

Syllabus for PPT – 2014

विद्यया ऽमृतमश्नुते 2014 गुरुकुल; ०६

SCIENCE

UNIT - 1 GENERAL PROPERTIES OF MATTER AND SOUND

1.1 Measurement, Motion & Force:

Measurement: Measurement in International system of Units (S.I.), Tool of measurement: Vernier callipers, screw gauge, Spherometer, Physical balance and stop watch.

Motion: Uniform and non uniform motion, Particle, Body, Distance, Displacement, Speed, Velocity, Acceleration, Retardation, Difference between velocity and speed.

Force: Mass and Weight, Inertia, Classification of force, Friction and Factors affecting friction, sliding and rolling friction, advantage and disadvantage of friction, ways and means of increase and decrease of friction, importance of friction. Gravity and Gravitational force, Acceleration due to gravity.

1.2 Work and Energy:

Work : Definition, work done by Constant force, Kinetic and potential energy.

Heat & Temperature: Thermometer, Conversion of temperature in Celsius, Fahrenheit and Kelvin scale. Specific heat, Heat capacity, Calculation of specific heat by the method of mixture, Change of state, Latent heat, cooling due to evaporation, humidity and specific humidity, Heat expansion, Linear expansion, Superficial expansion, Volume expansion and its coefficient.

1.3 Wave and Sound:

Waves: Nature of waves, types of waves (longitudinal and transverse), simple harmonic motion, amplitude, Time period, Wave length, Relation between – Velocities, Frequency & Wave length. Sound: Nature of sound and its motion, range of hearing, ultrasonic waves and its application.

UNIT - 2 MATTER – STRUCTURE & BEHAVIOR

2.1 Matter – Nature and Behavior

Classification of matter based on chemical constitution; elements, compounds and mixtures, types of mixture.

Solution: Homogenous and heterogeneous, Suspension and Colloid, Concentration of solution.

Atoms and Molecules: Dalton's atomic theory, Modern atomic theory, atomic and molecular mass, The mole, law of constant proportion, calculation of percentage composition of elements in simple compounds, determination of empirical and molecular formula in simple substances.

2.2 Structure of Atom:

Constituents of an atom (Electrons, Protons and Neutrons), Atomic number, Atomic mass, Discovery of Nucleus, Bohr's Atomic model, Distribution of electrons in Shells (upto atomic

number 1-20), Valencey electrons and valencey, Isotopes, Isobars, Isotones, Radio activity, Radio isotopes and their application.

UNIT - 3 LIGHT, ELECTRICITY AND MAGNETISM

- 3.1 Light:** nature of light, reflection of light, laws of reflection, reflection from plane and curved surface, image formation by plane convex and concave mirror, relation between focal length and radius of curvature, determination of focal length of concave mirror by single pin method, Relation between u - v - f . Refraction of light : Laws of refraction, refraction by glass slab, critical angle, total internal reflection, use of total internal reflection in daily life. Converging and diverging lens, Definition of focal length and optical center, image formation by lens. Human eye, its defects and remedies. Comparison between photographic camera and human eye. Construction, working, uses and way diagram of simple telescope and astronomical telescope.
- 3.2 Electricity and its effects:** electric intensity, potential, potential difference, electric current Ohm's law, Resistance, specific resistance, influencing factors, combination of resistances and related numerical examples. Thermal effect of current it's use, calculation of power and electrical energy. Chemical effects of electric current, Primary and secondary cells their properties and drawback, Leclanche cell, dry cell, lead accumulator cell.
- 3.3 Magnetic effect of current:** Magnetic effect of current, Oersted experiment, electro magnetic induction, electric motor, working principle and use of generator, general studies of alternating current and direct current, electric discharge in gases, discharge tube, cathode rays, X-rays and their properties.
- 3.4 Magnetism:** Magnet and it's types, artificial magnet, methods of preparing of magnets, molecular theory of magnetism, demagnetization, magnetic keepers, magnetic lines of force and their properties. Terrestrial magnetism, magnetic storm, magnetic meridian, geographical meridian, relation between V , H , I and μ .

UNIT – 4 CLASSIFICATION OF ELEMENTS, CHEMICAL BONDING, REACTION & SOME IMPORTANT COMPOUND:

4.1 Periodic Classification of Elements:

A brief historical perspective of periodic classification of elements, Modern periodic law, modern Periodic table, Periodic Properties in period and in groups, metallic and non metallic elements, atomic size, ionization energy and electron affinity.

- 4.2 Chemical Bonding** – Formation of Chemical Bonds, types of bonds-ionic and covalent bond, Electronegative and polar covalent compound, properties of ionic and covalent compound.
- 4.3 Chemical Reactions** – Chemical reaction, Formula of simple compound, equation of simple chemical reaction and their balancing. Types of Chemical reactions – Combination, decomposition, displacement, Oxidation and reduction.

4.4 Rate of chemical reaction and chemical equilibrium:

Preliminary knowledge of rate of chemical reaction, Fast and slow chemical reactions, Reversible and irreversible chemical reaction. Reversible reaction and dynamic nature of equilibrium, Acids and bases, pH scale, Exothermic and endothermic reactions.

4.5 Some important chemical compounds:

Method of production of washing soda, baking soda, bleaching powder and plaster of Paris. Preparation of building material-lime cement, glass and steel. Laboratory method of preparing alcohol and acetic acid. Properties and uses of some general artificial polymers, polythene, polyvinyl chloride, Teflon. Soap and detergents.

UNIT – 5 NATURAL RESOURCES:

- 5.1 **Metals:** Position of metals in the periodic table and general properties. Metal, mineral ore, Difference between mineral and ore. Metallurgy-concentration, roasting, smelting, refining of ores, Metallurgy of copper and Iron, Corrosion of metals, Alloys.
- 5.2 **Nonmetals:** Position of nonmetals in the periodic table, preparation, properties and uses of hydrogen, oxygen and nitrogen.
- 5.3 **Coal and petroleum:** Coal and petroleum as natural resources, Carbon and its compound, destructive distillation of coal. Petroleum its fractional distillation carbon tetravalency and catenation.
- 5.4 **Hydrocarbon:** Structure and classification of saturated and un-saturated hydro carbons, Homologous series, Isomerism. Preparation and properties of methane, Ethane and Ethylene.
- 5.5 **Source of Energy :** Conventional and new sources of energy, source of solar energy, causes of origin of energy in the sun, solar heating devices, solar cooker, solar cell, wind energy, biogas, fossil fuels, ideal fuel, properties of ideal fuel, Nuclear energy, nuclear Fission, Fusion, chain reaction, nuclear reactor, uses and harms of nuclear energy.

UNIT - 6 OUR ENVIRONMENT

- 6.1 **Biosphere:** Definition, Ecosystem and Biosphere, structure of eco system, food chain, food web, trophic level, function of an eco-system, energy flow, Biogeochemical cycle of carbon and nitrogen, Biomass, biodiversity and its importance.
- 6.2 **Pollution :** Causes of soil, water, air and sound pollution and their control. Ecological balance, natural resources uses and conservation of renewal and nonrenewable resources- water, soil and air conservation, green house effect, acid rain, depletion of ozone layer, biodegradable and non biodegradable materials.

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MATHS

UNIT – 1 ALGEBRA

- 1.1 **Rational Number & Expressions** – Rational numbers, irrational numbers, Decimal representation of rational numbers, Properties of Rational numbers, Meaning of rational expressions. Addition, subtraction, multiplication of rational numbers and expressions, Factorization of expression involving cyclic factors.
- 1.2 **Surds** – Rationalization of surds, real numbers and properties of set of real numbers, Law of Radicals, Comparison of surds, Addition, Subtraction, Multiplication and division of surds, Rationalization of Monomial and Binomial surds.
- 1.3 **Indices** - Laws of indices, Important concepts on law of indices, Definition and laws of logarithms, logarithms to base 10, characteristic and mantissa, antilogarithm, use of table in all types of calculation.
- 1.4 **Ratio and Proportion** – Ratio and Proportion, Componendo, Alternendo, Invertendo and their applications.
- 1.5 **Polynomials** – Introduction on real numbers, degree of a polynomial, sum, difference, product and division of polynomials.
- 1.6 **Quadratic Equations** – Meaning and standard form of quadratic equation: $ax^2+bx+c=0$, $a \neq 0$, Solution of quadratic equation (i) By factorization method (ii) By formula method, Discriminate of the quadratic equation and nature of the roots.

Application of quadratic equation: Application involving quadratic equation from several area, Solution of equations reducible to quadratic form factorization of quadratic polynomials by using quadratic formula.
- 1.7 **Arithmetic Series** – Meaning, n^{th} terms of arithmetic series, sum of n^{th} terms and arithmetic mean.
- 1.8 **Linear Equation** - Solution of linear equations in two variables and their application.

UNIT – 2 TRIGONOMETRY

- 2.1 Trigonometric ratios: $\sin A$, $\cos A$, $\tan A$, $\cot A$, $\sec A$, $\operatorname{cosec} A$.
- 2.2 Trigonometric ratios of 0° , 30° , 45° , 60° and 90° .
- 2.3 To find trigonometric ratios of 0° , 30° , 45° , 60° and 90° by Geometrical method.
- 2.4 Trigonometric equations: ($0^\circ \leq \leq 90^\circ$)
- 2.5 Measurement of angle in different system degree, grade and radian, Relation between arc, radius and central angle.
- 2.6 Trigonometrical Identities:- Meaning of trigonometrical identities.
- 2.7 Problems on height and distance.

UNIT – 3 GEOMETRY

3.1 Fundamental concepts of Geometry: Introduction, point, line and plane incidence properties of point and lines.

3.2 Different theorems and/or axioms and their converse: of Straight line and angles, Congruence of Triangles, Locus and sum inequality relation in a triangle, Parallelograms, Linear Symmetry – Symmetrical figured, axioms based on linear symmetrical pictures, Similar Triangle and Circle.

UNIT – 4 CO-ORDINATE GEOMETRY

Distance formula, section and mid-point formula.

Area of triangle, conditions for three points to be collinear, Centroid and Incentre of triangle.

UNIT – 5 MENSURATION

5.1 Area of triangle and rectangle.

5.2 Area and circumference of circle, Area of sector of circle and length of arc of circle.

5.3 Area of four walls of cube and cuboids, surface area and volume of cube and cuboids.

5.4 Surface Area and Volume of prism, cylinder, cone and sphere.

UNIT – 6 STATISTICS

6.1 Statistics and its definition: Meaning of statistics in singular and plural sense, Raw Data.

6.2 Collection and presentation of Data, Arranging data in ascending and descending order, Variate, class-interval, class-size, class-mark, frequency of a class, cumulative frequency of a class, class-limit, true class-limits, construction of cumulative frequency table, Inclusive and Exclusive class.

6.3 Graphical representation of statistical data, frequency polygon, cumulative frequency curve, histogram.

6.4 Problem based on mean, median, mode and pie chart.

6.5 Preliminary knowledge of probability (based on single event only).

UNIT – 7 COMPUTER

7.1 Introduction, What is computer, working of computer, Basic structure of a computer, constituents of a computer.

7.2 Mathematical logic – Statement use of Venn diagram in logic, negative statement, conjunction, Disjunction, Implication, Biconditional, Truth table.

7.3 Binary digit system, change in binary number to decimal number and decimal number to binary number.

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cy % nD; eku , oa Hkkj] tMRo] cyka dk oxhdj .k] ?k"KZ k , oa ?k"KZ k dks i Hkkfor djus okys dkj d] I fi ſy , oa cſyu ?k"KZ k] ?k"KZ k I s ykHk , oa gkfuj ?k"KZ k dks de djus , oa c<kus ds mi k;] ?k"KZ k dk egRo] xq Ro , oa xq Rokd"KZ k cy] xq Roh; Roj .kA

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dk; Z % i fjHkk"kk] vpj cy }kjk fd; k x; k dk;] LFkſrd , oa xfrt mtKZ A

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i jek .kq , oa v .kq % MkYVv dk i jek .kq fl) kar] vk/kfud i jek .kq fl) kar] i jek .kq , oa vk .kfod nD; eku] eksy] fLFkj vuq kr dk fu; e] I k/kj .k ; kſxdka ea rRo ds i fr'kr I æBu dh x.kuk djuka I k/kj .k i nkFkZ ea enykuq krh I æ , oa v .kq æ dh x.kuk djuka

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i jek .kq ds vo; o }byDVku] i ks/RW] U; W/RW} i jek .kq I a[; k] i jek .kq nD; eku] ukfHkd dh [kkst] cksj dk i jek .kq ekW]y] fofHku d{kkvka ea byDVku dk forj .k }i jek .kq dækad 1&20 rd ds rRoka dk byDVkfud fol; kl ½ I a ksth byDVku , oa I a kst drk] I eLFkkfud] I ehk fjd] I el; W/kfud] jſM; ks/kfærk] jſM; ks/kehZ I eLFkkfud vkj muds mi ; ksx A

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- 3-1 i d k' k & i d k' k dh i d f r] i d k' k dk i j k o r l u] i j k o r l u ds fu; e] l e r y , oa o d z l r g l s i j k o r l u] l e r y] m r r y , oa v o r y n i z k } k j k i f r f c E c j p u k] Q k s d l n i j h r F k k o d r k f = T; k e a l a c a k] , d f i u f o f / k } k j k v o r y n i z k dh Q k s d l n i j h K k r d j u k] u - v - f e a l a c a k] i d k' k dk v i o r l u % v i o r l u ds fu; e] d k a p ds x q / d s } k j k v i o r l u] d k f r d d k s k] i w k z v k a r f j d i j k o r l u] i w k z v k a r f j d i j k o r l u dk n f u d t h o u e a m i ; k s x] v f h k l k j h , oa v i l k j h y a] i f j H k k " k k Q k s d l n i j h v k s] i d k f ' k d d l n j y a] } k j k i f r f c E c j p u k] e k u o u s = ; b l ds n k s ' k , oa f u j k d j . k r F k k Q k s / k s x k f Q d d e j s v k s] e k u o u s = e a r g y u k] l j y n i j n ' k h z r F k k [k x k s y h ; n i j n ' k h z] c u k o V] m i ; k s x] d k ; f o f / k , oa f d j . k v k j s [k A
- 3-2 fo | r v k s] b l ds i H k k o % fo | r r h o z k] f o H k o & f o H k o k a r j] fo | r / k k j k] v k g e dk fu; e] i f r j k s [k] f o f ' k " V i f r j k s [k] i H k k f o r d j u s o k y s d k j d] i f r j k s ' k k a dk l a k s t u , oa b l ds v k f d d i z u] fo | r / k k j k dk m " e h ; i H k k o] b l dh m i ; k f x r k] ' k f D r , oa fo | r m t k z 0 ; ; dh x . k u k] fo | r i z k s x e a j [k h t k u s o k y h l k o / k k f u ; k v] fo | r / k k j k dk j k l k ; f u d i H k k o] i k f k f e d r F k k f } r h ; d l s y] b u d s x q k & n k s ' k] y s d y k ' k h l s y] ' k q d l s y] l h l k l p k ; d l s y A
- 3-3 fo | r / k k j k ds p f c d h ; i H k k o % fo | r / k k j k ds p f c d h ; i H k k o] v k l V M dk i z k s x] fo | r p f c d h ; i g . k] fo | r e k s [j] t f u = dh dk ; l i z k k y h f l) k a r , oa m i ; k s x i R ; k o r h z / k k j k , oa f n " V / k k j k dk l k e k u ; v / ; ; u A x s k a e a fo | r f o l t l u] f o l t l u u f y d k] d f k k M f d j . k a , D l f d j . k a , oa b u d s x q k / k e z A
- 3-4 p f c d R o % p f c d , oa b l ds i d k j] d f = e p f c d] p f c d c u k u s dh f o f / k ; k v] p f c d R o dk v k . k f o d f l) k a r] p f c d h ; f o u k ' k] p f c d h ; j { k d] p f c d h ; c y j s [k k ; a o m u d s x q k A H k k & p f c d R o % H k k & p f c d R o] p f c d h ; r Q k u] p f c d h ; , oa H k k s x k f y d ; k E ; k R r j] V , H , I , oa e a l a c a k A

Hkx & 4 r R o k a dk o x h z d j . k] j k l k ; f u d c a k] j k l k ; f u d v f h k f d z ; k ; a , oa e g R o i w k z j k l k ; f u d ; k f x d %

- 4-1 r R o k a dk v k o r h z o x h z d j . k %
r R o k a ds v k o r h z o x h z d j . k dk , f r g k f l d i f j i z ;] v k / k f u d v k o r z fu; e] v k / k f u d v k o r z l k j . k h] v k o r z , oa o x z e a v k o r h z x q k] / k k r q , oa v / k k r q i j e k . k q v k d k j] v k ; u u m t k z b y D V k u c a k r k A
- 4-2 j k l k ; f u d v k a k u % j k l k ; f u d c a k dk f u e z k] c a k ds i d k j] o s k r l a k s t h , oa l g l a k s t h c a k] fo | r l a k s t h , oa l g l a k s t h ; k f x d k a ds x q k] fo | r _ . k k R e d , oa / k u p h ; l g l a k s t h ; k f x d
- 4-3 j k l k ; f u d v f h k f d z ; k ; a % j k l k ; f u d v f h k f d z ; k] l j y ; k f x d k a ds l w =] l k / k k j . k j k l k ; f u d v f h k f d z ; k ; a , oa m u d k l a r g y u] j k l k ; f u d v f h k f d z ; k v k a ds i d k j] ; k s x R e d] v i ? k V u , oa i f r L F k k i u v f h k f d z ; k ; a v k W l h d j . k , oa v i p ; u A
- 4-4 j k l k ; f u d v f h k f d z ; k dh n j , oa j k l k ; f u d l k E ; % j k l k ; f u d v f h k f d z ; k dh n j dk i k j a H k d K k u] r h o z , oa e n j k l k ; f u d v f h k f d z ; k ; a m R d a e . k h ; , oa v u f d a e . k h ; j k l k ; f u d v f h k f d z ; k ; a j k l k ; f u d l k E ; dh x f r d i d f r] v E y , oa { k k j] p h i s e k u k] m " e k { k i h , oa m " e k ' k k s ' k h v f h k f d z ; k ; a A
- 4-5 d i n e g R o i w k z j k l k ; f u d ; k f x d % d i M s / k k u s dk l k M k] [k k u s dk l k M k] f o j a t d p w k z , oa l y k L V j v k W d i f j l dk x q k , oa m i ; k s x] c u k u s dh f o f / k] m R i k n u] H k o u f u e z k l a c a k h d i n i n k F k k z dk f u e z k k % & p w u k] l h e a /] d k W b , oa b l i k r A , s ' d k g y , oa , f l f v d v E y c u k u s dh i z ; k s x ' k k y k f o f / k A d i n l k e k u ; d f = e c g y d] i k W y h f k h u] i k W y h f o u k b y D y k j k b M] V Q y k u] l k a u , oa v i e k t z d dk x q k , oa m i ; k s x A

Hkx & 5 i k d f r d l a k / u %

- 5-1 / k k r q W % v k o r z l k j . k h e a / k k r q / k a dh f l F k f r , oa l k e k u ; x q k A / k k r q [k f u t] v ; L d [k f u t , oa v ; L d e a v a r j A / k k r q d e z % v ; L d k a dk l k a n z k] f u l R k i u] H k t l u] i x y u , oa ' k k s ' k u A d k W j , oa v k ; j u dk / k k r q d e j / k k r q / k a dk l a k k j . k] f e J / k k r q W A

- 5-2 $v/krq W \% vkorZ l kj.kh ea v/krq/ka dh fLFkr , oa l keku; xq.k] gkbM'kstu] ukbV'kstu , oa vkrDI hitu dh iz; ksx'kkyk fof/k] xq.k , oa mi ; ksx A$
- 5-3 $dky , oa i s/kfy; e \% ikdfrd l d k/ku ds : i ea dkcU , oa ml ds ; kfxd A dks ys dk Hkatd vkl ou] i s/kfy; u dk i Hkk'th vkl ou] dkcU dh prd a kstdrk , oa dkcU dh J'[kyu {kerk A$
- 5-4 $gkbM'kdkcU \% l j'puk , oa oxhdj.k] l r'lr , oa vl r'lr] l tkrh; Js kh] l eko; ork] eFku] , Fku] , fFkyhu cukus dh fof/k , oa xq.k A$
- 5-5 $mtkZ ds L=kr \% mtkZ ds uohu L=kr , oa i kja kfjd L=kr] l ksj mtkZ dk L=kr] l wZ ea mtkZ mRi fRr ds dkj.k] l ksj rki u ; fDr; k] l ksyj d'j] l ksyj l sy] iou mtkZ ty mtkZ ck; ks xS] thok'e b'ku] vkn'kz b'ku ds xq.k/ke] ukfHkdh; mtkZ ukfHkdh; fo[kMu] l ay; u] J'a[kyk vfhkfdz; k] ukfHkdh; fj, DVj] ukfHkdh; mtkZ ds ykHk , oa gkfu; kA$

Hkkx & 6 gekjk i ; kbj.k %

- 6-1 $tD eMy \% i fjHkk'kk] ikfjLFkfrd ra= , oa thoeMy] ikfjLFkfrd ra= dh l j'puk] [kk] J'a[kyk] [kk] tky i k's.k l rj] i j'ra= ds dk; j] mtkZ i'okg dkcU , oa ukbV'kstu dk tD jkl k; fud pd] tD Hkkj] tD fofo/krk , oa egRo A$
- 6-2 $i n'kk.k \% enk] ty] ok; q /ofu i n'kk.k ds dkj.k] jksdFkke , oa fu; a=.k A ikfjLFkfrd l rgyu] ikdfrd l d k/ku] uohuhdr] vuohuhdr l d k/ku] dk mi ; ksx , oa l j' {k.k A ty] enk , oa ok; q dk l j' {k.k} xhu gkml i Hkko] vEyh; o"kk] vkstkuirZ dk {kj.k} ck; kFMxay , o ukuck; kFMxay i nkFkZ A$

xf.kr

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- 1-1 $ifjes l a[; k , oa 0; atd & ifjes , oa vi fjes l a[; kvka dk T; kferh; fu: i.k bu l a[; kvka dk tkm] ?kVko] xqkk] Hkkx ij l fdz; k; a A 'n'keyo ds : i ea 1/2 ifjes 0; atd & vFk] ifjes 0; atdka dk tkm] ?kVko] xqkk djuk] pdh; xqku[kM Kkr djuk A$
- 1-2 $dj.kh & dj.kh , oa dj.kh dk ifjes dj.k] okLrfod l a[; k; q] dj.kh fpUg] dj.kh fpUg ds fu; e] dj.kh ij l fdz; k; a 1/2 rgyu] ; ksx] varj] xqkk] Hkkx 1/2 , d inh; , oa f}inh; dj.kh dk ifjes dj.kA$
- 1-3 $?kkrkd & ?kkrkd ds fu; e , oa buds vuqz; ksx 1/2 i wkkZ] ifjes ?kkr l fgr 1/2 y?kq.k dk dk vFkZ buds fu; e , oa vuqz; ksx 1/2 i wkkZ k , oa vi wkkZ k 1/2 i fr y?kq.k dk dk vFkZ A$
- 1-4 $vuq kr , oa l ekuq kr & vuq kr , oa l ekuq kr dh i fjHkk'kk] ; ksxkuq kr] varjkuq kr] , dkarjkuq kr] 0; d'ekukr vkfn o muds vuqz; ksx A$
- 1-5 $cgq n & i fjHkk'kk , oa i fjp; %okLrfod l a[; kvka ij 1/2 cgq n ds ?kkr] cgq nka dk ; ksx] 0; dyu] xqkuQy] HkkxQy] 'k's'kQy i z s , oa xqku[kM i z s A$
- 1-6 $oxZ l ehdj.k & oxZ l ehdj.k dk vFkZ o ekud : i a^2 b x e , a \neq 0 xqku[kM fof/k] oxZ l ehdj.k dk fofDr dj , oa emyka dh i z dfr A oxZ l ehdj.k ds vuqz; ksx & oxZ l ehdj.k dk fofHku {ks=ka ea vuqz; ksx] oxZ l ehdj.k ea i fjo fr r' gks l dus okys l ehdj.kka dk gy] l = dh l gk; rk l s oxh; cgq nka dk xqku[kM djuk A$
- 1-7 $l ekarj Js kh & i fjHkk'kk] l ekarj Js kh dk 0; ki d in 1/noka in 1/2 rFk n inka dk ; ksxQy A l ekarj e/; A$
- 1-8 $jS[kd l ehdj.k & nks pj jkf'k; ka dk jS[kd l ehdj.k gy djus dh fof/k; k] l ehdj.kka dh l xrrk , oa bl dk vuqz; ksx A$

Hkkx & 2 f=dks kfefr &

- 2-1 $f=dks kferh; fu"i fRr; k] T; k 1/2 sin A 1/2 dksT; k 1/2 cos A 1/2 Li 'kZT; k 1/2 tan A 1/2 0; d'ae T; k 1/2 cosec A 1/2 0; d'ae dksT; k 1/2 sec A 1/2 0; d'ae Li 'kZT; k 1/2 cot A 1/2$

- 2-2 0] 30] 45] 60] 90 vā k dks kka ds fy; s f=dks kferh; vuuj krka dk eku A
- 2-3 f=dks kferh; fu"i fRr; ka dk : i karj.k ,oa ml ij vk/kkfjr iz u A
- 2-4 f=dks kferh; I ehdj .kka ds gy %0 I s 90 vā k ds chp e% A
- 2-5 f=dks kfevr ds dks kka dh eki f"Vd] 'kfDrd ,oa oRrh; i) fr] pki &f=T; k ,oa dšlnh; dks k ea I aak A
- 2-6 f=dks kfevr; I oš fedk; a & f=dks kfevr I oš fedk dk vFkz A
- 2-7 mškbz ,oa njh ds I aak ea iz u A

Hkkx & 3 T; kfevr

- 3-1 vk/kkj Hkur T; kferh; vo/kkj .kk; a % i fjp;] fclnq] js[kk ,oa lery
- 3-2 I jy js[kk vks dks k] f=Hkqt dh I okkI erk] fclnq i Fk] I ekUrj pr[kkt] js[kh; I efvr] I e: i f=Hkqt] oRr ds I aak ea fofHku i es ka ,oa@vFkok vfHkxghrka %Lo; a fl) % vks] muds foyka A

Hkkx & 4 funž kka d T; kfevr

nks fclnq/ka ds chp dh njh] js[kk[kM dk vuuj kfrd foHkktu %foHkktu I w-% f=Hkqt dk {ks=Qy} rhu fclnq/ka ds I es[k dk i fcaak % kr%A f=Hkqt dk dšln d o v-%dšlnA

Hkkx & 5 {ks=fvr &

- 5-1 f=Hkqt ,oa pr[kkt dk {ks=Qy A
- 5-2 oRr dk {ks=Qy o i f f/k] oRr ds f=T; k[kM dk {ks=Qy ,oa pki dh yaakbz A
- 5-3 ?ku] ?kukHk ,oa pkjka nhokjka dh vo/kkj .kk] ?ku o ?kukHk dk i "Bh; {ks=Qy o vk; ru A
- 5-4 fi zTe] cyu] 'kaq ,oa xsyk dk i "Bh; {ks=Qy ,oa vk; ru A

Hkkx & 6 I kf[; dh &

- 6-1 I kf[; dh dk vFkz ,oa i f jHk"kk & I kf[; dh dk ,d opu o cgq opu ds : i ea vFk] dPps vkadMš I kf[; dh dh I j Hkur fo'ks'krk; a A
- 6-2 vkadMka dk I xg.k ,oa i Lrfrdj.k vjkgh ,oa vojgh dæ ea vkadMka dks fy[kuk] I kfj.kh c) : i] vkofRr ,oa vkofRr forj.k I kfj.kh dk Kku] oxz I hek] oxz fplg] oxz I a[; k] oxhđj.k ea I ko/kkfu; k] ,oa fof/k] vkofRr forj.k I kfj.kh rš kj djuk] I p; h vkofRr I kj.kh rš kj djuk] I ekos kh ,oa vI ekos kh oxkđ dk Kku ,oa cnyuk
- 6-3 I kf[; dh vkadMka dk xkQ ea i Lrfhdj.k] vk; r fp= vkofRr] I p; h vkofRr cg[kkt] I p; h vkofRr] odz %rkj .k% ,oa budk vkys[k.k A
- 6-4 ek/;] ehfM; u] ekM ,oa i kbpkVz ij iz u A
- 6-5 i kf; drk dk i kjHkd Kku %doy ,d ?kVuk ij vk/kkfjr %

Hkkx & 7 dEI; wj

- 7-1 i fjp;] vFk] dk;] dEI; wj dk i fr: i o I j puk A
- 7-2 xf.krh; rdz & dFku ou vkjs[k dk rdz ea iz; ksx] fu"ks'kkRed I fdz; k] eyHkur rkfdzd I a kst d rFkk I a qR dFku muds fu"ks'kkRed eku ds I kfk] I R; rk I kj.kh A
- 7-3 f}vk/kkj h vādu i) fr] I fdz; k; a f}vk/kkj h dk nk'kfed ea ,oa nk'kfed dk f}vk/kkj h ea i f jorū A