BOARD PATTERN TEST PAPER

CLASS - X

* SCIENCE

* SOCIAL SCIENCE

* MATHEMATICS (STANDARD)

SCIENCE

TIME : 3 HRS.   **MAX. MARKS : 80**

GENERAL INSTRUCTIONS :

1.   This question paper consists of 39 questions in 5 sections.

2.   All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

3.   Section A consists of 20 objective type questions carrying 1 mark each.

4.   Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.

5.   Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words.

6.   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.

7.   Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

SECTION-A

Select and write one most appropriate option out of the four options given for each of the questions from 1 to 20.

1. $A_2O_3 + 2B \rightarrow B_2O_3 + 2A$ is an example of   **(Chemistry)**

 (1) displacement reaction   (2) decomposition reaction

 (3) double displacement reaction   (4) combination reaction

2.   Which of the following is not a thermal decomposition reaction?   **(Chemistry)**

 (1) $2H_2O \rightarrow 2H_2 + O_2$ (2) $2FeSO_4 \rightarrow Fe_2O_3 + SO_2 + SO_3$

 (3) $ZnCO_3 \rightarrow ZnO + CO_2$ (4) $2KClO_3 \rightarrow 2KCl + 3O_2$

3. $Mg + CuO \rightarrow MgO + Cu$ **(Chemistry)**

 Which of the following is wrong relating to the above reaction?

 (1) CuO gets reduced.   (2) Mg gets oxidised.

 (3) CuO gets oxidised.   (4) It is a redox reaction.

4.   The solution with the lowest concentration of H^+ ion is   **(Chemistry)**

 (1) pH = 7   (2) pH = 8.6

 (3) pH = 2.0   (4) pH = 6.8

5.   On passing CO_2 gas in excess in aqueous solution of sodium carbonate, the substance obtained is

                                                                                        (Chemistry)

 (1) NaOH   (2) $NaHCO_3$

 (3) $Na_2CO_3.10H_2O$ (4) $Na_2CO_3 \cdot H_2O$

6. Complete the following reaction : **(Chemistry)**

$$CH_3CH_2OH + 2[O] \xrightarrow[\text{KMnO}_4]{\text{alk}} H_2O + \underline{\quad ? \quad}$$
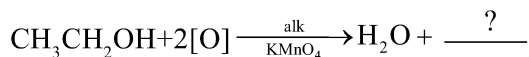
(1) CH_3COOH (2) $HCOOH$ (3) CH_3COCH_3 (4) CH_3OH

7. Which of the following organic compounds does not have the same chemical properties as methanol? **(Chemistry)**

(1) C_2H_6O (2) $C_5H_{10}O$ (3) $C_4H_{10}O$ (4) $C_7H_{16}O$

8. Choose the function of the pancreatic juice from the following **(Biology)**

(1) Trypsin digests proteins and lipase carbohydrates

(2) Trypsin digests emulsified fats and lipase fats.

(3) Pepsin digests proteins and amylase fats.

(4) Lipase digests emulsified fats and amylase starch.

9. In a synapse, chemical signal is transmitted from **(Biology)**

(1) Dendritic end of one neuron to axonal end of another neuron.

(2) Axon to cell body of same neuron.

(3) Cell body to axonal end of the same neuron.

(4) Axonal end of one neuron to dendritic end of another neuron.

10. In tissue culture, new plants are grown by removing tissue or separating _____ from the growing _____ of a plant. The cells are then placed in an artificial medium where they divide rapidly to form a small group of cells or callus. The callus is transferred to another medium containing _____ for growth and _____. **(Biology)**

Fill in the blanks by selecting correct sequence of words from the options given below.

(1) Tissue, cells, minerals, development

(2) Cells, tip, hormones, differentiation

(3) Cell organelles, root, minerals, and modification

(4) Tissue, rhizome, hormones, differentiation

11. Height of a plant is regulated by **(Biology)**

(1) DNA which is directly influenced by growth hormone.

(2) Genes which regulate the protein directly.

(3) Growth hormones under the influence of enzymes coded by a gene.

(4) Growth hormone directly under the influence of a gene.

12. Sometimes we get painful cramps in our leg muscles after running for a long period of time due to the accumulation of ___A____ by the process of ____B_____. **(Biology)**

(1) A-Carbon dioxide, B- Aerobic respiration

(2) A- Lactic acid, B- Aerobic respiration

(3) A- Lactic acid, B- Anaerobic respiration

(4) A- Fatty acid, B- Anaerobic respiration

13.

Principal axis
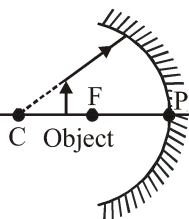
While looking at the above diagram, Nalini concluded the following?   **(Physics)**

(i) The image of the object will be a virtual one.

(ii) The reflected ray will travel along the same path as the incident ray but in opposite direction.

(iii)The image of the object will be inverted.

(iv)This is a concave mirror and hence the focal length will be negative.

Which of the above statements are correct?

(1) (i) and (ii)   (2) (i) and (iii)   (3) (ii), (iii) and (iv)   (4) (i), (ii) (iii) and (iv)

14. A person cannot see distinctly the objects kept beyond 2 m. This defect can be corrected by using a lens of power :   **(Physics)**

(1) + 0.5 D   (2) – 0.5 D   (3) + 0.2 D   (4) – 0.2 D

15. _____ helps endangered organisms to overcome their number.   **(Biology)**

(1) Food chain   (2) Food web

(3) Both food chain and food web   (4) None of these

16. Excessive exposure of humans to uv-rays result's in   **(Biology)**

(i) damage to immune system

(ii) damage to lungs

(iii) skin cancer

(iv) Peptic ulcer

(1) (i) and (ii)   (2) (ii) and (iv)   (3) (i) and (iii)   (4) (iii) and (iv)

Directions : Q.17 to 20 are Assertion - Reasoning based questions. These consist of two statements- Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

(1) Both A and R are true and R is the correct explanation of A

(2) Both A and R are true and R is not the correct explanation of A

(3) A is true but R is false

(4) A is false but R is true

17. **Assertion :** Zinc is used in the galvanisation of iron.   **(Chemistry)**

Reason : Its coating on iron articles increases their life by protecting iron from rusting.

18. **Assertion :** Amoeba reproduces by binary fission.   **(Biology)**

Reason : Majority of unicellular organisms reproduces asexually.

19. **Assertion (A) :** The strength of the magnetic field produced at the centre of a current carrying circular coil increases on increasing the number of turns in it.   **(Physics)**

Reason (R) : The current in each circular turn has the same direction and the magnetic field due to each turn then just adds up.

20. **Assertion :** Plastics and glass are not decomposed by biological process **(Biology)**

    Reason : Both plastics and glass are biodegradable.

SECTION-B

Q. no. 21 to 26 are very short answer questions.

21. (a) Name the products formed when sodium hydrogencarbonate is heated. **(Chemistry)**

    (b) Write the chemical equation for the above reaction.

22. (a) Newly formed DNA copies may not be identical at times. Give one reason. **(Biology)**

    (b) Name the structures of the ovule which after fertilization develops into seed coat and stalk of the seed respectively.

23. (a) Name the blood vessel that carries blood towards the glomerulus and the blood vessel that carries blood away from it respectively. **(Biology)**

    (b) What is the purpose of making urine in the human body?

    OR

    (a) Veins are thin walled and have valves. Justify.

    (b) Name the component of blood which transport

    (i) Food, CO_2 & nitrogenous wastes.

    (ii) Oxygen

24. Two media A and B with refractive indices 1.31 and 1.50 respectively are given. In which media,

    (a) the bending of light is more when it enters the media from air at same angle of incidence?

    (b) the speed of light is more? **(Physics)**

25. State whether an alpha particle will experience any force in a magnetic field if : **(Physics)**

    (i) It is placed in the field at rest.

    (ii) It moves in the magnetic field, parallel to field lines.

    (iii) It moves in the magnetic field, perpendicular to field lines.

    OR

    Write the two ways to produce magnetic field.

26. A food web is given below, observe the figure and answer the questions given below. **(Biology)**
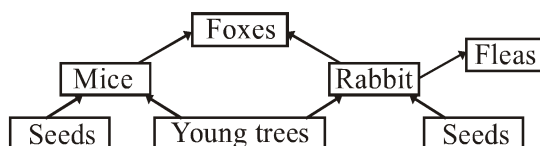
    (i) Identify the primary consumers in the food web.

    (ii) If all the foxes are killed due to a disease, what will be your observations about food web?

SECTION-C

Q.no. 27 to 33 are short answer questions.

27. (a) What happens when a small piece of sodium is dropped into ethanol?   **(Chemistry)**

   (b) Which two of the following compounds belong to same homologous series?

   $C_2H_6O_2$, C_2H_6O, C_2H_6, CH_4O

   (c) Out of ketonic and aldehydic groups, which is the terminal functional group?

28. (a) Give one example of a reaction in which two compounds combine to form a single compound.

   (Chemistry)

   (b) Give one example of an electrolytic decomposition reaction used in metallurgy.

   (c) Why does zinc react with dilute sulphuric acid to give hydrogen gas but copper does not?

   OR

   (a) Write the chemical equations showing roasting and calcination of zinc ores.

   (b) What happens when manganese dioxide is heated with aluminium powder? Give reaction.

29. Hormone are needed by our body in an appropriate amount, slightly more or slightly secretion causes disorders in our body. Illustrate this by using three examples.   **(Biology)**

30. (a) What would be the ratio of chromosome number between an egg and its zygote?   **(Biology)**

   (b) How is the sperm genetically different from the egg.

31. (i) Observe the following incomplete ray diagram for an object, where the object's image A'B' is formed by a convex lens.   **(Physics)**
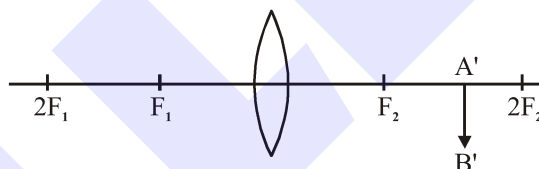
   Based upon the above information, fill in the blanks:

   (a) The position of object AB would have been..........

   (b) Size of the object would have been ....than the size of image.

   (ii) Refractive indices of water and glass are $\dfrac{4}{3}$ and $\dfrac{3}{2}$ respectively. A light ray travelling in water is incident on water-glass interface at 45°. What is the angle of refraction for light ray? (Take, sin 38.9° = 0.6284)

32. An electric network of resistors is shown below, which is supplied by a battery of 12 V.   **(Physics)**
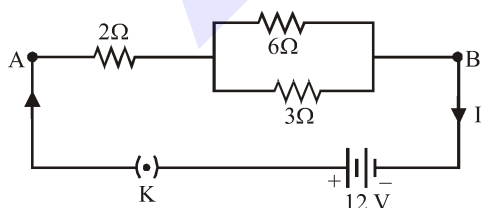
   Find :

   (i) Effective resistance between the points A and B in the network.

   (ii) Current flowing through resistor of 6 Ω.

33. (a) The magnetic field lines associated with a current carrying vertical straight conductor is in anti-clockwise direction, as seen by an observer. What is the direction of current through it? Explain it with the help of diagram. **(Physics)**

(b) How will the magnetic field produced at the centre of a current carrying circular coil change if we

(i) increase the current flowing through the coil?

(ii) reverse the direction of current through the coil?

SECTION-D

Q.no. 34 to 36 are Long answer questions.

34. A hydrocarbon has three carbon atoms. Write down its molecular formulae as **(Chemistry)**

(a) alkene   (b) alkyne

(c) alcohol derivative   (d) aldehyde derivative

(e) acid derivative

OR

(a) Why is respiration considered as an exothermic reaction?

(b) Define the terms oxidation and reduction.

(c) Identify the substance that is oxidised in the following reaction -

(i) $CuO + Zn \longrightarrow Cu + ZnO$

(ii) $2Mg + O_2 \longrightarrow 2MgO$

(iii) $Fe_2O_3 + 3CO \longrightarrow 2Fe + 3CO_2$

35. (a) Give reasons : **(Biology)**

(i) Placenta is extremely essential for foetal development.

(ii) Blocking of vas deferens prevents pregnancy.

(b) Given below are certain situations. Analyse and describe its possible impact on a person.

(i) Testes of a male are not able to descend into scrotum during his embryonic development.

(ii) Egg is not fertilized in a human female.

(iii) Prostate and seminal vesicle are not functional.

OR

(a) Which hormone is responsible for bending of shoot towards the light and which hormone increases the number & size of fruits?

(b) Write the mechanism of transfer of nerve impulse through a neuron.

36. (a) When an object is placed at a distance of 60 cm from a convex mirror, the magnification produced is $\frac{1}{2}$. Where should the object be placed to get a magnification of $\frac{1}{3}$? **(Physics)**

(b) Name the type of mirror used in the following situations, support your answer with reason.

(i) Headlights of a car.

(ii) Side/rear-view mirror of a vehicle.

(iii) Solar furnace.

OR

(a) What is presbyopia? State its cause. How is it corrected?

(b) The defective eye of a person has near point 0.5 m and far point 3 m. Calculate the focal lengths of corrective lenses required by the person for reading purpose and seeing far off.

SECTION-E

Q.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. The pH is quite useful to us in a number of ways in daily life. Some of its applications are -control of pH of the soil. Plants need a specific pH range for proper growth. The soil may be acidic, basic or neutral depending upon the relative concentration of H^+ and OH^-. The pH of any soil can be determined by using pH paper. If the soil is too acidic, it can be corrected by adding lime to it. If the soil is too basic, it can be corrected by adding organic manure which contains acidic materials.

    (a) The pH of soil X is 7.5 while that of soil Y is 4.5. Which of the two soils, should be treated with powdered chalk to adjust the pH?

    (b) Arrange the following substances in increasing order of pH values-

    Ammonium hydroxide, potassium hydroxide, sulphuric acid Ethanoic acid.   **(Chemistry)**

    OR

    (b) What will be the action on litmus paper by the aq. solution of $CuSO_4$?

38. Mendel blended his knowledge of science and mathematics to keep the count of the individuals exhibiting a particular trait in such generation. He observed a number of contrasting visible characters controlled in pea plants in a field. He conducted many experiments to arrive at the laws of inheritance.   **(Biology)**

    (a) What do the F_1 progeny of tall plants with round seeds and short plants with wrinkled seeds look like?

    (b) Name the recessive traits in above case.

    (c) Mention the type of the new combinations of plants obtained in F_2 progeny along with their ratio, if F_1 progeny was allowed to self pollinate.

    OR

    If 1600 plants were obtained in F_2 progeny, write the number of plants having traits:

    (i) Tall with round seeds.

    (ii) Short with wrinkled seeds.

    Write the conclusion of the above experiment.

39. The combination of resistors in series or parallel are very useful in electrical circuits. When two or more resistors are joined in series and their combination is supplied by a voltage source, the current flowing through each resistor remains same but the potential difference across each resistor is directly proportional to the resistance of the resistor.   **(Physics)**

    On the other hand, when a parallel combination of two or more resistors is supplied by a voltage source, the potential difference across each resistor remains same but the current flowing through each resistor is inversely proportional to the resistance of the resistor.

    The equivalent resistance of resistors in series combination is equal to sum of the individual resistances in the combination.

    In a parallel combination of resistors, the sum of the reciprocals of the separate resistances is equal to the reciprocal of equivalent resistance.

(a) Find the current flowing in the circuit shown below and potential difference across the 15 Ω resistor. **(1)**
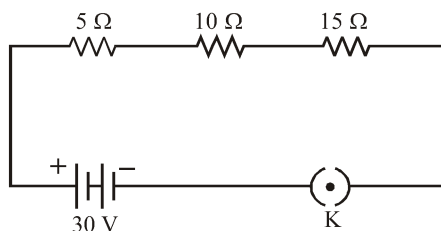
(b) If all the three resistors used in series combination of sub-part (a) of the question, are now connected in parallel across the same voltage source; find the current flowing through the 5 Ω and 10 Ω resistors in this parallel combination. **(1)**

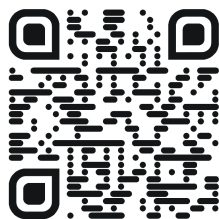(c) Calculate the equivalent resistance of the following network : **(2)**
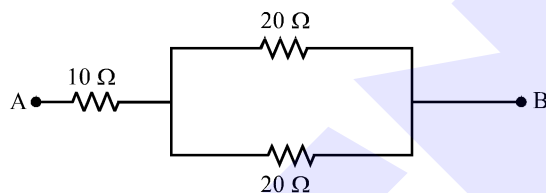
OR

Calculate the equivalent resistance of the following network : **(2)**
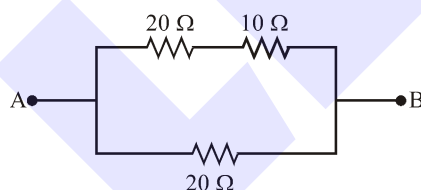
FOR SOLUTION

SCAN

ALLEN®

SOCIAL SCIENCE

TIME : 3 HRS.   **MAX. MARKS : 80**

GENERAL INSTRUCTIONS :

▸ *QUESTION PAPER COMPRISES SIX SECTIONS - A, B, C, D, E AND F. THERE ARE 37 QUESTIONS IN THE QUESTION PAPER. ALL QUESTIONS ARE COMPULSORY.*

▸ *SECTION A - FROM QUESTION 1 TO 20 ARE MCQS OF 1 MARK EACH.*

▸ *SECTION B - QUESTION NO. 21 TO 24 ARE VERY SHORT ANSWER TYPE QUESTIONS, CARRYING 2 MARKS EACH. ANSWER TO EACH QUESTION SHOULD NOT EXCEED 40 WORDS.*

▸ *SECTION C CONTAINS Q.25 TO Q.29 ARE SHORT ANSWER TYPE QUESTIONS, CARRYING 3 MARKS EACH. ANSWER TO EACH QUESTION SHOULD NOT EXCEED 60 WORDS*

▸ *SECTION D - QUESTION NO. 30 TO 33 ARE LONG ANSWER TYPE QUESTIONS, CARRYING 5 MARKS EACH. ANSWER TO EACH QUESTION SHOULD NOT EXCEED 120 WORDS.*

▸ *SECTION-E - QUESTIONS NO FROM 34 TO 36 ARE CASE BASED QUESTIONS WITH THREE SUB QUESTIONS AND ARE OF 4 MARKS EACH*

▸ *SECTION F - QUESTION NO. 37 IS MAP BASED, CARRYING 5 MARKS WITH TWO PARTS, 37(a) FROM HISTORY (2 MARKS) AND 37(b) FROM GEOGRAPHY (3 MARKS).*

▸ *THERE IS NO OVERALL CHOICE IN THE QUESTION PAPER. HOWEVER, AN INTERNAL CHOICE HAS BEEN PROVIDED IN FEW QUESTIONS. ONLY ONE OF THE CHOICES IN SUCH QUESTIONS HAVE TO BE ATTEMPTED.*

▸ *IN ADDITION TO THIS, SEPARATE INSTRUCTIONS ARE GIVEN WITH EACH SECTION AND QUESTION, WHEREVER NECESSARY.*

ATTEMPT Q.37 IN THE MAP GIVEN AT THE END OF QUESTION PAPER AND ATTACH THE SAME WITH YOUR ANSWERSHEET.

SECTION-A

1. The foods introduced in Europe and Asia after Christopher Columbus accidentally discovered the vast continents, later known as Americas, were _____.

   (1) Spaghetti and noodles

   (2) Potatoes, soya, groundnuts, maize, tomatoes, chillies and sweet potatoes

   (3) Pasta and potatoes

   (4) All the above

2. Identify the correct statement(s) from the following.

   A. A children's press, devoted to literature for children alone, was set up in UK in 1857.

   B. This press published only old fairy tales and folk tales.

   C. The Grimm Brothers in Germany spent years compiling traditional folktales gathered from peasants.

   D. What Grimm Brothers collected was edited before the stories were published in a collection in 1912.

   (1) A, B   (2) B, C, D   (3) Only C   (4) A, B, C, D

3. Who said, "Printing is the ultimate gift of God and the greatest one"?

   (1) Charles Dickens   (2) J. V. Schely

   (3) Mahatma Gandhi   (4) Martin Luther

4. Which of the following is a correct match ?

   (1) Rashsundari Debi -Istri Dharm Vichar

   (2) Ram Chaddha - Amar Jiban

   (3) Kashibaba - Chhote Aur Bade ka Sawal

   (4) Sudarshan Chakra - Gulamgiri

5. It supervises the functioning of formal sources of loans in India.

    (1) SBI   (2) SHG   (3) CBI   (4) RBI

6. Choose the correct sequence to indicate the following statements as True (T) or False (F).

    (a) Money eliminates the need for double coincidence of wants.

    (b) Money deposits in bank accounts that can be withdrawn on demand are called demand deposits.

    (c) Debt-trap pushes the borrower in such a situation from which recovery is very easy

    (1) TTF   (2) FFT   (3) TFT   (4) FTF

7. Rituraj is employed as a government teacher. Which of the following statement is right about him?

    (1) He works in secondary sector

    (2) He works in private sector

    (3) He works in unorganized sector

    (4) He works in public sector

8. Assertion: Most of the workers in the agricultural sector are under-employed.

    Reason: A study conducted by the erstwhile Planning Commission (now known as NITI Aayog) estimates that nearly 50 lakh jobs can be created in education sector alone.

    (1) Both Assertion & Reason are True & the Reason is a correct explanation of the Assertion.

    (2) Both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.

    (3) Assertion is True but the Reason is False.

    (4) Assertion is False but the Reason is True.

9. Organization that publishes Human Development Report is _____.

    (1) UNESCO   (2) WHO   (3) UNDP   (4) WTO

10. In which of the following iron ore belt Kudremukh mines are located ?

    (1) Odisha-Jharkhand belt

    (2) Maharashtra-Goa belt

    (3) Durg-Bastar-Chandrapur belt

    (4) Ballari-Chitradurga-Chikkamagaluru-Tumakuru belt

11. Pick the odd one out.

    (1) Namrup - Assam   (2) Tarapur - Maharashtra

    (3) Naraura - MP   (4) Kalpakkam - Tamil Nadu

12. Sixty percent of sugar mills are concentrated in which of the following states?

    (1) Punjab and Haryana   (2) Himachal Pradesh and Gujarat

    (3) Uttar Pradesh and Bihar   (4) West Bengal and Odisha

13. In which of the following countries the participation of women in public life is very high ?

    (1) African countries   (2) Asian countries

    (3) Latin American countries   (4) Scandinavian countries

14. Who said that "religion can never be separated from the politics"?

    (1) Acharya Vinoba Bhave   (2) Mahatma Gandhi

    (3) Sarojini Naidu   (4) Dr. Rajendra Prasad

15. Which of the following statements is not true about Democracy?

(1) Promotes equality among citizens   (2) It is free of corruption

(3) Have formal constitutions   (4) Guarantees rights of citizens

16. Mr. Y needs a loan for buying fertilisers to enhance crop production. He borrows loan from a bank as it is :

(i) Cheap and affordable since rate of interest is lower

(ii) No need of paper work

(iii) Going to ask him to sell his property

(iv) Free of interest

(1) Only i   (2) iii and iv   (3) i and ii   (4) Only ii

17. Which of the following is the primary factor which contributed to the emergence of multiple political parties in India?

(1) A federal political system   (2) Varied economic conditions

(3) Social and Geographical diversity   (4) Low levels of literacy and political awareness

18. Which of the following statements accurately describes a "community government" in Belgium?

i. 'Community government' is elected by people belonging to one language community - Dutch, French and German-speaking - no matter where they live.

ii. This government had the power regarding cultural, educational and language-related issues.

iii. This government has the power sharing regarding economical, educational and language-related issues.

iv. 'Community government' is elected by people belonging to one language community - Dutch, Spanish and German-speaking - no matter where they live.

(1) Only i   (2) Only iii   (3) Only iv   (4) Both i and ii

19. There are two statements marked as Assertion (A) and Reason (R). Mark your answer as per the codes provided below:

Assertion (A): Power sharing is desirable.

Reason(R): Power sharing is good because it helps to reduce the possibility of conflict between various social groups.

(1) Both (A) and (R) are true and (R) is the correct explanation of A

(2) Both A and R are true and R is not the correct explanation of A.

(3) (A) is correct but (R) is wrong

(4) (A) is wrong but (R) is correct

20. Why is the power shared among different organs of government i.e. executive, legislature and judiciary called horizontal distribution of power? What does it result in?

(1) Because it allows different organs of government placed at the same level to exercise different powers. This results in a balance of power among various institutions.

(2) Because it allows different organs of government placed at the same level to exercise different powers. This results in an imbalance of power among various institutions.

(3) Because it allows different organs of government placed at the same level to exercise the same powers. This results in a balance of power among various institutions.

(4) Because it does not allow different organs of government placed at the same level to exercise different powers. This results in a balance of power among various institutions.

SECTION-B

Very Short Answer Type Questions **(2 × 4 = 8 marks)**

21. 'Printed books at first closely resembled the written manuscripts in appearance and layout.' Justify the statement with 2 points.

22. Explain the following terms :
(a) Cheque   (b) Credit

OR

Mention any 2 differences between formal and informal sources of credit.

23. When did Sri Lanka become an independent country? After independence, Sri Lanka witnessed the supremacy of which community?

24. Point out any four uses of jute.

SECTION-C

Short Answer Type Questions **(3 × 5 = 15 marks)**

25. 'Food offers many examples of long distance cultural exchange.' Justify this statement with examples.

26. Explain the three fold distribution of legislative powers between the union government and the state governments in India.

OR

Distinguish between 'coming together' and 'holding together' type of federations.

27. 'For development people look at a mix of goals.' Support the statement with suitable examples.

28. What are the different types of forests found in India? Explain them.

29. What is the status of women's representation in India's legislative bodies?

SECTION-D

Long Answer Type Questions **(5 × 4 = 20 marks)**

30. What were the different ways in which culture was used to unite the Indian masses?

OR

Which different sections of the society participated in the civil disobedience movement in India? What were their different demands?

31. Compare the employment conditions prevailing in the organized and unorganized sectors in India.

OR

Suggest any five ways to create more employment opportunities in rural and urban sector in India.

32. Explain any five functions of political parties.

OR

Suggest any five measures to reform political parties.

33. Mention some ways to solve problems of land degradation in India.

OR

Write a short note on alluvial soil.

SECTION-E

Case Based Questions **(4 × 3 = 12 marks)**

34. **Read the source given below and answer the question that follows:**
In 1815, representatives of the European powers – Britain, Russia, Prussia and Austria – who had collectively defeated Napoleon, met at Vienna to draw up a settlement for Europe. The Congress was hosted by the Austrian Chancellor Duke Metternich. The delegates drew up the Treaty of Vienna of 1815 with the object of undoing most of the changes that had come about in Europe during the Napoleonic wars.

(i) The Bourbon dynasty, which had been deposed during the French Revolution, was restored to power, and France lost the territories it had annexed under Napoleon.

(ii) A series of states were set up on the boundaries of France to prevent French expansion in future. Thus the kingdom of the Netherlands, which included Belgium, was set up in the north and Genoa was added to Piedmont in the south. Prussia was given important new territories on its western frontiers, while Austria was given control of northern Italy.

(iii) The German confederation of 39 states that had been set up by Napoleon was left untouched. In the east, Russia was given part of Poland while Prussia was given a portion of Saxony.

The main intention was to restore the monarchies that had been overthrown by Napoleon, and create a new conservative order in Europe.

34.1 Which countries met at Vienna in 1815? **(1)**

34.2 Who hosted the Vienna Congress? **(1)**

34.3 Mention any two changes brought in Europe by the 'Vienna Treaty'. **(2)**

35. **Read the source given below and answer the question that follows:**

Globalisation is the process of rapid integration or interconnection between countries. MNCs are playing a major role in the globalisation process. More and more goods and services, investments and technology are moving between countries. Most regions of the world are in closer contact with each other than a few decades back.

Besides the movements of goods, services, investments and technology, there is one more way in which the countries can be connected. This is through the movement of people between countries. People usually move from one country to another in search of better income, better jobs or better education. In the past few decades, however, there has not been much increase in the movement of people between countries due to various restrictions.

Factors that have enabled Globalisation

(i) Rapid improvement in technology has been one of the major factors that has stimulated the globalisation process. Due to major improvement in transportation technology, goods can be transported throughout the world in a short period of time and at a lower cost.

(ii) Containers for transport of goods : Several improvements in transportation technology has made much faster delivery of goods across long distances possible at lower costs. Goods are placed in containers that can be loaded intact onto ships, railways, planes and trucks. containers have led to huge reduction import handling costs and increased the speed with which exports can reach markets. Similarly, the cost of air transport has fallen. This has enabled much greater volumes of goods being transported by airlines.

(iii)Information and communication technology : Development in telecommunications, computers, internet has given a big boost to the process of globalisation. It is very easy to access information instantly and to communicate from remote areas. This has been facilitated by satillite communication devices.

35.1 What is Globalisation? **(1)**

35.2 Give one example of trade barriers. **(1)**

35.3 Analyse the role of MNC's in the process of globalisation. **(2)**

36. **Read the source given below and answer the question that follows:**

When we speak of water shortages, we immediately associate it with regions having low rainfall or those that are drought prone. True, the availability of water resources varies over space and time, mainly due to the variations in seasonal and annual precipitation, but water scarcity in most cases is caused by over- exploitation, excessive use and unequal access to water among different social groups.

Water scarcity may be an outcome of large and growing population and consequent greater demands for water, and unequal access to it. To facilitate higher food-grain production, water resources are being over-exploited to expand irrigated areas and dry-season agriculture. Most farmers have their own wells and tube-wells in their farms for irrigation to increase their produce. It may lead to falling groundwater levels, adversely affecting water availability and food security of the people.

36.1 What are the sources of fresh water? (1)

36.2 'The availability of water resources varies over space and time.' Why? State reason. (1)

36.3 'Water scarcity may be an outcome of large and growing population'. Justify the statement. (2)

SECTION-F

Map Skill Based Question. (2 + 3 = 5 marks)

37(a). Two places A and B have been marked on the given outline map of India. Identify them and write their correct names on the lines drawn near them.

A. Indian National Congress session held at this place in December 1920.

B. Mahatma Gandhi organized a Satyagraha Movement at this place to inspire the peasants to struggle against the oppressive plantation system.

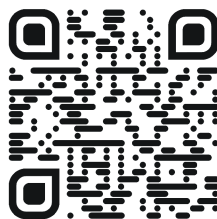**37(b).** On the same map of India, locate and label any Three of the following with suitable symbols.

(i) Rana Pratap Sagar Dam

(ii) Largest Coffee Producing State

(iii) Kandla Sea Port

(iv) Mumbai Software Technology Park

ATTEMPT Q.37 IN THE MAP GIVEN AT THE END OF QUESTION PAPER AND ATTACH THE SAME WITH YOUR ANSWERSHEET.

37. (a) & (b)
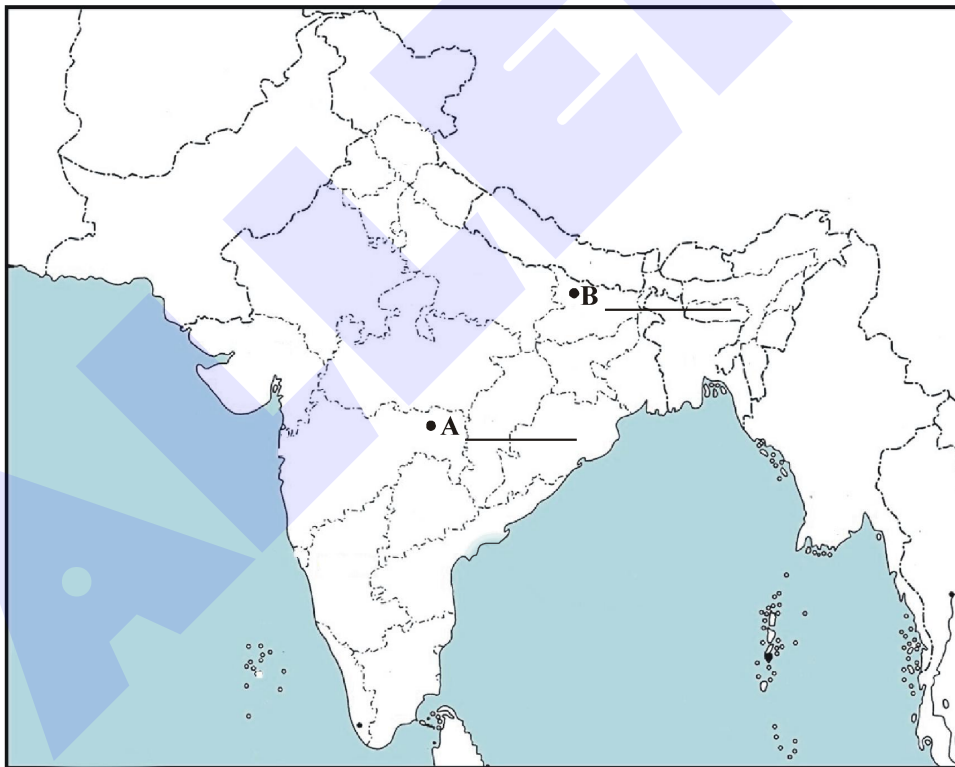
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MATHEMATICS

(STANDARD)

TIME : 3 HRS.   **MAX. MARKS : 80**

GENERAL INSTRUCTIONS :

- All questions are compulsory.
- The question paper consists of 38 questions divided into five sections A, B, C, D and E.
- Section A contains multiple choice questions (Q.1 to Q.18) and Assertion-Reason based questions (Q.19 & Q.20) of one mark each, only the correct option is to be written in your answer sheet.

  Section B contains short answer type questions (Q.21 to Q.25) carrying two marks each.

  Section C contains short answer type questions (Q.26 to Q.31) carrying three marks each.

  Section D contains long answer type questions (Q.32 to Q.35) carrying five marks each.

  Section E has 3 case based integrated units of assessment 4 marks each with sub-parts of the values of 1, 1 and 2 marks each respectively.

- All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2 marks sub-part of each question of Section E

- There is no overall choice. However, internal choice may be provided. You have to attempt only one of the alternatives in all such questions.

- Use of calculators and cell-phones are not permitted in the Examination Hall.

SECTION-A

1. The ratio of HCF to LCM of the least composite number and the prime number is:

    (1) 1 : 2   (2) 2 : 1   (3) 1 : 1   (4) 1 : 3

2. Shown below are the graphs of the lines $y - 2x = 0$, $x + y = 6$ and $px + qy = r$.
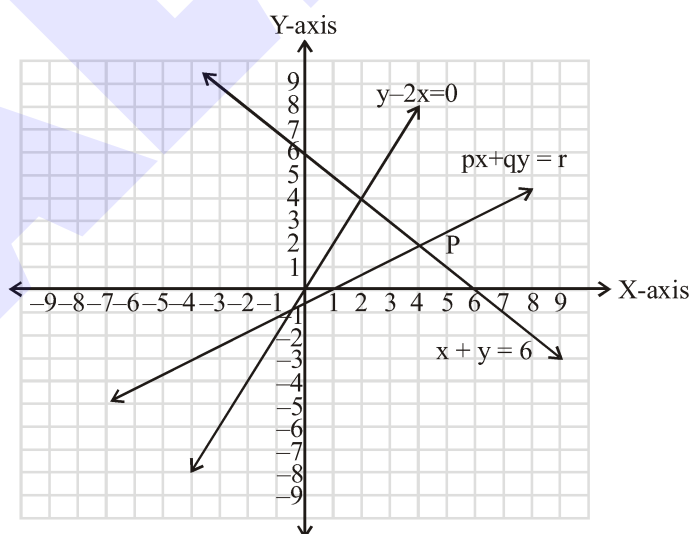
   Which of these is the solution for the pair of equations $x + y = 6$ and $px + qy = r$.

    (1) $x = 2$, $y = 4$ (2) $x = 4$, $y = 2$

    (3) $x = 3$, $y = 2$ (4) We cannot say for sure as the values of p and q are not known.

3. The value of k for which the following pair of equations $x - 2y = 3$ and $-3x + ky = -9$ have infinitely many solutions is

(1) –6   (2) –3   (3) 3   (4) 6

4. Values of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots, is

(1) 0 only   (2) 4   (3) 8 only   (4) 0, 8

5. The first negative term of the AP: $20, 19\frac{1}{4}, 18\frac{1}{2}, 17\frac{3}{4}, ...$ is

(1) 27   (2) 24   (3) 25   (4) 28

6. AOBC is a rectangle whose three vertices are A(0, – 3), O(0, 0) and B(4, 0). The length of its diagonal is ....

(1) 3 units   (2) 4 units

(3) 7 units   (4) 5 units

7. A point (x, y) is at a distance of 5 units from the origin. How many such points lie in the third quadrant

(1) 0   (2) 1   (3) 2   (4) Infinitely many

8. In the figure below, DE || AC and DF || AE. Which of these is equal to $\dfrac{BF}{FE}$?
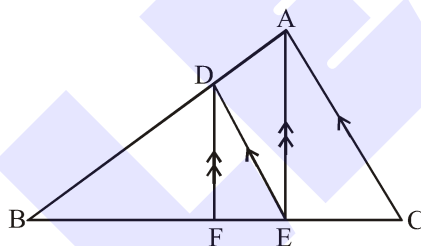
(1) $\dfrac{DF}{AE}$ (2) $\dfrac{BE}{EC}$ (3) $\dfrac{BA}{AC}$ (4) $\dfrac{FE}{EC}$

9. In the given figure, AB is a chord of the circle and AOC is its diameter, such that $\angle ACB = 50°$. If AT is the tangent to the circle at the point A, then $\angle BAT$ is equal to
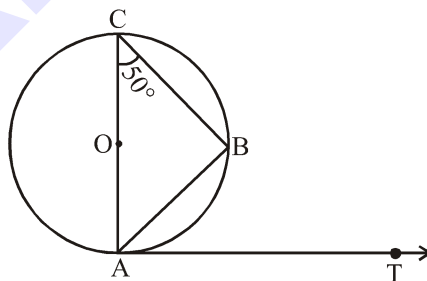

(1) 65°   (2) 60°   (3) 50°   (4) 40°

10. If two tangents inclined at an angle of 60° are drawn to a circle of radius 3 cm, then the length of each tangent is equal to

(1) $\dfrac{3\sqrt{3}}{2}$ cm   (2) 3 cm   (3) 6 cm   (4) $3\sqrt{3}$ cm

11. If $\cot\theta = \dfrac{1}{\sqrt{3}}$, then the value of $\sec^2\theta + \cosec^2\theta$ is

(1) 1   (2) $\dfrac{40}{9}$ (3) $\dfrac{38}{9}$ (4) $5\dfrac{1}{3}$

12. If $a\cot\theta + b\cosec\theta = p$ and $b\cot\theta + a\cosec\theta = q$, then $p^2 - q^2 =$

(1) $a^2 - b^2$ (2) $b^2 - a^2$ (3) $a^2 + b^2$ (4) $b - a$

13. The length of a string between a kite and a point on the ground is 85 m. If the string makes an angle θ with the ground level such that $\tan\theta = \dfrac{15}{8}$, then height of the kite from the ground is

(1) 75 m   (2) 79.41 m   (3) 80 m   (4) 72.5 m

14. If the perimeter of a circle is half to that of a square, then the ratio of the area of the circle to the area of the square is

(1) 22 : 7   (2) 11 : 7   (3) 7 : 11   (4) 7 : 22

15. Shown below is a circle with centre O. Chord MN subtends an angle at O.

Which of these statements is true for the given circle.

I. $\dfrac{x}{360°} = \dfrac{\text{length of arc MPN}}{\text{circumference of the circle}}$

II. $\dfrac{x}{360°} = \dfrac{\text{Minor sector area}}{\text{area of the circle}}$
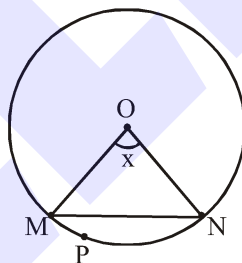
(1) Only I   (2) Only II   (3) Both I and II   (4) Neither I nor II

16. The diameter of a car wheel is 42 cm. The number of complete revolutions it will make in moving 132 km is

(1) 10^4 (2) 10^5 (3) 10^6 (4) 10^3

17. The probability that the drawn card from a pack of 52 cards is neither an ace nor a spade is

(1) $\dfrac{9}{13}$ (2) $\dfrac{35}{52}$ (3) $\dfrac{10}{13}$ (4) $\dfrac{19}{26}$

18. Consider the following frequency distribution :

Class	1-5	6-10	11-15	16-20	21-25
Frequency	13	10	15	8	11

the upper limit of the median class is

(1) 7   (2) 15.5   (3) 16   (4) 16.5

19. **Assertion (A) :** If the volumes of two spheres are in the ratio 64 : 27, then ratio of their surface areas is 4 : 3.

     Reason (R) : If the surface areas of two spheres are in the ratio 16 : 9, then the ratio of their volumes is 64 : 27.

     (1) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

     (2) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

     (3) Assertion (A) is true but Reason (R) is false.

     (4) Assertion (A) is false but Reason (R) is true.

20. **Assertion (A) :** If the second term of an A.P., is 13 and the fifth term is 25, then its 7th term is 33.

     Reason (R) : If the common difference of an A.P. is 5, then $a_{18} - a_{13}$ is 25.

     (1) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

     (2) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

     (3) Assertion (A) is true but Reason (R) is false.

     (4) Assertion (A) is false but Reason (R) is true.

SECTION-B

21. Prove that $\sqrt{3}$ is irrational number.

22. ABCD is parallelogram point P divides AB in the ratio 2 : 5 and point Q divides DC in the ratio 3 : 4. Prove that OA is half of OC. (figure is not drawn to scale)
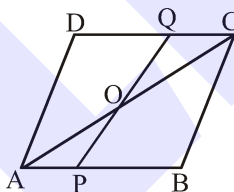
23. In the figure, quadrilateral ABCD is circumscribing a circle with centre O and AD $\perp$ AB. If radius of incircle is 10 cm, then find the value of x.
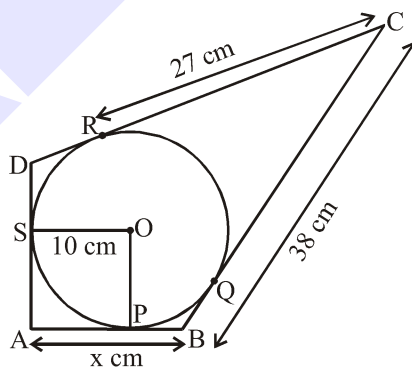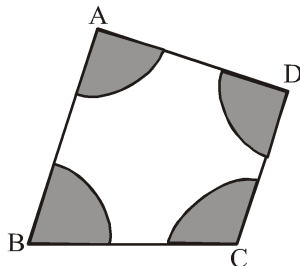

24. Prove that : $\dfrac{\cosec^2 x - \sin^2 x \cot^2 x - \cot^2 x}{\sin^2 x} = 1$

<div align="center">**OR**</div>

     Evaluate : $\dfrac{3\tan^2 30° + \tan^2 60° + \cosec 30° - \tan 45°}{\cot^2 45°}$

25. In the given figure, four arcs have been drawn of radius 7 cm each with vertices A, B, C and D of quadrilateral ABCD as centres. Find the area of the shaded region.

OR

The length of the minute hand of a clock is 6 cm. Find the area swept by minute hand when it moves from 7 : 05 p.m. to 7 : 40 p.m.

SECTION-C

26. Three sets of Science, History and Drawing books have to be stacked in such a way that all the books are stored subject wise and the height of each stack is the same. The number of Science books is 192, the number of History books is 480 and the number of Drawing books is 672. Assuming that the books are of the same thickness, determine the minimum number of stacks of Science, History and Drawing books.

27. If α, β are the zeros of quadratic polynomial $p(x) = x^2 - 5x + 4$, then find the value of

(i) $\dfrac{1}{\alpha} + \dfrac{1}{\beta} - 2\alpha\beta$ (ii) $\dfrac{\alpha}{\beta} + \dfrac{\beta}{\alpha}$

28. The sum of two-digit number and the number obtained by reversing the order of its digits is 165. If the digits differ by 3, find the number.
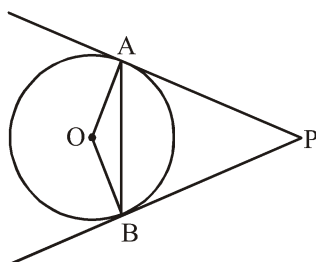
OR

Solve the following system of equations in x and y

$(a - b)x + (a + b)y = a^2 - 2ab - b^2$

$(a + b)(x + y) = a^2 + b^2$

29. PA and PB are tangents drawn to a circle of centre O from an external point P. Chord AB makes angle of 30° with the radius at the point of contact.

If length of the chord is 6 cm, find the length of the tangent PA and the length of the radius OA.

OR

Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that $\angle PTQ = 2\angle OPQ$

30. Prove that : $(1 - \sin\theta + \cos\theta)^2 = 2(1 + \cos\theta)(1 - \sin\theta)$

31. A frequency distribution of the life times of 400 T.V. picture tubes tested in a tube company is given below. Find the average life of tube.

| Life time (in hrs)	Frequency
300-399	14
400-499	46
500-599	58
600-699	76
700-799	68
800-899	62
900-999	48
1000-1099	22
1100-1199	6

SECTION-D

32. Swati can row her boat at a speed of 5 km/hr in still water. If it takes her 1 hour more to row the boat 5.25 km upstream than to return downstream, find the speed of the stream.

OR

A person on tour has Rs.360 for his expenses. If he extends his tour for 4 days, he has to cut down his daily expenses by Rs 3. Find the original duration of the tour.

33. Two poles of height a metres and b metres are p metres apart. Prove that the height of the point of intersection of the lines joining the top of each pole to the foot of the opposite pole is given by

$\dfrac{ab}{a+b}$ metres.
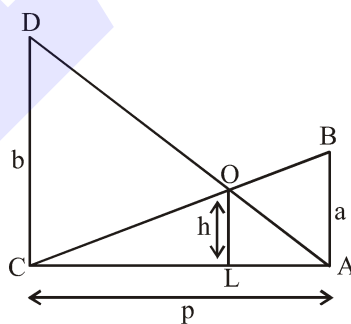
34. Water flows at the rate of 10 metre per minute through a cylindrical pipe having its diameter as 5 mm. How much time will it take to fill a conical vessel whose diameter of base is 40 cm and depth 24 cm?

OR

A tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 2.1 m and 4 m, and slant height of the top is 2.8 m, find the area of the canvas used for making the tent. Also, find the cost of canvas of the tent at the rate of Rs.500 per m².

35. If the median of the distribution given below is 28.5, find the value of x and y.
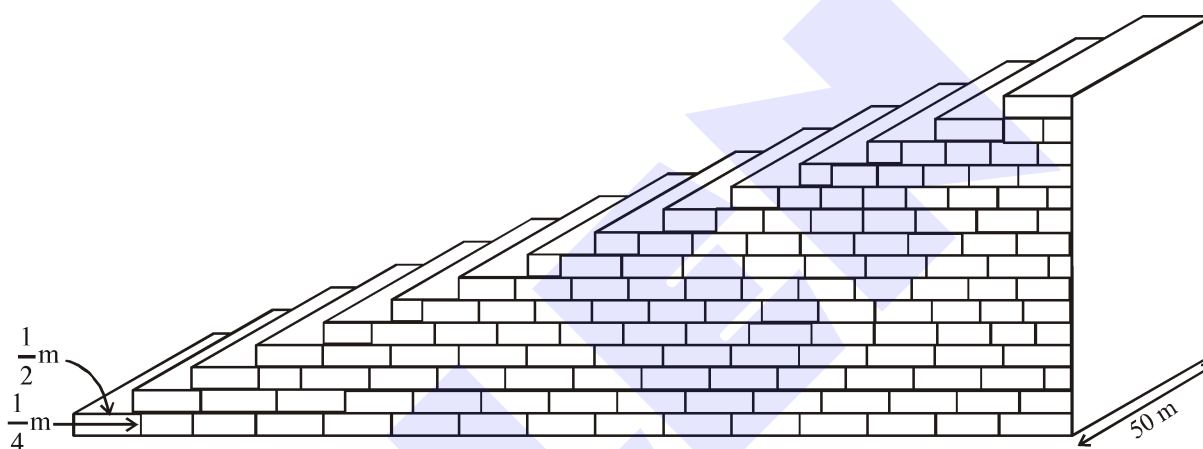
Class interval	0-10	10-20	20-30	30-40	40-50	50-60	
Number of students	5	x	20	15	y	5	Total = 60

Also find mode of the data.

SECTION-E

36. Case Study-1

Small terrace at a football ground comprises of 15 steps each of which is 50 m long and built of solid concrete. Each step has a rise $\frac{1}{4}$ m and a tread of $\frac{1}{2}$ m.


(i)   What is the volume of the required concrete for step 1? **(1)**

(ii) What is the volume of the required concrete for step 2? **(1)**

(iii) What is the volume of the required concrete for step 3? **(2)**

OR

What is the total volume concrete to build the terrace? **(2)**

37. Case Study-2

In a room, 4 friends are seated at the points A, B, C and D as shown in figure. Reeta and Meeta walk into the room and after observing for a few minutes, Reeta asks Meeta.
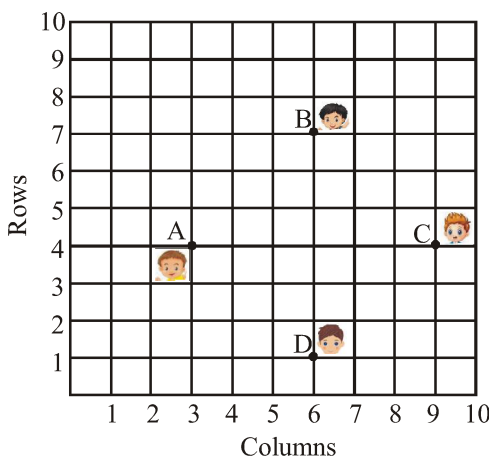
(i) What is the distance between A and B? **(1)**

(ii) Write the coordinates of the point that divides line BC in the ratio 3 : 5. **(2)**

OR

Write the coordinates of the point that divides line AB in the ratio 1 : 2. **(2)**

(iii) What is the middle position of B and C? **(1)**

38. **Case Study-3**

An aeroplane is a vehicle with wings and one or more engines that enable it to fly through the air. Most people think about inventors of aeroplane was Wrights brothers, we have discussed about an aeroplane as following :

An aeroplane at an altitude of 300 meters observes the angles of depression of opposite points on the two banks of a river to be 45° and 60°.
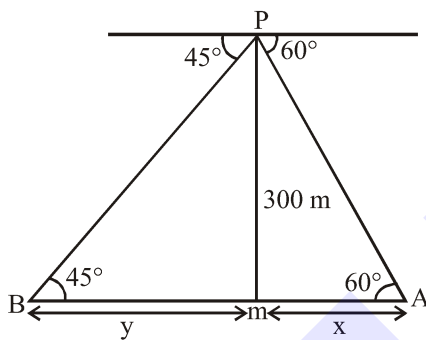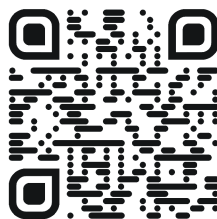

(i) Find the value of y. **(1)**

(ii) Find the value of x. **(1)**

(iii) Find the width AB of the river. **(2)**
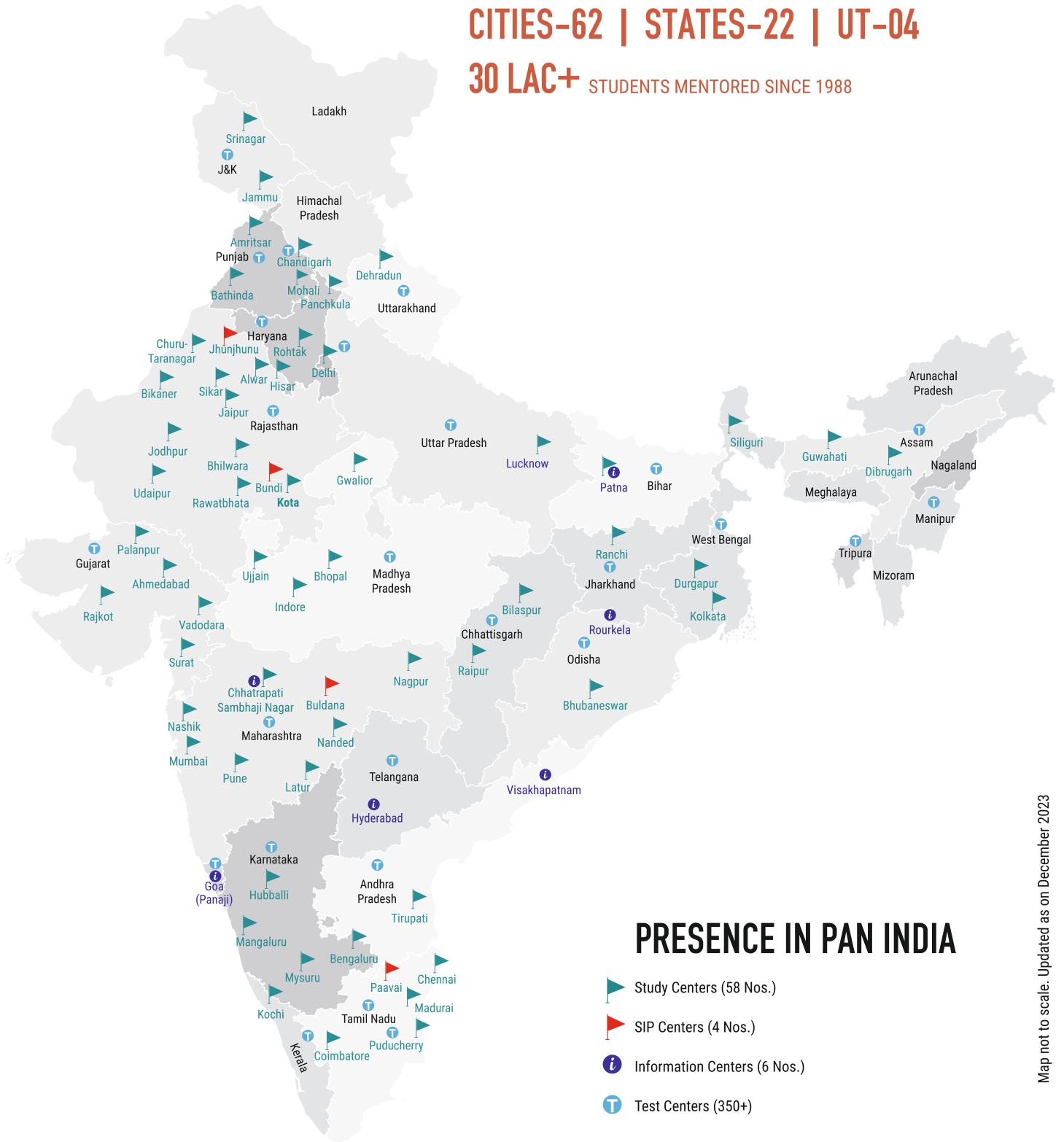
OR

Find the distance of PB. **(2)**

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Map not to scale. Updated as on December 2023

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