School code: 70732   Affiliation No.2130013

Date: 15.05.2024

HOLIDAY HOME WORK 2024-25

CLASS   10

HINDI

1. **अनुच्छेद लेखन**

   <u>विषय-1 आज की बचत कल का सुख</u>

   ∗बचत का अर्थ एवं स्वरूप, ∗दुख दायक स्थितियों में बचत का महत्व, ∗ वर्तमान और भविष्य को सुरक्षित करना

   2 इंटरनेट: एक संचार क्रांति

   2 पत्र लेखन

   1 पेयजल की बढ़ती समस्या को लेकर जल अधिकारी को पत्र लिखिए।

   2 चेक- बुक और एटीएम कार्ड खो जाने की सूचना देते हुए अपने बैंक के प्रबंधक को पत्र लिखिए।

   3 आपके विद्यालय में पर्यावरण सुरक्षा सप्ताह मनाया जा रहा है। इस अवसर पर पर्यावरण मंत्री को आमंत्रित करने हेतु लगभग 80 शब्दों में ई -मेल लिखिए।

3 <u>कला समेकित परियोजना कार्य-</u>

विषय-अरुणाचल प्रदेश और उत्तर प्रदेश का

 तुलनात्मक प्रस्तुतीकरण।

उपविषय-∗भौगोलिक स्थिति ∗संस्कृत ∗कला और हस्तशिल् ∗लोक नृत् ∗पर्यटन ∗ खानपान ∗वेशभूषा ∗ त्योहार ∗उद्योग धंधे

(उपर्युक्त रचनात्मक क्रियाकलाप की अभिव्यक्ति चित्रात्मक रूप में करें, प्रत्येक उप विषय को लगभग 100 शब्दों में लिखें। रंगीन पेपर का प्रयोग करें। चित्रों को पृष्ठ के बाएं ओर (left side)चिपकाएं।)

SOCIAL SCIENCE

Prepare a Power Point Presentation of the following topic

SUSTAINABLE DEVELOPMENT

∗Sustainable development Concept And Need

∗Coining the term Sustainable Development

(Earth Summit)

∗Different ways of Sustainable Development

∗Sustainable development and disaster reduction

∗Conclusion

Note:-Follow the instructions given in the class to prepare the slide share

Read and Complete the work of History Chapter : The Rise Of Nationalism in Europe

ENGLISH

1. Read the lesson 'From the Diary of Anne Frank'. Summarise the lesson in 150-200 words. Elucidate the key points.

2. Prepare an Art Integrated Project on 'Art and Culture' of Arunachal Pradesh (Choose any one topic like authors and poets, dance forms, food, attire, tourism, festivals,etc

SCIENCE

Science Worksheet 1-Class X Chapter-10 Light

(Reflection of Light)

1. In torches, search lights and headlights of vehicles, the bulb is placed

 a) between the pole and the focus of the reflector

 b) very near to the focus of the reflector

 c) between the focus and centre of curvature of the reflector

 d) at the centre of curvature f the reflector.

 2. A student wants to project the image of a candle flame on the walls of the school laboratory by using a mirror.

a) Which type of mirror should he use and why?

b) At what distance, in terms of focal length 'f' of the mirror , should he place the candle flame to get the magnified image on the wall?

c) Draw a ray diagram to show the formation of the image in this case.

d) Can he use this mirror to project a diminished image of the candle flame on the same wall?   State 'how' if your answer is 'yes' and 'why not' if your answer is 'no'.

3. In this question, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below: a) Both A and R are true, and R is correct explanation of the assertion. b) Both A and R are true, but R is not the correct explanation of the assertion. c) A is true, but R is false. d) A is false, but R is true.

Assertion (A):Plane mirror may form real image

Reason (R): Plane mirror forms virtual image if object is real.

4. Explain why a ray of light passing through the centre of curvature of a concave mirror, gets reflected along the same path?

5. A 6 cm tall object is placed perpendicular to the principal axis of a concave mirror of focal length 30 cm. The distance of the object from the mirror is 45 cm. Use mirror formula to determine the position, nature and size of the image formed. Also draw labelled ray diagram to show the image formation in this case.

6. If the image formed by mirror for all positions of the object placed in front of it is always virtual and diminished, state the type of the mirror. Draw a ray diagram in support of your answer. Where are such mirrors are commonly used and why?

7. A 5 cm tall object is placed at a distance of 30 cm from a convex mirror of focal length 15 cm. Find the position, size and nature of the image formed.

8. To construct a ray diagram, we use two rays which are so chosen that it is easy to know their directions after reflection from the mirror. List two such rays and state the path of these rays after reflection in case of concave mirror. Use these two rays and draw ray

diagram to locate the images of an object placed between the pole and focus of a concave mirror.

9. A concave mirror produces three times magnified image on a screen. If the object is placed 20 cm in front of the mirror , how far is the screen from the object?

10. Suppose you have three concave mirrors, A , B and C of focal lengths 10 cm, 15 cm and 20 cm. For each concave mirror you perform the experiment of image formation for three values of object distances of 10 cm, 20 cm and 30 cm. By giving reason, answer the following.

(i) For the three object distances identify the mirror/mirrors which will form an image of magnification -1.
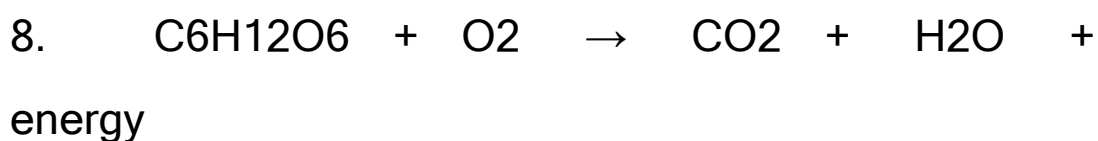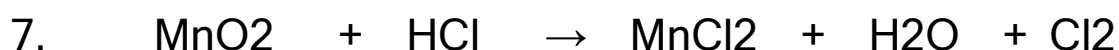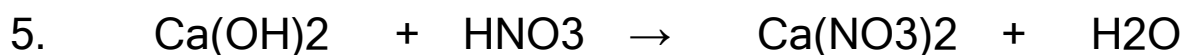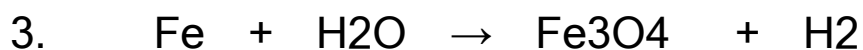
(ii) Out of the three mirrors identify the mirror which would be preferred to be used for shaving purpose/ makeup.

(iii) For the mirror B draw ray diagram for image formation for object distances 10 cm and 20 cm.

Worksheet 2

Chemical Reaction And Equations

(I) BALANACE THE CHEMICAL EQUATIONS:

1.   Al   + CuCl2   →   AlCl3 + Cu

2.   FeSO4   →   Fe2O3 + SO2 + SO3

3.   Fe + H2O → Fe3O4   + H2

4.   BaCl2   + H2SO4 → BaSO4 + HCl

5.   Ca(OH)2   + HNO3 →   Ca(NO3)2   +   H2O

6.   Pb(NO3)2   →   PbO + NO2   +O2

7.   MnO2   + HCl   → MnCl2 + H2O   + Cl2

8.   C6H12O6 + O2   →   CO2 +   H2O   +
energy

9.   HNO3 + Ca(OH)2   →   Ca(NO3)2   + H2O

(II) WRITE CHEMICAL EQUATIONS FOR THE
FOLLOWING REACTIONS AND BALANCE THEM:

1. Silver bromide on exposure to sunlight decomposes
into silver and bromine.

2. Sodium metal reacts with water to form sodium
hydroxide and hydrogen gas.

3. Solution of barium chloride and sodium sulphate in water reacts to give insoluble barium sulphate and solution of sodium chloride.

4. Hydrogen gas combines with nitrogen to form ammonia.

5. Hydrogen sulphide gas burns in air to give water and sulphur dioxide.

6. Barium chloride reacts with ammonium sulphate to give ammonium chloride and precipitate of barium sulphate.

7. Potassium metal reacts with water give potassium hydroxide and hydrogen gas.

8. Calcium hydroxide + carbon dioxide → calcium carbonate + water

9. zinc + silver nitrate → zinc nitrate + silver

10. Potassium bromide + barium iodide → potassium iodide + barium bromide

11. Sodium carbonate on reaction with hydrochloric acid gives sodium chloride and sodium hydrogen carbonate.

12. Copper sulphate on treatment with potassium iodide precipitates cuprous iodide (Cu2I2),liberates iodine gas and also forms potassium sulphate.

(III) State one basic difference between a physical change and chemical change.

(IV) On what basis a chemical reaction is balanced?

(V) Write a balanced chemical equation between sodium chloride and silver nitrate indicating the physical state of the reactant and product.

(VI) Why should Mg ribbon be cleaned before burning in air?

(VII) Using a suitable chemical equation justify that some chemical reactions are determined by -

   (i)   change in colour

        (ii) change in temperature

          (iii) evolution of light

        (iv) change in state

(VIII) How will you test for the gas which is liberated when hydrochloric acid reacts with an activemetal?

(IX) State any two observations in an activity, which may suggest that a chemical reaction has taken place. Give examples to support your answers.

(X) A magnesium ribbon is burnt in oxygen to give a white compound X accompanied by emission of light. If the burning ribbon is now placed in atmosphere of nitrogen. It continues to burn and forms a compound Y.

(i) Write the chemical formula of X and Y.

(ii) Write a balanced chemical equation when X is dissolved in water.

(XI) What happens when piece of –

(i) zinc metal is added to copper sulphate solution

(ii) aluminium metal is added to dilute hydrochloride acid

(iii) silver metal is added to copper sulphate solution

(XII) What happens chemically when quick lime is added to water?

(XIII) Solid calcium oxide was taken in a container and water was added slowly to it   (i) State two observations made in the experiment

(ii) Write the name and chemical formula of the product formed.

(XIV) What is oxidation reaction?

Identify (i) the substance oxidised (ii) the substance reduced in the given equation.

$$ZnO + C \rightarrow Zn + CO$$
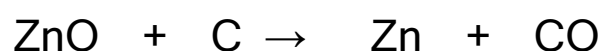
(XV) Give an example of photo chemical reaction.

(XVI) Give an example of decomposition reaction.

(XVII) Give an example of combination reaction.

(XVIII) In electrolysis of water, why is volume of gas collected over one electrode double that of gas collected over other electrode.

WorkSheet3

LIFE PROCESSES

Topic 1- NUTRIT10N

I. Identify P, Q and R in the given figure?

(a) P-Gastric gland, Q-Pancreas, R-Small intestine

(b) P-Salivary glands. Q-Stomach, R-Large intestine

(c) P-Gastric gland, Q-Pancreas, R-Large intestine

(d) P-Salivary glands, Q-Pancreas, R-Small intestine

2. The given figure is a demonstration of an experiment to show that carbon dioxide is essential for photosynthesis. What is the substance 'X, kept in watch-glass?
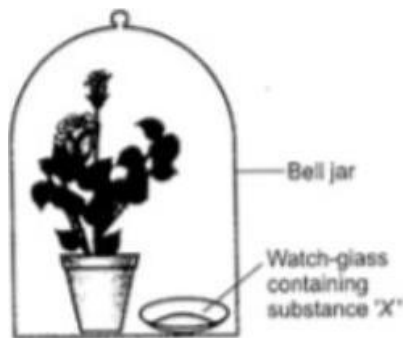
(a) Potassium hydroxide

(b) Sodium bicarbonate

(c) Sodium carbonate

(d) Potassium sulphate

3. Given below are the events of photosynthesis. Identify which of the following is/are true and select the correct option.

(i) Absorption of light energy by chlorophyll.

(ii) Conversion of light energy to chemical energy and splitting of carbon dioxide into carbohydrates and oxygen.

(iii) Reduction of carbon dioxide to carbohydrates.

(iv) Conversion of chemical energy to radiant energy and splitting of water molecules into hydrogen and oxygen,
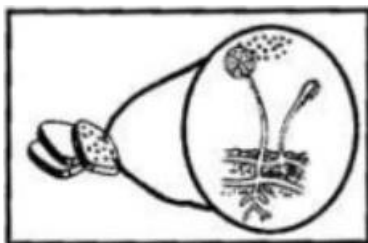
(a)   (i) and (ii) only

(b)   (ii) only

(c)   (ii) and (iii) only

(d)   (ii) and (iv) only

4. Identify the type of nutrition exhibited by the given figure.

(a)   Autotrophic nutrition

(b)   Saprophytic nutrition

(c)   Parasitic nutrition

(d)   Symbiotic nutrition

Following questions 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 correct explanation of the Assertion. (b) Both 'A' and 'R' are true but 'R' is not correct explanation of the Assertion

(c)   'A' is true but 'R' is false.

(d)   'A' is false but 'R' is true.

5.   Assertion: Walls of the intestine have numerous villi.

   Reason: These Villi increase the surface area of digestion.

6.   Assertion: Raw materials needed for photosynthesis are carbon dioxide, water and minerals.

Reason: Nutrients provide energy to an organism.

7. Assertion: Liver is known as the smallest gland in the human body.

 Reason: Liver secretes bile juice.

8. A student was–performing an activity to prove the requirements for photosynthesis. During this activity, he kept two identical healthy potted plants A and B in dark for 72 hours. After 72 hours, he covered plant

A and B by bell shaped jars separately. While covering the plants with separate bell jars, he kept KOH in the watch glass by the side of the plant in setup A and not in setup B. Both these setups were made air tight and were kept in light for 6 hours. Then. Iodine Test was performed with one leaf from each of the two plants A and B.

I. This experimental set up is used to prove essentiality of which of the following requirements of photosynthesis?

(a) Chlorophyll   (b) Oxygen   (c) Carbon dioxide(d) Sunlight

2. The function of KOH is to absorb

(a) Oxygen.   (b) Carbon dioxide.   (c) Moisture. (d) Sunlight

3. Which of the following statements shows the correct results of Iodine Test performed on leaf from plant A and B respectively?

(a) Blue - black colour would be obtained on the leaf of plant A

(b) Blue - black colour would obtained on the leaf of plant B

(c) Red colour would be obtained on the leaf of plant A

(d) Red colour would be obtained on the leaf of plant B

9. Heterotrophic nutrition is a mode of nutrition in which organisms obtain readyma& organic food from outside sources. The organisms that depend upon outside sources for obtaining organic nutrients are called heterotrophs. Heterotrophic nutrition is of three types: saprophytic, parasitic and holozoic nutrition.

I. In which of the following groups of organisms food material is broken outside the body and absorbed?

(a) Mushroom, green plants, Amoeba

(b) Yeast, mushroom, bread mould

(c) Paramecium, Amoeba, Cuscuta

(d) Cuscuta, lice, tapeworm

2. Which of the following is a parasite?

(a) Yeast

(b) Taenia

(c) Amoeba

(d) Earthworm

3. Which of the following is an example of saprotroph?

(a) Grass

(b) Mushroom

(c) Amoeba

(d) Paramecium

4. Heterotrophic nutrition involves

(a) production of simple sugar from inorganic compounds

(b) utilisation of chemical energy to prepare food (c) utilisation of energy obtained by plants (d) all of these.

TOPIC 2 - RESPIRATION

1. Refer to the given figure and answer the following question.
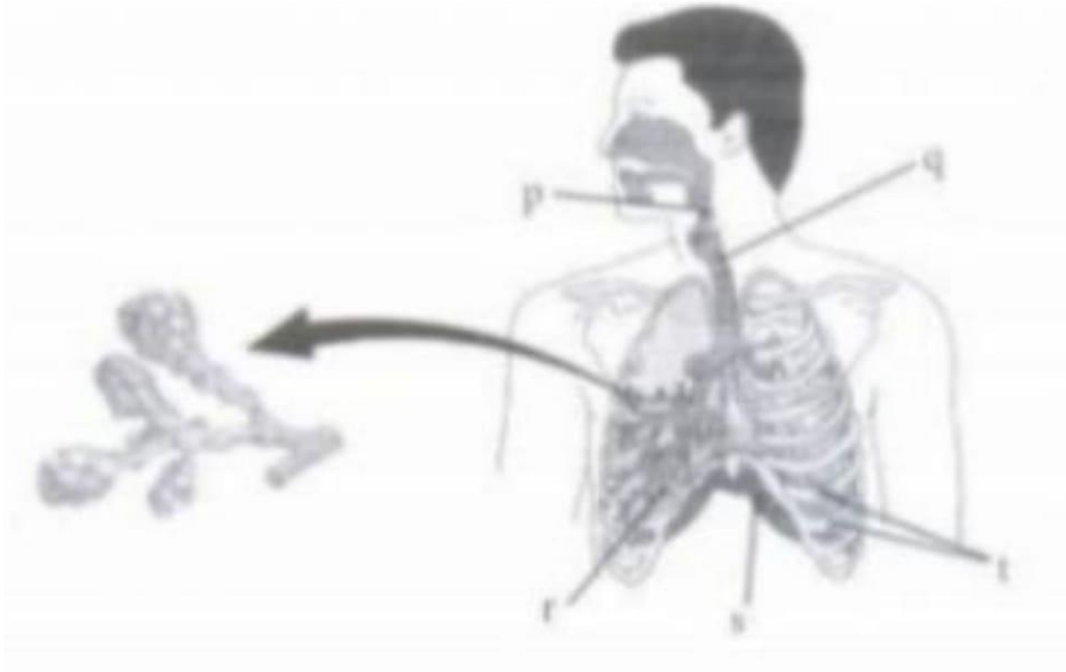
Which of these parts-

(I) are the actual sites of respiratory gas exchange?

(II) is common passage for air and food

(III) is provided with cartilaginous rings?

(IV) relaxes and gets back to its original shape during expiration?

CASE STUDY BASED QUESTION

We need energy to perform various activities, this energy is derived from the catabolism of various components of food, e.g., proteins. carbohydrates. fats. etc. Oxygen is required for catabolic processes and carbon dioxide is released in the process. So. the body requires a continuous exchange of gases. oxygen from the atmosphere is taken inside and carbon dioxide produced is given out. In human beings, respiratory pigment called haemoglobin present in RBCs has very high affinity for oxygen. In tissues. exchange of gases occurs between oxygenated blood and tissue cells.

I. People living at sea level have around 5 million RBCs per cubic millimetre of their blood whereas those living at an altitude of 5400 metres have around 8 million. This is because at high altitude

(a) people eat more nutritive food, therefore more RBCs are formed

(b) people get pollution-free air to breathe and more oxygen is available

(c) atmospheric 02 level is less and hence more RBCs are needed to absorb the required amount of 02 to survive

(d) there is more UV radiation which enhances RBC production.

2. What is respiration?

3. Differentiate between Respiration and Combustion.

MATHEMATICS

Section A

Real Numbers

1. HCF of $5^2 \times 3^2$ and $3^5 \times 5^3$ is:
   (a) $5^3 \times 3^5$ (b) 5×3^3 (c) $5^3 \times 3^2$ (d) $5^2 \times 3^2$

2. 4 Bells toll together at 9.00 am. They toll after 7, 8, 11 and 12 seconds respectively. How many times will they toll together again in the next 3 hours ?
   (a) 3 (b) 4 (c) 5 (d) 6

3. If n is a natural number, then $9^{2n} - 4^{2n}$ is always divisible by
   (a) 11 (b) 4 (c) 5 (d) 9

4. If n is any natural number, then $9^n - 5^n$ ends with
   (a) 3 (b) 6 (c) 5 (d) 8

5. If p is prime, then HCF and LCM of p and $p + 1$ would be
   (a) HCF = p, LCM = $p + 1$
   (b) HCF = $p(p + 1)$, LCM = 1
   (c) HCF = 1, LCM = $p(p + 1)$
   (d) None of these

6. Two numbers are in the ratio of 15:11. If their H.C.F. is 13, then numbers will be
   (a) 195 and 143   (b) 190 and 140
   (c) 185 and 163   (d) 185 and 143

7. The total number of factors of a prime number is
   (a) 1 (b) 0 (c) 2 (d) 3
   [CBSE 2020]

8. Given that LCM (91, 26) = 182, then HCF (91, 26) is
   (a) 11 (b) 26 (c) 13 (d) 91

9. Can we have any $n \in N$, where 4^n ends with the digit zero?

10. The LCM of two numbers is 14 times their HCF. The sum of LCM and HCF is 600. If one number is 280, then find the other number.   [CBSE 2012]

11. Find the largest number that divides 2053 and 967 and leaves a remainder of 5 and 7 respectively.

12. Show that 21^n can not end with the digits 0, 2, 4, 6 and 8 for any natural number n.   [CBSE 2014]

13. If HCF of 144 and 180 is expressed in the form $13m - 3$, find the value of m.   [CBSE 2014]

14. Determine the values of p and q so that the prime factorisation of 2520 is expressible as $2^3 \times 3^p \times q \times 7$.   [CBSE 2014]

15. The HCF of two numbers is 145 and their LCM is 2175. If one number is 725, then find the other number.

16. The HCF and LCM of two numbers are 9 and 360 respectively. If one number is 45, write the other number.

17. The HCF of 45 and 105 is 15. Write their LCM.

18. Find the least number which when divided by 16, leaves a remainder 6, when divided by 19 leaves a remainder 9 and when divided by 21 leaves a remainder 11.

19. Find pairs of natural numbers whose least common multiple is 78 and the greatest divisor is 13.

20. Two equilateral triangles have the sides of lengths 34 cm and 85 cm respectively. Find the greatest length of tape that can measure the sides of both of them exactly.

21. P is a prime and Q is a positive integer such that P + Q = 1696. If P and Q are co-prime and their LCM is 21879, then find P and Q.

22. If x is an even number, then what is the LCM of $4x$, $2x^2$ and x^3.

23. Find the HCF and LCM of 288, 360 and 384 by prime factorisation method.

24. Prove that $3 + \sqrt{2}$ is irrational number, given that $\sqrt{2}$ is an irrational number.

25. Let d be the HCF of 24 and 36. Find two numbers a and b, such that $d = 24a + 36b$. [CBSE 2014]

26. There is a circular path around a sports field. Kamal takes 32 minutes to drive one round of the field while Indu takes 24 minutes for the same. Suppose they both start at the same point, and go in the same direction. After how many minutes they meet again at the starting point?

27. The length, breadth and height of a room are 8 m 25 cm, 6 m 75 cm and 4 m 50 cm respectively. Determine the length of the longest rod which can measure the three dimensions of the room exactly.

28. On a morning walk three persons step off together and their steps measure 40 cm, 42 cm, 45 cm, what is the minimum distance each should walk so that each can cover the same distance in complete steps?

29. P is LCM of 2, 4, 6, 8, 10; Q is LCM of 1, 3, 5, 7, 9 and L is LCM of P and Q. Evaluate L – 21P.

Real Numbers
Section B

1. What will be the least possible number of the planks, if three pieces of timber 42 m, 49 m and 63 m long have to be divided into planks of the same length?
   (a) 5
   (b) 6
   (c) 7
   (d) None of these

2. What is the greatest possible speed at which a man can walk 52 m and 91 m in an exact number of minutes?
   (a) 17 m/min
   (b) 7 m/min
   (c) 13 m/min
   (d) 26 m/min

3. The HCF and LCM of two numbers are 33 and 264 respectively. When the first number is divided by 2 the quotient is 33. The other number is
   (a) 66
   (b) 130
   (c) 132
   (d) 196

4. The greatest number of 5 digits, that will give us remainder of 5, when divided by 8 and 9 respectively is
   (a) 99921
   (b) 99931
   (c) 99941
   (d) 99951

5. HCF of $(2^3 \times 3^3 \times 5)$, $(2^2 \times 3^2 \times 5^2)$ and $(2^5 \times 3 \times 5^3 \times 7)$ is
   (a) 30
   (b) 60
   (c) 105
   (d) 210

6. If x and y are positive integers such that $x = a^2b^3$ and $y = a^3b^2$, where a, b are prime numbers, then LCM of $(x, y) =$
   (a) a^2b^3
   (b) a^3b^2
   (c) a^3b^3
   (d) a^2b^2

7. If LCM of 24 and 48 is $10m + 8$ then value of m is
   (a) 4
   (b) 8
   (c) 2
   (d) 1

8. If x and y are coprime then x^3 and y^3 are
   (a) even
   (b) odd
   (c) co-prime
   (d) not coprime

9. The LCM and HCF of two non-zero positive numbers are equal, then the numbers must be
   (a) composite
   (b) prime
   (c) co-prime
   (d) equal

10. The least number which when divided by 18, 24, 30 and 42 will leave same remainder 1, would be
    (a) 2520
    (b) 2519
    (c) 2521
    (d) 2522

11. In a school there are two sections, section A and section B of class X. There are 45 students in section A and 36 students in section B. The minimum numbers of books required for their class library so that they can be distributed equally among the students of section A or section B are
    (a) 280
    (b) 180
    (c) 90
    (d) 120

12. The largest number which divides 71 and 126 leaving remainder 6 and 9 respectively is
    (a) 65
    (b) 875
    (c) 13
    (d) 1750

13. The smallest number, which when increased by 14 is exactly divisible by 165 and 770, is
    (a) 2297
    (b) 2310
    (c) 2296
    (d) 2295

14. The exponent of 2 in prime factorisation of 288 is
    (a) 2
    (b) 3
    (c) 4
    (d) 5

Polynomials

1. If $p(x) = ax + b$, then zero of $p(x)$ is

   (a) a (b) b

   (c) $\dfrac{-a}{b}$ (d) $\dfrac{-b}{a}$

2. Graph of a quadratic polynomial is a

   (a) straight line   (b) circle

   (c) parabola   (d) ellipse

3. A quadratic polynomial whose one zero is 6 and sum of the zeroes is 0, is

   (a) $x^2 - 6x + 2$ (b) $x^2 - 36$

   (c) $x^2 - 6$ (d) $x^2 - 3$

4. A quadratic polynomial whose one zero is 5 and product of zeroes is 0, is

   (a) $x^2 - 5$ (b) $x^2 - 5x$

   (c) $5x^2 + 1$ (d) $x^2 + 5x$

5. A quadratic polynomial, the product and sum of whose zeroes are 5 and 8 respectively is

   (a) $k\,[x^2 - 8x + 5]$ (b) $k\,[x^2 + 8x + 5]$

   (c) $k\,[x^2 - 5x + 8]$ (d) $k\,[x^2 + 5x + 8]$

6. If the sum of the zeroes of the quadratic polynomial $kx^2 + 4x + 3k$ is equal to their product, then the value of k is

   (a) $-\dfrac{3}{4}$ (b) $\dfrac{3}{4}$

   (c) $\dfrac{4}{3}$ (d) $-\dfrac{4}{3}$

7. The zeroes of the quadratic polynomial $x^2 + 25x + 156$ are

   (a) both positive

   (b) both negative

   (c) one positive and one negative

   (d) can't be determined

8. If α, β are the zeroes of $f(x) = 2x^2 + 8x - 8$, then

   (a) $\alpha + \beta = \alpha\beta$ (b) $\alpha + \beta > \alpha\beta$

   (c) $\alpha + \beta < \alpha\beta$ (d) $\alpha + \beta + \alpha\beta = 0$

9. If the sum of the zeroes of the polynomial $P(x) = (p^2 - 23)x^2 - 2x - 12$ is 1, then p takes the value (s)

   (a) $\sqrt{23}$ (b) -23

   (c) 2 (d) ± 5

10. The zeroes of the polynomial $x^3 - x$ are

    (a) $0, \pm 2$ (b) $0, \pm 1$

    (c) $0, \pm 3$ (d) $0, \pm 4$

11. If α, β are the zeroes of the polynomial $x^2 + 5x + c$ and $\alpha - \beta = 3$, then $c =$

    (a) 0 (b) 1

    (c) 4 (d) 5

12. If α, β are the zeroes of the polynomial $f(x) = x^2 - p(x + 1) - q$, then $(\alpha + 1)(\beta + 1) =$

    (a) $q - 1$ (b) $1 - q$

    (c) q (d) $1 + q$

13. The zeroes of the polynomial $f(x) = x^2 - 2\sqrt{2}x - 16$ are

    (a) $\sqrt{2}, -\sqrt{2}$ (b) $4\sqrt{2}, -2\sqrt{2}$

    (c) $-4\sqrt{2}, 2\sqrt{2}$ (d) $4\sqrt{2}, 2\sqrt{2}$

14. The zeroes of the polynomial $f(x) = x^2 + x - \dfrac{3}{4}$ are

    (a) $-\dfrac{1}{2}, \dfrac{3}{2}$ (b) $\dfrac{1}{2}, -\dfrac{3}{2}$

    (c) $1, -\dfrac{3}{2}$ (d) $1, \dfrac{\sqrt{3}}{2}$

15. If one of the zeroes of the quadratic polynomial $(k - 1)x^2 + kx + 1$ is -3, then the value of k is

    (a) $\dfrac{4}{3}$ (b) $\dfrac{-4}{3}$

    (c) $\dfrac{2}{3}$ (d) $\dfrac{-2}{3}$

16. If the zeroes of the quadratic polynomial $x^2 + (a + 1)x + b$ are 2 and –3, then

(a) $a = -7, b = -1$ (b) $a = 5, b = -1$

(c) $a = 2, b = -6$ (d) $a = 0, b = -6$

17. If the zeroes of the quadratic polynomial $ax^2 + bx + c, c \neq 0$ are equal then

(a) c and a have opposite signs

(b) c and b have opposite signs

(c) c and a have the same sign

(d) c and b have the same sign

18. If one zero of the quadratic polynomial $2x^2 - 8x - m$ is $\dfrac{5}{2}$, then the other zero is

(a) $\dfrac{2}{3}$ (b) $-\dfrac{2}{3}$

(c) $\dfrac{3}{2}$ (d) $\dfrac{-15}{2}$

19. The value of k such that the quadratic polynomial $x^2 - (k + 6)x + 2(2k + 1)$ has sum of the zeroes as half of their product, is

(a) 2   (b) 3   (c) –5   (d) 5

20. If one zero of the polynomial $f(x) = (k^2 + 4)x^2 + 13x + 4k$ is reciprocal of the other, then k is equal to

(a) 2   (b) –2   (c) 1   (d) –1

21. The graph of $y = x^3 - 4x$ cuts x-axis at $(-2, 0)$, $(0, 0)$ and $(2, 0)$. The zeroes of $x^3 - 4x$ are

(a) 0, 0, 0   (b) –2, 2, 2

(c) –2, 0, 2   (d) –2, –2, 2

22. If sum of zeroes, $\alpha + \beta = -8$ and product of zeroes, $\alpha\beta = 6$, then a polynomial whose zeroes are $\dfrac{1}{\alpha}$ and $\dfrac{1}{\beta}$ is

(a) $6x^2 + 8x + 1$ (b) $6x^2 - 8x - 1$

(c) $6x^2 - 4x + 6$ (d) $6x^2 - 8x + 1$

23. Twice the product of the zeroes of the polynomial $23x^2 - 26x + 161$ is $14p$. The value of p is

(a) 1   (b) 2

(c) 4   (d) 3

24. Zeroes of a quadratic polynomial are in the ratio $2 : 3$ and their sum is 15. The product of zeroes of this polynomial is

(a) 36   (b) 48

(c) 54   (d) 60

25. If the graph of a polynomial $p(x)$ cuts the x-axis at 3 points and touches it at the three points, then the number of zeroes of $p(x)$ is/are

(a) 1   (b) 3

(c) 2   (d) 6

26. The graph of a polynomial $p(x)$ does not intersect the x-axis but intersects y-axis at one point. Find the number of zeroes of $p(x)$.

27. If α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - px + q$, then find the value of $\alpha^2 + \beta^2$.

28. If α and β are the zeroes of the quadratic polynomial $f(x) = ax^2 + bx + c$, find the value of $\dfrac{1}{\alpha} + \dfrac{1}{\beta}$.

29. If α, β are the zeroes of the polynomial $p(x) = x^2 - p(x + 1) - c$ such that $(\alpha + 1)(\beta + 1) = 0$. What is the value of c?

Polynomials

30. Find the zeroes of the quadratic polynomial $p(y) = 4\sqrt{3}y^2 + 5y - 2\sqrt{3}$ and verify the relationship between the zeroes and their coefficients.

31. Find a quadratic polynomial whose zeroes are $3 + \sqrt{5}$ and $3 - \sqrt{5}$.

32. Find a quadratic polynomial whose one zero is -8 and sum of zeroes is 0.

33. Find a quadratic polynomial whose one zero is -5 and product of zeroes is 0.

34. If α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - x - 4$, find the value of $\dfrac{1}{\alpha} + \dfrac{1}{\beta} - \alpha\beta$.

35. If the zeroes of the polynomial $x^2 + px + q$ are double in value to the zeroes of $2x^2 - 5x - 3$, find the value of p and q.   [CBSE 2012]

36. Form a quadratic polynomial, one of whose zero is $2 + \sqrt{5}$ and the sum of zeroes is 4.

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Find the quadratic polynomial sum of whose zeroes is 8 and their product is 12. Hence, find the zeroes of polynomial.

If one zero of the polynomial $(a^2 + 9)x^2 + 13x + 6a$ is reciprocal of the other, then find the value of a.

39. If the product of zeroes of the polynomial $ax^2 - 6x - 6$ is 4, then find the value of a.

40. Write a quadratic polynomial whose one zero is $3 - \sqrt{5}$ and product of zeroes is 4.

41. Form a quadratic polynomial whose zeroes are $\dfrac{3 - \sqrt{3}}{5}$ and $\dfrac{3 + \sqrt{3}}{5}$.

42. α, β are zeroes of the quadratic polynomial $x^2 - (k + 6)x + 2(2k - 1)$. Find the value of k if $\alpha + \beta = \dfrac{1}{2}\alpha\beta$.

43. m, n are zeroes of $ax^2 - 5x + c$. Find the value of a and c if $m + n = m.n = 10$.

44. If α and $\dfrac{1}{\alpha}$ are zeroes of polynomial $4x^2 - 2x + (k-4)$, find the value of k.

45. If α, β are zeroes of $x^2 + 5x + 5$, find the value of $\alpha^{-1} + \beta^{-1}$.

46. If α, β are zeroes of the $x^2 + 7x + 7$, find the value of $\dfrac{1}{\alpha} + \dfrac{1}{\beta} - 2\alpha\beta$.

Polynomials
☆ Do Holiday HW in a separate notebook.

In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

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

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

(c) A is true but R is false.

(d) A is false but R is true.

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1. Assertion (A): $5x + 2$ is a linear polynomial.
   Reason (R): A polynomial of degree 1 is a linear polynomial.

2. Assertion (A): $f(x) = 2x^4 - 3x + 7$ is a polynomial in the variable x of degree 4.
   Reason (R): The highest power of x in a polynomial $f(x)$ is called the degree of the polynomial $f(x)$.

3. Assertion (A): A quadratic polynomial having 5 and -3 as zeroes is $x^2 - 2x - 15$.
   Reason (R): The quadratic polynomial having α and β as zeroes is given by $p(x) = x^2 - (\alpha + \beta)x + \alpha\beta$.

Linear equations in two variables

1. One equation of a pair of dependent linear equations is $-5x + 7y = 2$, the second equation can be:
   (a) $10x + 14y + 4 = 0$
   (b) $-10x - 14y + 4 = 0$
   (c) $-10x + 14y + 4 = 0$
   (d) $10x - 14y = -4$

2. The pair of linear equations $2x - 3y = 1$ and $3x - 2y = 4$ has:
   (a) One solution
   (b) Two solutions
   (c) No solution
   (d) Many solutions

3. Two lines are given to be parallel. The equation of one of the lines is $4x + 3y = 14$. The equation of the second line can be
   (a) $3x + 4y = 14$
   (b) $8x + 6y = 28$
   (c) $12x + 9y = 42$
   (d) $-12x = 9y$

4. Match the Column:

(1)	$2x + 5y = 7$ $3x + 4y = 7$	(A)	Inconsistent pair of equations
(2)	$2x + 5y = 7$ $4x + 10y = 7$	(B)	Consistent pair of equations
(3)	$2x + 5y = 7$ $4x + 10y = 14$	(C)	Dependent consistent pair of equations

   (a) $1 - A, 2 - C, 3 - B$
   (b) $1 - B, 2 - C, 3 - A$
   (c) $1 - B, 2 - A, 3 - C$
   (d) $1 - C, 2 - A, 3 - B$

5. $y = a + \dfrac{b}{x}$ where a, b are real numbers, if $y = 1$ when $x = -1$ and $y = 5$ when $x = -5$, then $a + b$ equals
   (a) -1
   (b) 0
   (c) 11
   (d) 10

6. For what value of k, the pair of equations $2x + 3y + 5 = 0$ and $kx + 4y = 10$, has a unique solution?
   (a) $k = \dfrac{8}{3}$
   (b) $k \neq \dfrac{8}{3}$
   (c) $k = 3$
   (d) $k \neq 3$

7. The value of a the following pair of linear equations $ax - 3y = 1, -12x + ay = 2$ has infinitely many solution is
   (a) 6
   (b) -6
   (c) ± 6
   (d) 36

8. The values of x and y satisfying the two equations $32x + 33y = 34$, $33x + 32y = 31$ respectively are:
   (a) $-1, 2$
   (b) $-1, 4$
   (c) $1, -2$
   (d) $-1, -4$

9. For what value of k the following pair of linear equations has unique solution?
   $$7x + 8y = k$$
   $$9x - 4y = 12$$
   (a) 9
   (b) 6
   (c) 8
   (d) any value of k

10. For what value of k the following pair of linear equation has unique solution?
    $$kx + 3y = 3$$
    $$12x + ky = 6$$
    (a) 6
    (b) -6
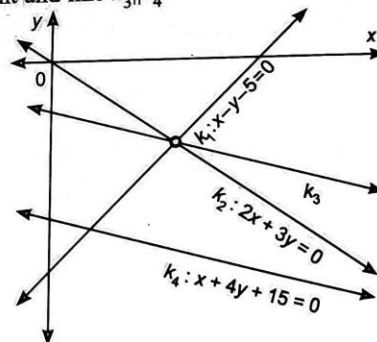   (c) ± 6
    (d) 36

11. Find whether the following pair of equations has no solution, unique solution or infinitely many solutions.
    $$5x - 8y + 1 = 0;$$
    $$3x - \frac{24}{5}y + \frac{3}{5} = 0$$
    (a) No solution
    (b) unique solution
    (c) infinitely many solution
    (d) None of these

12. Shown below is a graph with four straight lines. It is given that lines k_1, k_2 and k_3 intersect at exactly one point and line $k_3 \| k_4$. [CFPQ, CBSE]

   Which of the following is the equation of line k_3?
   (a) $x + y - 1 = 0$
   (b) $x + 4y + 5 = 0$
   (c) $x - 4y - 11 = 0$
   (d) $2x + 8y + 35 = 0$

13. Harsh correctly solved a pair of linear equations in two variables and found their only point of Intersection as $(3, -2)$. One of the lines was $x - y = 5$.
    Which of the following could have been the other line? [CFPQ, CBSE]
    I. $3x - 3y = 15$
    II. $2x - 3y = 12$
    III. $2x - 3y = 14$
    (a) only I
    (b) only II
    (c) only I and II
    (d) only II and III

14. Two linear equations in variables x and y are given below.

$$a_1 x + b_1 y + c = 0$$
$$a_2 x + b_2 y + c = 0$$

Which of the following pieces of information is independently sufficient to determine if a solution exists or not for this pair of linear equations?

[CFPQ, CBSE]

I. $\dfrac{a_1}{b_1} = \dfrac{a_2}{b_2} = 1$ II. $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2}$

III. $\dfrac{a_1}{a_2} = \dfrac{a_1}{b_1} \neq 1$ IV. $\dfrac{a_1}{a_2} \neq \dfrac{b_1}{b_2}$

  (*a*) IV   (*b*) I and IV
  (*c*) II and IV   (*d*) I and III

15. The ratio of a two-digit number and the sum of its digits is 7:1. How many such two-digit numbers are possible?   [CFPQ, CBSE]
  (*a*) 1   (*b*) 4
  (*c*) 9   (*d*) (infinitely many)

16. $x = 3, y = 4$ is a solution of the linear equation.
  (*a*) $2x + 3y - 17 = 0$ (*b*) $3x + 2y - 17 = 0$
  (*c*) $2x - 3y + 17 = 0$ (*d*) $2x + 3y + 17 = 0$

17. Find the conditions to be satisfied by coefficients for which the following pair of equations $ax + by + c = 0$, $dx + ey + f = 0$ represent coincident lines.
  (*a*) $ab = ed;\ bf = ce$ (*b*) $ae = bd;\ bc = ef$
  (*c*) $ad = bc;\ bf = ce$ (*d*) $ae = bd;\ bf = ce$

18. In a $\triangle ABC$, if $\angle C = 50°$ and $\angle A$ exceeds $\angle B$ by $44°$, then $\angle A =$
  (*a*) $43°$ (*b*) $40°$ (*c*) $67°$ (*d*) $87°$

19. If $3^{x-y} = 9$ and $x - 2y = 6$ represent a system of the equations, then the value of $x + y$ is
  (*a*) -2 (*b*) -6
  (*c*) -4 (*d*) None of these

20. The value of y. when $\dfrac{1}{y} + \dfrac{1}{x} = 3$ and $\dfrac{1}{y} - \dfrac{1}{x} = 7$, is
  (*a*) $\dfrac{1}{5}$ (*b*) $-\dfrac{1}{3}$ (*c*) $-\dfrac{1}{5}$ (*d*) $\dfrac{1}{3}$

21. If $x = a$ and $y = b$ is the solution of the equations $x - y = 2$ and $x + y = 4$, then the values of a and b are respectively
  (*a*) 3 and 5   (*b*) 5 and 3
 (*c*) 3 and 1   (*d*) -1 and -3

22. Aruna has only ₹ 1 and ₹ 2 coins with her. If the total number of coins that she has is 50 and the amount of money with her is ₹ 75, then the number of ₹ 1 and ₹ 2 coins are, respectively.
  (*a*) 35 and 15   (*b*) 35 and 20
  (*c*) 15 and 35   (*d*) 25 and 25

23. The father's is age is six times his son's age. Four years hence, the age of the father will be four times his son's age. The present age, (in years) of the son is
  (*a*) 4   (*b*) 5   (*c*) 6   (*d*) 3

24. In the given figure, ABCD is a parallelogram. Find the value of $x + y$.
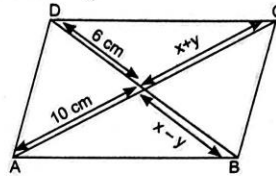
  (*a*) 2   (*b*) 1   (*c*) 3   (*d*) 4

25. If $x + 4y = 27$, $x + 2y = 21$ then the value of $x - y$ is
  (*a*) 5   (*b*) 2   (*c*) 12   (*d*) 18

26. Graphically the pair of equations $6x - 3y + 10 = 0$, $2x - y + 9 = 0$ represent two lines which are
  (*a*) intersecting exactly at one point
  (*b*) intersecting exactly at two point
  (*c*) coincident
  (*d*) parallel

27. It is give that there is no solution to the system of equations $x + 2y = 3$, $ax + by = 4$.
  Which one of the following is true?
  (*a*) a has a unique value
  (*b*) b has a unique value
  (*c*) a can have more than one value
  (*d*) a has exactly two different values

28. Solve the following equations for x and y:
$$mx - ny = m^2 + n^2$$
$$x + y = 2m$$

29. Find the value of k for which the system of equations $x + 2y = 5$ and $3x + ky + 15 = 0$ has no solution.

30. Solve: $99x + 101y = 499$
                 $101x + 99y = 501$

31. Show that the system of equations is consistent and dependent:
$$x - 5y = 6,\ 2x - 10y = 12.$$

32. Find whether the following pair of linear equations is consistent or inconsistent:
$$x + 3y = 5;\ 2x + 6y = 8$$ [CBSE 2015]

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33. Use a single graph paper and draw the graph of the following equations:

$$2y - x = 8 \; ; \; 5y - x = 14; \; y - 2x = 1$$

Obtain the vertices of the triangle so obtained.

34. Solve the following system of equations graphically: Also find the points where the lines represented by the given equations intersect the x-axis.

$$3x + 2y = 14, \; x - 4y = -7$$

35. In the figure below, ABCDE is a pentagon with BE ∥ CD and BC ∥ DE. BC is perpendicular to CD. If the perimeter of ABCDE is 21 cm, find the value of x and y.   **[DoE]**
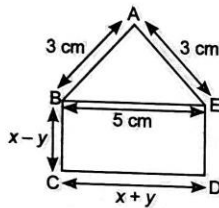
36. A man travels 600 km partly by train and partly by car. It takes 8 hours and 40 minutes if he travels 320 km by train and the rest by car. It would take 30 minutes more if he travels 200 km by train and the rest by car. Find the speed of the train and the car separately.

37. The age of a father is equal to the sum of the ages of his 5 children. After 15 years, sum of the ages of the children will be twice the age of the father. Find the age of father.   **[HOTS]**

38. Find the four angles of a cyclic quadrilateral ABCD in which $\angle A = (2x - 1)°$, $\angle B = (y + 5)°$, $\angle C = (2y + 15)°$ and $\angle D = (4x - 7)°$.

39. A man starts his job with a certain monthly salary and earns a fixed increment every year. If his salary was ₹ 1500 after 4 years of service and ₹ 1800 after 10 years of service, what was his starting salary and what is the annual increment?

40. The incomes of X and Y are in the ratio of 8 : 7 and their expenditures are in the ratio of 19 : 16. If each saves ₹ 1250, find their income.

41. A bag contains 94 coins of 50 paise and 25 paise denominations. If the total worth of these coins be ₹ 29.75, find the number of coins of each kind.

42. A man travels 600 km partly by train and partly by car. If he covers 400 km by train and rest by car, it takes him 6 hours and 30 minutes. But if he travels 200 km by train and rest by car. He takes half an hour longer. Find the speed of the train and that of car.

43. Solve for x and y:

$$3x - \frac{y + 7}{11} + 2 = 10, \; 2y + \frac{x + 11}{7} = 10$$

44. Solve for x and y:

$$631x + 279y = 910$$
$$279x + 631y = 910$$

45. Solve for x and y:

$$254x + 309y = -55$$
$$309x + 254y = 55$$

46. Solve for x and y:

$$3x + 2y = 2x + y + 3 = 4x + 3y - 3$$ **[HOTS]**

47. Solve for x and y:

$$6x + 3y = 8x + 9y - 5 = 10x + 12y - 8$$ **[HOTS]**

48. Ratio between the girls and boys in a class of 40 students is 2 : 3. Five new students joined the class. How many of them must be boys so that the ratio between girls and boys becomes 4 : 5?   **[HOTS]**

49. On selling a tea set at 5% loss and a lemon set at 15% gain, a crockery seller gains ₹ 7. If he sells the tea set at 5% gain and lemon set at 10% gain, he gains ₹ 13. Find the actual price of the tea set.

50. If you travel by an autorickshaw, the fare for the first kilometre is different from the rate per km for the remaining distance. The total fare for a distance of 20 km is ₹ 37.70 and that for a distance of 26 km is ₹ 48.50. Find the auto fare for the first kilometre and for each successive kilometre.

51. One kilogram of tea and 4 kg of sugar together cost ₹ 220. If the price of sugar increases by 50% and the price of tea increases by 10%, the cost would be ₹ 266. Find the original cost per kilogram of each.

52. If three times the larger of the two numbers is divided by the smaller one, we get 4 as quotient and 3 as remainder. Also, if seven times the smaller number is divided by the larger one, we get 5 as quotient and 1 as remainder. Find the numbers.

Quadratic Equations

1. Which of the following is a solution of the equation $x^2 - 6x + 5 = 0$?

   (a) 2

   (b) 5

   (c) 9

   (d) 15

2. The roots of the quadratic equation $x^2 + 5x - (\alpha + 1)(\alpha + 6) = 0$, where α is a constant, are

   (a) $\alpha + 1, \alpha + 6$

   (b) $(\alpha + 1), -(\alpha + 6)$

   (c) $-(\alpha + 1), (\alpha + 6)$

   (d) $-(\alpha + 1), -(\alpha + 6)$

3. If a non zero root of the equations $x^2 + 2x + 3\lambda = 0$ and $2x^2 + 3x + 5\lambda = 0$ is common, the value of λ will be

   (a) 2

   (b) 1

   (c) −1

   (d) 0

4. Let α, β be the roots of the equation $(x - a)(x - b) + c = 0, c \neq 0$.

   The roots of the equation $(x - \alpha)(x - \beta) - c = 0$ are

   (a) a, c

   (b) b, c

   (c) a, b

   (d) $a + c, b + c$

5. If α, β are the roots of the equation $x^2 - p(x + 1) - c = 0$, then $(\alpha + 1)(\beta + 1) =$

   (a) c

   (b) $c - 1$

   (c) $1 - c$

   (d) $1 + c$

6. If $x^2 + px + q = 0$ is the quadratic equation whose roots are $a - 2$ and $b - 2$, where a, b are the roots of $x^2 - 3x + 1 = 0$, then

   (a) $p = 1, q = 2$

   (b) $p = 2, q = 1$

   (c) $p = -1, q = 1$

   (d) $p = 1, q = -1$

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Quadratic Equations

7. The quadratic equation whose roots are twice the roots of $2x^2 - 5x + 2 = 0$ is

   (a) $8x^2 - 10x + 2 = 0$ (b) $x^2 - 4x + 4 = 0$

   (c) $x^2 - 5x + 4 = 0$ (d) $2x^2 - 5x + 2 = 0$

8. A quadratic equation, the product and sum of whose zeroes are 5 and 8 respectively is

   (a) $x^2 - 8x + 5 = 0$ (b) $x^2 + 8x + 5 = 0$

   (c) $x^2 - 5x + 8 = 0$ (d) $x^2 + 5x + 8 = 0$

9. Which of these is a QUADRATIC equation having one of its roots as zero?

   (i) $x^3 + x^2 = 0$

   (ii) $x^2 - 2x = 0$

   (iii) $x^2 - 9 = 0$

   (a) only (i)   (b) only (ii)

   (c) only (i) and (ii)   (d) only (ii) and (iii)

10. Three students were asked how they would verify their solution of a quadratic equation, $(x - 2)(x - 5) = 0$. Shown below are their responses.

Student 1 said, "In the first bracket, x must equal 2, and in the second bracket, x must equal 5. So, $(2 - 2)(5 - 5) = 0$."

Student 2 said, "In the first bracket, x must equal 2, but in the second bracket, x can have any real number value. For example, $(2 - 2)(3 - 5) = 0$ or $(2 - 2)(10 - 5) = 0$."

Student 3 said, "Both brackets should always have the same x value. So, x is either 2 or 5 in both brackets. For example, $(2 - 2)(2 - 5) = 0$ and $(5 - 2)(5 - 5) = 0$."

Whose response is correct?

   (a) only student 1

   (b) only student 3

   (c) only students 1 and 2

   (d) all students 1, 2 and 3

11. If $x = k\sqrt{2}$ be a solution of the quadratic $x^2 + \sqrt{2}\ x - 4 = 0$, then $k =$

   (a) -1 (b) -2

   (c) 2   (d) 4

12. The non-negative real root of the quadratic equation $3x^2 - 5x - 2 = 0$ is

   (a) 3   (b) $\frac{1}{3}$

   (c) 2   (d) $\frac{1}{2}$

13. If arithmetic mean of two numbers α and β is A and $\alpha \cdot \beta = G^2$ then a quadratic equation whose roots are α and β is

   (a) $x^2 - 2Ax + G^2 = 0$ (b) $x^2 + 2Ax + G^2 = 0$

   (c) $x^2 - 2Ax - G^2 = 0$ (d) $x^2 + 2Ax - G^2 = 0$

14. The discriminant of the quadratic equation $ax^2 - 4ax + 2a + 1 = 0$ is equal to

   (a) $4a(2a + 1)$ (b) $2a(2a + 1)$

   (c) $4a(2a - 1)$ (d) $2a(4a - 1)$

15. The quadratic equation $ax^2 - 4ax + 2a + 1 = 0$ has repeated root if $a =$

   (a) 0   (b) $\frac{1}{2}$

   (c) 2   (d) 4

16. If $x^2 - 5x + 1 = 0$, then the value of $x + \frac{1}{x}$ is

   (a) 5   (b) -5

   (c) -2 (d) 3

17. The quadratic $kx^2 - 2kx + 2 = 0$ has equal roots if $k =$

   (a) 0   (b) 2

   (c) 1   (d) 4

18. Which of the following equations has the sum of its roots as 3?

   (a) $2x^2 - 3x + 6 = 0$

   (b) $-x^2 + 3x - 3 = 0$

   (c) $\sqrt{2}x^2 - \frac{3}{\sqrt{2}}x + 1 = 0$

   (d) $3x^2 - 3x + 3 = 0$

19. If $px^2 + 3x + q = 0$ has two roots -1 and -2, then the value of $q - p$ is

   (a) -1 (b) 2

   (c) -2 (d) 1

20. The quadratic equation with integral coefficients, whose one root is $2 + \sqrt{3}$, is

   (a) $x^2 - 4x + 1 = 0$ (b) $x^2 - 2x + 1 = 0$

   (c) $x^2 - 4x + 4 = 0$ (d) $x^2 - 4x + 3 = 0$

21. The common root of the quadratic equations $x^2 - 3x + 2 = 0$ and $2x^2 - 5x + 2 = 0$ is

   (a) 2   (b) 1

   (c) -2 (d) $\frac{1}{2}$

22. Which of the following equations has two distinct real roots?

   (a) $2x^2 - 3\sqrt{2}x + \frac{9}{4} = 0$

   (b) $x^2 + x - 5 = 0$

   (c) $x^2 + 3x + 2\sqrt{2} = 0$

   (d) $5x^2 - 3x + 1 = 0$

Quadratic Equations

23. The equation $(x^2 + 1)^2 - x^2 = 0$ has

    (a) four real roots   (b) two real roots

    (c) no real roots   (d) one real roots

24. If $x > y > 0$, $x^2 + y^2 = 13$ and $xy = 6$, then $y =$

    (a) 4   (b) 3

    (c) 2   (d) 1

25. S_1 and S_2 are two square figures. S_1 is smaller square and length of its side is x cm; S_2 is bigger square and length of its side is y cm. If it is given that $x^2 + y^2 = 74$ and $2x^2 - y^2 = 1$ then the side of the larger square is of length

    (a) 5 cm   (b) 7 cm

    (c) 25 cm   (d) 14 cm

26. If the roots of the quadratic equation $kx^2 + (a + b)x + ab = 0$ are $-a$ and $-b$, then the value of k is

    (a) -1   (b) 1

    (c) 2   (d) -2

27. Solve the quadratic equation $2x^2 + ax - a^2 = 0$ for x.   [Delhi 2014]

28. Solve the following quadratic equation for x:
$4x^2 - 4a^2x + (a^4 - b^4) = 0$ [Delhi 2015]

29. Solve for x: $x^2 - (\sqrt{3} + 1)x + \sqrt{3} = 0$
     [Foreign 2015]

30. Solve for x: $\sqrt{2x + 9} + x = 13$.   [AI 2016]

31. A two-digit number is four times the sum of its digits. It is also equal to 3 times the product of digits. Find the number.   [Foreign 2016]

32. Solve for x: $(a + b)^2 x^2 + 8(a^2 - b^2) x + 16 (a - b)^2 = 0$

33. Find the value of k for which the quadratic equation $(k + 4)x^2 + (k + 1)x + 1 = 0$ has equal roots.

34. Solve for x: $x^2 - (\sqrt{2} + 1)x + \sqrt{2} = 0$ [Foreign 2013]

35. Using quadratic formula, solve the following quadratic equation for x:
$x^2 - 4ax + 4a^2 - b^2 = 0$.

36. Solve the quadratic equation: $x^2 + 2\sqrt{2}x - 6 = 0$ for x.
     [CBSE 2022]

37. If one root of the quadratic equation $2x^2 - 3x + p = 0$ is 3, find the other root of the quadratic equation. Also find the value of p.

38. One root of the equation $2x^2 - 8x - m = 0$ is $5/2$. Find the other root and the value of m.

39. The sum of a number and its positive square root is $6/25$. Find the number.

40. For what values of p the equation
$(1 + p)x^2 + 2(1 + 2p)x + (1 + p) = 0$ has coincident roots?

41. In each of the following determine whether the given values are solutions of the equations or not:

    (i) $6x^2 - x - 2 = 0$; $x = -1/2$; $x = 2/3$

    (ii) $x^2 + \sqrt{2}x - 4 = 0$, $x = \sqrt{2}$, $x = -2\sqrt{2}$

42. Solve the equation $\dfrac{4}{x} - 3 = \dfrac{5}{2x + 3}$; $x \neq 0, -\dfrac{3}{2}$, for x.
     [Delhi 2014]

43. Solve for x: $x^2 + 5x - (a^2 + a - 6) = 0$
     [Foreign 2015]

44. One root of the quadratic equation $2x^2 - 8x - k = 0$ is $\dfrac{5}{2}$. Find the value of k. Also, find the other root.

45. Using quadratic formula, solve the following equation for x:

$abx^2 + (b^2 - ac) x - bc = 0$

46. A two-digit number is such that the product of its digits is 15. If 18 is added to the number, the digits interchange their places. Find the number.

47. The area of a right-angled triangle is 600 sq cm. If the base of the triangle exceeds the altitude by 10 cm, find the dimensions of the triangle.

48. The cost price of an article is ₹ x and is sold at a profit of $(x + 10)$ %. Find the cost price of the article, if its selling price is ₹ $(2x - 20)$.

49. The product of two successive integral multiples of 5 is 300. Determine the multiples.

50. Solve the equation: $\dfrac{4x}{x - 2} - \dfrac{3x}{x - 1} = 7\dfrac{1}{2}$.

51. Solve the equation:
$2(x - 3)^2 + 3(x - 2)(2x - 3) = 8(x + 4)(x - 4) - 1$.

52. The age of father is equal to the square of the age of his son. The sum of the age of father and five times the age of the son is 66 years. Find their ages.