DEFINITION SHEETS

[A2 SIZE]

COVERS ALL

20 SUBJECTS DEFINITION

Infinity Academy Office

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IMPORTANT CIVIL ENGINEERING DEFINATION SHEET

Building material and construction

Reveal: The external jamb of a door or a window opening at right angles to the wall face.

Rebate: The depression or recess made inside the door frame to receive the door shutter.

Corner Window: It is provided at the corner of a room.

Gable Window: It is vertical window provided in the gable end of roof.

Dormer Window: It is vertical window provided on the sloping sides of a pitched roof.

Bay Window: These windows project outside the external walls of a room.

Casement Window: The shutter of this type of window open likes doors.

Sash Or Glazed Window: In which panels are fully glazed.

Lanterns : This windows fixed in flat roofs for lighting passages.

Gable Roof: They have two sloping sides that come together at a ridge, creating end walls with a triangular extension, called a gable.

Gambrel Roof: These are a type of gabled roof. they break each sloping roof section into two parts.

Hip Roof: A hip roof style roof has four sloping sides with zero vertical roof lines/walls.

Mansard Roof: It is similar to a Gambrel roof in that each side of the roof has multiple gradients.

Polishing : It is the mechanical process to grind the concrete floor surface to a high glass finish.

Mud/Muram flooring: It has good thermal Insulation property due to which it remains cool in summer & fairly warm in winter.

Terazzo flooring: It is laid in thin layer over concrete topping.

Cork flooring: It is perfectly Noiseless & is used in libraries, Theatres, Art Galleries, Broadcasting staions etc.

Glass flooring: It is used for entrance of light at basement from the upper floors.

Mosaic flooring: In it, we use chips of marble in coloured cement.

IMPORTANT CIVIL ENGINEERING DEFINATION SHEET

Strength of material

Strength: The strength of a material is its ability to sustain loads without undue distortion, collapse or rupture.

Ultimate Strength Or Tenacity : The maximum stress that any material will withstand.

Elasticity: It is the property of a material by virtue of which it regains its original size and shape after deformation, when the loads causing deformation are removed.

Plasticity: The characteristics of the material by which it undergoes inelastic strain beyond those at the elastic limit.

Ductility: It is the property of a material to undergo a considerable deformation under tension before rupture.

Brittleness: The brittleness of a material is the property of breaking, fracturing or shattering without prior warning or without much permanent distortion under load.

Malleability: It is the property of a material by virtue of which it gets permanently deformed by compression without rupture.

Impact Strength: The amount of shock energy absorbed by a specimen before it fractures.

Hardness : The ability of a material to resist wear, abrasion, scratching or indentation (penetration) by harder bodies.

Fatigue : The phenomenon of failure of a material under fluctuating or repeated loading.

Creep : The continuous deformation with time which the material undergoes due to application of external steady loads.

Stiffness : The ability of a material to resist elastic deformation.

Stress : It is the internal resistance offered by the body to deformation due to externally applied load.

Strain : It is the ratio of change in dimension w.r. to orginal dimension.

Limit of proportionality : it is the stress at which the stress – strain curve ceases to be a straight line.

Elastic limit : It is the point on the stress-strain curve upto which the material remains elastic.

Ductile material : when post elastic strain is greater than 5%.

Brittle material : when post elastic strain is less than 5%.

Modular Ratio : It is the ratio of modulli of elasticity of the two different materials.

Poisson's Ratio : It is the ratio of the lateral strain to the linear strain within elastic limit.

Modulus of Elasticity : When the body is loaded within its elastic limit, the ratio of stress and strain is known as Modulus of Elasticity or Young Modulus.

Shear modulus or modulus of rigidity : It is the ratio of shear stress and shear strain.

Volumetric Strain: It is the ratio of change in volume to the original volume.

Bulk Modulus : It is the ratio of direct stress and the corresponding volumetric strain of the body.

Strain energy : Energy is stored or absorbed by the body during deformation process.

Resilience : It is the total strain energy which can be stored in the given volume of metal and can be released after unloading.

Proof Resilience : Maximum strain energy absorbing capacity of the body in the elastic region.

Modulus of Resilience : Maximum strain energy which can be stored or absorbed in a body per unit volume, at elastic limit.

Principal plane : A plane which carry only normal strain and no shear stress.

Principal stress : It is the magnitude of normal stress acting on the principal plane.

Major principal stress : It is the maximum value of normal stress acting on the principal plane.

Minor principal stress : It is the minimum value of normal stress acting on the principal plane.

Resultant Stress : It is the resultant of normal stress and tangential stress.

Angle of Obliquity : It is the angle made by the resultant stress with the normal stress.

Mohr's circle : It is the locus of those points which represents the normal and shear stresses on various planes passing through a point on a loaded body.

Thin Cylinder : When the thickness of the wall of the cylinder is equal to or less than of the diameter of the cylinder, the cylinder is called as thin cylinder.

Hoop stresses : The stresses which act in the tangential direction to the perimeter of the cylinder.

Longitudinal stresses : The stresses which act parallel to the longitudinal axis of the cylinder.

Radial stresses : The stresses which act radially i.e. along the radius of the cylinder.

Cantilever Beam : It is a beam fixed at one end and free at the other end.

Simply Supported Beam : It is a beam is freely supported at both the ends. (Pinned at one end & roller support at other end).

Overhanging Beam : A beam is freely supported at two points and having one or both ends extending beyond those supports.

Point load : Load acting at a point on a beam is known as a point or concentrated load.

Uniformly distributed load : The load which is evenly spread over the beam.

Uniformly varying load : When the intensity of load varies linearly from one value at one point to some other value at other point on the beam.

Shear force : It is the algebraic sum of all the vertical forces, either to the left or to the right hand side of the section.

Bending moment : It is the algebraic sum of the moments of all the forces either to the left or to the right of a section.

Focal length : It is the distance between two adjacent points of contraflexure.

Shear span : It is the portion of beam in which shear force is constant.

Point of contra-shear : It is that point where shear force changes its sign.

Point of contra-flexure : It is that point where bending moment changes its sign.

Unsymmetric Bending : When bending couple does not acts in the plane of symmetry of member.

Pure Bending : Bending of beam under constant bending moment.

Shear Center (centre of flexure): It is a point from which a concentrated load passes then there will be only bending and no twisting.

Moment of Resistance : It is the maximum bending moment that can be resisted by section without failure of section.

Section Modulus : It is the ratio of moment of inertia of the beam cross-section about neutral axis to the distance of extreme fibre from neutral axis.

Torsion : It means twisting of a structural member when it is loaded by couple that produces rotation about longitudinal axis.

Bending Moment : bending moment or couple acts about Transverse axis.

Twisting Moment : In twisting, couple acts about longitudinal axis or polar axis.

Column : Vertical structural member fixed at both ends and subjected to axial compressive load.

Theory of structure

Statically determinate structure : It can be analysed with the help of equations of static equilibrium alone.

Statically indeterminate structure : Any structure whose reaction components or internal stresses cannot be established by using the equations of static equilibrium alone.

Kinematic Indeterminancy : Number of unknown joint displacement in the structure.

Castigliano's First Theorem : For a linear structure the partial derivative of the strain energy with respect to any displacement is equal to the corresponding force

Castigliano's Second Theorem : For a linear structure the partial derivative of the strain energy with respect to any load is equal to the corresponding displacement .

Sway frame : sway mem... symmetric about vertical ...

Non- sway frame : If fra... non- sway frames.

Stiffness Factor : It is ...

Distribution Factor : It i... stiffness of a members ...

Carry Over Factor : It i... the moment applied.

Influence Line Diagram

Shear force and Bending ...

Muller – Breslau princi... (reaction ,S.F , B.M) is t... a straw function from the ... positive direction of stress

Three Hinged arch : It is ...

Two Hinged Arch : It is ...

Fixed Arch : It is statically ...

Linear arch or theoretic... obtained by a funicular p... truss and loaded at joints ...

Eddy theorem : If a line ... B.M at any section on giv... between given arch and th...

Stiffness : It is the force ... rotation.

Flexibility : It is the defle...

Steel structure

Nominal diameter : It is the diameter of the shank of a rivet before riveting.

Gross / Effective diameter : It is the diameter of the hole it fills after riveting.

Bolt Length : It is the distance from the bottom of bolt head to the end of bolt.

Grip Length : It is the distance from bottom of the bolt head to the back of the washer.

Net area : It is the area at the root of the thread.

Lap joint : Here the two members to be connected are overlapped.

Butt joint : Here the two members to be connected are placed end to end.

Pitch : It is the distance between the centers of two consecutive rivets/ bolts in the direction of

distance from the root of fillet weld to the hypotenuse of the inscribed right triangle within the weld.

Throat of fillet : It is the weakest section in a fillet weld.

Butt weld : Butt welding is when two pieces of metal are placed end-to-end without overlap and then welded along the joint.

Slot weld : In this fillet welding is made along the periphery of hole.

Boom : The compression member of truss.

Shear lag : The nonuniform straining of web due to tension in angled shear lug ...

vertical compressive stress near centre of section becomes greater than the critical buckling stress for the web acting as a column.

Principle rafter (Main strut) : It is the top chord members of a roof truss.

Strute : It is the member carrying compressive forces in a roof truss.

Ties : It is the members carrying tensile forces.

Main Tie (Principle Tie) : It is the bottom chord member.

Ridge line : The top line of the roof truss is called the ridge line

Eves : The bottom edge of roof surface is called eves.

Purlins : These are Members subjected to ...

Construction management

Scheduling : It is the allocation of resources such as time, material, space, equipment and human and technological effort.

Network : It is the flow of diagram consisting of activities and events connected logically and sequentially.

Event : An event is either start or completion of an activity.

Tail event or the start event : It makes the beginning of an activity.

Head event or the final event : The event which marks the completion of an activity.

Dual role events : All events except the first and the last event of a project are dual role events. They have both incoming and outgoing arrows.

Predecessor events : The event or events that occur before another event.

Successor events : The event or events that follow another event.

Activity : Any portion of a project which consumes time or resources and has a definite beginning and an end.

Dummy : It is a type of operation which neither requires time nor any resource, but it denotes dependency among the activities.

Optimistic time : This is the minimum possible time in which an activity can be completed under the most ideal conditions.

Pessimistic time : This is the maximum time required to complete an activity under the worst possible conditions.

Most likely time This is the time required to complete an activity under normal working conditions.

Standard Deviation of An Activity : It is the measurement of uncertainty, which is approximately one sixth of time range.

Variance of an Activity : Square of standard deviation is called variance of an activity.

Slack : It is the difference between latest allowable time and earliest expected time of an event.

Earliest occurrence time Time at which an event may occur as early as possible.

Latest allowable time Time at which event may occur as late as possible without delaying the overall project completion time.

Earliest start time : It is the earliest possible time at which an activity can be started.

Earliest finish time : It is the earliest possible time by which an activity can be completed.

Latest start time : This is the latest possible time at which an activity can be started without delaying the overall project.

completed without delaying the project.

Float : It is the range within which start or finish time of an activity may fluctuate without affecting the project completion time.

Total float : It is the maximum available time in excess of the activity completion time.

Free float : The delay which can be made without delaying succeeding activities. It affects only preceding activities.

Independent Float : It is the minimum excess available time which exists without affecting any of succeeding or preceding activities.

Interfering float : It is similar to head event slack.

Critical Path : The path along which total floats are zero or minimum or it is the time wise longest path.

Subcritical Path : It is the path joining all subcritical activities.

Supercritical Path : It is the path joining all super critical activities.

Normal time : It is the standard time that an estimator would usually allow an activity.

Latest finish time : This is the latest time by which an operation or activity must be

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Tangent modulus : It is the slope of curve tangent at a given point on stress-strain curve.

Secant modulus : It is the slope of line drawn between grain & point on curve.

Factor of safety : The ratio of failure load to working load is called as factor of safety.

Permissible stresses : Stresses in concrete and steel are allowed not to exceed a particular value called as permissible stresses.

Balanced section : The maximum strain in steel and concrete reach their maximum values simultaneously.

Under reinforced section : The maximum strain in steel to reach their maximum value in concrete.

Over reinforced section : The maximum strain in concrete to reach their maximum value in Steel.

Flanged beam : In monolithic construction, slab & beams are cast together. If slab in such cases is in compression zone, they become effective in adding significantly to the area of concrete in compression.

Vertical stirrups : These are best for load reversal case.

Inclined stirrups : It is ineffective in load reversal.

Bent up bars : These are the main tensile reinforcement bend at appropriate location & it is always provided in combination with vertical

change in bending moment. It develops along the length of a bar to let the concrete & steel act together.

Anchorage Bond stress : It develops in the anchorage zone at the ends bar or at the cut-off point of a bar within span of beam so that bars are not pulled out.

One way slab : $\frac{l_y}{l_x} > 2$

Two way slab : $\frac{l_y}{l_x} = 1$

For square slab : $\frac{l_y}{l_x} \leq 2$

Flat slab : This is a two-way reinforced concrete slab that usually does not have beams and girders and the loads are transferred directly to the supporting concrete columns.

IMPORTANT CIVIL ENGINEERING DEFINATION SHEET

Estimate and costing

Specification : It contains detailed description of all workmanship and materials which are required to complete an project.

Estimate : It is the process of calculating the quantities and costs of the various items required in connection with the work.

A Preliminary or approximate or rough Estimate : This is an estimate to find out an approximate cost in a short time.

A Quantity Estimate or Quantity Survey : This is a complete estimate or list of quantities for all items of work required to complete the concerned project.

Revised Estimate : It is a detailed estimate for the revised quantities and rates of items of works originally provided in the estimate without material deviations of a structural nature from the design originally approved for a project.

Contingencies : It indicates the incidental expenses of a miscellaneous character which cannot be reasonably predicted during preparation of the estimate.

Work-charged establishment : This will include such temporary establishments as are employed for the execution or the immediate technical supervision or departmental stores and machinery in connection with a specific work.

Capital cost : It indicate the actual amount incurred in completing a work.

Administrative approval : The formal acceptance of the proposals by the authority.

Expenditure sanction : It means the concurrence of the Government the expenditure proposed.

Lead : It is the average horizontal distance between the centre of excavation to the centre of deposition.

Lift : It is the average height through which the earth has to be lifted from the source to the place of spreading or heaping.

Contract: An agreement enforceable by law is Contract.

Tender: It is a written offer submitted by the contractors in pursuance of the notification given, to execute certain work with the terms and conditions.

Tender form: It is a printed standard form of contract giving standard conditions of contract, general rules and directions for guidance of contractors.

Earnest money: While submitting a tender, the contractor is required to deposit some amount with the department, as guarantee of the tender, known as Earnest money.

Security deposit: It is an amount of money which shall be deposited by the contractor whose tender has been accepted.

Liquidated damage: It is an amount of compensation payable by a contractor to the owner or Government due to delayed construction having no relationship with real damage.

Unliquidated damage: This is known as ordinary damage having relation with the actual damage done.

Valuation : Valuation is the art of assessing the present fair value of a property at a stated time.

Scrap value (junk value) : It is the value of the property at the end of its useful life.

Salvage value (Resale value): It is the value of the property at the end of its useful life without being dismantled.

Market value: It is the value at which it can be sold in the open market at a particular time.

Book value: It the value of the property shown in the account book in that particular year, i.e. the original cost less the total depreciation till that year.

Distress value/forced sale value: In case a property is sold at a lower price than the market value.

Sentimental value: When a property is sold or purchased at a higher value than the market value due to playing of sentiments in the mind of the owner or the purchaser.

Reversionary value: Present value of an amount deferred for a certain period at a fixed rate of interest is known as reversion value.

Sinking fund: Sinking fund is an amount which has to be set aside at fixed intervals of time (say annually) out of the gross income so that at the end of the useful life of the building or property, the fund should accumulate to the initial cost of the property.

Capitalised value: It is the sum or amount, the interest on which at the highest prevailing rate would be equal to the net income out of the property.

Year's purchase: It is the capital sum required to be invested in order to receive a net annual income as an annuity of Rs. 1/- at certain rate of interest.

Depreciation: This is the loss in the value of the property due to its use, life, wear, tear, decay and obsolescence.

Obsolescence: This is the loss in the value of the property due to change in fashion, in designs, in structure, in adequacy to present or growing needs, necessity for replacement new inventions etc.

Annuity: It is the net instalment of annual or periodical payment for repayment of the capital amount invested in a property for a specified period.

Annuity certain: If an annuity is payable at the end of each period and payments are continued for certain fixed number of periods it is known as Annuity certain.

Annuity due: When the annuity is payable at the beginning of each period of year and payments are continued for certain fixed number of periods it is known as.

Perpetual Annuity: When the annuity is receivable for an indefinite period.

Deferred Annuity: When the annuity commences after a few years from the actual date of the capital investment.

Freehold property : It is in absolute possession of its owner or freeholder for a period of indefinite duration who has the right to use the property at his free will subject only to the law of land.

Leasehold property : The leaseholder is known as lessee and holds the physical possession of a property for a definite period under terms and conditions specified in the lease document.

Surveying

Plane surveying : In which the mean surface of the earth is considered as a plane.

Geodetic surveying : In which the curvature of the earth is taken into consideration.

Scale of a map : It is the ratio of the distance marked on the map to the corresponding distance on the ground.

Representative Fraction : It is the ratio of the distance on the map to the corresponding distance on the ground.

Graphical scale: A graphical scale is a line drawn on the map so that its map distance corresponds to a convenient unit of length on the ground.

Plain scale : It is possible to measure two successive dimensions only.

Diagonal scale : It is Possible to measure three successive dimensions.

Chord scales : these are used to measure and to set out angles, without using a protractor.

Ranging : The method of locating or establishing intermediate points on a straight line between two survey stations or between the two fixed points.

Normal Tension : It is the theoretical pull at which the pull correction is numerically equal to the sag correction.

Base Line : The longest survey line passing through the centre of the area to be surveyed.

Tie Line : A line joining some fixed points as tie stations on the main survey line.

Check Line : A line joining between the apex of triangles and some fixed point on survey lines or on base line.

Offsets : It is the distances are measured from the survey lines to the object right or left of the survey line.

Perpendicular offsets : When distances are measured at right angles (90°) to the chain line.

Oblique offsets : When distances are measured other than 90° to the chain line.

Arbitrary meridian : It is any convenient direction towards a well defined permanent object.

Bearing of a line : It is the angle between a meridian and a survey line.

True Bearing (Azimuth) : It is horizontal angle between true meridian and the line.

Magnetic bearing : It is the horizontal angle which the line makes with magnetic north.

Grid bearing: It is the horizontal angle with Grid meridian.

Arbitrary bearing : It is the horizontal angle with Arbitrary meridian.

Whole circle bearing system : Bearing of a line is measured always in clockwise from North end of reference.

Reduced bearing or Quadral Bearing (QB) system: Bearing of a line is measured eastward or westward from North or South, whichever is nearer.

Fore bearing : The bearing observed in the direction of progress of survey.

Back bearing : The bearing observed on the same line of fore bearing in opposite direction at the other end.

Dip : It is the inclination of the magnetic needle with the horizontal.

Local attraction : It is the attraction of the magnetic needle to a local magnetic field other than earth's magnetic field.

Magnetic Declination : The horizontal angle which the magnetic meridian makes with the true meridian.

Residual Error : It is the difference between the most probable value of a quantity and its observed value.

True Error : It is the difference between the true value of a quantity and its observed value.

Parallax : If the image formed by objective lens is not in the same plane with cross-hairs, any movement of the eye is likely to cause an apparent movement of the image with respect to the cross-hairs. This is called parallax.

Bench mark : It is a fixed reference point whose elevation with respect to some datum is known.

G.T.S. bench marks : These bench marks are established by the survey of India department throughout the country.

Permanent bench marks : These are permanent reference points established with reference to G.T.S.

Arbitrary bench marks : When small ordinary levelling work is to be carried out and chosen as bench mark and its elevation is assumed arbitrarily.

Temporary bench marks : any permanent object is chosen on which the work is stopped and can be started further on the next day.

Barometric Levelling : The levelling in which the elevations are determined indirectly from the changes in the atmospheric pressure.

Hypsometric Levelling : The levelling in which the difference of elevations is determined by noting down the temperature at which water starts boiling.

Reduced level : It is a vertical distance between survey point and adopted datum plane.

Back Sight : It is the reading taken on a staff held at a point of known elevation.

Fore Sight : It is the reading taken on the staff either held at the last point.

Transit Theodolite : The Theodolite in which line of sight can be reversed by revolving the telescope through 180° in the vertical plane about horizontal axis.

Face Right : When vertical circle of the theodolite is on the right of the observer.

Face Left : When vertical circle of the theodolite is on the left of the observer.

Changing Face : It is the operation of bringing the telescope from face left condition to face right condition and vice versa.

Double Sighting : It is the process of making the horizontal and vertical measurements twice.

Swing the telescope : It is the operation of revolving the telescope in the horizontal plane about the vertical axis.

Telescope normal : The telescope is said to be in normal position when vertical circle is on the Left of the observer.

Telescope inverted : The telescope is said to be in inverted position when vertical circle is on the right of the observer.

Centering : It is the operation of setting up the instrument exactly over the station mark.

Axis of level tube : It is the line tangential to the longitudinal curve of the level tube at its centre.

Line of collimation : Line joining the intersection of the cross-hairs to the optical center of the objective and its continuation.

Sensitiveness of bubble tube : It is the angular value of one division of the bubble tube.

Vertical axis : It is the axis about which telescope can be rotated in horizontal plane. Also called azimuth axis.

Horizontal axis : It is the axis about which telescope is rotated in vertical plane. Also called transit axis or trunnion axis.

Indian clinometer : It is used to determine the difference of elevations of two points by measuring the inclination of line of sight.

Total station : It is a combination of an electronic theodolite and an electronic distance meter (EDM).

Simple Circular Curve : A simple circular curve has the property that it connects two straight lines with a curve of constant radius at all the points on the curve and connects the two straight lines tangentially.

Compound Curve : When all the curves turn in the same direction then the resulting curve is called as compound curve.

Reverse Curve : The two curves of different radii and take turn in opposite directions.

Transition Curve : It is a horizontal curve of varying radius.

Combined Curve : It is a combination of simple and transition curves.

Terrestrial photogrammetry : It deals with taking photographs from the cameras on the ground to know the terrain of earth.

Aerial Photograph : It is the photograph of an area taken from air with a camera mounted on an aircraft.

Tilted Photograph : In a tilted photograph, the camera axis is unintentionally inclined to the vertical by an angle not exceeding 3°.

Crab : It is the angle between the flight line of the aircraft and the edges of the photograph in the direction of flight.

Vertical photograph : A photograph taken with the optical axis coinciding with direction of gravity.

Focal length : The distance from the middle of the camera lens to the focal plane.

Tunnelling

Open cuts : It is open to sky passage excavated through huge soil mass of obstacle like hill etc.

Tunnels : It is an artificial underground passage to bypass obstacles safely without disturbing the and above it to carry passengers, goods water & sewage etc.

Alignment of tunnel : It is a process of locating centre line position of underground tunnel.

Setting out of tunnel : It means marking the centre line or alignment of any construction work on ground.

Portals : It is the actual doorways or main entrances of the tunnels.

Shove of shield : It is the forward movement of shield in alignment.

Length of shove : It is the movement of shield in a single shove.

Blind shove : When the shield is to be driven in quick sand with its eyes (parts) closed is known as blind shore.

Primer : For burning on explosive is placed in charge (explosive) itself this small quantity of explosive is known as primer.

Mucking : It is removal of the blasted debris of spoil from the tunnel interior to sites outside the tunnel entrance.

Drill bits : It is the portion of a drill contacts the rock for its disintegration.

Nipper cars : It is the vehicle which comes the drill steel for sharpening & brings it back to the site after sharpening.

Scaling : It is the Removal of rock protrusions by hammering immediately in the wake of blasting.

Shafts : These are vertical tunnels or wells or passages reaching from the ground surface down to the tunnel invert.

Pre-drainage : It means preventing the entry of excess water from entering the tunnel before starting the construction work.

Dewatering : removing the water that has entered the tunnel during the construction of tunnel.

Tunnel lining : Lining is used to indicate the finishing touch given to the cross section of tunnel.

Tunnel ventilation : It is the supply of air, light & keeping the level of noise to bearable to human beings.

Permanent ventilation : When ventilation is to be provided after the construction work is over and tunnel is open for traffic such ventilation is known as permanent ventilation.

Silicosis : As extended breathing of silica dust causes a fibrosis of lung tissues known as silicosis.

IMPORTANT CIVIL ENGINEERING DEFINATION SHEET

Geotechnical Engg.

Organic soil : These are formed by growth and subsequent decomposition of plant.

Inorganic soil : These soil obtain from rock disintegration due to weathering.

Loess : These are wind-blown uniformly graded fine soil.

Caliche : It is cemented soil rich in calcium carbonate consisting of gravel, sand and clays.

Loam: It is a mixture of mud, silt and clay in definite proportion.

Cumulose: These are formed due to accumulation of organic content under water-logged condition.

Humus: Humus is a mixture of mud and dead plants.

Peat: It is highly organic soil containing almost decomposed vegetable matter.

Bentonite: It is a clay formed by chemical weathering of volcanic ash which have high content of montmorillonite.

Kaolin (China Clay): It is very pure form of white clay.

Varved Clays: These are sedimentary deposits consisting of alternate thin layer of silt and clay.

Water Content : It is the ratio of weight of water to the weight of soil solids.

Degree of Saturation : It is the ratio of the volume of water to the volume of voids in the soil mass.

Void Ratio : It is the ratio of the total volume of voids to the volume of solids.

Porosity : It is the ratio of volume of voids to the total volume of soil.

Air Content : It is the ratio of the volume of air to the total volume of voids present in soil.

Percentage Air Voids : It is the ratio of volume of air to the total volume of soil mass.

Unit Weight of Solids : It is the ratio of weight of soil solids to the volume occupied by the soil solids.

Specific gravity: It is the ratio of the mass of unit volume of soil at a stated temperature to the mass of the same volume of distilled water at a stated temperature.

Relative density : It is the index which quantifies the degree of packing between the loosest and densest packing of coarse grained soil.

Effective size : A diameter that directly corresponds to the percentage, by weight, of grains that equal to 10% on the grain-size diagram.

Coefficient of uniformity : It is measure of particle size range.

Coefficient of curvature : It represents shape of particles distribution curve.

Liquid Limit : It is that minimum water content at which soil has tendency to flow.

Flow Index : The slope of flow curve is called flow index.

Plastic Limit : The water content at which soil would just begin to crumble when rolled into a thread of appro. 3 mm diameter.

Shrinkage limit : It is the smallest value of water content at which soil mass is completely saturated.

Shrinkage ratio : It is expressed as a percentage of the dry volume to the corresponding change in water content above the shrinkage limit.

Volumetric Shrinkage: It is the percentage loss in volume of soil on drying.

Degree of shrinkage: It is the percentage loss in volume of soil on drying corresponding to initial volume.

Plasticity Index : It is the range of moisture content over which a soil exhibits plasticity.) ($I_p = W_p - W_s$)

Shrinkage Index (Is) : It represents semi-solid state of consistency. ($I_s = W_p - W_s$)

Consistency Index : It is the ratio of the difference between the liquid limit and the natural water content of the soil to the plasticity index.

Liquidity Index : It is the ratio of the difference between the natural water content of a soil and its plastic limit to its plasticity index.

Toughness Index : It is the ratio of plasticity index to flow index.

Sensitivity : It is the ratio of unconfined compressive strength (UCS) in undisturbed condition to the UCS in its remoulded state at constant water content.

Thixotropy : It is the property of soil by virtue of which it regains a part of lost shear strength at constant water content.

Activity of clay : It is the ratio of plasticity index to the % by weight finer than 2 μ.

Single Grained Structure : These are found in soils having size greater than 0.02 mm.

Honeycomb Structures : This are found in soil having size between 0.02 mm to 0.002 mm.

Flocculated and Dispersed Structures : These are found in the soils having size less than 0.002 mm.

Permeability : It is property of soil by virtue of which soil allow the flow of fluid through it.

Darcy's law : for laminar flow in saturated soil, velocity of flow (V) is directly proportional to the hydraulic gradient (i)

Seepage Velocity : The velocity through the pore is called seepage velocity (Vs).

Seepage Pressure : When water flow through saturated soil mass it exerts pressure over soil solids by virtue of frictional drag. This pressure exerted by water is termed as seepage pressure

Quick Sand Condition : If seepage pressure equals to the pressure due to the submerged weight of soil mass then effective stress reduces to zero, in this condition cohesionless soil looses its strength and starts to flow. This phenomenon is termed as Quick Sand Condition Or Boiling Condition.

Critical hydraulic gradient : The hydraulic gradient at which Quick sand condition occurs.

Optimum moisture content : It is the moisture content corresponding to maximum dry density.

Air void lines : A line showing the relationship between water content and dry unit weight of compacted soil at constant percentage of air voids.

Saturation line : A line showing relationship between water content and dry unit weight of compacted soil at constant degree of saturation.

Compressibility : It is the process of decrease in volume of soil mass due to increase in loading.

Consolidation : The decrease in soil volume by the squeezing out of the pore water.

Normally Consolidated Soils : Those which are loaded for the first time to the present applied effective stress.

Over Consolidated Soils : Those which have been subjected to effective stress in the past greater than present applied effective stress.

Over Consolidation Ratios : It is the ratio of maximum applied effective stress in the past to the present applied effective stress.

Coefficient of Compressibility : The slope of effective stress void ratio curve on Arithmetic scale.

Coefficient of volume change : It is the ratio of unit volume change per unit increase in effective stress.

Expansion index or swelling index : It is the slope of the plot during unloading.

Shear strength : It is the resistance offered by soil against shear deformation.

Brittle failure : This occurs in dense sand and heavily over

Rotational failure : This type of failure is common in homogeneous fine grained soil.

Slope failure : If the failure surface intersects with the slope above the toe.

Toe Failure : This type of failure occurs when, failure surface passes through toe.

Base Failure : This type of failure is observed when the soil mass below the toe is soft and weak in compression and the slope is flat.

Bearing Capacity : The load carrying capacity of foundation soil or rock which enables it to bear and transmit loads from a structure is known as bearing capacity.

Gross pressure intensity (q_g) : It is the total pressure at the base of foundation due to the weight of super structure, self weight of footing and weight of the earth fill.

Net pressure intensity (q_n) : It is that part of gross pressure at the base of footing which is in excess to initial effective overburden pressure.

$$q_n = q_g - \bar{\sigma} = q_g - \gamma D_f$$

Ultimate bearing capacity (q_u) : The maximum gross pressure, which a foundation can withstand without the occurrence of shear failure.

Net ultimate bearing capacity (q_{nu}) : It is that maximum net pressure which can be applied at the base of foundation without shear failure.

$$q_{nu} = q_u - \bar{\sigma}$$

Net safe bearing capacity (q_{ns}) : It is that net pressure which can be applied safely at the base of footing without the risk of shear failure.

$$q_{ns} = \frac{q_{nu}}{F} = \frac{q_u - \gamma D_f}{F}$$

Friction piles : If piles are driven through soft strata then load supporting power is due to skin friction along the surface area of the pile.

Anchor piles : These piles are used for providing anchorage against horizontal pull from sheet piles or retaining wall.

Sheet piles : These are used to retain backfill of soil and support soil in open excavation.

Tension piles : These piles are used to resist uplift force.

Compaction piles : The piles driven in granular soils in order to improve density and bearing capacity.

Fender piles : These piles are used to protect concrete dock or other water front structure from impact which may be caused by the waves generated by ships and floating objects.

Batter piles : These are driven in inclined direction to resist the large horizontal or inclined force.

Franki pile: It has an enlarged base of mush-room shape, which gives effect of a spread footing.

Displacement piles : The piles whose installation causes displacement and disturbance of soil

Non-displacement piles : The piles which do not cause any displacement and disturbance of soil.

Negative Skin Friction : It is a phenomena which occurs when a soil layer surrounding a portion of the pile settles more than pile.

Efficiency of Pile Group : It is the ratio of ultimate load capacity of the pile group to the sum of ultimate load capacities of all the piles under individual action.

Soil Exploration : The process of sampling and field & laboratory investigations required to obtain the physical properties of subsoil

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Catchment Area : The area of land from which the runoff comes into a stream.

Residence Time : It is the average duration for a water molecule to pass through a subsystem of hydrological cycle.

Ridge : This is the line which divides the catchment area from its neighboring catchment area.

Rain : The water droplet size are larger than and smaller than called as rain.

Drizzle : A fine sprinkle of numerous water droplets which have size less than 0.5 mm and intensity of these water droplet is less than , then it called as drizzle.

Sleet : It is frozen rain drops which have transparent grains.

Hail : It is a large size of snow which have size greater than 8 mm.

Raingage : An instrument for measurement of rainfall.

Water Equivalent of Snow: It is the depth of water that would result in melting of a unit of snow.

Mass Curve of Rainfall : It is plot after the accumulated precipitation against of time in chronological order.

Hyetograph : It is plot of the intensity of rainfall against the time interval.

Isohyet : It is a line joining the point's of equal rainfall magnitude.

Index of Wetness : The ratio of the actual rainfall in a particular year at a given place to the average annual rainfall of the place.

Probable maximum precipitation : It is the maximum possible precipitation that can reasonably be expected at a given location.

Standard Project Storm : It is the greatest storm that can reasonably be expected on a particular area, it is to be calculated on actual basis and in it no modification of rainfall data can be done.

Iso-Pluvial : A line connecting point of equal rainfall depth.

Evaporation : It is the process in which a liquid changes to the gaseous state at the free surface, below the boiling point through the transfer of heat energy.

Interception : It is the part of the rainfall that is intercepted by the Earth's surface and which subsequently evaporates.

Through Fall : Water which drips through, comes down etc. onto the ground surface.

Stem Flow : Water which trickles along the twigs a finally down the main trunk onto the ground surface.

Transpiration : It is the process by which water leav living plant and reaches the atmosphere as water vapour.

Evapotranspiration : evaporation and transpiration are c one head.

Percolation : It is the downward flow of water thro zation towards the water table.

Infiltration : When water is applied to surface of a soil, into the soil. This movement of water through soil is cal

Infiltration Capacity : It is the maximum rate at wh absorbed by a soil in given condition.

Φ – Index : It is the average rainfall above which the r equal to the runoff volume.

W – Index : It is the average infiltration rate during t intensity exceeds the capacity rate.

Runoff : The portion of precipitation which come on reach the stream channel by above and below the surface runoff.

Interflow : Part of precipitation that infiltrate into the soil and returns to the surface at some location away from t to the soil is called interflow.

Direct Runoff : It is that part of runoff which enters the stre just after the rainfall.

Base flow : The delayed flow that reaches a stream gau water.

Natural Flow : That runoff which flow in its natural c being affected by the human intervention is called natural fl

Time of Concentration : It is the time required by the w outlet from most remote point of drainage area.

Travel Time : It is the time taken by the water to reac outlet, from the different points in the catchment.

Capillary Water : It is that water which is retained in the soil after the gravitational water gets drained.

Hygroscopic Water : It is that water which is adsorbed by the particles of dry soil and is held as a very thin film on the surface of soil particles due to adhesion.

Intermediate zone : It exists between soil water zone and capillary zone.

Capillary zone : Pressure in this zone is less than atmosphere because of capillary potential within the capillary fringe.

Aquifer : An aquifer is a saturated formation of earth material which not only store water but yield it in sufficient quantity.

Aquitard : It is formation through which only seepage is possible and thus the yield is insignificant compared to aquifers.

Aquiclude : Formation like clay which is highly porous but not permeable due to very small size pores.

Aquifuge : It is a geological formation which is neither porous nor permeable.

Unconfined aquifer (water table aquifer or phreatic aquifer) : an aquifer whose upper water surface (water table) is at atmospheric pressure and thus is able to rise and fall.

Perched Aquifer : If within a zone of saturation, an impervious deposit below a pervious deposit is found to support a body of saturated material, then this body of saturated material is known as Perched Aquifer.

Confined aquifer / artisan aquifer : It is an aquifer below the land surface that is saturated with water.

Specific yield : The actual volume of water that can be extracted by the force of gravity from a unit volume of aquifer material is known as the specific yield.

Specific Retention : It is the ratio of that volume of water which can be retained in the voids against the gravity to the total volume aquifer.

Dead Storage : It is the water held below the minimum pool level.

Live or Useful Storage : It is the volume of storage between the minimum and normal pool levels.

Surcharge Storage : The water level rises above the normal pool level.

Bank Storage : It is the water that enters the permeable reservoir banks when the reservoir fills, and this water drains out when the water level in the reservoir is lowered.

Valley Storage : It is the volume of water occupied in a natural stream channel entering the reservoir.

Prism Storage : It is the volume of water between a plane drawn through a line drawn parallel to the stream bed and the stream bed itself.

Wedge Storage : It is the volume of water between a line parallel to the stream bed and the actual water surface profile.