DEEKSHACLASSES.COM

TOPPER'S CHOICE

DEEKSHA™
SINCE 2003

Class X (English Medium)

MERIT BOOSTER

Want to be a TOPPER

Solve these **very important Questions**

JEE हो या NEET
करें जीत की तैयारी

Ex. R.A.S. अधिकारी **अनुभव सर** के मार्गदर्शन में

TOP RANKS
के साथ सर्वाधिक सिलेक्शन रेट

JEE Advanced - 2022

Rank 125
Samarpan Verma

Rank 147
Prabhat kumar

Rank 179
Architha

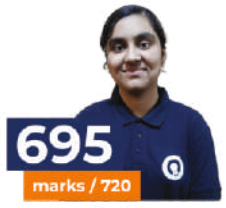
Rank 383
Keshav Rai

Rank 447
Mans Mandal

NEET-UG - 2022

Vasu Garg
AIR 33

Yashik Bansal
AIR 92



Asmita Sharma
AIR 128

Nayanika Mathur
AIR 1457

Suman Bishnoi
D/o Satypal Ji

Madhvika Deora
D/o Surendra Singh Ji Deora

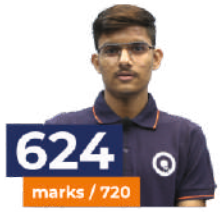
Pratyush Lakhawat
S/o Lal Singh Ji Lakhawat

Prerna Rajpurohit
D/o Bheru Singh Ji

Dinesh Choudhary
S/o Chaina Ram Ji Choudhary

Ravi Choudhary
S/o Champa Lal Ji Choudhary

Shivani Rajpurohit
D/o Pradeep Singh Ji Rajpurohit



Sumit Sharma
S/o Motu Das Ji Sharma

40+ Students Scored more than 600 Marks

SCIENCE

Electricity

Single Correct Answer Type Questions :

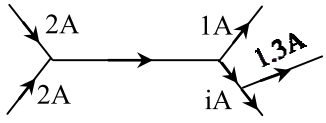
Q.1 How many electrons in 1 s constitute a current of 1 A?
(A) 6.25×10^{18} (B) 6.25×10^{12}
(C) 6.25×10^{11} (D) 6.25

Q.2 If a charged body attracts another body, the charge on the other body-
(A) must be negative
(B) must be positive
(C) must be zero
(D) may be negative or positive or zero

Q.3 A suitable unit for expressing the strength of electric field is -
(A) V/C (B) C/m
(C) N/C (D) C/N

Q.4 What constitutes current in a metal wire ?
(A) Electrons (B) Protons
(C) Atoms (D) Molecules

Q.5 Figure shows, current in a part of electrical circuit, then the value of current is-



(A) 1.7 A (B) 3.7 A
(C) 13 A (D) 1.0 A

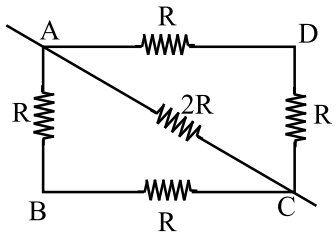
Q.6 Specific resistance of wire depends upon-
(A) its length (B) its cross-section area
(C) its dimensions (D) Its material

Q.7 A piece of wire of resistance 4Ω is bent through 180° at its mid point and the two halves are twisted together, then resistance is -
(A) 1 Ω (B) 2 Ω
(C) 5 Ω (D) 8 Ω

Q.8 In how many parts (equal) a wire of 100 Ω be cut so that a resistance of 1 Ω is obtained by connecting them in parallel ?
(A) 10 (B) 5
(C) 100 (D) 50

Q.9 The filament of an electric bulb is made of tungsten because-
(A) its resistance is negligible
(B) it is cheaper
(C) its melting point is high
(D) its filament is easily made

Q.10 In the given circuit, the effective resistance between points A and C will be -



(A) $\frac{3}{2}R$ (B) 6R
(C) $\frac{2}{3}R$ (D) 3R

Q.11 Two heater wires of equal length are first connected in series and then in parallel with a battery. The ratio of heat produced in the two cases is-
(A) 2 : 1 (B) 1 : 2
(C) 4 : 1 (D) 1 : 4

Q.12 How much electrical energy in kilowatt hour is consumed in operating ten, 50 watt bulbs for 10 hours per day in a month of 30 days ?
(A) 15 (B) 150
(C) 1500 (D) 15000

Q.13 Laws of heating are given by-
(A) faraday (B) joule
(C) Ohm (D) Maxwell

Q.14 A fuse wire is always connected to the-
(A) neutral wire (B) earth wire
(C) live wire (D) none of these

Q.15 The correct relation between heat produce (H) and electric current I flowing is-
(A) $H \propto I$ (B) $H \propto \frac{1}{I}$
(C) $H \propto I^2$ (D) $H \propto \frac{1}{I^2}$

Q.16 The wire having a green plastic covering is a
(A) live wire (B) neutral wire
(C) earth wire (D) none of these

Q.17 In electric fittings in a house:
(A) the live wire goes through the switch
(B) the neutral wire goes through the switch
(C) the earth wire goes through the switch
(D) no wire goes through the switch

Very Short Answer Type Questions :

Q.1 Define current.

Q.2 Define one ampere.

Q.3 State Ohm's law.

Q.4 Define specific resistance.

Q.5 Distinguish between resistance and resistivity.

Q.6 Two resistors R_1 and R_2 are joined in series. Find the equivalent resistance.

Q.7 Two resistors R_1 and R_2 are joined in parallel. Find the equivalent resistance.

Short Answer Type Questions :

Q.8 On what factors does the resistance of a conductor depend?

Q.9 Why is the series arrangement not used for domestic circuits?

Long Answer Type Questions :

Q.10 Define charge. What do you understand by positive and negative charge ? Write down the expression for force between two charges.

Q.11 Describe the conditions for constituting an electric current. Explain the mechanism of flow of electrons in a conductor.

Numerical Problems :

Q.12 How many electrons pass through a lamp in one minute if the current be 200 mA?

(Charge on an electron, $e = 1.6 \times 10^{-10}$ C).

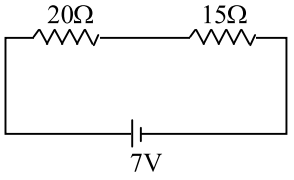
Q.13 A conductor carries a current of 0.2A. Find the amount of charge that will pass through the cross-section of the conductor in 30 s. How many electrons will flow in this time-interval?

(Charge on an electron, $e = 1.6 \times 10^{-19}$ C.)

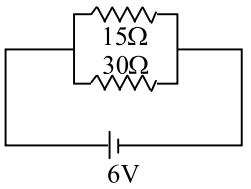
Q.14 A resistance of 12 ohm is connected in parallel with another resistor X. The resultant resistance of the combination is 4.8 ohms. What is the resistance X?

Q.15 Three resistances 12 ohms each are connected in parallel. Three such combinations are connected in series. What is the total resistance?

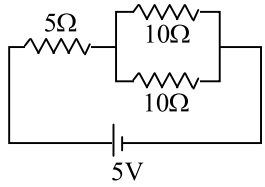
Q.16 Find the current through the circuit shown in figure. Also find the potential difference across the 20-Ω resistor.



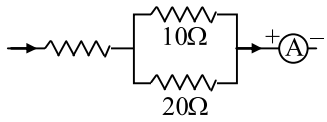
Q.17 Find (a) the equivalent resistance, (b) the current passing through the cell, and (c) the current passing through the 30-Ω resistor in the circuit shown in figure.



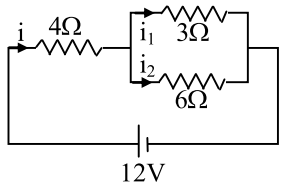
Q.18 Find the current supplied by the cell in the circuit shown in figure.



Q.19 Figure shows a part of an electric circuit. The reading of the ammeter is 3.0 A. Find the currents through the 10-Ω and 20-Ω resistors.



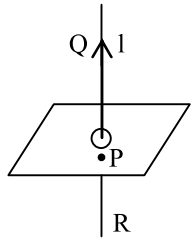
Q.20 Consider the circuit shown in figure. Calculate the current through the 3-Ω resistor.



Magnetic Effect of Current

Single Correct Answer Type Questions :

Q.1 In the figure QR is a vertical conductor and the current I flows R to Q. P is point on the horizontal plane and is to the south of the wire. The direction of the magnetic field at P due to the current will be towards –



(A) upward (B) north
(C) east (D) west

Q.2 A.C. used in our domestic consumption has a frequency-
(A) 60 Hz (C) 50 Hz
(C) 30 Hz (D) 100 Hz

Q.3 AC is preferred because -
(A) it is cheap
(B) it is easily reproducible
(C) it is economical in transmission
(D) it is not dangerous

Q.4 A cylindrical bar magnet is kept along the axis of a circular coil. If the magnet is rotated about its axis, then.
(A) a current will be induced in the coil
(B) no current will be induced in the coil
(C) only emf will be induced in the coil
(D) an emf and current both will be induced in the coil

Very Short Answer Type Questions :

Q.1 Differentiate between an electromagnet and a permanent magnet.

Q.2 Give the unit of intensity of magnetic field.

Q.3 On what principle does the working of a generator depend ?

Q.4 State two characteristics of a fuse wire.

Short Answer Type Questions :

Q.5 Define electromagnetic induction.

Long Answer Type Questions :

Q.6 How is an electromagnet made ? Give the principle of an electromagnet. How will you determine the polarities ?

Q.7 Explain Fleming's right–hand rule.

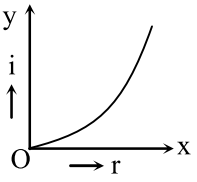
Q.8 Describe the construction and working of a DC generator.

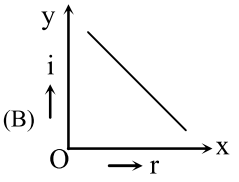
Light Reflection

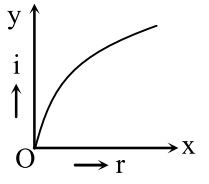
Single Correct Answer Type Questions :

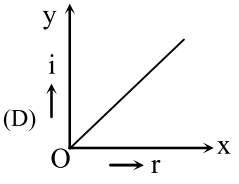
Q.1 An object 0.5 m tall is in front of a plane mirror at a distance of 0.2 m. The size of the image formed is-
(A) 0.2 m (B) 0.5 m (C) 0.1 m (D) 1 m

Q.2 Which of the following correctly represents graphical relation between angle of incidence (i) and angle of reflection (r) ?

(A) 

(B) 

(C) 

(D) 

Q.3 A light ray falls on a mirror and deviates by 60° then the angle of reflection will be
(A) 30° (B) 90°
(C) 60° (D) 180°

Q.4 The magnification of an object placed 10 cm from a convex mirror of radius of curvature 20 cm will be-
(A) 0.2 (B) 0.5
(C) 1 (D) infinity

Q.5 A boy is standing in front of a plane mirror at a distance of 3m form it. What is the distance between the boy and his image ?
(A) 3 m (B) 4.5 m
(C) 6 m (D) none of these

Very Short Answer Type Questions :

Q.1 What is the focal length of a plane mirror?

Q.2 What is the magnification produced by a plane mirror?

Short Answer Type Questions :

Q.3 Why mirrors used in search light are parabolic and not concave spherical?

Q.4 If you were driving a car, what type of mirror would you prefer to use for observing traffic at your back and why?

Q.5 A concave mirror is held in water. What would be the change in the focal length of the mirror?

Q.6 Use the mirror equation to deduce that an object placed between f and 2f of a concave mirror produces a real image beyond 2f.

Q.7 We know that a virtual image cannot be obtained on a screen. But when we see a virtual image, we are obviously bringing it on the retina (may be regarded as a screen) of the eye. Point out the contradiction, if any.

Q.8 What do you understand by the term 'parallax'?

Q.9 What is the effect of size of mirror on the nature of image?

Long Answer Type Questions :

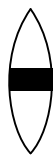
Q.10 Find formulae for magnification produced in the following cases : (i) concave mirror, when image formed is real (ii) concave mirror, when image formed is virtual (ii) convex mirror.

Q.11 Draw a ray diagram to show the formation of image of an object placed between the pole and centre of curvature of a concave mirror. Derive the formula connecting object distance (u), image distance (υ) and focal length (f) for this particular case for the given concave mirror. State clearly the assumptions and sign conventions used.

Light Refraction

Single Correct Answer Type Questions :

Q.1 How will the image formed by a convex lens be affected, if the central portion of the lens is wrapped in black paper, as shown in the fig.



(A) No image will be formed
(B) Full image will be formed but it is less bright
(C) Full image will be formed but without the central portion
(D) Two images will be formed, one due to each exposed half.

Q.2 An object is immersed in a fluid. In order that the object becomes invisible, it should
(A) behave as a perfect reflector
(B) absorb all light falling on it
(C) have refractive index one
(D) have refractive index exactly matching with that of the surrounding fluid

Q.3 If refractive index of water w.r.t. air is $\frac{4}{3}$, then refractive index of air w.r.t. water will be-
(A) 4×3 (B) $\frac{3}{4}$ (C) $\sqrt{\frac{4}{3}}$ (D) $\sqrt{\frac{3}{4}}$

Q.4 A ray of light is incident normally on a rectangular piece of glass. The value of angle of refraction will be-
(A) 180° (B) 90° (C) 45° (D) 0°

Q.5 The speed of light in vacuum is 3.0×10^8 m/s. If the refractive index of a transparent liquid is 4/3, then the speed of light in the liquid is-
(A) 2.25×10^8 m/s (B) 3×10^8 m/s
(C) 4×10^8 m/s (D) 4.33×10^8 m/s

Q.6 To get a real and inverted image of the same size as that of the object the object should be placed in front of the convex lens at-
(A) F
(B) 2F
(C) between F and 2F
(D) away from 2F, where F is focus

Q.7 Focal length of coloured goggles (Without number) is-
(A) zero
(B) infinity
(C) between zero and infinity
(D) None of these

Q.8 A thin lens is made with a material having refractive index $\mu = 1.5$. Both the sides are convex. It is dipped in water ($\mu = 1.33$). It will behave like-
(A) convergent lens (B) a divergent lens
(C) a rectangular slab (D) a prism

Q.9 A convex lens forms a real image of a point object placed on its principal axis. If the upper half of the lens is painted black.
(A) the image will be shifted backward
(B) the image will not be shifted
(C) the intensity of the image will decrease
(D) both (B) and (C)

Very Short Answer Type Questions :

Q.1 Can the absolute refractive index of a medium be less than unity?

Q.2 Does the apparent depth of a tank of water change if viewed obliquely? If so, does the apparent depth increase or decrease?

Q.3 What is critical angle for a material of refractive index $\sqrt{2}$?

Q.4 What is the power of the combination of a convex lens and a concave lens of the same focal length?

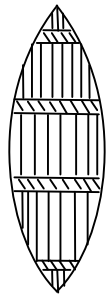
Q.5 Define critical angle for total internal reflection.

Short Answer Type Questions :

Q.6 Define focus and principal focus of a lens.

Q.7 Why goggles (Sun glasses) have zero power even though their surfaces are curved?

Q.8 The lens shown in fig. is made of two different materials. A point objects is placed on the principal axis of this lens. How many images will be obtained?



Q.9 Images formed by totally reflected light are brighter than the images formed by ordinary reflected light. why?

Numerical Problems :

Q.10 A ray of light travelling in air falls on the surface of a glass slab at an angle of incidence 45°. Find the angle made by the refracted ray with the normal within the slab where refractive index for glass is 3/2.

Q.11 A ray of light travelling in air is incident on the surface of a transparent material of refractive index $\sqrt{3}$. If the angle of refraction is 30°, calculate the angle of incidence.

Q.12 A pin 2 cm long is placed at a distance of 16 cm from a convex lens of focal length 12 cm perpendicular to the principal axis. Find the position, nature and size of the image.

Human Eye & Colourful World

Single Correct Answer Type Questions :

Q.1 Blue colour of sky is due to-
(A) dispersion of light (B) scattering of light
(C) refraction of light (D) reflection of light

Q.2 Power of accommodation (max. variation in power of eye lens) of a normal eye is about
(A) 1D (B) 2D (C) 3D (D) 4D

Q.3 Least distance of distinct vision of a long-signted man is 40 cm. He wish to reduce it to 25 cm by using a lens the focal length of the lens is-
(A) $+\frac{200}{3}$ cm (B) $-\frac{200}{3}$ cm
(C) +200 cm (D) –200 cm

Q.4 Which of the following colour has the least wavelength ?
(A) Red (B) Orange
(C) Violet (D) Blue

Q.5 Convex lens of suitable focal length can correct-
(A) short sightedness (B) long sightedness
(C) presbyopia (D) astigmatism

Very Short Answer Type Questions :

Q.1 A child sitting in a classroom on the back seat is not able to view what is written on blackboard. What defect of vision does he suffer from? What types of lens should be provided to him to correct the defect?

Q.2 Which defect of vision is corrected by using cylindrical lens?

Q.3 Which type of retinal cells respond to colours?

Short Answer Type Questions :

Q.4 What is astigmatism? How is it corrected?

Long Answer Type Questions :

Q.5 Describe the construction of the human eye with a well-labelled diagram. Explain the functioning of its various parts.

Q.6 What do you understand by persistence of vision? Give their applications in theatre.

Source of Energy

Single Correct Answer Type Questions :

Q.1 Most of the sources of energy we use represent stored solar energy. Which of the following is not ultimately derived from the Sun's energy?
(A) geothermal energy
(B) wind energy
(C) nuclear energy
(D) bio-mass

Q.2 The device in which the nuclear fission and release of energy is controlled is known as-
(A) Thermopile (B) Thermostat
(C) Nuclear reactor (D) Cloud chamber

Q.3 For a sustained chain reaction, the reproduction factor should be -
(A) zero (B) one
(C) two (D) three

Q.4 The number of neutrons in an atom X of atomic number Z and mass number A is-
(A) Zero (B) Z
(C) A – Z (D) A

Q.5 When a beta particle is given out, the atomic number of the parent atom -
(A) Increases by unity
(B) Decreases by unity
(C) Remains the same
(D) Is halved

Q.6 Which of the following has least penetrating power ?
(A) Alpha particles
(B) Gamma rays
(C) Beta particles
(D) All have the same penetrating power

Subjective Questions :

Q.1 Compare and contrast bio-mass and hydro electricity as sources of energy.

Q.2 What are the advantages and disadvantages of using a solar cooker? Are there places where solar cookers would have limited utility?

Q.3 What are the environmental consequences of the increasing demand for energy? What steps would you suggest to reduce energy consumption?

Metals & Non Metals

Very Short Answer Type Questions :

Q.1 Name the metal which is the best conductor of electricity.

Q.2 Which metal is used to coat iron objects in galvanizing ?

Q.3 Name the metal which exists in the liquid state.

Q.4 Name the lightest & heaviest metals.

Q.5 Name the method of concentration of sulphide ores.

Q.6 Which metal is added to gold to make it hard.

Short Answer Type Questions :

Q.7 Differentiate between calcination and roasting.

Long Answer Type Questions :

Q.8 Differentiate between physical and chemical properties of metals and non-metals.

Fill in the Blanks :

Q.9 ..... ore is concentrated by froth floatation method.

Chemical Reactions

Very Short Answer Type Questions :

Q.1 Find the oxidising and reducing agent in the following reaction :

$PbS(s) + 4H_2O_2(aq) \longrightarrow PbSO_4(s) + 4H_2O(l)$

Q.2 Consider the following reaction :

$SO_2(g) + 2H_2S(g) \longrightarrow 3S(s) + 2H_2O(l)$

(i) Name the substance oxidized

(ii) Name the oxidising agent.

(iii) Name the substance reduced.

(iv) Name the reducing agent.

Q.3 Classify each of the following reaction as : thermal decomposition, displacement, double displacement, electrical decomposition, combination or photo decomposition reaction.

(i) $CaCO_3(s) \longrightarrow CaO(s) + CO_2(g)$

(ii) $2AgBr(s) \longrightarrow 2Ag(s) + Br_2(g)$

(iii) $2H_2O(l) \longrightarrow 2H_2(g) + O_2(g)$

(iv) $Zn(s) + CuSO_4(aq) \longrightarrow ZnSO_4(aq) + Cu(s)$

(v) $Na_2SO_4(aq) + BaCl_2(aq) \longrightarrow BaSO_4(s) + 2NaCl(aq)$

(vi) $CaO(s) + H_2O(l) \longrightarrow Ca(OH)_2(aq)$

Q.4 What is a chemical equation ?

Q.5 Balance the following chemical equation :

$NaOH + H_2SO_4 \longrightarrow Na_2SO_4 + H_2O$

Q.6 Write two condition for rusting of an iron article.

Short Answer Type Questions :

Q.7 What is an oxidation reaction ? Identify in the following reaction :

(i) The substance oxidised,

(ii) The substance reduced :

$ZnO + C \longrightarrow Zn + CO$

Q.8 What is an oxidation reaction ? Give an example of oxidation reaction. Is oxidation an exothermic or an endothermic reaction.

Q.9 On the basis of the following chemical equations, find out which is the least reactive metal amongst iron, copper and zinc ?

(i) $FeSO_4(aq) + Zn(s) \longrightarrow ZnSO_4(aq) + Fe(s)$

(ii) $CuSO_4(aq) + Fe(s) \longrightarrow FeSO_4(aq) + Fe(s)$

Q.10 Why do silver, gold and platinum not corrode in moist air ?

Long Answer Type Questions :

Q.11 Consider the following chemical equations :

(i) $CuO(s) + H_2(g) \rightarrow Cu(s) + H_2O(g)$

(ii) $Fe_2O_3(s) + 3CO(g) \rightarrow 2Fe(l) + 3CO_2(g)$

Identify the following in these equations, giving reasons :

(a) The substance getting oxidised.

(b) The substance getting reduced

(c) The oxidising agent

(d) The reducing agent

Q.12 Balance the following chemical equations :

(i) $S(s) + H_2SO_4(aq) \longrightarrow H_2O(l) + SO_2(g)$

(ii) $S(s) + HNO_3(aq) \longrightarrow H_2SO_4(aq) + NO_2(g) + H_2O(l)$

(iii) $Fe_2O_3(s) + CO(g) \longrightarrow Fe(l) + CO_2(g)$

(iv) $KMnO_4(aq) + HCl(aq) \longrightarrow KCl(aq) + MnCl_2(aq) + Cl_2(g) + H_2O(l)$

(v) $MnO_2(s) + HCl(aq) \longrightarrow MnCl_2(aq) + H_2O(l) + Cl_2(g)$

Q.13 Matching columns

Column-I	**Column-II**
1. Displacement reaction	(a) $CaCO_3(s) \xrightarrow{Heat} CaO(s) + CO_2(g)$
2. Double displacement reactions.	(b) $AgCl(s) \xrightarrow{Sunlight} 2Ag(s) + Cl_2(g)$
3. Thermal decomposition reaction.	(c) $Na_2SO_4(aq)+BaCl_2(aq) \longrightarrow BaSO_4(s)+2NaCl(aq)$
4. Photolytic decomposition reaction.	(d) $Pb(NO_3)_2(s) \xrightarrow{Heat} 2PbO(s)+4NO_2(g)+O_2(g)$
5. Addition reaction involving combination of two compound	(e) $Pb(NO_3)_2(aq) + 2KI(aq) \longrightarrow PbI_2(s)+2KNO_3(aq)$
6. Reaction involving combination between two elements	(f) $Zn(s) + CuSO_4(aq) \longrightarrow ZnSO_4(aq)+ Cu(s)$
7. Reaction involving combination between element and compound	(g) $AgNO_3(aq) + NaCl(aq) \longrightarrow AgCl(s)+NaNO_3(aq)$
8. Reaction in which white precipitate is formed.	(h) $CaO(s)+H_2O(l) \longrightarrow Ca(OH)_2(aq)$
9. Reaction in which yellow precipitate is formed.	(i) $SO_2(g) + O_2(g) \longrightarrow SO_3(g)$
10. Reaction in which brown fumes are formed	(j) $C(s) + O_2(g) \longrightarrow CO_2(g)$

Fill in the Blanks :

Q.14 Combustion reactions are always …… in nature.

Q.15 Chemically rust is ……

Q.16 The symbol aq in a chemical equation represents ……

Q.17 In the type of reaction called …… two compounds exchange their positive and negative radicals.

Ture/False Type Questions :

Q.18 On heating the crystals of ferrous sulphate, the colour changes from green to grey.

Q.19 Calcium oxide is also called lime or quicklime.

Q.20 The insoluble substance formed during a chemical reaction is known as a precipitate.

Q.21 Due to corrosion iron gets a brown coating, copper gets a green coating and silver gets a black coating.

Acid Bases & Salts

Very Short Answer Type Questions :

Q.1 What is the nature of the solution which turns blue litmus to red ?

Q.2 What is the nature of the solution which turns red litmus to blue ?

Q.3 Is an aqueous solution of sodium carbonate acidic or basic?

Q.4 Name of the substance which on being treated with chlorine yields bleaching powder.

Q.5 What is the chemical name of bleaching powder.

Q.6 Which gas will be evolved if sodium hydrogencarbonate is heated with tartaric acid?

Q.7 Name the constituents of baking powder.

Short Answer Type Questions :

Q.8 Find the pH value of the solution when its H^+ ion concentration is
(a) 10^{-4} mol L^{-1}
(b) 10^{-7} mol L^{-1}

Q.9 What is the pH of a solution when the hydrogen ion concentration is 1×10^{-10} ?

Q.10 Calculate the pH of solution containing concentration of hydroxyl ions as 1×10^{-11}.

Q.11 What is the pH range ?

Q.12 If pH is equal to 7, what kind of solution is indicated ?

Q.13 What happens when sodium carbonate is reacted with dilute HCl?

Q.14 What happens when bleaching powder is exposed to CO_2?

Q.15 List three important use of bleaching powder.

Long Answer Type Questions :

Q.16 Define pH. What is pH-scale ?

Q.17 How is Plaster of Paris obtained ? What reaction is involved in the setting of Plaster of Paris?

Q.18 What will happen if a solution of sodium hydrocarbonate is heated ? Give the equation of the reaction involved.

Q.19 Write an equation to show the reaction between Plaster of Paris and water.

Q.20 Give two important used of washing soda and baking soda.

Q.21 Answer the following :
(i) Why is Plaster of Paris written as $CaSO_4$. 1/2 H_2O ? How is it possible to have half a water molecule attached to $CaSO_4$?
(ii) Why is sodium Hydrogen carbonate an essential ingredient in antacids ?
(iii) When electricity is passed through an aqueous solution of sodium chloride, three products are obtained. Why is the process called chlor-alkali ?

Q.22 **(i)** Name the products formed when sodium hydrogen carbonate is heated.
(ii) Write the chemical equation for the reaction involved in the above.

Q.23 Name the four chemicals which can be obtained from common salt.

Q.24 How is Plaster of Paris prepared ? Why is Plaster of Paris stored in an air-tight container ?

Fill in the Blanks :

Q.25 The pH of an acidic solution is..... than 7

Q.26 An acid produce..... ions when dissolved in water.

Q.27 A Base produce..... ions when dissolved in water.

Q.28 The pH of a basic solution is..... than 7

Q.29 Chemical formula of washing soda is .....

Q.30 Bleaching powder is prepared by passing .....gas through slaked lime.

Ture/False Type Questions :

Q.31 NH_4OH is a strong base.

Q.32 In pure water $[H_3O^+] = [OH^-]$.

Q.33 pH of pure water is always 7

Q.34 pH + pOH = 14 is valid at all temperatures

Carbon and Its Compound

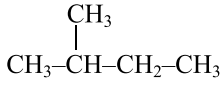
Very Short Answer Type Questions :

Q.1 Write the formula of two homologous of propane (C_3H_8)

Q.2 Give the general name of the class of compounds having the general formula C_nH_{2n-2}

Q.3 Give the general formula of alkane

Q.4 Give the IUPAC name



Q.5 Write the structural formulae for
2-methyl-2 butene

Q.6 Give two examples of unsaturated hydrocarbons

Q.7 Write the IUPAC name of the compound CH_3COOH

Q.8 Complete the reaction
$CH_3COOH + NaHCO_3 \rightarrow$

Q.9 Name two allotropes of carbon

Q.10 Write the name of C_{60}

Short Answer Type Questions :

Q.11 Write the structural formulae of the isomers of n-butane.

Q.12 What are hydrocarbons? Give two points of difference between saturated and unsaturated hydrocarbons.

Q.13 Classify the following compounds as alkanes, alkenes and alkynes.

C_2H_4, C_3H_4, C_4H_8, C_5H_{12}, C_5H_8, C_3H_8, C_6H_6

Q.14 Complete the following reactions :

(i) $CH_3CH_2OH \xrightarrow{Alc.KMnO_4}$

(ii) $C_2H_5OH + Na \longrightarrow$

(iii) $CH_3CH_2OH + O_2 \longrightarrow$

Fill in the Blanks :

Q.15 The organic acid present in vinegar is .....

Periodic Classification of Elements

Very Short Answer Type Questions :

Q.1 Give one example each of the following

(i) Metal belonging to Group 12.

(ii) Metal belonging to Group 2.

(iii) Non-metal belonging to the halogen group.

(iv) Most reactive halogen.

(v) Alkali metal which is radioactive.

Q.2 What are the vertical columns in the periodic table called ?

Q.3 Give an example of an element discovered after Mendeleev gave the periodic table

Short Answer Type Questions :

Q.4 State the modern periodic law

Q.5 Explain Newland's law of octaves

Q.6 Give reasons for the following:

(i) Atomic size decreases as we move from left to right across a period

(ii) Atomic size increases as we move from top to bottom along a group.

Q.7 Explain why potassium is more reactive than lithium and chlorine less reactive than fluorine.

Long Answer Type Questions :

Q.8 What is meant by the statement, 'properties of elements are a periodic function of atomic number'?

Q.9 Write a short note on the following:

(i) Dobereiner's triads

(ii) Newland's law of octaves

(iii) Lothar Meyer's curves

Q.10 Discuss the variation in the following along a group and a period:

(i) Atomic size (ii) Ionization energy

(iii) Metallic character (iv) Electron affinity

(v) Chemical reactivity

Q.11 What is the octet rule ? Explain it with the help of suitable examples.

Q.12 Write the electronic configuration of the noble gases.

Q.14 Define cations and anions. Discuss with suitable examples.

Q.15 What is the difference between ionic and covalent compounds ?

Q.16 State the properties of electrovalent and covalent compounds.

Fill in the Blanks :

Q.17 Vertical columns of elements in the periodic table are called.....

Q.18 The first period contains .....elements.

Q.19 Na^+ and Cl^- ions combine together to form an ..... solid.

Q.20 F^- and Ne contain the same number of ....

Ture/False Type Questions :

Q.21 Elements of a group have the same chemical properties.

Q.22 Element with least ionization energy is Ceasuim.

Q.23 The element with configuration ns^2np^5 will belong to group 17.

Q.24 Elements having atomic numbers 57 to 71 constitute the lanthanide series.

Q.25 From top to bottom in a group, electronegativity increases.

Q.26 CCl_4 is a good conductor of electricity.

Q.27 Mg^{2+} and O^{2-} have achieved stable octet arrangement.

Q.28 The size of Na^+ is smaller than the size of Na.

Nutrition

Single Choice Type Questions :-

Q.1 CO_2 and O_2 balance in atmosphere is due to

(A) Photorespiration (B) Photosynthesis

(C) Respiration (D) Leaf anatomy

Q.2 During photosynthesis the oxygen in glucose comes from

(A) Water

(B) Carbon dioxide

(C) Both from water and carbon dioxide

(D) Oxygen in air

Q.3 Dark reaction of photosynthesis occurs in the

(A) Stroma of the chloroplast outside the lamellae

(B) Space between the two membranes of the chloroplast

(C) Membranes of the stroma lamellae

(D) Thylakoid membrane of the grana

Q.4 Phloem always flows from a
(A) Solar source to sugar sink
(B) Sugar sink to sugar source
(C) Leaf to the xylem to the phloem
(D) Leaf to a root

Q.5 With regards to natural eating habits, a human is
(A) An herbivore (B) A carnivore
(C) An omnivore (D) A Granivore

Q.6 Which of the following regions of the alimentary canal of man does not secrete a digestive enzyme ?
(A) Oesophagus (B) Stomach
(C) Duodenum (D) Mouth

Q.7 A digestive enzyme, salivary amylase, in the saliva begin digestion of
(A) Protein (B) Nucleic acids
(C) Fats (D) Carbohydrates

Q.8 In the presence of lactase, lactose breaks down into molecules of
(A) Glucose and galactose
(B) Glucose and fructose
(C) Galactose only
(D) Glucose only

Q.9 Saliva has the enzyme
(A) Pepsin (B) Ptyalin
(C) Trypsin (D) Rennin

Q.10 Pepsin digests
(A) Proteins in stomach
(B) Carbohydrates in duodenum
(C) Proteins in duodenum
(D) Fats in ileum

Q.11 Chief function of HCl is
(A) To maintain a low pH to prevent growth of micro-organisms
(B) To facilitate absorption
(C) To maintain low pH to activate pepsinogen to form pepsin
(D) To dissolve enzyme secreted in stomach

Q.12 If the stomach did not produce any hydrochloric acid, which enzyme will not function ?
(A) Ptyalin (B) Trypsin
(C) Pepsin (D) Collagenase

Q.13 Chief function of bile is
(A) To digest fat by enzymatic action
(B) To emulsify fat for digestion
(C) To eliminate waste product
(D) To regulate process of digestion

Q.14 Where is bile produced ?
(A) In gall bladder
(B) In blood
(C) In liver
(D) In spleen

Q.15 Largest gland in human body is
(A) Liver (B) Pancreas
(C) Pituitary (D) Thyroid

Q.16 The specific function of liver is
(A) Excretion
(B) Digestion
(C) Histolysis
(D) Glycogenesis and glycogenolysis

Q.17 The original function of the vertebrate stomach was
(A) Storage
(B) Digestion
(C) Enzyme secretion
(D) Absorption

Very Short Answer Type Questions :

Q.1 Define heterotrophic nutrition.

Q.2 Which types of organisms are called consumers?

Q.3 Define saprophyte.

Q.4 What is carnivore?

Q.5 Define digestion.

Q.6 What is the mode of nutrition in *Amoeba*?

Short Answer Type Questions :

Q.7 What is the action of hydrochloric acid of gastric juice ?

Q.8 Name a digestive juice that has no enzymes. What is the role of this juice ?

Q.9 Name the various parts of large intestine. What is the role of large intestine ?

Long Answer Type Questions :

Q.10 Briefly describe the digestive system of humans.

Q.11 What happens to food in the small intestine?

Q.12 Why chlorophyll is needed for photosynthesis.

Respiration

Single Choice Type Questions :

Q.1 Which one is anabolic process -
(A) Respiration (B) Digestion
(C) Photosynthesis (D) Ascent of sap.

Q.2 Glycolysis occurs in -
(A) Cytoplasm
(B) Mitochondria
(C) Chloroplasts
(D) Golgi complex

Q.3 Which one is a product of glycolysis -
(A) Oxaloacetate
(B) Pyruvate
(C) Ethyl alcohol
(D) Lactic acid

Q.4 Adam's Apple occurs in -
(A) Buffaloes (B) Dogs
(C) Human males (D) Human females

Q.5 Muscular partition present between thorax and abdomen is -
(A) Pericardium (B) Pleura
(C) Epiglottis (D) Diaphragm

Q.6 Covering of lungs is -
(A) Pleura (B) Pericardium
(C) Epiglottis (D) Capsule

Q.7 Gaseous exchange occurs in the lungs in the region of-
(A) Trachea (B) Bronchi
(C) Bronchioles (D) Alveoli

Q.8 Trachea and bronchi have -
(A) C-shaped cartilaginous rings
(B) Complete cartilaginous rings
(C) Complete chitinous rings
(D) C-shaped chitinous rings

Q.9 Skin is an ideal respiratory organ in frog because it is-
(A) Highly vascular
(B) Kept moist
(C) Devoid of hair and scales
(D) All the above

Q.10 Glycolysis occurs in -
(A) Anaerobic organisms
(B) Muscle cells
(C) Prokaryotic cells
(D) Almost all the cells

Q.11 Anaerobic respiration is likely to occur in -
(A) Ants (B) Earthworms
(C) Echinoderms (D) Tapeworms

Q.12 Respiratory quotient is -
(A) CO_2/O_2 (B) O_2/CO_2
(C) CO_2/N_2 (D) N_2/CO_2

Q.13 Skin is an accessory respiration in -
(A) Humans (B) Frog
(C) Rabbit (D) Lizard

Q.14 Lungs are covered with the covering of -
(A) Pleural membrane
(B) Pericardium
(C) Peritoneum
(D) Mucous membrane

Very Short Answer Type Questions :

Q.1 What is respiration ?

Q.2 What are stomata ?

Q.3 Name the energy currency of living system.

Q.4 What is diaphragm ?

Q.5 What is epiglottis ?

Q.6 Define breathing

Q.7 Name the common passage for food and air.

Q.8 What is the shape of diaphragm during expiration?

Short Answer Type Questions :

Q.9 Differentiate between photosynthesis and respiration.

Q.10 Distinguish between breathing and respiration.

Q.11 Differentiate between bronchioles and tracheoles.

Q.12 Differentiate between inspiration and expiration.

Long Answer Type Questions :

Q.13 Name the respiratory organs in the following :
(a) a fish (b) a bird
(c) an earthworm

Q.14 Draw a diagram showing 'human respiratory system'. Label its following parts
(i) Larynx (ii) Trachea
(iii) Primary Bronchus (iv) Lungs.

Transportation

Single Choice Type Questions :

Q.1 Water will be absorbed by root hairs when -
(A) Concentration of solutes in the cell sap is high
(B) Plant is rapidly respiring
(C) They are separated from soil by a permeable membrane
(D) Concentation of salts in the soil is high

Q.2 Which of the following is connected with transport of water in plants ?
(A) Phloem (B) Xylem
(C) Epidermis (D) Cambium

Q.3 In a closed circulatory system blood is completely enclosed within -
(A) The skeleton (B) Sinuses
(C) Vessels (D) Hearts

Q.4 In which of the following groups of animal the heart pumps only deoxygenated blood ?
(A) Fishes (B) Reptile
(C) Birds (D) Amphibians

Q.5 The smallest blood vessel in the body is a -
(A) Capillary (B) Artery
(C) Vena cava (D) Vein

Q.6 Both erythrocytes and leucocytes are formed in the -
(A) Bone marrow (B) Thymus
(C) Arterial walls (D) Lymph nodes

Q.7 An erythrocyte lives for approximately -
(A) One week (B) One month
(C) Four months (D) One year

Q.8 Number of RBC increases if one lives at higher altitude because -
(A) There is less oxygen on mountains
(B) More heat is required in body for producing body warmth
(C) There are no germs in moutian air
(D) There is more oxygen on mountains

Q.9 Blood clot inside a blood vessel is known as -
(A) Thrombosis (B) Agglutinin
(C) Clot (D) Thrombus

Q.10 In human, the prothrombin required for blood clotting is produced in -
(A) Liver (B) Stomach
(C) Pancreas (D) Spleen

Q.11 Which chamber of a bird heart does oxygen rich blood first enter ?
(A) Right atrium (B) Right ventricle
(C) Left ventricle (D) Left atrium

Q.12 Which chamber of the heart has the thickest muscular walls ?
(A) Right atrium (B) Left atrium
(C) Right ventricle (D) Left ventricle

Q.13 Which one of the following is called pace maker of the heart ?
(A) SA node (B) AV node
(C) Bundle of His (D) AV septum

Q.14 The colour of lymph is -
(A) White (B) Yellow
(C) Colourless (D) Milky

Very Short Answer Type Questions :

Q.1 Define circulatory system.
Q.2 What is the function of blood platelets?
Q.3 List components of blood.
Q.4 Define serum.
Q.5 Define double circulation.
Q.6 What is transpiration ?

Short Answer Type Questions :

Q.7 Enumerate the functions of transportation in human.
Q.8 Write a note on arteies ?
Q.9 Distinguish an artery from a vein.
Q.10 Write the differences between xylem and phloem.

Long Answer Type Questions :

Q.11 Describe the structure and functioning of heart with the help of a diagram.
Q.12 Explain the blood group in human.

Excretion

Single Choice Type Questions :

Q.1 Contractile vacuole of *Amoeba* takes part in -
(A) Locomotion
(B) Digestion of food
(C) Ingestion of food
(D) Osmoregulation

Q.2 Basic filteration unit of kidney is -
(A) Ureter (B) Glomerulus
(C) Urethra (D) Collecting tubule

Q.3 Dilution of concentration of urine is determined by availability of -
(A) Hormone thyroxine
(B) Hormone thymosine
(C) Hormone ADH
(D) Both A and B

Q.4 Excretion means -
(A) Removal of substances present in excess
(B) Formation of those substances that have some role in the body
(C) Removal of such substances that have never been part of the body
(D) All of the above

Q.5 Ureotelic animals are those that eliminate the nitrogenous wastes predominatly in the form of -
(A) Uric acid (B) Ammonia
(C) Amino acids (D) Urea

Q.6 A mammal excretes nitrogen in the form of -
(A) Ammonium ions (B) Amino acids
(C) Urea (D) Uric acid

Q.7 Kidneys are not only organs of excretion.Their work is supplemented by -
(A) Liver (B) Heart
(C) Large intestine (D) Skin

Q.8 The Bowman's capsule functions as a
(A) Filter
(B) Suction pump
(C) Egestion
(D) All of the above

Q.9 The basic unit of a vertebrate kidney is the -
(A) Ureter
(B) Nephron
(C) Malpighian tubule
(D) Islets of langerhans

Very Short Answer Type Questions :

Q.1 What are waste products?
Q.2 What is the function of ADH?
Q.3 What is unit of human kidney?
Q.4 What is glomerulus ?
Q.5 Name the structure which absorb glucose in nephron.
Q.5 Define micturition.
Q.6 Where is urine stored in the body?

Short Answer Type Questions :

Q.7 Named the various waste products produced in human beings.
Q.8 Named the different waste products by plants.
Q.9 Write a short note on ultra filteration.
Q.10 Describe the mechanism of urine formation.

Long Answer Type Questions :

Q.11 Explain the structure of nephron with the help of a labelled diagram.

Control & Coordination

Single Choice Type Questions :

Q.1 Olfactorceptors occur in -
(A) Nasal cavity
(B) Buccal cavity
(C) Lungs
(D) Skin

Q.2 Photoreceptors are present in -
(A) Eyes (B) Mouth
(C) Ears (D) Brain

Q.3 Spinal cord is part of -
(A) Autonomic nervous system
(B) Voluntary peripheral nervous system
(C) Involuntary peripheral system
(D) Central nervous system

Q.4 Cerebellum is part of -
(A) Mid brain
(B) Fore brain
(C) Hind brain
(D) Peripheral nervous system

Q.5 Number of cranial nerves is -
(A) 36 (B) 24
(C) 18 (D) 12

Q.6 In human, number of spinal nerves is -
(A) 31 pairs (B) 32 pairs
(C) 33 pairs (D) 36 pairs

Q.7 Phototropsin is caused by differential distribution of -
(A) IAA (B) Kinetin
(C) Gibberellin (D) Abscisic acid

Q.8 Artificial ripening of fruits is carried out by -
(A) Auxin (B) Kinetin
(C) Ethylene (D) ABA

Q.9 Which one is male hormone -
(A) Estrogen (B) Adrenaline
(C) Testosterone (D) Insulin

Q.10 Structural and functional unit of nervous system is -
(A) Nephron (B) Neuron
(C) Dendrite (D) Cyton

Q.11 Select the correct match from the following -
(A) Thyroxin : Ovary
(B) Growth hormone : Pituitary
(C) Insuline : Thyroid
(D) Testosterone : Testis

Very Short Answer Type Questions :

Q.1 Write the function of hormone thyroxine in our body.

Q.2 Name the part of hind brain which takes part in regulation of respiration.

Q.3 Which hormone helps in lowering the level of blood Calcium in human beings.

Q.4 Which hormone is responsible for the development of moustache and beard in man?

Q.5 What is neuron?

Short Answer Type Questions :

Q.6 Name hormones produced by Neurohypophysis.

Q.7 Name four hormones produced by pituitary gland with function.

Q.8 What is the role of oxytocin?

Q.9 Where is medulla oblongata ? situates?

Q.10 Wrtie a note on ABA.

Q.11 What is reflex action?

Long Answer Type Questions :

Q.12 Draw a labelled diagram of brain.

Q.13 Describe the structure of neuron.

Reproduction

Single Choice Type Questions :

Q.1 Binary fission occurs in -
(A) *Amoeba* (B) *Paramecium*
(C) *Leishmania* (D) All the above

Q.2 Sugarcane is multiplied by -
(A) Seeds (B) Root cuttings
(C) Stem cuttings (D) Leaves

Q.3 Potato is grown from -
(A) Cutting of aerial stems
(B) Cutting of tubers having depressions
(C) Cuttings of tubers without depressions
(D) Cuttings of roots

Q.4 The grafted portion of a plant is called -
(A) Stalk (B) Stock
(C) Layer (D) Scion

Q.5 Grafting is most successful in -
(A) Dicots (B) Monocots
(C) Pteridophytes (D) Bryophytes

Q.6 In flower the male organ is -
(A) Stamen (B) Carpel
(C) Sepal (D) Petal

Q.7 Seed is formed from -
(A) Unfertilised ovary (B) Fertilised ovary
(C) Fertilised ovule (D) Unfertilised ovule

Q.8 Which is shed in a fertilized flower ?
(A) Stamens (B) Petals
(C) Style and stigma (D) All the above

Q.9 Gonads form -
(A) Sex organs (B) Gametes
(C) Sex hormones (D) Both B and C

Q.10 Mucosal lining of uterus is -
(A) Mesometrium (B) Endometrium
(C) Epimetrium (D) Epidermis

Q.11 Ovum is fertilized in -
(A) Vagina (B) Uterus
(C) Fallopain tube (D) Ovary

Q.12 Gestation period in human is -
(A) 270 days (B) 290 days
(C) 200 days (D) 245 days

Q.13 Which one is a mechanical barrier to conception ?
(A) Oral pill (B) Norplant
(C) Abortion (D) Condom

Very Short Answer Type Questions :

Q.1 What is multiple fission ?
Q.2 Define budding?
Q.3 Define grafting ?
Q.4 What are gametes ?
Q.5 Define fertilization.
Q.6 What are essential floral organs?
Q.7 Name the male floral organ.
Q.8 What is pollination?
Q.9 What is the function of scrotum?
Q.10 Define placenta.
Q.11 Define menarche.

Short Answer Type Questions :

Q.12 Write a note on human fallopian tubes.
Q.13 Differentiate between menarche and menopause
Q.14 Distinguish vasectomy from tubectomy.
Q.15 Differentiate self pollination and cross pollination ?
Q.16 Describe budding in *Hydra.*

Long Answer Type Questions :

Q.17 Describe male reproductive system of humans.
Q.18 Describe the various methods of contraception.
Q.19 Write a note on pollination in flowering plants.
Q.20 Describe the methods of asexual reproduction in multicellular organisms.

Heredity & Evolution

Single Choice Type Questions :

Q.1 Mendel worked on -
(A) *Pisum* (B) *Solanum*
(C) *Lathyrus* (D) *Dolichos*

Q.2 Father of genetics is -
(A) Morgan (B) Mendel
(C) Darwin (D) Hutchinson

Q.3 Mendel noted as many pairs of contrasting traits in pea plants -
(A) 2 (B) 5 (C) 7 (D) 9

Q.4 Which one is not a vestigial organ in man ?
(A) Vermiform appendix
(B) Epiglottis
(C) Muscles of ear pinna
(D) Nictitating membrane

Q.5 The wings of bat, locust and pigeon are the example of -
(A) Homologous organs
(B) Analogous organs
(C) Vestigial organs
(D) Exoskeleton

Q.6 Homologous structure are -
(A) Dissimilar in origin, similar in function
(B) Dissimilar in origin and function both
(C) Similar in origin and similar in function
(D) Similar in origin and dissimilar in function

Q.7 Palaentology is study of -
(A) Fossils (B) Bones
(C) Birds (D) Embryo

Q.8 The book "Origin of Species by Natural Selection" was written by -
(A) Oparin
(B) Wallace
(C) Darwin
(D) Darwin and Wallace

Q.9 Inheritance of acquired characters was proposed by -
(A) Darwin (B) Lamarck
(C) Wallace (D) Oparin

Q.10 Vestigal organs are -
(A) Primitive organs
(B) Preimordial organs
(C) Organs reduced due to disuse
(D) Organs marked only in embryonic stage

Very Short Answer Type Questions :

Q.1 Give two examples of inherited traits.
Q.2 Who is known as father of genetics?
Q.3 Define monohybrid cross.
Q.4 What is the literal meaning of the word 'evolution.'
Q.5 What are acquired characters?

Short Answer Type Questions :

Q.6 Distinguish between homologous and analogous organs.
Q.7 Explain the process of fossil formation.
Q.8 How is sex of the child determined in human beings?

Long Answer Type Questions :

Q.9 Explain the role of natural selection and genetic drift in speciation.
Q.10 Explain the interpretations drawn by Mendel after his experiments on pea plant.
Q.11 What are sex chromosomes ? Explain the process of sex determination in human beings.

Our Environment

Single Choice Type Questions :

Q.1 Environment consists of -
(A) Land, air, water
(B) Light, temperature and rainfall
(C) Plants, animals and microbes
(D) All the above

Q.2 A biodegradable waste is -
(A) Polythene bags
(B) Broken glass and crockery
(C) Livestock waste
(D) Discarded plastic

Q.3 Which one is recyclable waste ?
(A) Paper
(B) Torn clothes
(C) Metallic and plastic discards
(D) All the above

Q.4 Carcinogenic chemicals produced during recycling of plastics and polythene are -
(A) Formaldehyde
(B) Polycyclic aromatic compounds
(C) Vinyl chloride
(D) Dioxins and furans

Q.5 Which is abiotic component of ecosystem ?
(A) Humus (B) Bacteria
(C) Plants (D) Fungi

Q.6 Who coined the term ecosystem ?
(A) Tansley (B) Odum
(C) Warming (D) Darwin

Q.7 Amount of energy transferred from one trophic level to the next is -
(A) 1.5% (B) 10%
(C) 15% (D) 20%

Q.8 Which one is present in maximum number in an ecosystem ?
(A) Herbivores (B) Carnivores
(C) Producers (D) Omnivores

Q.9 An artificial ecosystem is -
(A) Lake (B) Ocean
(C) Aquarium (D) Forest

Q.10 Ozone shield protects us from -
(A) Cosmic rays (B) UV–C
(C) UV–B (D) Both (B) and (C)

Q.11 Organisation involved in formulating programmers for protecting environment is -
(A) WHO (B) UNDP
(C) UNEP (D) UNICEF

Very Short Answer Type Questions :

Q.1 Name a component of environment which is both a resource and a regulatory factor.

Q.2 Define garbage.

Q.3 Define a nonbiodegradable waste.

Q.4 Name a natural ecosystem.

Q.5 Name a man-made ecosystem.

Q.6 What are microconsumers?

Short Answer Type Questions :

Q.7 Differentiate between herbivores and consumers.

Q.8 Describe the various categories of consumers.

Q.9 Describe a forest food chain.

Q.10 Write a note on ozone depletion.

Long Answer Type Questions :

Q.11 Describe the biological components of an ecosystem.

Q.12 Explain briefly what you know about food web. Give its importance.

Management of Natural Resources

Single Choice Type Questions :

Q.1 Soil erosion can be prevented by -
(A) Afforestation
(B) Deforestation
(C) Overgrazing
(D) Removal of vegetation

Q.2 Mild grazing in grasslands by herbivores -
(A) Retards growth of grasses
(B) Stimulates growth of grasses
(C) Destroys vegetation
(D) Arrests growth of grasses

Q.3 Measurement of water pollution is made by -
(A) Coliform count (B) BOD
(C) pH (D) All the above

Q.4 Ganga Action Plant was started in -
(A) 1973 (B) 1985
(C) 1971 (D) 1983

Q.5 Which of the following is not the function of forest ?
(A) It is used to make paper
(B) Resin, gum and drugs are obtained
(C) Controls flood
(D) Causes soil erosion

Q.6 Biodiversity hotspots are -
(A) Oceans (B) Glaciers
(C) River (D) Forests

Q.7 Forest is an -
(A) Exhaustible resources
(B) Renewable resource
(C) Inexhaustibe resource
(D) Both A and B

Q.8 Petroleum is -
(A) Inexhaustible resource
(B) Exhasutible resource
(C) Nonrenewable resource
(D) Both B and C

Q.9 Animals get extinct mainly due to -
(A) Predation
(B) Habitat destruction
(C) Afforestation Pollution
(D) Pollution

Q.10 Indira Gandhi Canal has brought greenery to -
(A) Haryana (B) Rajasthan
(C) Karnataka (D) Andhra Pradesh

Very Short Answer Type Questions :

Q.1 What is natural resource?

Q.2 When was Ganga Plan started?

Q.3 What is recycling?

Q.4 What is reforestation?

Short Answer Type Questions :

Q.5 Why had Ganga become polluted?

Q.6 Why should we conserve forests and wildlife?

Q.7 What will happen if deforestation takes place?

Long Answer Type Questions :

Q.8 Define natural resource with examples.

Q.9 Write a note on water harwesting?

MATHEMATICS

Real Numbers

Solve the following Questions :

Q.1 Classify the following numbers as rational or irrational :

(i) $\frac{22}{7}$ (ii) 3.1416

(iii) π (iv) $3.\overline{142857}$

(v) 5.636363..... (vi) 2.040040004.....

(vii) 1.535335333.... (viii) 3.121221222...

(ix) $\sqrt{21}$ (x) $\sqrt[3]{3}$

Q.2 Without actual division, show that each of the following rational numbers is a non-terminating repeating decimal :

(i) $\frac{11}{(2^3 \times 3)}$ (ii) $\frac{73}{(2^3 \times 3^3 \times 5)}$ (iii) $\frac{9}{35}$

(iv) $\frac{32}{147}$ (v) $\frac{64}{455}$ (vi) $\frac{77}{210}$

(vii) $\frac{29}{343}$ (viii) $\frac{129}{(2^2 \times 5^7 \times 7^5)}$

Q.3 Express each of the following as a fraction in simplest form :

(i) $0.\overline{8}$ (ii) $2.\overline{4}$ (iii) $0.\overline{24}$

(iv) $0.1\overline{2}$ (v) $2.2\overline{4}$ (vi) $0.3\overline{65}$

Q.4 Using Euclid's algorithm, find the HCF of

(i) 405 and 2520 (ii) 504 and 1188

(iii) 960 and 1575

Q.5 The HCF of two numbers is 11 and their LCM is 7700. If one of the numbers is 275, find the other.

Q.6 Three pieces of timber 42 m, 49 m and 63 m long have to be divided into planks of the same length. What is the greatest possible length of each plank ?

Q.7 Find the maximum number of students among whom 1001 pens and 910 pencils can be distributed in such a way that each student gets the same number of pens and the same number of pencils.

Q.8 Three sets of English, Mathematics and Science books containing 336, 240 and 96 books respectively 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. How many stacks will be there ?

Q.9 Three measuring rods are 64 cm, 80 cm and 96 cm in length. Find the least length of cloth that can be measured an exact number of times, using any of the rods.

Q.10 An electronic device makes a beep after every 60 seconds. Another device makes a beep after every 62 seconds. They beeped together at 10 am. At what time will they beep together at the earliest ?

Q.11 Six bells commence tolling together and toll at intervals of 2, 4, 6, 8, 10, 12 minutes respectively. In 30 hours, how many times do they toll together ?

Polynomials

Short Answer Type Questions :

Q.1 Simplify : $\sqrt{2a^2 + 2\sqrt{6}ab + 3b^2}$

Q.2 Find the value of k if (x – 2) is a factor of $2x^3 - 6x^2 + 5x + k$.

Q.3 $p(x) = 3x^6 - 7x^5 + 7x^4 - 3x^3 + 2x^2 - 2, q(x) = x - 1$

Long Answer Type Questions :

Q.4 Find the zeros of the polynomial $f(x) = 2x^2 + 5x - 12$ and verify the relation between its zeroes and coefficients.

Q.5 Obtain the zeroes of the quadratic polynomial $\sqrt{3}x^2 - 8x + 4\sqrt{3}$ and verify the relation between its zeroes and coefficients.

Q.6 Find a cubic polynomial with the sum of its zeroes, sum of the products of its zeroes taken two at a time and the product of its zeroes as 2, –7 and –14 respectively.

Q.7 Divide $5x^3 - 13x^2 + 21x - 14$ by $(3 - 2x + x^2)$ and verify the division algorithm.

Q.8 What real number should be subtracted from the polynomial $(3x^3 + 10x^2 - 14x + 9)$ so that $(3x - 2)$ divides it exactly?

Q.9 Find all the zeroes of $(2x^4 - 3x^3 - 5x^2 + 9x - 3)$, it being given that two of its zeroes are $\sqrt{3}$ and $-\sqrt{3}$.

Q.10 If $\left(x - \frac{1}{x}\right) = \frac{1}{2}$, then find $\left(4x^2 + \frac{4}{x^2}\right)$.

Q.11 If $\left(x + \frac{1}{x}\right) = 4$, then find $\left(x^4 + \frac{1}{x^4}\right)$.

Q.12 If $x^3 + 6x^2 + 4x + k$ is exactly divisible by $(x + 2)$, then find the value of k.

Q.13 Find a quadratic polynomial whose one zero is $5 + \sqrt{7}$.

Q.14 Find all the zeros of the polynomial $(2x^4 - 11x^3 + 7x^2 + 13x - 7)$, it being given that two if its zeros are $(3 + \sqrt{2})$ and $(3 - \sqrt{2})$.

Q.15 If α, β are the zeros of the polynomial $f(x) = x^2 - 5x + k$ such that $\alpha - \beta = 1$, find the value of k.

Q.16 Use remainder theorem to find the value of k, it being given that when $x^3 + 2x^2 + kx + 3$ is divided by $(x - 3)$, then the remainder is 21.

Linear Equation in Two Variables

Very Short Answer Type Questions :

Q.1 **In each of the following verify whether the given value of the x is a solution or not :**

$$\frac{5x + 4}{4} - \frac{3x - 2}{2} = 5, \; x = \frac{1}{2}$$

Q.2 Draw the graph of $y = -2x$. Show that the point $(2, -5)$ is not on the graph.

Short Answer Type Questions :

Q.3 Draw the graph of (i) $x = 3$ (ii) $y = -2$.

Q.4 Express x in terms of y, it is being given that $7x - 3y = 15$. Check if the line represented by the given equation intersects the y-axis at $y = -5$

Q.5 The following observed values of x and y are thought to fulfil the law $y = ax + b$. Find the values of a and b.

x	1	2	–3	0	5
y	12	19	–16	5	–30

Q.6 Solve the following system of equations graphically. Also, find out the points, where these lines meet the x-axis.

$x - 2y = 1$
$2x + y = 7$

Q. 7 Solve the following pair of linear equations by the substitution method :

(i) $7x - 15y = 2$ (ii) $2x + 3y = 9$
$x + 2y = 3$ $4x + 6y = 18$

(iii) $x + 2y = 5$ (iv) $0.2x + 0.3y = 1.3$
$2x + 3y = 8$ $0.4x + 0.5y = 2.3$

(v) $x + 2y = -1$ (vi) $3x - 5y + 1 = 0$
$2x - 3y = 12$ $x - y + 1 = 0$

Q. 8 Solve the following equations by the method of elimination by equating the coefficients.

(i) $12x + 5y = 17$; $7x - y = 6$

(ii) $17x + 12y = -2$; $15x + 8y = 6$

(iii) $23x + 17y = 6$; $39x - 19y = 58$

(iv) $43x - 37y = 31$; $13x + 23y = -59$

(v) $0.4x + 3y = 1.2$, $7x - 2y = \frac{17}{6}$

(vi) $(a + 2b)x + (2a - b)y = 2$,
$(a - 2b)x + (2a + b)y = 3$

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

Q.9 Solve the following system of equations by cross-multiplication method :

(i) $\frac{2}{x - 1} + \frac{3}{y + 1} = 2$

$\frac{3}{x - 1} + \frac{2}{y + 1} = \frac{13}{6}$, $x \neq 1$, $y \neq -1$

(ii) $\frac{5}{x + y} - \frac{2}{x - y} = -1$

$\frac{15}{x + y} + \frac{7}{x - y} = 10$; $x + y \neq 0$, $x - y \neq 0$

Q.10 For what value of k will the following system of equations have infinitely many solutions.

(i) $7x - y = 5$ and $21x - 3y = k$

(ii) $5x + 2y = k$ and $10x + 4y = 3$

(iii) $kx + 4y = k - 4$ and $16x + ky = k$

Q.11 Find the conditions so that the following systems of equations have infinitely many solutions.

(i) $3x - (a + 1)y = 2b - 1$ and $5x + (1 - 2a)y = 3b$, find a and b.

(ii) $2x + 3y = 7$ and $(p + q)x + (2p - q)y = 3(p + q + 1)$, find p and q.

(iii) $2x - (2a + 5)y = 5$ and $(2b + 1)x - 9y = 15$, find a and b.

Q.12 Solve the following pair of linear equations

(i) $\frac{1}{2x} - \frac{1}{y} = -1$.

$\frac{1}{x} + \frac{1}{2y} = 8$, $x \neq 0$, $y \neq 0$

(ii) $\frac{2}{x} + \frac{2}{3y} = \frac{1}{6}$, $\frac{3}{x} + \frac{2}{y} = 0$; $x \neq 0$ $y \neq 0$

and hence, find a for which $y = ax - 4$.

(iii) $\frac{1}{7x} + \frac{1}{6y} = 3,$

$\frac{1}{2x} - \frac{1}{3y} = 5;\ x \neq 0\ y \neq 0$

(iv) $\frac{m}{x} - \frac{n}{y} = a,$

$px - qy = 0;\ x \neq 0\ y \neq 0$

(v) $\frac{2}{y} + \frac{3}{x} = \frac{7}{xy},$

$\frac{1}{y} + \frac{9}{x} = \frac{11}{xy};\ x \neq 0,\ y \neq 0$

(vi) $\frac{xy}{x+y} = \frac{6}{5},$

$\frac{xy}{y-x} = 6;\ xy \neq 0,\ y \neq 0$

(vii) $x + y = 5xy$

$3x + 2y = 13\ xy$

Q.13 3 bags and 4 pens together cost ₹ 257 whereas 4 bags and 3 pens together cost ₹ 324. Find the total cost of 1 bag and 10 pens.

Q.14 Five years hence, father's age will be three times the age of his son. Five years ago, father was seven times as old as his son Find their present ages.

Q.15 The sum of a two-digit number and the number formed by interchanging its digits is 110. If 10 is subtracted from the first number, the new number is 4 more than 5 times the sum of the digits in the first number. Find the first number.

Q.16 The sum of the numerator and denominator of a fraction is 18. If the denominator is increased by 2, the fraction reduces to 1/3. Find the fraction.

Q.17 The length of a rectangle exceeds its width by 8 cm and the area of the rectangle is 240 sq. cm. Find the dimensions of the rectangle.

Q.18 The area of a rectangle gets reduced by 8 sq. metres, if its length is reduced by 5 metres and width is increased by 3 metres. If we increase the length by 3 metres and breadth by 2 metres, the area is increased by 74 sq. metres. Find the length and breadth of the rectangle.

Long Answer Type Questions :

Q.19 Solve for x

$$\frac{4x+17}{18} - \frac{13x-2}{17x-32} + \frac{x}{3} = \frac{7x}{12} - \frac{x+16}{36}$$

Q.20 Solve the following system of equations by cross-multiplication method :

(i) $ax + by = a^2$

$bx + ay = b^2$

(ii) $\frac{2x}{a} + \frac{y}{b} = 2.$

$\frac{x}{a} - \frac{y}{b} = 4;\ a \neq 0,\ b \neq 0$

(iii) $x - y = a + b$

$ax + by = a^2 - b^2$

(iv) $\frac{x}{a} + \frac{y}{b} = 2,$

$ax - by = a^2 - b^2;\ a \neq 0,\ b \neq 0$

(v) $x + y = a + b$

$ax - by = a^2 - b^2$

Q.21 Two numbers are in the ratio of 3 : 4. If 8 is added to each number, they become in the ratio of 4 : 5. Find the numbers.

Q.22 A two-digit number is 4 times the sum of its digits. If 18 is added to the number, the digit are reversed. Find the number.

Q.23 In a factory, women are 35% of all the workers, the rest of the workers being men. The number of men exceeds that of women by 252. Find the total number of workers in the factory.

Q.24 Solution of the equation

Column 1	**Column 2**
(i) $\frac{2x-3}{5} + \frac{x+3}{4} = \frac{4x+1}{7}$ is	(A) 7
(ii) $\frac{7x-1}{4} - \frac{1}{3}\left[2x - \frac{1-x}{2}\right] = \frac{19}{3}$	(B) $-\frac{41}{11}$
(iii) $\frac{4x+5}{6} - \frac{2(2x+7)}{3} = \frac{3}{2}$, is	(C) $\frac{1}{11}$

Q.25 Solution of the equation

Column 1	**Column 2**
(i) $\frac{2y-3}{5} + \frac{y-3}{4} = \frac{4y+1}{7}$	(A) $\frac{8}{5}$
(ii) $\frac{3}{x-1} + \frac{4}{x-2} = \frac{7}{x-3}$, $x \neq 1, 2, 3$ है	(B) $\frac{209}{11}$
(iii) $(x + 1)(2x + 1) = (x + 3)(2x + 3) - 14$, है	(C) 1

Q.26 The age of a father is twice that of the elder son. Ten years hence the age of the father will be three times that of the younger son. If the difference of ages of the two sons is 15 years, then find the age of the father.

Q.27 If $2^x - 2^{x-1} = 4$, then find x^x.

Q.28 The monthly incomes of A and B are in the ratio 8 : 7 and their expenditures are in the ratio 19 : 16. If each saves ₹5000 per month, find the monthly income of each.

Q.29 Places A and B are 160 km apart on a highway. One car starts from A and another from B at the same time. If they travel in the same direction, they meet in 8 hours. But, if they travel towards each other, they meet in 2 hours. Find the speed of each car.

Q.30 Taxi charges in a city consist of fixed charges per day and the remaining depending upon the distance travelled in kilometers. If a person travels 110 km, he pays ₹1130, and for travelling 200 km, he pays ₹ 1850. Find the fixed charges per day and the rate per km.

Q.31 Points A and B are 70 km apart on a highway. A car starts from A and another car starts from B simultaneously. If they travel in the same direction, they meet in 7 hours. But, if they travel towards each other, they meet in 1 hour. Find the speed of each car.

Q.32 If twice the son's age in years is added to the mother's age, the sum is 70 years. But, if twice the mother's age is added to the son's age, the sum is 95 years. Find the age of the mother and that of the son.

Trigonometry

Solve the following Questions :

Q.1 Without using trigonometric tables evaluate the following :

(i) $\frac{\sin 20^\circ}{\cos 70^\circ}$ (ii) $\frac{\cos 19^\circ}{\sin 71^\circ}$ (iii) $\frac{\sin 21^\circ}{\cos 69^\circ}$

(iv) $\frac{\tan 10^\circ}{\cot 80^\circ}$ (v) $\frac{\sec 11^\circ}{\operatorname{cosec} 79^\circ}$ (vi) $\frac{\sin 20^\circ 30'}{\cos 69^\circ 30'}$

Q.2 Without using trigonometric tables evaluate the following :

(i) $\sin^2 20^\circ + \sin^2 70^\circ - \tan^2 45^\circ$

(ii) $\sec 50^\circ \sin 40^\circ + \cos 40^\circ \operatorname{cosec} 50^\circ$

Q.3 Without using trigonometric tables prove the following :

(i) $\tan 20^\circ \tan 35^\circ \tan 45^\circ \tan 55^\circ \tan 70^\circ = 1$

(ii) $\sin 48^\circ \sec 42^\circ + \cos 48^\circ \operatorname{cosec} 42^\circ = 2$

(iii) $\sin 63^\circ \cos 27^\circ + \cos 63^\circ \sin 27^\circ = 1$

(iv) $\frac{\sin 70^\circ}{\cos 20^\circ} + \frac{\operatorname{cosec} 20^\circ}{\sec 70^\circ} - \cos 70^\circ \operatorname{cosec} 20^\circ = 1$

(v) $\frac{\cos 80^\circ}{\sin 10^\circ} + \cos 59^\circ \operatorname{cosec} 31^\circ = 2$

Q.4 Prove the following :

(i) $\sin\theta \sin(90^\circ - \theta) - \cos\theta \cos(90^\circ - \theta) = 0$

(ii) $\frac{\sin\theta \cos(90^\circ - \theta)\cos\theta}{\sin(90^\circ - \theta)} + \frac{\cos\theta \sin(90^\circ - \theta)\sin\theta}{\sin(90^\circ - \theta)} = 1$

(iii) $\frac{\sin\theta}{\sin(90^\circ - \theta)} + \frac{\cos\theta}{\cos(90^\circ - \theta)} = \sec\theta \operatorname{cosec}\theta$

(iv) $\sin(90^\circ - \theta)\cos(90^\circ - \theta) = \frac{\tan\theta}{1 + \cot^2(90^\circ - \theta)}$

(v) $\frac{\cos(90^\circ - \theta)}{1 + \sin(90^\circ - \theta)} + \frac{1 + \sin(90^\circ - \theta)}{\cos(90^\circ - \theta)} = 2\operatorname{cosec}\theta$

(vi) $\frac{1}{1 + \cos(90^\circ - \theta)} + \frac{1}{1 - \cos(90^\circ - \theta)}$

$= 2 \operatorname{cosec}^2(90^\circ - \theta)$

(vii) $\sin^2(90^\circ - \theta)(1 + \cot^2(90^\circ - \theta)) = 1$

(viii) $\frac{\cos(90^\circ - \theta)\sec(90^\circ - \theta)\tan\theta}{\operatorname{cosec}(90^\circ - \theta)\sin(90^\circ - \theta)\cot(90^\circ - \theta)} + \frac{\tan(90^\circ - \theta)}{\cot\theta} = 2$

(ix) $\frac{\tan(90^\circ - A)\cot A}{\operatorname{cosec}^2 A} - \cos^2 A = 0$

(x) $\frac{\cos(90^\circ - A)\sin(90^\circ - A)}{\tan(90^\circ - A)} = \sin^2 A$

Q.5 Without using trigonometric tables, evaluate each of the following :

(i) $\sec^2 10^\circ - \cot^2 80^\circ + \frac{\sin 15^\circ \cos 75^\circ + \cos 15^\circ \sin 75^\circ}{\cos\theta \sin(90^\circ - \theta) + \sin\theta \cos(90^\circ - \theta)}$

(ii) $\sin(50^\circ + \theta) - \cos(40^\circ - \theta) + \tan 1^\circ \tan 10^\circ \tan 20^\circ \tan 70^\circ \tan 80^\circ \tan 89^\circ$

(iii) $\cot\theta \tan(90^\circ - \theta) - \sec(90^\circ - \theta)\operatorname{cosec}\theta + \sin^2 25^\circ + \sin^2 65^\circ + \sqrt{3}(\tan 5^\circ \tan 45^\circ \tan 85^\circ)$

(iv) $\cot\theta \tan(90^\circ - \theta) - \sec(90^\circ - \theta)\operatorname{cosec}\theta + \sqrt{3}(\tan 5^\circ \tan 30^\circ \tan 85^\circ) + \sin^2 25^\circ + \sin^2 65^\circ$

(v) $\frac{-\tan\theta \cot(90^\circ - \theta) + \sec\theta \operatorname{cosec}(90^\circ - \theta)}{\tan 10^\circ \tan 20^\circ \tan 45^\circ \tan 70^\circ \tan 80^\circ} + \frac{\sin^2 35^\circ + \sin^2 55^\circ}{\tan 10^\circ \tan 20^\circ \tan 45^\circ \tan 70^\circ \tan 80^\circ}$

Q.6 If $\sin\theta = 8/17$ and $0^\circ < \theta < 90^\circ$, find $\tan\theta$.

Q.7 If $\sin A = \frac{24}{25}$, find the value of $\tan A + \sec A$, where $0^\circ < A < 90^\circ$.

Q.8 If $5\tan\theta = 12$, find the value of $\frac{2\cos\theta + \sin\theta}{\sin\theta - \cos\theta}$.

Q.9 If $\tan\theta = \frac{12}{5}$, find the value of $\frac{1+\sin\theta}{1-\sin\theta}$.

Q.10 If $\tan A = \frac{1}{2}$ and $\tan B = \frac{1}{3}$, by using $\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$, prove that $A + B = 45^\circ$

Q.11 If $4\tan\theta = 3$, find the value of $\frac{4\sin\theta - 2\cos\theta}{4\sin\theta + 3\cos\theta}$.

Q.12 If $\operatorname{cosec}\theta = \frac{13}{12}$, find the value of $\frac{2\sin\theta - 3\cos\theta}{4\sin\theta - 9\cos\theta}$.

Q.13 Find the value of $\left(\frac{3\pi}{5}\right)$ radians in degrees.

Q.14 If $\tan\theta = \frac{x}{y}$, then find the value of $\left(\frac{x\sin\theta + y\cos\theta}{x\sin\theta - y\cos\theta}\right)$.

Q.15 If $\tan\theta = \frac{1}{\sqrt{7}}$, then find the value of $\left(\frac{\operatorname{cosec}^2\theta - \sec^2\theta}{\operatorname{cosec}^2\theta + \sec^2\theta}\right)$.

Q.16 If $\tan\theta = \frac{4}{3}$, then find the value of $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}}$.

Q.17 Find the value of $(\sin A + \cos A)^2 + (\sin A - \cos A)^2$.

Q.18 Find the value of $\sqrt{\frac{1+\sin A}{1-\sin A}}$.

Q.19 Find the value of $\sqrt{\frac{1-\sin A}{1+\sin A}}$.

Q.20 Find the value of $\sqrt{\frac{1-\cos x}{1+\cos x}}$.

Q.21 Find the value of $\sqrt{\frac{1+\cos x}{1-\cos x}}$.

Q.22 Find the value of $\sqrt{\frac{\sec x - \tan x}{\sec x + \tan x}}$.

Q.23 Find the value of $\left(\frac{\cot\theta}{\cot\theta - \cot 3\theta} + \frac{\tan\theta}{\tan\theta - \tan 3\theta}\right)$.

Q.24 Find the value of $\left(\frac{\sin A + \sin B}{\cos A + \cos B} + \frac{\cos A - \cos B}{\sin A - \sin B}\right)$.

Q.25 If $x = r\sin A\cos B$, $y = r\sin A\sin B$ and $z = r\cos A$, then which is correct ?

(A) $x^2 + y^2 + z^2 = r^2$ (B) $x^2 - y^2 + z^2 = r^2$

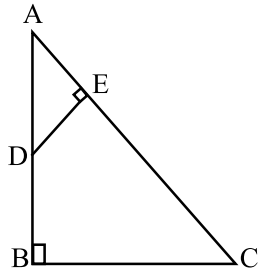
(C) $x^2 + y^2 - z^2 = r^2$ (D) $-x^2 + y^2 + z^2 = r^2$

Similar Triangles

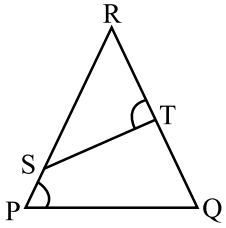
Very Short Answer Type Questions :

Q.1 In ΔABC, $\angle B = 2\angle C$ and the bisector of $\angle B$ intersects AC and D. Prove that $\frac{BD}{DA} = \frac{BC}{BA}$.

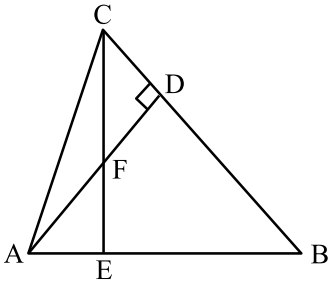
Q.2 In fig. if $AB \perp BC$ and $DE \perp AC$. Prove that $\Delta ABC \sim \Delta AED$.



Q.3 In fig. if $\angle P = \angle RTS$, prove that $\Delta RPQ \sim \Delta RTS$.



Q.4 In fig. AD and CE are two altitudes of ΔABC.



Prove that

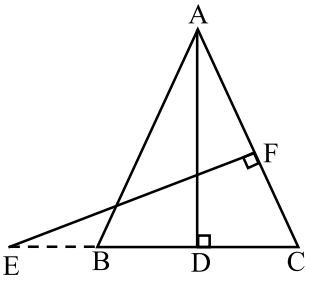
(i) Δ AEF ~ Δ CDF

(ii) Δ ABD ~ Δ CBE

(iii) Δ AEF ~ Δ ADB

(iv) Δ FDC ~ Δ BEC

Q.5 In fig. E is a point on side CB produced of an isosceles triangle ABC with AB = AC. If AD ⊥ BC and EF ⊥ AC, prove that Δ ABD ~ Δ ECF.



Short Answer Type Questions :

Q.6 (i) In fig.1, if AB || CD, find the value of x.

(ii) In fig.2, if AB || CD, find the value of x.

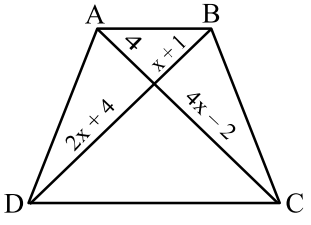


Fig.1

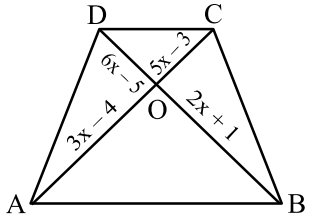


Fig.2

(iii) In fig.3, AB || CD. If OA = 3x – 19, OB = x – 4, OC = x – 3 and OD = 4, find x.

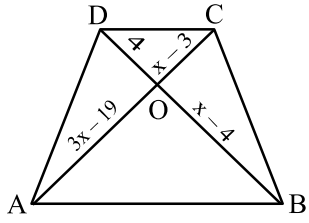
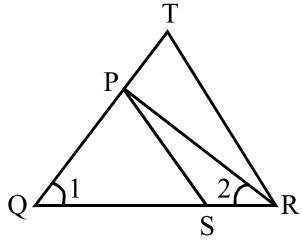


Fig.3

Q.7 In Δ ABC, D is the mid-point of BC and ED is the bisector of the ∠ADB and EF is drawn parallel to BC cutting AC in F. Prove that ∠EDF is a right angle.

Q. 8 In fig. if $\frac{QT}{PR} = \frac{QR}{QS}$ and ∠1 = ∠2. Prove that ΔPQS ~ ΔTQR



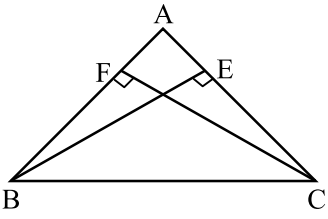
Q. 9 If CD and GH (D and H lie on AB and FE) are respectively bisectors of ∠ACB and ∠EGF and Δ ABC ~ ΔFEG, prove that

(i) Δ DCA ~ Δ HGF

(ii) $\frac{CD}{GH} = \frac{AC}{FG}$

(iii) Δ DCB ~ Δ HGE

Q.10 In a ΔABC, the angles at B and C are acute. If BE and CF be drawn perpendiculars on AC and AB respectively, prove that



(i) $BC^2 = AB \times BF + AC \times CE$.

(ii) $AC^2 = AB^2 + BC^2 - 2AB.\ BF$

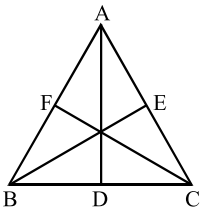
(iii) $AB^2 = BC^2 + AC^2 - 2AC\ .\ CF$

Q.11 For a triangle ABC, the true statement is –

(A) $AC^2 = AB^2 + BC^2$ (B) AC = AB + BC

(C) AC > AB + BC (D) AC < AB + BC

Q.12 If AD, BE and CF are the medians of a triangle ABC, then the true statement is –



(A) $AB^2 + BC^2 + AC^2 = AD^2 + BE^2 + CF^2$

(B) $2 (AB^2 + BC^2 + AC^2)$
$= 3 (AD^2 + BE^2 + CF^2)$

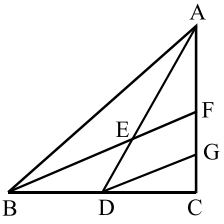
(C) $3 (AB^2 + BC^2 + AC^2)$
$= 4 (AD^2 + BE^2 + CF^2)$

(D) $AB^2 + BC^2 + AC^2$
$= 3 (AD^2 + BE^2 + CF^2)$

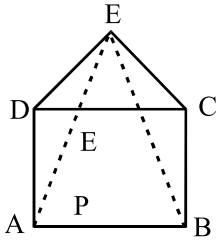
(E) $AB^2 + AC^2 = 2AD^2 + 1/2\ BC^2$

Q.13 In a right angled triangle, one of the angles is 60º. Find the side opposite to this angle.

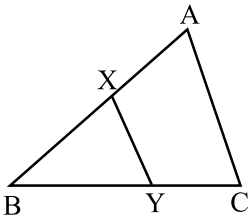
Q.14 In Δ ABC, AD is the median through A and E is the mid point of AD and BE produced meets AC in F. Then, find AF.



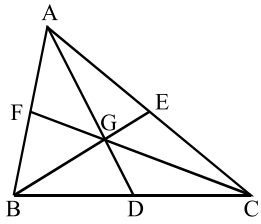
Q.15 If ABCD is a square and DCE is an equilateral triangle in the given figure, then find ∠ DAE.



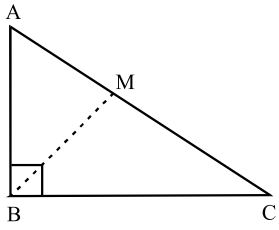
Q.16 In the adjoining figure, XY is parallel to AC. If xy divides the triangle into equal parts, then find the value of $\frac{AX}{AB}$.



Q.17 In Δ ABC, the medians BE and CF intersect at G. AGD is a line meeting BC in D. If GD is 1.5 cm, then find AD.



Q.18 In the given figure, ∠ ABC = 90º and BM is a median, AB = 8 cm and BC = 6 cm. Then, find length BM.



Long Answer Type Questions :

Q.19 In Δ ABC, the bisector of ∠B meets AC at D. A line PQ || AC meets AB, BC and BD at P, Q and R respectively. Show that

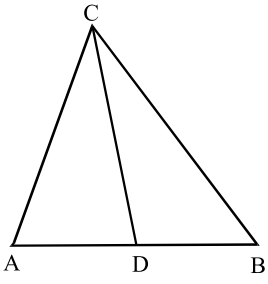
(i) $PR \cdot BQ = QR \cdot BP$

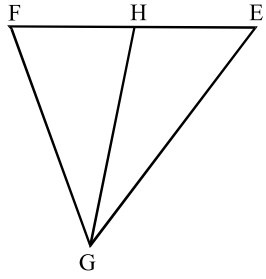
(ii) $AB \times CQ = BC \times AP$.

Q.20 In fig. CD and GH are respectively the medians of ΔABC and ΔEFG. If ΔABC ~ ΔFEG.

Prove that

(i) Δ ADC ~ Δ FHG (ii) $\frac{CD}{GH} = \frac{AB}{FE}$

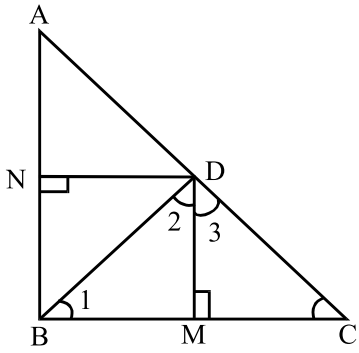




(iii) Δ CDB ~ Δ GHE

Q.21 In trapezium ABCD, AB || DC and DC = 2 AB. EF drawn parallel to AB cuts AD in F and BC in E such that $\frac{BE}{EC} = \frac{3}{4}$. Diagonal DB intersects EF at G. Prove that 7 FE = 10 AB.

Q.22 In fig. ABC is a right triangle right angled at B and D is the foot of the perpendicular drawn from B on AC. If DM ⊥ BC and DN ⊥ AB.

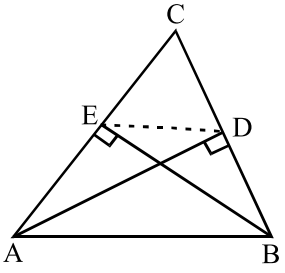


सिद्ध करो कि

(i) $DM^2 = DN \times MC$

(ii) $DN^2 = DM \times AN$

Q.23 In fig. AD and BE are respectively perpendiculars to BC and AC.



Show that

(i) Δ ADC ~ Δ BEC

(ii) CA × CE = CB × CD

(iii) Δ ABC ~ Δ DEC

(iv) CD × AB = CA × DE

Q.24 ABC is an isosceles triangle with AB = AC and D is a point on AC such that $BC^2 = AC \times CD$. Prove that BD = BC.

Q.25 Prove that the sum of the squares of the diagonals of a parallelogram is equal to the sum of the squares of its sides.

Statistics

Very Short Answer Type Questions :

Q.1 Find the range of the following array of data :

70, 65, 71,36, 55, 61, 62, 41, 40, 39, 35.

Q.2 The weights (in kilograms) of 25 students are given as follows :

35, 38, 36, 37, 38, 35, 37, 36, 35, 38, 36, 36, 37, 37, 35, 38, 36, 35, 36, 37, 37, 38, 36, 38, 37.

Complete the following frequency table:

Weights	35	36	37	38
Frequency	–	–	–	–

Q.3 The marks scored by 55 students in a test are given below :

Marks	No. of students
0-5	2
5-10	6
10-15	13
15-20	17
20-25	11
25-30	4
30-35	2

Prepare a cumulative frequency table.

Apply Direct method to find arithmetic mean in each of the following :

Q.4

Class-interval	0–6	6–12	12–18	18–24	24–30
Frequency	7	5	10	12	6

Q.5

Class-interval	100–120	120–140	140–160	160–180	180–200
Frequency	10	20	30	15	5

Q.6 Find out the mode for the following data showing frequency with which profits are made:

Profits (in '000 rupees)	Frequency
3 – 4	83
4 – 5	27
5 – 6	25
6 – 7	50
7 – 8	75
8 – 9	38
9 –10	18

Q.7 Find the mode of the following series :

Wages (Rs.)	No. of persons
0 – 25	10
25 – 50	30
50 – 75	40
75 – 100	25
100 – 125	20
125 – above	15

Q.8 Compute the mode of the following distribution

x	f
0 – 5	20
5 – 10	24
10 – 15	32
15 – 20	28
20 – 25	20
25 – 30	16
30 – 35	17
35 – 40	10
40 – 45	18

Short Answer Type Questions :

Q.9 Draw a frequency table for the following data:

C.I.	C.F.
111-120	6
121-130	11
131-140	16
141-150	20
151-160	27
161-170	36
171-180	42
181-190	45
191-200	50

Q.10 Form the cumulative frequency table of less than series from following data :

C.I.	Frequency
0-10	3
10-20	12
20-30	36
30-40	76
40-50	97
50-60	85
60-70	39
70-80	12
80-90	12
90-100	6

Q.11 Construct a c.f. table for the following data :

C.I.	Frequency
4-7	3
8-11	10
12-15	12
16-19	8
20-23	5
24-27	9

Q.12 The water bills (in ruppees) of 32 houses in a certain street for the period 1.1.98 to 31.3.98 are given below :

56, 43, 32, 38, 56, 24, 68, 85, 52, 47, 35, 58, 63, 74, 27, 84, 69, 35, 44, 75, 55, 30, 54, 65, 45, 67, 95, 72, 43, 65, 35, 59.

Tabulate the data and present the data as cumulative frequency table using 70-79 as one of the clas intervals.

Q.13 The weights (in kg) of 15 students are : 31, 35, 27, 29, 32, 43, 37, 41, 34, 28, 36, 44, 45, 42, 30. Find the median. If the weight 44 kg is replaced by 46 kg and 27 kg by 25 kg, find the new median.

Q.14 Find the mode of the following data in each case:

(i) 14, 25, 14, 28, 18, 17, 18, 14, 23, 22, 14, 18

(ii) 7, 9, 12, 7, 12, 13, 15, 7, 12, 7, 25, 18, 7

Apply Deviation method to find arithmetic mean in each of the following:

Q.15

Class-interval	0–10	10–20	20–30	30–40	40–50
Frequency	12	11	8	10	9

Q.16

Class-interval	0–10	10–20	20–30	30–40	40–50
Frequency	7	8	12	13	10

Q.17

Class-interval	20–30	30–40	40–50	50–60	60–70	70–80
Frequency	13	18	20	27	12	10

Q.18

Class-interval	Frequency
0–50	4
50–100	10
100–150	12
150–200	10
200–250	8
250–300	6

Q.19

Class-interval	Frequency
0–20	8
20–40	10
40–60	15
60–80	10
80–100	7

Q.20

Class-interval	Frequency
0–10	8
10–20	12
20–30	10
30–40	11
40–50	9

Q.21 Find the mode for the following data :

Age	Frequency
0–6	6
6–12	11
12–18	25
18–24	35
24–30	18
30–36	12
36–42	6

Q.22 Calculate the mode for the following data concerning to the students of X class

Marks	No. of students
20–29	5
30–39	12
40–49	15
50–59	20
60–69	18
70–79	10
80–89	6
90–99	4

Long Answer Type Questions :

Q.23 Represent the following data by an ogive:

Daily earning	No. of shops
0-20	3
20-40	5
40-60	12
60-80	2
80-100	3
100-120	2
120-140	2
140-160	1

Q.24 Plot a cumulative frequency diagram the following distribution :

C.I.	Frequency
0-9	5
10-19	15
20-29	20
30-39	25
40-49	17
50-59	11
60-69	7

Q.25 Draw a cumulative frequency diagram.

Score	No. of students
20-30	20
30-40	35
40-50	40
50-60	32
60-70	24
70-80	27
80-90	18
90-100	34

Q.26 Draw an orgive to represent the following frequency distribution of marks scored by 750 students.

Marks	No. of students
600-640	16
640-680	45
680-720	156
720-760	284
760-800	172
800-840	59
840-880	18

Q.27 The demand of different shirt sizes, as obtained by a survey, is given below :

size	38	39	40	41	42	43	44	Total
Number of persons (wearing it):	26	39	20	15	13	7	5	125

Find the modal shirt sizes, as observed from the survey

Apply short cut method to find arithmetic mean in each of the following :

Q.28

Class-interval	Frequency
0–50	17
50–100	24
100–150	42
150–200	45
200–250	36
250–300	14

Q.29

Class-interval	Frequency
0–8	8
8–16	10
16–24	15
24–32	9
32–40	8

Q.30 Determine the median from the following data :

Wages (in ₹)	No. of workers	Wages (in ₹)	No. of workers
20 – 40	4	100 – 120	12
40 – 60	6	120 – 140	7
60 – 80	10	140 – 160	3
80 – 100	16		

Q.31 The following is the frequency distribution of the marks obtained by 250 students in an examination. Compute the median

Marks obtained	No. of students
0 – 10	15
10 – 20	20
20 – 30	25
30 – 40	24
40 – 50	12
50 – 60	31
60 – 70	71
70 – 80	52

Q.32 Given the following information, determine the median

Age	No. of persons
20 – 25	50
25 – 30	70
30 – 35	100
35 – 40	180
40 – 45	150
45 – 50	120
50 – 55	70
55 – 60	60

Q.33 Following table gives the cumulative frequency of the age of a group of 199 teachers. Find the median age of the group.

Age in years	No. of persons
20 – 25	21
25 – 30	40
30 – 35	90
35 – 40	130
40 – 45	146
45 – 50	166
50 – 55	176
55 – 60	186
60 – 65	195
65 – 70	199

Q.34 Compute the median from the following distribution of monthly income (in Rs.) of locality.

No. of families	Income
Below 100	50
100 – 200	50
200 – 300	555
300 – 400	100
400 – 500	3
500 and above	2

Q.35 Draw a less than Ogive from the following frequency distribution.

Marks	No. of students
0 – 5	3
5 – 10	7
10 – 15	13
15 – 20	25
20 – 25	40
25 – 30	14
30 – 35	10

From the curve find out median.

Q.36 Draw a less than Ogive from the following frequency distribution.

Pocket Expences	No. of students
0 – 5	10
5 – 10	16
10 – 15	30
15 – 20	42
20 – 25	50
25 – 30	30
30 – 35	16
35 – 40	12

Find out the median from the curve.

Q.37 Draw a less than Ogive from the following frequency distribution.

Expenditure	No. of workers
100 – 150	25
150 – 200	40
200 – 250	33
250 – 300	28
300 – 350	30
350 – 400	22
400 – 450	16
450 – 500	8

Q.38 Draw a cumulative frequency curve for the following frequency distribution by more than Ogive method also find the median from the curve.

Weight (in kg)	No. of students
40 – 44	7
44 – 48	12
48 – 52	33
52 – 56	47
56 – 60	20
60 – 64	11
64 – 68	5

Quadratic Equations

Very Short Answer Type Questions :

Q.1 Find the value of each given polynomial at the given value of its variable :

(i) $5x^2 - 7x + 2$ at $x = 3$

(ii) $x^2 + 15x - 4$ at $x = -1$

(iii) $2y^2 - y + 2$ at $y = -2$

(iv) $3y + 8 - 2y^2$ at $y = -3$

(v) $\sqrt{2}\,x^2 + 3x + 1$ at $x = \sqrt{2}$

(vi) $x^3 - 3x^2 + 5x + 2$ at $x = -4$

(vii) $5\sqrt{2}\,x^3 + 2x^2 - \sqrt{2}\,x + 1$ at $x = 2\sqrt{2}$

Solve each of the following quadratic equations (Q.2 to Q. 8)

Q.2 $x^2 + 5x + 6 = 0$

Q.3 $x^2 + 5x - 6 = 0$

Q.4 $x^2 - 5x + 6 = 0$

Q.5 $3x^2 + 2ax - a^2 = 0$

Q.6 $8x^2 - 2x - 3 = 0$

Q.7 $x(4x - 7) = 0$

Q.8 $x(x - 1) + (x - 2)(x - 3) = 42$

Q.9 Find the discriminant of the following quadratic equations :

(i) $x^2 - 3x + 1 = 0$ (ii) $4x^2 + 3x - 2 = 0$

(iii) $x^2 - x + 1 = 0$ (iv) $9x^2 - px + 2 = 0$

(v) $ax^2 - 3x - 5 = 0$ (vi) $4x^2 - 5x + c = 0$

(vii) $\sqrt{2}\,x^2 + 5\sqrt{3}\,x - 2\sqrt{2} = 0$

(viii) $3\sqrt{5}\,x^2 - 8x + 2\sqrt{5} = 0$

Short Answer Type Questions :

Q.10 Find the roots (if they exist) of the following quadratic equation by the method of completing the square : $x^2 - 2\sqrt{5}\,x + 1 = 0$

Solve each of the following equations by using quadratic formula (Q.11 to Q.13)

Q.11 $x^2 - 2\sqrt{2}\,x - 6 = 0$

Q.12 $\sqrt{6}\,x^2 - 4x - 2\sqrt{6} = 0$

Q.13 $\sqrt{3}\,x^2 + 11x + 6\sqrt{3} = 0$

Long Answer Type Questions :

Q.14 Find the value of 'm' so that the roots of the equation :

$(4 - m)\,x^2 + (2m + 4)\,x + (8m + 1) = 0$ may be equal.

Q.15 For the quadratic equation $ax^2 + 7x + c = 0$; the sum of roots is –1 and the product of roots is 1 ; find the values of 'a' and 'c'.

Q.16 Find the value of p ; if one root of quadratic equation $3x^2 - px - 6 = 0$ is 3. Also, find the second (other) roots of the equation.

Q.17 If α and β are the roots of the equation $2x^2 + 5x - 4 = 0$; find the value of :

(i) $\alpha^2 + \beta^2$ (ii) $\alpha^2 + \beta^2 - 3\alpha - 3\beta$

(iii) $\alpha^2 + \beta^2 - 4\alpha\beta$ (iv) $\alpha^3 + \beta^3$

(v) $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$

Q.18 If α and β are the roots of the equation, $x^2 - 6x + 1 = 0$; find the value of :

(i) $\alpha^2 + \beta^2$ (ii) $\alpha^4 + \beta^4$

(iii) $\alpha^3 + \beta^3$ (iv) $\alpha^2 + \beta^2 - 2\alpha\beta$

Q.19 For each equation, given below, find the value (s) of p so that the equation has equal roots :

(i) $2x^2 - 7x + p = 0$

(ii) $6x^2 + 12x - p = 0$

(iii) $px^2 + 4x + p = 0$

(iv) $2px^2 - 20x + (13p - 1) = 0$

(v) $3px^2 + 18x + p = 0$

Q.20 The sum of the squares of two natural numbers is 116. If the square of the larger is 25 times the smaller, find the numbers.

Q.21 (i) The sum of the square of three consecutive natural numbers is 110, find the numbers.

(ii) Three consecutive natural numbers are such that the square of the middle number exceeds the different of the square of the other two by 60, find the numbers.

Q.22 The difference of two natural number is 4 and the difference of their reciprocals is $\frac{1}{8}$, find the numbers.

Q.23 A two digit number contains the bigger at ten's place. The product of the digit is 27 and the difference between the two digits is 6. find the number.

Q.24 A cottage industry produces a certain number of toys in a day. The cost of production of each toy (in rupees) was found to be 55 minus the number of toys produces in a day. On a particular day, the total cost reduction was Rs. 750. Find the number of toys produced on that day.

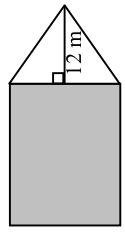
Q.25 The area of rectangular plot is 528 m^2. The length of the plot (in meters) is one more than twice its breadth. find the length and breadth of the plot.

Q.26 A rectangular garden 10 m by 16 m is to be surrounded by a concrete walk of uniform width. If the area of the walk is 120 m^2, find the width of the walk.

Q.27 The sum of the areas of two squares is 468 m^2. If the difference of their perimeters is 24 m, find the sides of the two squares.

Q.28 The altitude of a right triangle is 7 cm less than its base. If the hypotenuse is 13 cm, find the other two sides.

Q.29 A rectangular park is to be designed whose length is 3m more than its breadth. Its area is 4 square metres more than the area of a park that has already been made in the shape of an isosceles triangle with its base as the breadth of the rectangular park and of altitude 12 m (Shown in the adjoining figure). Find the dimensions of the rectangular park.



Q.30 A school bus transported an excursion party to a picnic spot 150 km away. While returning it was raining and the bus had to reduce its speed by 5 km / hr, and it took one hour longer to make the return trip. Find the time taken in return trip.

Q.31 An aeroplane flying with a wind of 30 km / hr takes 40 minutes less of fly 3600 km, than what it would have taken to fly the same wind. Find the plane's speed in still air.

Q.32 A motor boat whose speed is 18 km/hr in still water takes 1 hour more to go 24 km upstream than to return to the same spot. Find the speed of the stream.

Q.33 A trader bought a number of articles for Rs 900, five were damaged and he sold each of the rest at Rs 2 more than what he paid for it thus getting a profit of Rs 80 on the whole transaction. Find the number of articles he bought.

Q.34 (i) Rohan's mother is 26 years older than him. The product of their ages (in years) 3 years from now will be 360. What is Rohan's present age ?

(ii) Forty years hence Mr. Pratap's age will be square of what it was 32 years ago. Find his present age.

(iii) The sum of the ages of father and his son is 45 years. Five years ago, the product of their ages (in years) was 124. Find the present ages.

Arithmetic Progressons

Very Short Answer Type Questions :

Q.1 The first term of an A.P. is 5, the common difference is 3 and the last term is 80; find the number of terms.

Short Answer Type Questions :

Q.2 Find :

(i) 10^{th} term of the A.P. 1, 4, 7, 10, ...

(ii) 18^{th} term of the A.P. $\sqrt{2}$, $3\sqrt{2}$, $5\sqrt{2}$, ...

(iii) n^{th} term of the A.P. 13, 8, 3, –2, ...

Q.3 The 10^{th} and 18^{th} terms of an A.P. are 41 and 73 respectively. Find 26^{th} term.

Q.4 The 6^{th} and 17^{th} terms of an A.P. are 19 and 41 respectively, find the 40^{th} term.

Q.5 Find the sum of all integers between 84 and 719, which are multiples of 5.

Long Answer Type Questions :

Q.6 If $(m + 1)^{th}$ term of an A.P. is twice the $(n + 1)^{th}$ term, prove that $(3m + 1)^{th}$ term is twice the $(m + n + 1)^{th}$ term.

Q. 7 The sum of three terms of an A.P. is 21 and the product of the first and the third terms exceeds the second term by 6, find three terms.

Q.8 Three numbers are in A.P. If the sum of these numbers be 27 and the product 648, find the numbers.

Q.9 Find the sum of the following arithmetic progressions :

(i) a + b, a – b, a – 3b, ... to 22 terms

(ii) $(x - y)^2$, $(x^2 + y^2)$, $(x + y)^2$, ... to n terms

(iii) $\frac{x-y}{x+y}$, $\frac{3x-2y}{x+y}$, $\frac{5x-3y}{x+y}$, to n terms

Q.10 The third term of an A.P. is 7 and the seventh term exceeds three times the third term by 2. Find the first term, the common difference and the sum of first 20 terms.

Q.11 The first term of an A.P. is 2 and the last term is 50. The sum of all these terms is 442. Find the common difference.

Q.12 If 12^{th} term of an A.P. is –13 and the sum of the first four terms is 24, what is the sum of first 10 terms ?

Q.13 In an A.P., if the 5^{th} and 12^{th} terms are 30 and 65 respectively, what is the sum of first 20 terms.

Q.14 The production of TV in a factory increases uniformly by a fixed number every year if produced 8000 acts in 6^{th} years & 11300 in 9^{th} year find the production in (i) first year (ii) 8^{th} year (iii) 6^{th} year.

Q.15 A sum of ₹2800 is to be used to award four prizes. If each prize after the first prize is ₹200 less than the preceding prize, find the value of each of the prizes.

Application of Trigonometry

Solve the following Questions :

Q.1 If the length of shadow of a pole on a level ground is twice the length of that pole, then find the angle of elevation of the sun.

Q.2 The angle of elevation of a tower from a distance 100 m from its foot is 30º. Find the height of the tower.

Q.3 The angles of elevation of an aeroplane flying vertically above the ground as observed from two consecutive stones 1 km apart are 45º and 60º. Find the height of the aeroplane above the ground in km.

Q.4 On the level ground, the angle of elevation of a tower is 30º. On moving 20 m nearer, the angle of elevation is 60º. Then find the height of the tower.

Q.5 A, B, C are three collinear points on the ground such that B lies between A and C and AB = 10 m. If the angles of elevation of the top of a vertical tower at C are respectively 30º and 60º as seen from A and B, then find the height of the tower.

Q.6 If the angles of elevation of a tower from two points distant a and b (a > b) from its foot and in the same straight line from it are 30º and 60º, then find the height of the tower.

Q.7 A straight tree breaks due to storm and the broken part bends so that the top of the tree touches the ground making an angle of 30º with the ground. The distance from the foot of the tree to the point where the top touches the ground is 10 metres. Find the height of the tree.

Q.8 From the top of a light house, the angles of depression of two ships on the opposite sides of it are observed to be α and β. If the height of the light house be h metres and the line joining the ships passes through the foot of the light house, find the distance between the ships.

Q.9 Determine the height of a mountain if the elevation of its top at an unknown distance from the base is 45º and at a distance 10 km further off from the mountain, along the same line, the angle of elevation is 30º.

(Use tan 30º = 0.5774).

Q.10 A man on the deck of a ship is 16m above water level. He observes that the angle of elevation of the top of a cliff is 45º and the angle of depression of the base is 30º. Calculate the distance of the cliff from the ship and the height of the cliff.

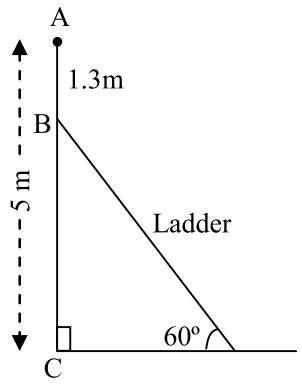
Q.11 An aeroplane, when 3000m high, passes vertically above another aeroplane at an instant when the angles of elevation of the two aeroplanes from the same point on the ground are 60º and 45º respectively. Find the vertical distance between the aeroplanes at that instant.

Q.12 From a point P on the level ground, the angle of elevation of the top of a tower is 30°. If the tower is 100 m high, how far is P from the foot of tower? Take $\sqrt{3}$ = 1.732

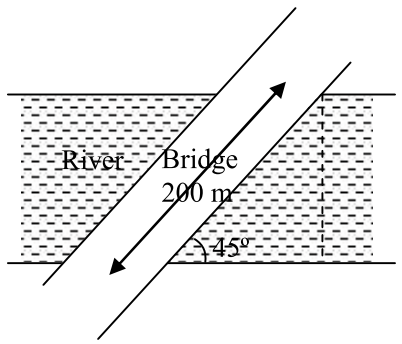
Q.13 A circus artist is climbing a 20 m long rope, which is tightly stretched and tied from the top of a vertical pole to the ground. Find the height of the pole, if the angle made by the rope with the ground level is 30°.

Q.14 If the length of a shadow cast by a pole be $\sqrt{3}$ times the length of the pole, find the angle of elevation of the sun.

Q.15 An electrician has to repair an electric fault on a pole of height 5 m. He needs to reach a point 1.3 m below the top of the pole to undertake the repair work (as shown in the adjoining figure). What should be the length of the ladder that he should use which, when inclined at an angle of 60° to the horizontal, would enable him to reach the required position? Also, how far from the foot of the pole should he place the foot of the ladder? Take $\sqrt{3}$ = 1.73



Q.16 A bridge across a river makes an angle of 45° with the river bank. If the length of the bridge across the river is 200 metres, what is the breadth of the river?



Q.17 The upper part of a tree broken by wind, falls to the ground without being detached. The top of the broken part touches the ground at an angle of 30° at a point 8 m from the foot of the tree. Calculate (i) the height at which the tree is broken. (ii) the original height of the tree.

Q.18 The horizontal distance between two towers is 140 m. The angle of elevation of the top of the first tower when seen from the top of the second tower is 30°. If the height of the second tower is 60 m, find the height of the first tower.

Q.19 An observer 1.5 m tall is 28.5 m away from a chimney. The angle of elevation of the top of the chimney from his eye is 45°. What is the height of the chimney?

Q.20 From a point P on the ground the angle of elevation of the top of a 10 m tall building is 30°. A flag is hoisted at the top of the building and the angle of elevation of the top of the flagstaff from P is 45°. Find the length of the flagstaff and the distance of the building from the point P. (Take $\sqrt{3}$ = 1.732)

Q.21 A statue, 1.6 m tall, stands on the top of a pedestal. From a point on the ground, the angle of elevation of the top of the statue is 60° and from the same point the angle of elevation of the top of the pedestal is 45°. Find the height of the pedestal.

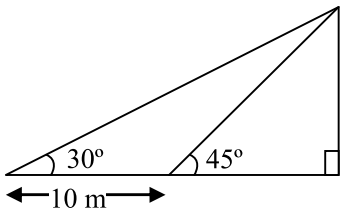
Q.22 The angle of elevation of the top of a building from the foot of a tower is 30° and the angle of elevation of the top of the tower from the foot of the building is 60°. If the tower is 50 m high, find the height of the building.

Q.23 A T.V. tower stands vertically on a bank of a canal. From a point on the other bank directly opposite the tower, the angle of elevation of the top of the tower is 60°. From another point 20 m away from this point on the line joining this point to the foot of tower, the angle of elevation of the top of the tower is 30°. Find the height of the tower and the width of the canal.

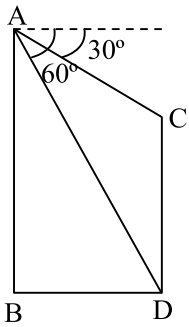
Q.24 The angle of elevation of the top of a tower from a point A (on the ground) is 30°. On walking 50 m towards the tower, the angle of elevation is found to be 60°. Calculate: (i) the height of the tower (correct to one decimal place), (ii) the distance of the tower from A.

Q.25 As observed from the top of a 75 m high lighthouse from the sea-level, the angles of depression of two ships are 30° and 45°. If one ship is exactly behind the other on the same side of the lighthouse, find the distance between the two ships.

Q.26 The shadow of a vertical tower on level ground increases by 10 m, when the altitude of the sun changes from 45° to 30°. Using the given figure, find the height of the tower correct to $\frac{1}{10}$ of a metre.



Q.27 In the adjoining figure, from the top of a building AB, 60 metres high, the angles of depression of the top and the bottom of a vertical lamp post CD are observed to be 30° and 60° respectively. Find (i) the horizontal distance between AB and CD. (ii) the height of the lamp post CD.



Q.28 The angle of elevation of the top of an unfinished tower at a point distant 120 m from its base is 45°. How much higher must the tower be raised so that its angle of elevation at the same point may be 60°?

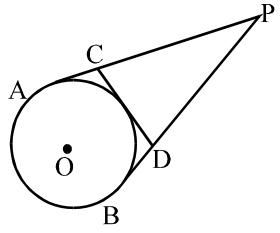
Q.29 A window in a building is at a height of 10m from the ground. The angle of depression of a point P on the ground from the window is 30º. The angle of elevation of the top of the building from the point P is 60º. Find the height of the building.

Q.30 A boy standing on a horizontal plane finds a bird flying at a distance of 100 m from him at an elevation of 30º. A girl standing on the roof of 20 metre high building finds the angle of elevation of the same bird to be 45º. Both the boy and the girl are on opposite sides of the bird. Find the distance of the bird from the girl.

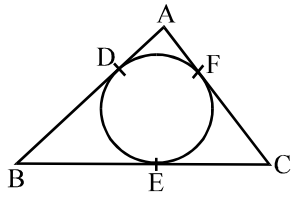
Circle

Solve the following Questions :

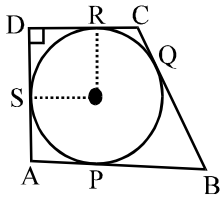
Q.1 From an external point P, tangents PA and PB are drawn to a circle with centre O. If CD is the tangent to the circle at a point E and PA = 14cm, find the perimeter of Δ PCD.



Q.2 A circle is inscribed in a ΔABC having AB = 10 cm, BC = 12 cm and CA = 8 cm and touching these sides at D, E, F respectively, as shown in the figure. Find AD, BE and CF.

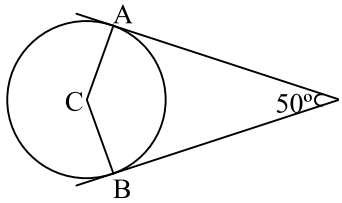


Q.3 In the given figure, ABCD is a quadrilateral in which $\angle D = 90°$. A circle C(O, r) touches the sides AB, BC, CD and DA at P, Q, R , S respectively. If BC = 38 cm, CD = 25 cm and BP = 27 cm, find the value of r.

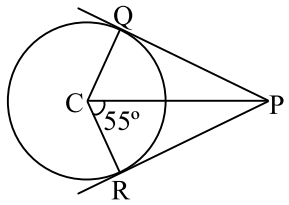


Q.4 Find the distance between two parallel tangents to a circle whose radius is 4.5 cm.

Q.5 In the adjoining figure, PA and PB are tangents from P to a circle with centre C. If $\angle APB = 50°$, find $\angle ACB$.



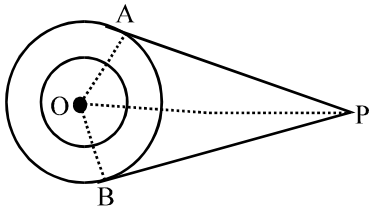
Q.6 In the adjoining figure PQ and PR are tangents from P to a circle with centre O. If $\angle POR = 55°$, find $\angle QPR$



Q.7 Find the length of tangent drawn to a circle with radius 7 cm from a point 25 cm away from the centre of the circle.

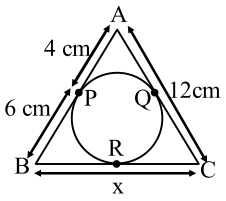
Q.8 A point P is 26 cm away from the centre of a circle and the length of the tangent drawn from P to the circle is 24 cm. Find the radius of the circle.

Q.9 In the given figure, O is the centre of two concentric circles of radii 4 cm and 6 cm respectively. PA and PB are tangents to the outer and inner circle respectively. If PA = 10 cm, find the length of PB up to one place of decimal.

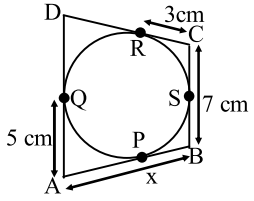


Q.10 (a) In the figure (i) given below, triangle ABC is circumscribed, find x.

(b) In the figure (ii) given below, quadrilateral ABCD is circumscribed, find x.



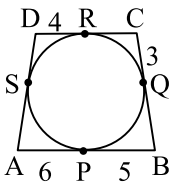
(i)



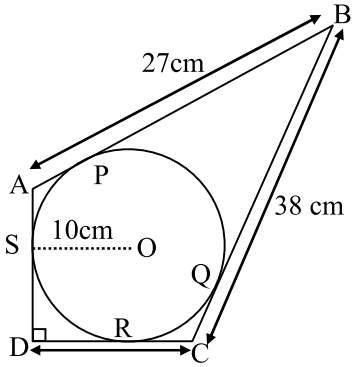
(ii)

Q.11 (a) In the figure (i) given below, quadrilateral ABCD is circumscribed; find the perimeter of quadrilateral ABCD.

(b) In the figure (ii) given below. quadrilateral ABCD is circumscribed and AD⊥DC, find x if radius of incircle is 10 cm.

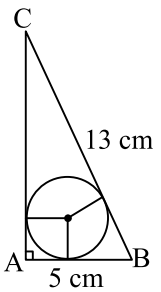


(i)

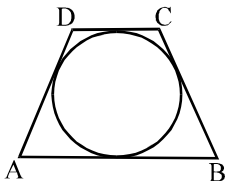


(ii)

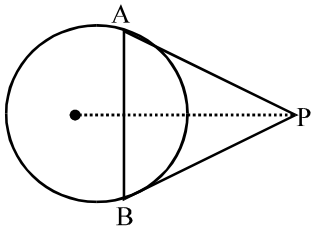
Q.12 In the figure given below, ABC is a right angled triangle at A with sides AB = 5 cm and BC = 13 cm. A circle with centre O has been inscribed in the triangle ABC. Calculate the radius of the incircle.



Q.13 In the given figure, a circle touches all the four sides of a quadrilateral ABCD whose three sides are AB = 6 cm, BC = 7 cm and CD = 4cm. Find AD.

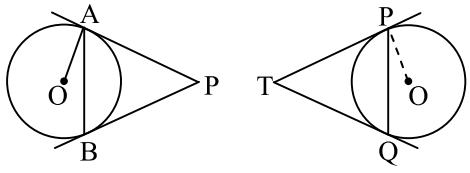


Q.14 From a point P, two tangents PA and PB are drawn to a circle C (O, r). If OP = 2r, show that ΔAPB is equilateral.



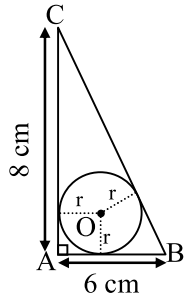
Q.15 (a) In the figure (i) given below, PA and PB are tangents drawn from an external point P to a circle with centre O. Prove that ∠APB = 2 ∠OAB.

(b) In the figure (ii) given below, PQ is a chord of length 8 cm of a circle with centre O. The tangents at P and Q intersect at T. If the radius of the circle is 5 cm, find the length PT.

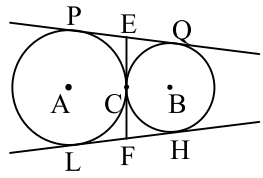


(i) (ii)

Q.16 In the adjoining figure, ABC is a right angled triangle with AB = 6 cm and AC = 8 cm. A circle with centre O has been inscribed inside the triangle. Calculate the value of r, the radius of the inscribed circle.

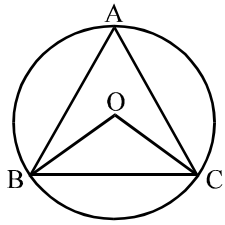


Q.17 In the adjoining figure two circles touch each other externally at C. Prove that the common tangent at C bisects the other two common tangents.

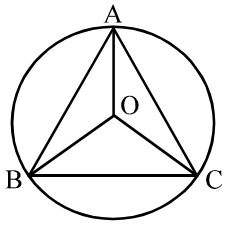


Q.18 The radius of a circle is 6 cm. Then find the perpendicular distance from the centre of the circle to the chord which is 8 cm in length.

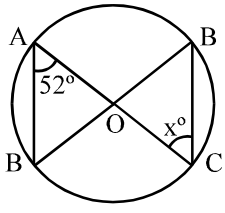
Q.19 An equilateral triangle ABC is inscribed in a circle with centre O. Then find ∠BOC.



Q.20 In the adjoining figure, O is the centre of the circle. If ∠ OBC = 25º, then find ∠ BAC.

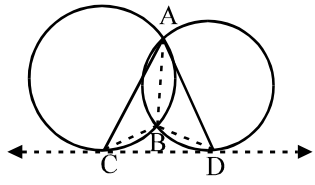


Q.21 In fig. O is the centre of the circle. If ∠ BAC = 52º, then find ∠ OCD.

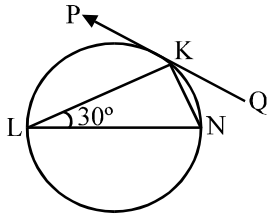


Q.22 In a circle with centre O, the unequal chords AB and CD intersect each other at P. Then find, Δ APC and Δ DPB.

Q.23 CD is a direct common tangent to two circles intersecting each other at A and B. Then find ∠ CAD + ∠ CBD.

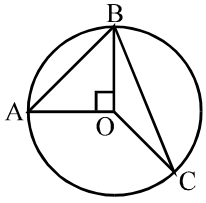


Q.24 In the adjoining figure, PQ is the tangent at K. If LN is a diameter and ∠ KLN = 30º, then find ∠ PKL.

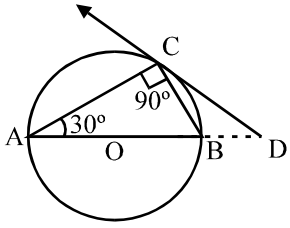


Q.25 Two equal circles of radius r intersect such that each passes through the centre of the other. Then find the length of common chord.

Q.26 In the adjoining figure, A, B, C are three points on a circle with centre O. If ∠ AOB = 90º and ∠ BOC = 120º, then find ∠ ABC.



Q.27 AB is a diameter and AC is a chord of a circle such that ∠ BAC = 30º. The tangent at C intersects AB produced in D. Then find relation between BC & BD.

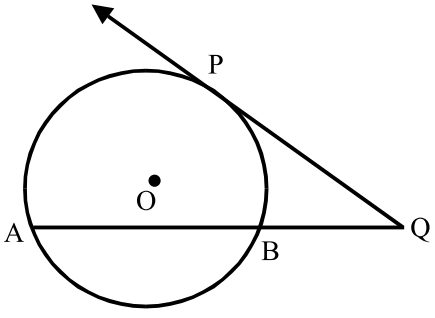


Q.28 Two circles of radii 20 cm and 37 cm intersect in A and B. If O and O' are their centres and AB = 24 cm, then find distance OO'.

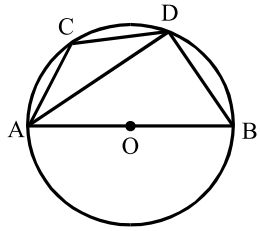
Q.29 If two diameters of a circle intersect each other at right angles, then find the type of quadrilateral formed by joining their end points.

Q.30 If ABC is an arc of a circle and ∠ ABC = 135º, then find the ratio of arc PQR to the circumference.

Q.31 O is the centre of a circle. If tangent PQ = 12 cm and BQ = 8 cm, then find chord AB.



Q.32 In the adjoining figure, ∠ ADC = 140º and AOB is the diameter of the circle. Then find ∠ BAC.



Q.33 If tangents QR, RP, PQ are drawn respectively at A, B, C to a circle circumscribing an acute angled Δ ABC so as to form another Δ PQR, then find ∠ RPQ.

Q.34 Two circles touch externally. The sum of their areas is 130 π sq cm and the distance between their centres is 14 cm. Find the radius of the smaller circle.

Q.35 Two circles touch internally. The sum of their areas is, 116 π sq. cm and the distance between their centres is 6 cm. Find the radius of the larger circle.

Q.36 Two circles touch each other internally. Their radii are 2 cm and 3 cm. Find the biggest chord of the outer circle which is outside the inner circle, is of length.

Co-ordinate Geometry

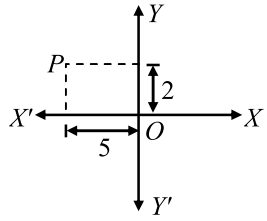
Solve the following Questions :

Q.1 Determine

(i) abscissa

(ii) ordinate

(iii) co-ordinate of point P in this given figure.

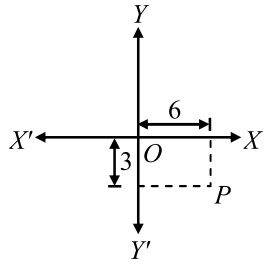


Q.2 In the given figure find

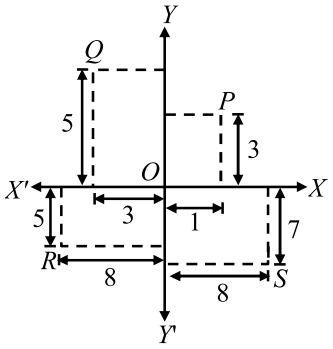
(i) abscissa

(ii) ordinate

(iii) co-ordinates of point P.



Q.3 Write down
(i) abscissa (ii) ordinates and
(iii) co-ordinates of the points P, Q, R and S in the given figure.



Q.4 Draw X-axis and Y-axis and mark the point A (3, 9), B (4, – 7), C (–8, 9), D (– 3, – 5), E (4, – 2) and F (7, 5)

Q.5 Draw a triangle ABC whose vertices A, B, and C are (– 3, 0), (3, 3) and (– 3, 3) respectively.

Q.6 Draw a rectangle KLMN such that its vertices K, L, M, and N are (5, 0), (5, 3), (0, 3) and (0, 0) respectively.

Q.7 Construct a square ABCD such that its vertices A, B, C, and D are (1, 2,) (– 7, 2), (– 7, – 6) and (1, – 6) respectively.

Q.8 Construct a trapezium PQRS in which vertices P, Q, R and S are (3, 0), (7, 9), (– 6, 9) and (– 2, 0) respectively.

Q.9 Find the distance between the following pair of points :
(i) (– 6, 7) and (– 1, – 5)
(ii) (a + b, b + c) and (a – b, c – b)
(iii) (a sin α, – b cos α) and (– a cos α, b sin α)
(iv) (a, 0) and (0, b)

Q.10 Find the value of a when the distance between the points (3, a) and (4, 1) is $\sqrt{10}$.

Q.11 Three vertices of a parallelogram are (a + b, a – b), (2a + b, 2a – b), (a – b, a + b), find the fourth vertex.

Q.12 Find the centroid of the triangle whose vertices are :
(i) (1, 4), (– 1, –1), (3, – 2)
(ii) (– 2, 3), (2, –1), (4, 0)

Q.13 If (– 2, 3), (4, – 3) and (4, 5) are the mid-points of the sides of a triangle, find the coordinates of its centroid.

Q.14 Find the area of a triangle whose vertices are
(i) (6, 3), (– 3, 5) and (4, – 2)
(ii) $(at_1^2, 2at_1)$, $(at_2^2, 2at_2)$ and $(at_3^2, 2at_3)$
(iii) (a, c + a), (a, c) and (– a, c – a)

Q.15 Show that the points A (1, – 2), B (3, 6), C (5, 10) and D (3, 2) are the vertices of a parallelogram.

Q.16 Prove that the points (3, 0), (6, 4) and (–1, 3) are the vertices of a right angled isosceles triangle.

Q.17 Prove that the points (2a, 4a), (2a, 6a) and $(2a + \sqrt{3}\,a, 5a)$ are the vertices of an equilateral triangle.

Q.18 Prove that the points (2, 3), (– 4, – 6) and (1, 3/2) do not form a triangle

Q.19 Two vertices of an isosceles triangle are (2, 0) and (2, 5). Find the third vertex if the length of the equal sides is 3.

Q.20 Find the value of k, if the point P (0, 2) is equidistant from (3, k) and (k, 5).

Q.21 Find the point of trisection of the line segment joining the points :
(i) (5, – 6) and (– 7, 5)
(ii) (3, – 2) and (– 3, – 4)
(iii) (1, 2) and (11, 9).

Q.22 If the coordinates of the mid-points of the sides of a triangle are (1, 1), (2, –3) and (3, 4), find the vertices of the triangle.

Q.23 If the mid-point of the line joining (3, 4) and (k, 7) is (x, y) and 2x + 2y + 1 = 0 find the value of k.

Q.24 Prove that (4, 3), (6, 4), (5, 6) and (3, 5) are the angular points of a square.

Q.25 Determine the ratio in which the point (– 6, a) divides the join of A (– 3, 1) and B (– 8, 9). Also find the value of a.

Q.26 The four vertices of a quadrilateral are (1, 2), (–5, 6), (7, –4) and (k, –2) taken in order. If the area of the quadrilateral is zero, find the value of k.

Q.27 Prove that the points (a, 0), (0, b) and (1, 1) are collinear if, $\frac{1}{a} + \frac{1}{b} = 1$.

Q.28 Find the centre of the circle passing through (5, – 8), (2, – 9) and (2, 1).

Q.29 Find the value of x such that PQ = QR where the coordinates of P, Q and R are (6, – 1), (1, 3) and (x, 8) respectively.

Q.30 Find the centre of the circle passing through (6, – 6), (3, –7) and (3, 3).

Q.31 If $a \neq b \neq c$, prove that the points (a, a^2), (b, b^2), (c, c^2) can never be collinear.

Q.32 Four points A (6, 3), B (– 3, 5), C (4, – 2), and D (x, 3x) are given in such a way that $\frac{\Delta DBC}{\Delta ABC} = \frac{1}{2}$, find x.

Q.33 Prove that the points (a, b), (a_1, b_1) and $(a - a_1, b - b_1)$ are collinear if $ab_1 = a_1b$.

Q.34 If three points (x_1, y_1), (x_2, y_2), (x_3, y_3) lie on the same line, prove that

$$\frac{y_2 - y_3}{x_2 x_3} + \frac{y_3 - y_1}{x_3 x_1} + \frac{y_1 - y_2}{x_1 x_2} = 0.$$

Q.35 If A (2, 2), B (–4, –4) and C(5, –8) are the vertices of a triangle, then find the length of the median through vertex C.

Q.36 If the points (k, 2k), (3k, 3k) and (3, 1) are collinear, then find k.

Q.37 If points (a, 0), (0, b) and (1, 1) are collinear, then find $\frac{1}{a} + \frac{1}{b}$.

Q.38 Find the ratio in which line segment joining points (– 3, –4) and (1, –2) is divided by y-axis.

Q.39 The line joining the points A(4, –5) and B(4, 5) is divided by the point P such that AP : AB = 2 : 5, find the coordinates of P.

Q.40 The mid-point of the line joining (a, 2) and (3, 6) is (2, b). Find the values of a and b.

Q.41 The centre of a circle is (2, –3) and one end of a diameter is (1, 4), find the other end.

Q.42 If A(1, 1) and B(–2, 3) are two points and C is a point on AB produced such that AC = 3AB, find the co-ordinates of C.

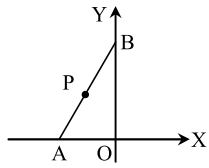
Q.43 The line segment joining A $\left(-1, \frac{5}{3}\right)$ and B (a, 5) is divided in the ratio 1 : 3 at P, the point where the line segment AB intersects y-axis. Find

(i) the value of a

(ii) the co-ordinates of P.

Q.44 A(10, 5), B(6, –3) and C(2, 1) are the vertices of a triangle ABC. L is the mid-point of AB and M is the mid-point of AC. Write down the co-ordinates of L and M. Show that LM = $\frac{1}{2}$BC.

Q.45 In the adjoining figure, P(–2, 3) is the mid-point of the line-segment AB. Find the coordinates of A and B.



Q.46 Prove that the coordinates of the centroid of a ΔABC, with vertices $A(x_1,y_1)$, $B(x_2,y_2)$ and $C(x_3,y_3)$ are given by

$$\left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3}\right)$$

Area Related to Circle

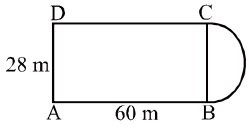
Solve the following Questions :

Q.1 The circumference of a circle exceeds the diameter by 16.8 cm. Find the circumference of the circle.

Q.2 A horse is tied to a pole with 28 m long string. Find the area where the horse can graze. (Take π = 22/7).

Q.3 A sector of a circle of radius 8 cm contains an angle of 135º. Find the area of the sector.

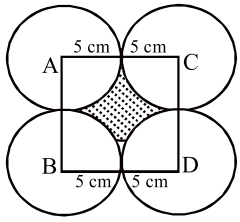
Q.4 A plot is in the form of a rectangle ABCD having semi-circle on BC as shown in Fig. If AB = 60 m and BC = 28 m, find the area of the plot.



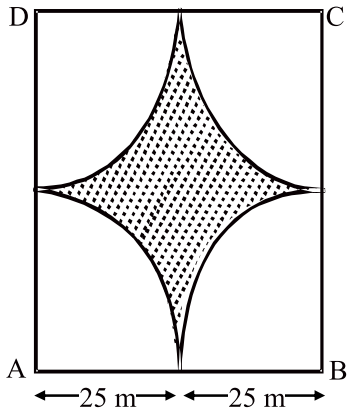
Q.5 The outer circumference of a circular race-track is 528 m. The track is everywhere 14m wide. Calculate the cost of levelling the track at the rate of 50 paise per square metre (Use π = 22/7).

Q.6 A rectangular piece is 20 m long and 15 m wide. From its four corners, quadrants of radii 3.5 m have been cut. Find the area of the remaining part.

Q.7 Four equal circles, each of radius 5 cm, touch each other as shown in Fig. Find the area included between them (Take π = 3.14).



Q.8 Four cows are tethered at four corners of a square plot of side 50 m, so that they just cannot reach one another. What area will be left ungrazed ?



Q.9 The sum of the radii of two circles is 140 cm and the difference of their circumferences is 88 cm. Find the diameters of the circles.

Q.10 The area of a circle inscribed in an equilateral triangle is 154 cm^2. Find the perimeter of the triangle. [Use π = 22/7 and $\sqrt{3}$ = 1.73]

Q.11 If a square is inscribed in a circle, find the ratio of the areas of the circle and the square.

Q.12 The radii of two circles are 8 cm and 6 cm respectively. Find the radius of the circle having its area equal to the sum of the areas of the two circles.

Q.13 A car travels 1 kilometre distance in which each wheel makes 450 complete revolutions. Find the radius of the its wheels.

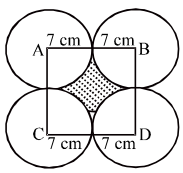
Q.14 A chord AB of a circle of radius 15 cm makes an angle of 60º at the centre of the circle. Find the area of the major and minor segment.

(Take π = 3.14, $\sqrt{3}$ = 1.73)

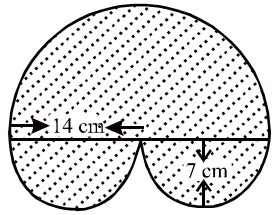
Q.15 A chord of a circle of radius 10 cm subtends a right angle at the centre. Find:

(i) area of the minor sector
(ii) area of the minor segment
(iii) area of the major sector
(iv) area of the major segment (Use π = 3.14)
(iv) दीर्घ वृत्तखण्ड का क्षेत्राफल (π = 3.14 का उपयोग करें)

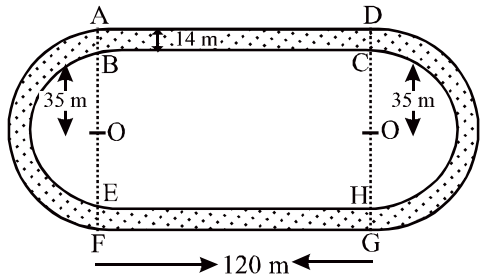
Q.16 Four equal circles are described about the four corners of a square so that each touches two of the others as shown in Fig. Find the area of the shaded region, each side of the square measuring 14 cm.



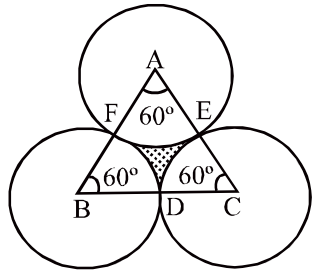
Q.17 Find the areas of the shaded region in the Fig.



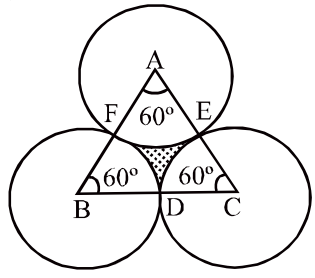
Q.18 An athletic track 14 m wide consists of two straight sections 120 m long joining semi-circular ends whose inner radius is 35 m. Calculate the area of the shaded region.



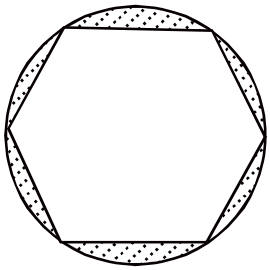
Q.19 The area of an equilateral triangle is $49\sqrt{3}$ cm^2. Taking each angular point as centre, a circle is described with radius equal to half the length of the side of the triangle as shown in Fig. Find the area of the triangle not included in the circle.



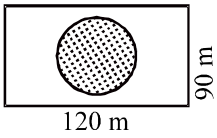
Q.20 The area of an equilateral triangle is 1732.05 cm^2. About each angular point as centre, a circle is described with radius equal to half the length of the side of the triangle. Find the area of the triangle not included in the circles (Use π = 3.14)



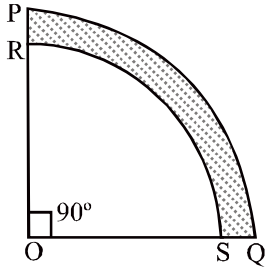
Q.21 A round table cover has six equal designs as shown in Fig. If the radius of the cover is 28 cm, find the cost of making the designs at the rate of ₹ 3.50 per cm^2. (Use $\sqrt{3} = 1.7$)



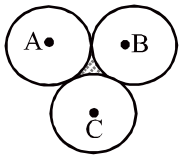
Q.22 A park is in the form of a rectangle 120 m by 90 m. At the centre of the park there is a circular lawn as shown in the figure. The area of the park excluding the lawn is 2950 m^2. Find the radius of the circular lawn.
(Given: $\pi = 3.14$)



Q.23 In the given figure, PQSR represents a flower bed. If OP = 21 m and OR = 14 m, find the area of the flower bed.

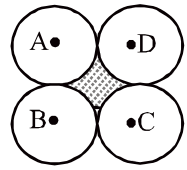


Q.24 Three equal circles, each of radius 6 cm, touch one another as shown in the figure. Find the area enclosed between them.
Take $\pi = 3.14$ and $\sqrt{3} = 1.732$.



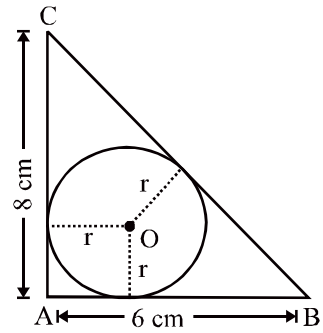
Q.25 If three circles of radius a each, are drawn such that each touches the other two, then find the area included between them.
(Take $\pi = 3.14$ and $\sqrt{3} = 1.732$)

Q.26 Four equal circles, each of radius 5 cm, touch each other, as shown in the figure. Find the area included between them. Take $\pi = 3.14$.



Q.27 Four equal circles, each of radius a units, touch each other. Find the area between them.

Q.28 In the given figure, ΔABC is right angled at A, with AB = 6 cm and AC = 8 cm. A circle with centre O had been inscribed inside the triangle. Find the value of r the radius of the inscribed circle.



Q.29 A circular disc of radius 6 cm is divided into three sectors with central angles 90º , 120º and 150º. What part of the whole circle is the sector with central angle 150º? Also, calculate the ratio of the areas of the three sectors.

Surface Area of Volume

Solve the following Questions :

Q.1 Three cubes whose edges measure 3 cm, 4 cm and 5 cm respectively to form a single cube. Find its edge. Also, find the surface area of the new cube.

Q.2 Water flows in a tank 150 m × 100 m at the base, through a pipe whose crosssection is 2 dm by 1.5 dm at the speed of 15 km per hour. In what time, will the water be 3 metres deep.

Q.3 A solid cube of side 7 cm is melted to make a cone of height 5 cm, find the radius of the base of the cone.

Q.4 A solid sphere of radius 3 cm is melted and then cast into small spherical balls each of diameter 0.6 cm. Find the number of balls thus obtained.

Q.5 How many spherical bullets can be made out of a solid cube of lead whose edge measures 44 cm, each bullet being 4 cm in diameter.

Q.6 A spherical canon ball, 28 cm in diameter is melted and cast into a right circular conical mould, the base of which is 35 cm in diameter. Find the height of the cone, correct to one placed of decimal.

Q.7 Length of a class-room is two times its height and its breadth is $1\frac{1}{2}$ times its height. The cost of white-washing the walls at the rate of ₹ 1.60 per m^2 is ₹ 179.20. Find the cost of tiling the floor at the rate of ₹ 6.75 per m^2.

Q.8 A rectangular tank is 225 m by 162 m at the base. With what speed must water flow into it through an aperture 60 cm by 45 cm that the level may be raised 20 cm in 5 hours?

Q.9 An agricultural field is in the form of a rectangle of length 20 m and width 14 m. A pit 6 m long, 3 m wide and 2.5 m deep is dug in a corner of the field and the earth taken out of the pit is spread uniformly over the remaining area of the field. Find the extent to which the level of the field has been raised.

Q.10 A cylindrical container of radius 6 cm and height 15 cm is filled with ice-cream. The whole ice-cream has to be distributed to 10 children in equal cones with hemispherical tops. If the height of the conical portion is four times the radius of its base, find the radius of the ice-cream cone.

Q.11 A solid wooden toy is in the shape of a right circular cone mounted on a hemisphere. If the radius of the hemisphere is 4.2 cm and the total height of the toy is 10.2 cm, find the volume of the wooden toy.

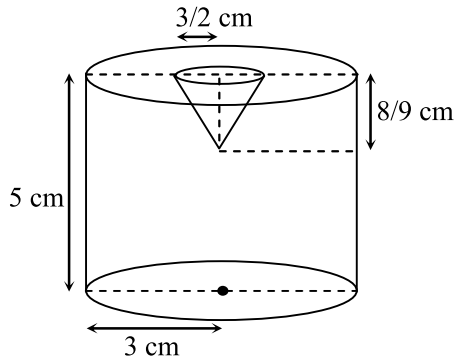
Q.12 A vessel is in the form of a hemispherical bowl mounted by a hollow cylinder. The diameter of the sphere is 14 cm and the total height of the vessel is 13 cm. Find its capacity. (Take $\pi = 22/7$).

Q.13 From a cube of edge 14 cm, a cone of maximum size is carved out. Find the volume of the cone and of the remaining material.

Q.14 A cone of maximum volume is carved out of a block of wood of size 20 cm × 10 cm × 10 cm. Find the volume of the cone carved out correct to one decimal place.
Take $\pi = 3.1416$.

Q.15 From a solid cylinder whose height is 8 cm and radius is 6 cm, a conical cavity of height 8 cm and of base radius 6 cm, is hollowed out. Find the volume of the remaining solid correct to 4 significant figures. ($\pi = 3.1416$). Also find the total surface area of the remaining solid.

Q.16 A metallic cylinder has radius 3 cm and height 5 cm. It is made of a metal A. To reduce its weight, a conical hole is drilled in the cylinder as shown and it is completely filled with a lighter metal B. The conical hole has a radius of $\frac{3}{2}$ cm and its depth is $\frac{8}{9}$ cm. Calculate the ratio of the volume of the metal A to the volume of the metal B in the solid.



Q.17 An open cylinder vessel of internal diameter 7 cm and height 8 cm stands on a horizontal table. Inside this is placed a solid metallic right circular cone, the diameter of whose base is $\frac{7}{2}$ cm and height 8 cm. Find the volume of water required to fill the vessel.

Q.18 The volume of a cone is the same as that of the cylinder whose height is 9 cm and diameter 40 cm. Find the radius of the base of the cone if its height is 108 cm.

Q.19 A girl fills a cylindrical bucket 32 cm in height and 18 cm in radius with sand. She empties the bucket on the ground and makes a conical heap of the sand. If the height of the conical heap is 24 cm, find

(i) The radius and

(ii) The slant height of the heap.

Leave your answer in square root form.

Q.20 A hollow metallic cylindrical tube has an internal radius of 3 cm and height 21 cm. The thickness of the metal of the tube is $\frac{1}{2}$ cm. The tube is melted and cast into a right circular cone of height 7 cm. Find the radius of the cone correct to one decimal place.

Q.21 A right circular cone of height 20 cm and base diameter 30 cm is cast into smaller cones of equal sizes with base radius 10 cm and height 9 cm. Find how many cones are made.

Q.22 A vessel, in the form of a hemispherical bowl, is full of water. Its contents are emptied in a right circular cylindrical. The internal radii of the bowl and the cylinder are 3.5 cm and 7 cm respectively. Find the height to which water will rise in the cylinder.

Q.23 An iron pillar has some part in the form of a right circular cylindrical and the remaining in the form of a right circular cone. The radius of the base of each of the cone and cylinder is 8 cm. The cylindrical part is 240 cm high and the conical part is 36 cm high. Find the weight of the pillar if one cu cm of iron weights 7.8 grams.

Q.24 A solid wooden toy is in the shape of a right circular cone mounted on a hemisphere. If the radius of the hemisphere is 4.2 cm and the total height of the toy is 10.2 cm, find the volume of the wooden toy.

Q.25 A hemispherical bowl of internal diameter 36 cm contains a liquid. This liquid is to be filled in cylindrical bottles of radius 3 cm and height 6 cm. How many bottles are required to empty the bowl?

Q.26 The circumference of the edge of a hemispherical bowl is 12 cm. Find the capacity of the bowl.

Q.27 A building is in the form of a cylinder surmounted by a hemispherical walled dome and contains $41\frac{19}{21}\text{m}^3$ of air. If the internal diameter of the building is equal to its total height above the floor, find the height of the building.

Q.28 The volume of a right circular cylinder of height 7 cm is 567π cm^3. Find its curved surface area.

Q.29 Two right circular cones X and Y are made, X having three times the radius of Y and Y having half the volume of X. Calculate the ratio of heights of X and Y.

Q.30 How many metres of cloth 5m wide will be required to make a conical tent, the radius of whose base is 7m and whose height is 24 cm.

Q.31 The radii of the internal and external surface of a hollow spherical shell are 3 cm and 5 cm respectively. If it is melted and recast into a solid cylinder of height $2\frac{2}{3}$ cm, find the diameter and the curved surface area of the cylinder.

Q.32 A hemispherical bowl of internal diameter 30 cm is full of some liquid. This liquid is to be filled into cylindrical shaped bottles each of diameter 5 cm and height 6 cm. Find the number of bottle necessary to empty the bowl.

Q.33 If the radii of the circular ends of a bucket, 45 cm high, are 28 cm and 7 cm, find the capacity and the total surface area of the bucket.

Q.34 The radii of the circular ends of a solid frustum of a cone are 33 cm and 27 cm and its slant height is 10 cm. Find its total surface area.

Q.35 A bucket made up of a metal sheet is in the form of a frustum of a cone of height 16 cm with radii of its lower and upper ends as 8 cm and 20 cm respectively. Find the cost of the bucket if the cost of the metal sheet used is ₹ 15 per 100 cm^2. (Use $\pi = 3.14$)

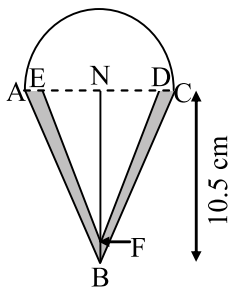
Q.36 A bucket made up of a metal sheet is in the form of a frustum of a cone. Its depth is 24 cm and the diameters of the top and the bottom are 30 cm and 10 cm respectively. Find the cost of milk which can completely fill the bucket at the rate of ₹. 20 per litre and the cost of the metal sheet used, if it costs ₹ 10 per 100 cm^2. (Use $\pi = 3.14$).

Q.37 A bucket is in the form of a frustum of a cone with a capacity of 12308.8 cm^3 of water. The radii of the top and bottom circular ends are 20 cm and 12 cm respectively. Find the height of the bucket and the area of the metal used in making it (Use $\pi = 3.14$).

Q.38 The adjoining figure shows the cross–section of an ice–cream cone consisting of a cone surmounted by a hemisphere. The radius of the hemisphere is 3.5 cm and the height of the cone is 10.5 cm. The outer shell ABCDEF is shaded and is not filled with ice cream. AE = DC = 0.5 cm, AB || EF and BC || FD. Calculate

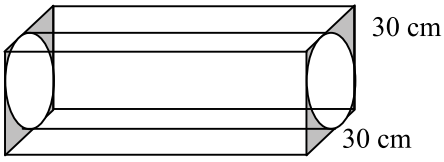
(i) The volume of the ice-cream in the cone (the unshaded portion including the hemisphere) in cm^3;

(ii) The volume of the outer shell (the shaded portion) in cm^3. Give your answer correct to the nearest cm^3.

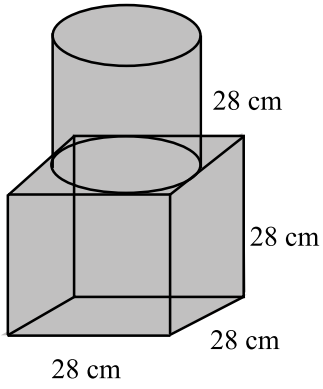


Q.39 (a) The figure (i) given below, shows a cuboidal block of wood through which a circular cylindrical hole of the biggest size is drilled. Find the volume of the wood left in the block.

(b) The figure (ii) given below, shows a solid trophy made of shinning glass. If one cubic centimeter of glass costs ₹0.75, find the cost of the glass for making the trophy.



(i)



(ii)

Constructions

Solve the following Questions :

Q.1 Draw a line segment of length 7.8 cm and divide it in the ratio 5 : 8. Measure the two parts.

Q.2 Construct a triangle with sides 5 cm, 6 cm and 7 cm and then construct another triangle similar to it whose sides are $\frac{2}{3}$ of the corresponding sides of the first triangle.

Q.3 Construct a triangle ABC whose sides are 5 cm, 12 cm and 13 cm. Construct another triangle similar to ΔABC and with sides $\frac{3}{5}$ th of the corresponding sides of the given triangle.

Q.4 Draw a triangle with side BC = 6 cm, ∠B = 45° and ∠A = 105°. Then, construct similar triangle whose sides are $\frac{4}{3}$ times the corresponding sides of ΔABC.

Q.5 Draw right triangle in which the sides (other than hypotenuse) are of lengths 3 cm and 4 cm. Then construct another similar triangle whose sides are $\frac{5}{3}$ times the corresponding sides of given triangle.

Q.6 Draw a circle of radius 4 cm. Mark its centre as O. Mark a point P such that OP = 5 cm. Using ruler and compasses only, construct two tangents from P to the circle. Measure the length of one of them.

Q.7 Draw a circle of diameter 8 cm. From a point P, 7 cm away from its centre, construct a pair of tangents to the circle. Measure the lengths of the tangent segments.

Q.8 Draw a circle with the help of a bangle. Take a point outside the circle. Construct the pair of tangents from this point to the circle.

Q.9 Draw a circle of diameter 6 cm with centre O. Draw a diameter AOB. Through A or B draw tangent to the circle.

Q.10 Construct a ΔABC in which AB = 5cm, ∠B = 60° and altitude CD = 3 cm. Construct ΔAQR similar to ΔABC such that each side of ΔAQR is 1.5 times that of the corresponding side of ΔABC.

Probability

Very Short Answer Type Questions :

Q.1 When a card is drawn from a pack of 52 cards. Find the probability that it may be either a king or a queen.

Short Answer Type Questions :

Q.2 The king, queen and jack of clubs are removed from a deck of 52 playing cards and then well shuffled. One card is selected from the remaining cards. Find the probability of getting

(i) a heart (ii) a king

(iii) a club (iv) the '10' of hearts

Q.3 If a coin is tossed two times, what is the probability of getting 'head' at least once ?

Q.4 From a set of 17 cards, numbered 1, 2, ..., 17, one is drawn. What is the probability that is number is multiple of 3 or 7 ?

Long Answer Type Questions :

Q.5 A bag contains 4 red and 8 blue marbles. A marble is drawn at random. What is the probability of drawing
(i) a red marble ?
(ii) a blue marble ?

Q.6 A bag contains 6 black, 7 red and 2 white balls. A ball is drawn from the bag at random. Find the probability that the ball drawn is -
(i) Red
(ii) Black or white
(iii) Not black

Q.7 On tossing three coins simultaneously, find the probability of getting -
(i) 3 tails
(ii) 2 tails
(iii) No tail
(iv) 2 heads and 1 tail
(v) at least one head

Q.8 17 cards numbered 1, 2, 3, ..., 16, 17 are put in a box and mixed throughly. One person drawn a card from the box. Find the probability that the number on the card is -
(i) odd
(ii) a prime
(iii) divisible by 3
(iv) not divisible by 3 and 2 both

Fill in the blanks :

Q.9 Fill in the blanks with appropriate correct answer-
(i) A pair of fair dice is thrown and one die shows a four. The probability that the other die shown 5 is .....
(ii) Probability of a sure event is .....
(iii) Probability of an impossible event is .....
(iv) The probability of an event (other than sure and impossible event) lies between .....
(v) A die is rolled once. The probability of getting a prime number is .....

Q.10 Complete the statement :
(a) Probability of event A + Probability of event 'not A' .....
(b) Probability of a 'sure' event is .....
(c) Probability of an 'impossible' event is .....
(d) Sum of the probabilities of each outcome in an experiment is .....
(e) Probability of an outcome/ event is greater than or equal to ..... and less than or equal to .....

Q.11 In a simultaneous throw of a pair of dice, find the probability of getting
(i) 8 as the sum
(ii) A doublet
(iii) A doublet of prime numbers
(iv) A doublet of odd numbers
(v) A sum greater than 9
(vi) An even number on first
(vii) An even number on one and a multiple of 3 on the other
(viii) Neither 9 nor 11 as the sum of the numbers on the faces
(ix) A sum less than 6
(x) A sum less than 7
(xi) A sum more than 7

Q.12 A card is drawn at random from a pack of 52 cards. Find the probability that the card drawn is
(i) A black king
(ii) Either a black card or a king
(iii) Black and a king
(iv) A jack, queen or a king
(v) Neither a heart nor a king
(vi) Spade or an ace
(vii) Neither an ace nor a king.

Q.13 State whether the following statements are true or false :
(i) if the probability of an event is 1, then it is an impossible event
(ii) if the probability of an event is 0, then it is a sure event.
(iii) the sum of the probabilities of all the elementary events of an experiment is 1.
(iv) the probability of an event is greater than or equal to 0 and less than or equal to 1.
(v) the probability of an event E + the probability of the event "not E" = 1.
(vi) the probability of an event can be negative
(vii) the probability of an event can be greater than 1.

Q.14 Which of the following experiments have equally likely outcomes ?
(i) A coin is tossed. It shows head or tail.
(ii) A driver attempts to start a car. The car starts or does not start.
(iii) A player attempts to shoot a basket ball. He/she shoots or misses the shot.
(vi) A die is thrown. It shows up any of the six numbers 1, 2, 3, 4, 5, 6.

Q.15 A coin is tossed twice. What are the possible outcomes ?

Q.16 Two dice are thrown once. What is the number of possible outcomes ?

Q.17 If the probability of winning a game is $\frac{4}{9}$, what is the probability of its losing ?

Q.18 If a die is thrown once, then what is the probability of getting

(i) an even number ?

(ii) a prime number less than 5 ?

(iii) a number between 3 and 5 ?

(iv) a number divisible by 3 ?

Q.19 A bag contains 4 blue balls and 3 red balls. A ball is drawn at random from the bag.

What is the probability that the ball drawn is.

(i) blue ?

(ii) not blue ball

(iii) red ?

(iv) green ?

Q.20 A box contains 11 cards numbered 1, 2, 3, … , 11 and are mixed thoroughly. A card is drawn at random from the box. What is the probability that the number on the card is

(i) odd ? (ii) even ?

(iii) prime ? (iv) divisible by 3 ?

Q.21 A card is drawn from a well shuffled pack of 52 playing cards. What is the probability of getting ?

(i) a king ? (ii) not a king ?

(iii) a red queen ? (iv) a face card ?

(v) a black face card ? (vi) a black card ?

Q.22 Rashmi has a die whose six faces show the letters as given below :

A	B	C	D	A	C

She throws the die once. What is the probability of getting.

(i) A ? (ii) B ?

दैनिक भास्कर

प्रतिभाओं के लिये एक जीती जागती मिसाल बन चुके - अनुभव वार्ष्णेय

ना संघर्ष, ना तकलीफ, तो क्या मजा है जीने में
बड़े-बड़े तूफान थम जाते हैं। जब कामयाबी की आग लगी हो सीने में।

अनुभव वार्ष्णेय
प्रबंध निदेशक
दीक्षा क्लासेज प्रा. लि.

सच्चे मन से सही दिशा में कड़ी मेहनत के साथ किए गए प्रयास के बाद दुनिया की कोई ताकत नहीं है जो आप को सफल होने से रोक सके। शारीरिक अक्षमता तो बिलकुल ही नहीं। यह कहना है विज्ञान के क्षेत्र में देश के 1 सर्वाधिक प्रतिष्ठित संस्थानों में शुमार स्थानीय दीक्षा क्लासेज के प्रबंध निदेशक एवं पूर्व आरएएस अनुभव वार्ष्णेय का। दैनिक भास्कर से एक खास मुलाकात में अपनी जीवन यात्रा को साझा करते हुए पुराने दिनों के ख्यालों में खोए वार्ष्णेय बताते हैं कि 5 अगस्त 1972 में उत्तर प्रदेश के बरेली जिले में उनका जन्म बहुत ही सामान्य परिवार में हुआ। पिता स्व. बांकेलाल गुप्ता रेलवे में सर्विस करते थे तथा छह भाई-बहनों में वह पांचवे नंबर पर थे। वार्ष्णेय बताते हैं कि सबसे छोटा पुत्र होने के कारण वह सभी के बहुत लाडले थे। जीवन अपनी गति से चल रहा था कि अचानक किस्मत ने पलटा खाया और वर्ष 1985 में जब वह 12 वर्ष के थे अचानक पिता चल बसे। उन्होंने बताया कि पिता की मृत्यु के बाद माता स्व. बसंती देवी ने अपना एक ही लक्ष्य बना लिया कि हम सभी भाई-बहन को पढ़ाकर जिम्मेदार नागरिक बनाना। इसके लिए उन्होंने मार्ग में आने वाली किसी भी बाधा की परवाह नहीं की। एक-एक कर घर के सारे आभूषण और सामान बेच कर हम सभी भाई-बहनों की पढ़ाई कराई और घर चलाया। मां की यह तपस्या खाली नहीं गई और मेरे दो बड़े भाइयों ने एमएनआईटी जयपुर से इंजीनियरिंग की पढ़ाई पूरी की। वार्ष्णेय बताते है कि उन्होंने 12वीं की परीक्षा मेरिट से उत्तीर्ण की और भौतिक विज्ञान में शत-प्रतिशत अंक अर्जित किये।

दुर्घटना ने पहुंचाया व्हील चेयर पर

वार्ष्णेय बताते हैं कि वह वर्ष 199 में पीएमटी में सलेक्शन हो चुका था परन्तु नियति को कुछ और मंजूर था उसी वर्ष अक्टूबर माह में मेरी जिंदगी बदल कर रख दी। साइकिल चलाते वक्त हुई सड़क दुर्घटना के बाद जब होश आया तो पता चला कि मेरी रीढ़ की हड्डी टूट गई और कमर से नीचे का हिस्सा लकवाग्रस्त हो गया। मेरी स्थिति को देखते हुए डॉक्टरों ने पारिवारिक जनों को जवाब दे दिया और कहा कि मैं बस 24 घंटे का मेहमान हूं। लेकिन मेरी माता जी को उस परमपिता परमेश्वर पर पूरा विश्वास था। इसके बाद वह मुझे कुछ पारिवारिक मित्रों के साथ इलाज के लिए दिल्ली ले गई। लेकिन मेरी गंभीर स्थिति को देखते हुए दिल्ली एम्स सहित लगभग सभी अस्पतालों ने मुझे भर्ती करने तथा इलाज करने से मना कर दिया। आखिरकार तीन दिन तक एक से दूसरे अस्पताल में भटकने के बाद सफदरजंग अस्पताल ने मुझे भर्ती कर इलाज शुरू किया। लेकिन तब तक मेरी स्थिति और ज्यादा नाजुक हो चुकी थी। यहां इलाज के दौरान एक दिन अचानक अस्पताल के चूहे मेरे पैर अंगुली खा गए। लकवा होने के कारण मुझे पता ही नहीं चला। इलाज भी सही तरीके से नहीं चल रहा था। इसके चलते मेरे बड़े भाई इंजीनियर सौरभ वार्ष्णेय मुझे यहां जोधपुर ले आए। उस वक्त महात्मा गांधी अस्पताल में मेरा ऑपरेशन हुआ तथा लगभग एक साल तक मैं अस्पताल में भर्ती रहा। इस इलाज से मैं बच तो गया लेकिन डॉक्टरों ने साफ बोल दिया कि अब आने वाली जिंदगी व्हीलचेयर पर ही गुजरेगी।

अस्पताल में ही की पढ़ाने की शुरूआत

अस्पताल में लगभग एक साल तक भर्ती के दौरान एक दिन एक डॉक्टर ने कहा कि खाली समय में क्यों ना वह उनके बच्चों को पढ़ाना शुरू कर दे। यह सुझाव पसंद आया और अस्पताल की छुट्टी के बाद शाम के वक्त डॉक्टर्स के बच्चे मेरे पास पढ़ने के लिए आने लगे। इससे ना सिर्फ मेरा मन लगने लगा जीने की ललक भी जागने लगी। अस्पताल से छुट्टी होने के बाद मैं घर के बाहर व्हील चेयर पर बैठ कर बच्चों के खेल के बीच अम्पायर की भूमिका निभाने लगा। इस दौरान आस-पास के कुछ बच्चों के कहने पर घर पर ही मैंने उन्हें भौतिक विज्ञान पढ़ाना शुरू कर दिया। कुछ ही वर्षों में अनेक विद्यार्थी आईआईटी व प्री-मेडिकल में सफल होने लगे जिससे मेरा आत्मविश्वास बढ़ने लगा। इस दौरान मेरे भाई ने प्रशासनिक सेवा की तैयारी का सुझाव दिया और मैं पढ़ाने के साथ-साथ प्रशासनिक सेवा की तैयारी में जुट गया।

नियम में बदलाव के लिए लड़ी लड़ाई

यह उस वक्त की बात है जब शारीरिक रूप से अक्षम व्यक्ति को प्रशासनिक सेवा में नहीं लिया जाता था। मुझे पूरा विश्वास था कि मैं चयनित हो जाउंगा लेकिन चयन के बाद क्या सरकार मुझे सेवा का मौका देगी क्योंकि मैं व्हीलचेयर पर जो था का डर सता रहा था। इस वक्त मेरे बड़े भाई ने मुझे हौंसला दिया और कहा कि विश्वास रखो सब अच्छा होगा। इसके बाद मैंने सामान्य श्रेणी में ही फार्म भरा और पहले ही प्रयास में राज्य स्तर पर 34वां स्थान प्राप्त किया। लेकिन मेरा डर सही निकला, मेरी शारीरिक अक्षमता को देखते हुए राज्य सरकार ने मेरा चयन निरस्त कर दिया। इसके बाद मैंने सरकार से इस बात को लेकर लंबी लड़ाई लड़ी। मेरी इस लड़ाई में तत्कालीन मुख्यमंत्री अशोक गहलोत ने मेरा पूरा साथ दिया और उनके दखल के बाद नियमों में बदलाव लाने के साथ मुझे प्रशासनिक सेवा में आने का मौका दिया।

पढ़ाने के पैशन के कारण छोड़ी प्रशासनिक सेवा और नींव रखी दीक्षा क्लासेज की ...

वार्ष्णेय बताते है कि प्रशासनिक सेवा में चयन, तीन साल तक एक प्रशासनिक अधिकारी के रूप में जनता की सेवा और चमकदार कॅरियर इतना सब होने के बावजूद आत्मिक संतुष्टि की कहीं ना कहीं कमी थी। ऐसा लग रहा था कि जीवन में कुछ अधूरा है । फिर खुद से ही सवाल-जवाब के दौरान पता चला कि मन तो शिक्षा में रम चुका है। उस वक्त सरकारी सेवा के दौरान लंबी छुट्टी लेने की सुविधा उपलब्ध थी। बस फिर क्या था.... प्रशासनिक सेवा से अवकाश और बाद में इस्तीफा देकर लग गया बच्चों को पढ़ाने और कुछ विद्यार्थियों को लेकर वर्ष 2003 में दीक्षा क्लासेज की नींव रख दी। एक दुर्घटना जिसने मुझे ना सिर्फ डॉक्टर नहीं बनने दिया बल्कि मुझे भी व्हीलचेयर पर पहुंचा दिया की कसक अभी भी मन में थी। तो इस कसक को दूर करने के लिए अपने विद्यार्थियों को डॉक्टर और इंजीनियर बनाने में लग गया। और हमारे मार्गदर्शन के साथ विद्यार्थियों की ओर से की गई कड़ी मेहनत के बाद आने वाले परिणाम रंग दिखाने लगे। कभी इस संस्थान का हिस्सा रहे आज के हजारों डॉक्टर और इंजीनियर देश-विदेश में सफलता की जो नई इबारत लिख रहे हैं को देखकर आज यह गर्व होता है कि मेरा फैसला सही था।

आज इस संस्थान के माध्यम से हम सामाजिक सरोकारों के तहत मेरी माता जी के नाम पर स्थापित बसंतीदेवी फाउण्डेशन के अंतर्गत आर्थिक रूप कमजोर प्रतिभावान विद्यार्थियों को निःशुल्क आवासीय शिक्षा उपलब्ध कराने के साथ आगे की पढ़ाई का भी सारा खर्च वहन करते हैं जिससे वह देश एवं समाज की सेवा में अपनी महती भूमिका अदा कर सके।

अनुभव ने अपनी दृढ़ इच्छाशक्ति और मजबूत मनोबल से यह दिखा दिया कि यदि जीवन में कुछ करने की इच्छा प्रबल है तो लक्ष्य के प्रति समर्पण ही सबसे महत्वपूर्ण है।

हॉस्टल सुविधा

दीक्षालय "छात्रावास में विद्यार्थियों के अनुकूल घर जैसा वातावरण" अध्ययन के साथ मानसिक व शारीरिक विकास के लिए ध्यान व योग, छात्र-छात्राओं के लिए पृथक छात्रावास सुविधा, दीक्षा का एकमात्र उद्देश्य - पूर्ण अनुशासन के साथ अध्ययन में प्रखरता, सुसभ्य एवं सुसंस्कृत व्यक्तित्व का निर्माण








सुविधाऐं

वातानुकूलित हॉस्टल | CCTV कैमरे की निगरानी | 24x7 विद्यार्थियों का ध्यान | प्राथमिक उपचार व मेडिकल सुविधा | RO प्यूरिफाइड पानी | सर्वसुविधा से युक्त कमरें | 24 घण्टे सुरक्षा व वार्डन घर जैसा भोजन | अध्ययन के लिए अनुकूल वातारण

छात्र व छात्राओं हेतु पृथक छात्रावास की सुविधा

20+ YEARS OF TRUST

DEEKSHACLASSES.COM

mySEAT Plus 2022

Scholarship Eligibility cum Admission Test

For Class 7th to 12th
JEE | NEET | PRE-FOUNDATION

Upto 100%* Scholarship

SUCCESS KA BHAROSA

*T&C apply

An institute run by Ex. Officer of Rajasthan Administrative Service (R.A.S)

DEEKSHA™
SINCE 2003

MOST
trusted **Brand**
in education

छात्र एवं छात्राओं (कैम्पस परिसर में) हेतु पृथक
Air-cooled छात्रावास की सुविधा

- हिन्दी एवं अंग्रेजी माध्यम के विद्यार्थियों के लिए पृथक कक्षाऐं
- School Tie-up Facility
- **Residential Coaching**
- Transport Facility

DEEKSHA CLASSES (P) LTD
SECTION 7, NEW POWER HOUSE ROAD, JODHPUR

☎ **74130-53555**
SUNDAY OPEN | DEEKSHACLASSES.COM

अधिक जानकारी के लिए QR Code स्केन करें