type of mirrors are generally used to make search mirrors? (b) With the help of a ray diagram describe the nature of image formed by the type of mirror identified in (a).	2
25	Ramya wants to measure the current flowing through the circuit shown below. Which among the four ammeters can she use for the same? Show your calculations. 	Ammeter	Minimum range	Maximum range		2

| P	0 mA	1 m A
Q	0 mA	10 mA
R	0 A	1 A
S	0 A	10 A

OR

A helical coil whose length is greater than its diameter is connected to a battery as shown below.
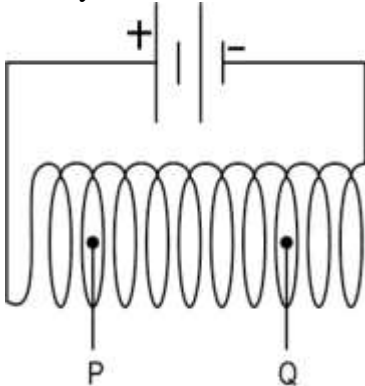
(a) How does the magnetic field at point P compare with the magnetic field at point Q? Justify your answer.

(b) State one way in which the strength of the magnetic field inside a current carrying helical coil can be changed?

26	Shown below are two food pyramids.	2
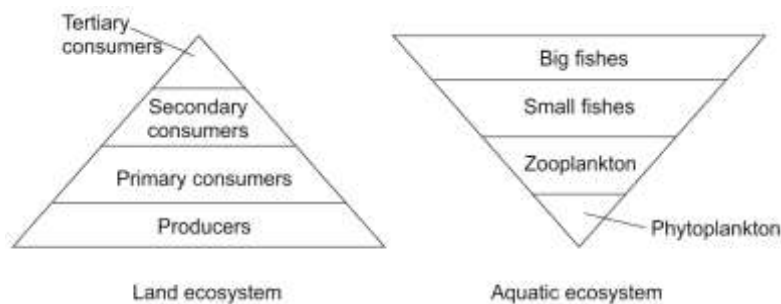
The pyramid representing the land ecosystem is traditional with producers being greater in mass than primary consumers and so on. Sometimes, in aquatic ecosystems, an inverted pyramid exists. Here, the total mass of producers (phytoplankton) is much smaller than the top consumers (big fishes).

(a) Which level is likely to have the most amount of energy in such an aquatic ecosystem? Give a reason to support your answer.
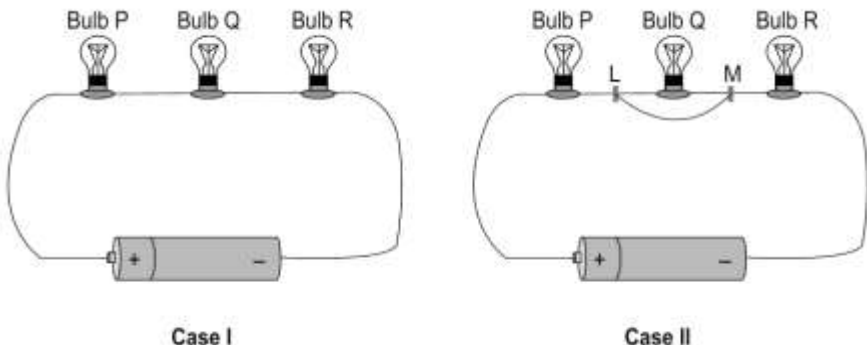
| | (b) Such aquatic ecosystems are not considered to be sustainable. Justify this statement. | |

Section C

Question No. 27 to 33 are short answer questions

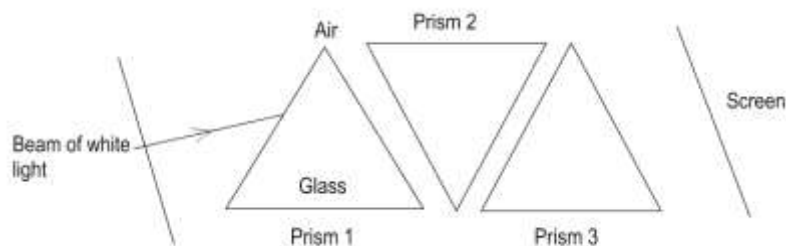| 27	Equal sized bars of aluminium and iron are exposed to the environment as shown below. Exposed surface Exposed surface Aluminium bar Iron bar Which of them is likely to corrode till the level marked by the line FIRST? Justify your answer.	3
28	The electronic configuration of some elements is given in the table below. 	Element	Electronic configuration	 	---	---	 	P	2, 8, 8	 	Q	2, 8, 8, 1	 	R	2, 6	 	S	2, 5	 	T	2, 8, 2	 	U	2, 8, 7	 (a) Identify any two pairs of elements that will react to form compounds by a transfer of electrons. (b) Write the molecular formula of the compounds formed by the pairs of elements identified in (a). **OR** A metal X is obtained from its chloride salt by exposure to sunlight. (a) In which section of the reactivity series of metals- top, middle or bottom, is it likely to be placed? Justify your answer. (b) Identify the type of reaction the chloride salt of metal X undergoes on exposure to sunlight.	3

29	In animals, hormones can be secreted by one organ and can act on multiple organs. Justify this statement by explaining the effect of a single animal hormone on three organs.	3
30	If two pea plants having round and green seeds (RRGg) are crossed, identify the percentage of the following with respect to the F1 generation: (a) gametes having both the round and yellow seed traits (b) offspring having the same genotype as the parents (c) offspring having the same phenotype as the parents	3
31	Absolute refractive indices of two media P and Q are 1.33 (n_P) and 2.52 (n_Q) respectively. The speed of light in medium P is 2×10^8 m/s. (a) What would be the speed of light in medium Q (V_Q)? (b) If the angle of incidence for a ray of light travelling from medium P to Q is 0°, then what will be the path of light in the medium Q?	3
32	Kaveri conducted an experiment to study the energy efficiency of different bulbs. She connected a bulb A having a resistance of 100 ohms to a 240 V power supply in a laboratory. (a) How much energy will be consumed by the bulb, if it is kept ON for 4 hours each day for a week? Express your answer in kJ. (b) Kaveri connects another similar bulb B in series with bulb A and connects the combination to a 240 V supply. Will there be any change in the brightness with which bulb A glows now? Explain mathematically.	3
33	(a) Vijaya connects three bulbs P, Q and R is series with a battery in two different ways using identical conducting wires as shown below. She notices that in case I all three bulbs glow but in case II only the bulbs P and R continue to glow. What could be the reason for the bulb Q to not glow in case II? Explain. (b) Two resistances when connected in parallel give a combined resistance of 10/3 ohms. When the same two resistors are connected in series, the combined resistance becomes 15 ohms. Calculate the individual resistance of each resistor.	3

Question No. 34 to 36 are long answer questions.

34	A carbon compound P has six carbon atoms and twelve hydrogen atoms. (a) Is P a saturated or unsaturated carbon compound. Justify your answer by drawing the structural formula. (b) Describe a test that can be used to determine if compound P is saturated or unsaturated. (c) Name the products that are formed on burning compound P in an excess of air. **OR** A carbon compound P is found to be neutral when tested with red and blue litmus. A gas, that burns with a 'pop' sound, is produced when a metal reacts with carbon compound P. (a) Write the chemical equation for the reaction. (b) The carbon compound P is heated with concentrated sulphuric acid to produce carbon compound Q. (i) Write the chemical equation for the reaction. (ii) Describe the type of flame that Q produces on combustion. (c) What is likely to be observed on heating compound P with ethanoic acid with an acid as catalyst? Write the chemical equation for the reaction.	5
35	(a) Certain specialised cells in animals called stem cells have the ability to divide and differentiate into different cell types. This helps in the replacement of a damaged organ. Name and explain two methods of asexual reproduction that are similar to stem cells and occur mostly in multicellular organisms. (b) Identify TWO pairs of reproductive organs in males and females that are functionally similar to each other. Justify. **OR** (a) Sagar saw a beautiful rose and smelled it. As he was smelling it, he happened to touch a thorn and pull his hand away. State TWO differences and similarities each in the way the nervous system performs the two actions. (b) Are all involuntary actions reflex actions? Justify.	5
36	Savera passed a beam of white light through a series of equilateral prisms as shown.	5

(a) What colour(s) will be seen on the screen?

(b) Copy the diagram above and draw the beam entering Prism 1 and emerging from Prism 3 and falling on the screen.

(c) Name all the processes that takes place when the beam of light enters the Prism 1 and emerges from Prism 3.

OR

(a) Rupal suffers from myopia. Where would the image form in her eye?

(b) Name the type of lens that is generally used to correct myopia.

(c) Rupal underwent cataract surgery and her eye lens was replaced with an artificial lens with a fixed focal length, made of a plastic material, silicone. State one likely visual disadvantage that Rupal is likely to experience as compared to a person who has normal eyesight.

(d) Identify the parts of the eye labeled in the diagram from the descriptions given below by writing the labels as your answer.
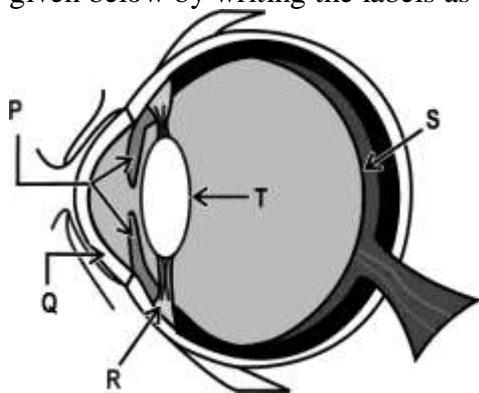
(i) It helps in changing the focal length of the lens.

(ii) It causes most of the refraction of the light entering the eye.

(iii) It controls the amount of light entering the eye.

(iv) It acts as a screen on which the image is formed.

Section – E

Question No. 37 to 39 are case-based/data -based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts

| 37 | Given below is a four carbon skeleton of a hydrocarbon compound.

$$C-\overset{\overset{\textstyle C}{\mid}}{\underset{\underset{\textstyle C}{\mid}}{C}}$$

(a) Fill in the hydrogen atoms/bonds to form:
(i) a saturated hydrocarbon
(ii) an unsaturated hydrocarbon

(b) If the four-carbon skeleton is of a straight chained alkene, draw the structures of all the possible compounds.

OR

If the four-carbon skeleton is of a straight chained alkyne:
(i) How many carbon atoms may NOT be bonded to any hydrogen atoms?
(ii) How many hydrogen atoms will there be in the compound? | 4 |
| 38 | Ram and Asha were a married couple. They had four children - one of these children had sickle cell anemia whereas the other four children did not show symptoms. Ram and Asha did not show symptoms of sickle cell anaemia. The trait for sickle cell anaemia is not linked to the sex chromosomes.

(a) Is this disease caused by a dominant or recessive trait? Why?
(b) If the child that had sickle cell anaemia got married to a person without a mutation in the sickle cell anaemia gene, what percentage of their children would have sickle cell anaemia? Show the cross.

OR

Identify the genetic composition of the sickle cell anaemia trait in Asha and Ram and use that to predict the genetic composition in the other four children who did not show symptoms that Ram and Asha had. | 4 |