INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

CIVIL ENGINEERING

DEFINITIONS AND TERMINOLOGY QUESTION BANK

Course Name	:	**ENGINEERING GEOLOGY**
Course Code	:	**ACEB05**
Program	:	**B. Tech**
Semester	:	**IV**
Branch	:	**Civil Engineering**
Section	:	**A & B**
Academic Year	:	**2019-2020**
Course Faculty	:	Mr K Tarun kumar, Assistant Professor Ms. H Apurva Rama, Assistant Professor

COURSE OBJECTIVES:

The course should enable the students to:	
I	Discuss the process of formation of rocks, their classifications and properties of minerals.
II	Identify different geological structures encountered in nature.
III	Recognize different hazards such as earthquakes, landslides etc causes and their effects
IV	Explain the importance of geophysical and geological studies of sites for tunnels, dams and Reservoirs.

DEFINITIONS AND TERMINOLOGYQUESTION BANK

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
MODULE-I						
1	Define engineering geology.	The science which deals with the physical structure and substance of the earth, their history and processes which act on them.	Understand	CO1	CLO1	ACEB05.01
2	What is petrology?	Petrology is the branch of geology that studies the origin, composition, distribution and structure of rock(from the greek language : petra- Rock and logos- Study)	Remember	CO1	CLO1	ACEB05.01
3	What is lithology?	“Lithology” was once approximately synonymous with petrography, but in current usage, lithology focuses on macroscopic hand-sample or outcrop-scale description of rocks while petrography is the specialty that deals with microscopic details.	Understand	CO1	CLO1	ACEB05.01
4	What is structural geology?	Structural geology is the study of the three -dimensional distribution of rock units with respect to their deformational histories. The primary goal of structural geology	Remember	CO1	CLO1	ACEB05.01

		is to use measurements of present-day rock Geometries to uncover information about the history of deformation (strain) in the rocks, and ultimately, to understand the stress field that resulted in the observed strain and geometries.				
4	What is weathering of Rocks?	Weathering breaks down and loosens the surface minerals of rock so they can be transported away by agents of erosion such as water, wind and ice	Understand	CO1	CLO2	ACEB05.02
5	What are the types of weathering?	There are two types of weathering: mechanical and chemical. 1. Mechanical or physical weathering involves the breakdown of rocks and soils through direct contact with atmospheric conditions, such as heat, water, ice and pressure. 2. Chemical weathering involves the direct effect of atmospheric chemicals or biologically produced chemicals also known as biological weathering in the breakdown of rocks, soils and minerals.	Remember	CO1	CLO2	ACEB05.02
6	What is igneous rock?	Igneous petrology focuses on the composition and texture of igneous rocks (rocks such as granite or basalt which have crystallized from Molten rock or magma). Igneous rocks include volcanic and plutonic rocks	Understand	CO1	CLO2	ACEB05.02
7	What is sedimentary rock?	Sedimentary petrology focuses on the composition and texture of sedimentary rocks (rocks such as sandstone, shale	Remember	CO1	CLO2	ACEB05.02
8	What is metamorphic rock?	Metamorphic petrology focuses on the composition and texture of metamorphic rocks such as slate, marble, gneiss, or schist which started out as sedimentary or igneous rocks but which have undergone chemical, mineralogical or textural changes due to extremes of pressure, temperature or both)	Understand	CO1	CLO3	ACEB05.03
9	What is mineral?	A mineral is a naturally occurring substance that is solid and inorganic represent able by a chemical formula, and has an ordered atomic structure.	Remember	CO1	CLO1	ACEB05.01
10	What is mineralogy?	The study of minerals is called mineralogy.	Understand	CO1	CLO2	ACEB05.02
11	What is the formation of minerals?	1) Minerals are crystalline solid substances, meaning the atoms making up a mineral are arranged in an ordered, three-dimensional, structure. 2) The distances and angles between an individual atom and the neighbors it is bonded to are constant. 3) The process of mineral formation is known as crystallization. In order for a mineral to crystallize, ions from the nearby environment must be brought together.	Remember	CO1	CLO2	ACEB05.02
12	What are physical properties?	The physical characteristics of minerals include traits which are used to identify and describe mineral species. These traits include color, streak, luster, density, hardness, cleavage, fracture, tenacity, and crystal	Understand	CO1	CLO2	ACEB05.02

S.NO	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
13	What do you mean by study of minerals?	Mineralogy is a subject of geology specializing in the scientific study of chemistry, crystal structure, and physical (including optical) properties of minerals. Specific studies within mineralogy include the processes of mineral origin and formation, classification of minerals, their geographical distribution, as well as their utilization.	Remember	CO1	CLO2	ACEB05.02
MODULE – II						
1	What is petrology?	Petrology is the branch of geology that studies the origin, composition, distribution and structure of rock(from the greek language : petra- Rock and logos- Study)	Remember	CO2	CLO5	ACEB05.05
2	What is crystallization?	Crystallization is also a chemical solid-liquid separation technique in which mass transfer of a solute from the liquid solution to a pure solid crystalline phase occurs.	Understand	CO2	CLO5	ACEB05.05
3	Define dykes	A dike or dyke in geological usage is a sheet of rock that formed in a fracture in a pre-existing rock body	Remember	CO2	CLO5	ACEB05.05
4	Define sill?	when the new rock forms within and parallel to the bedding of a layers rock, it is called a sill.	Understand	CO2	CLO5	ACEB05.05
5	What do you mean by structure and texture of igneous rocks?	The texture of igneous rocks depends on the composition of the magma and the conditions surrounding the magma's cooling.	Remember	CO2	CLO6	ACEB05.06
6	What do you mean by structure and texture of sedimentary rocks?	The relationship between rock structure and texture and rock genesis is more pronounced in sedimentary rocks than in igneous rocks.	Understand	CO2	CLO 6	ACEB05.06
7	What do you mean by structure and texture of metamorphic rocks?	The structures and textures of metamorphic rocks arise during the recrystallization in the solid state of primary sedimentary and magmatic rocks. The recrystallization occurs under the action of lithostatic pressure, temperature	Remember	CO2	CLO6	ACEB05.06
8	Define ground water	Groundwater (or ground water) is the water present beneath Earth's surface in soil pore spaces and in the fractures of rock formations.	Understand	CO2	CLO6	ACEB05.06
9	What is a spring?	A spring is the result of an aquifer being filled to the point that the water overflows onto the land surface.	Remember	CO2	CLO7	ACEB05.07
10	What is cone of depression?	A cone of depression occurs in from a an aquifier when groundwater is pumped aquifier well. In an un confined depression of the water table, this is an actual water level. In confined aquifers (artesian), the cone of depression is a reduction in the pressure head surrounding the pumped well.	Understand	CO2	CLO7	ACEB05.07

S.NO	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
11	What is aquifer?	An aquifer is an underground layer of water-bearing permeable rock or unconsolidated materials (gravel, sand, or silt) from which groundwater can be extracted using water well.	Remember	CO2	CLO7	ACEB05.07
12	What is hydro-geology?	The study of water flow in aquifers and the characterization of aquifers is called hydrogeology.	Understand	CO2	CLO7	ACEB05.07
13	What is confining layer (aquitard)?	Geological material through which significant quantities of water cannot move, located below unconfined aquifers, above and below confined aquifers.	Remember	CO2	CLO8	ACEB05.08
14	What are the causes of slope erosion?	Four factors cause slope erosion are 1. Amount and rate of rainfall, 2. steepness or gradient of the slope, 3.Amount and nature of plant cover, 4. Type of soil and bedrock underneath.	Understand	CO2	CLO8	ACEB05.08
15	What is Undrained soil?	Undrained condition occurs when the pore water is unable to drain out of the soil. In an undrained condition, the rate of loading is much quicker than the rate at which the pore water is able to drain out of the soil	Remember	CO2	CLO8	ACEB05.08
16	What is confined aquifers?	A regional confined aquifer is directly recharged by precipitation in the area where the aquifer crops out, having the same characteristics as an unconfined aquifer.	Remember	CO2	CLO5	ACEB05.05
17	What is unconfined aquifer?	Natural recharge of the unconfined aquifers is mainly due to the downward seepage (or percolation) through the unsaturated zone of the excess water over passing the field capacity of the soil. Recharge can also occur through upward seepage (leakage) from underlying aquifers.	Remember	CO2	CLO5	ACE018.05
18	What is an infiltration gallery?	The underground tunnel used for tapping underground water near rivers, lakes or streams are called as infiltration galleries	Remember	CO2	CLO5	ACEB05.05
MODULE – III						
1	Define Stratigraphy	Stratigraphy is a branch of geology which studies rock layers (strata) and layering (stratification).	Understand	CO3	CLO9	ACEB05.09
2	What is lithostratigraphy?	Lithostratigraphy, or lithologic Stratigraphy, provides the most obvious visible layering. It deals with the physical contrasts in lithology, or rock type. Such layers can occur both vertically– in layering or bedding of varying rock types.	Understand	CO3	CLO9	ACEB05.09
3	What is Biostratigraphy?	Biostratigraphy is the branch of Stratigraphy which focuses on correlating and assigning relative ages of rock strata by using the fossil assemblages contained within them. Biologic Stratigraphy was based on	Remember	CO3	CLO6	ACEB05.06

		William Smith's principle of faunal succession, which predated, and was one of the first and most powerful lines of evidence for, biological evolution.				
4	Define out crop	An outcrop or rocky outcrop is a visible exposure of bedrock or ancient superficial deposits on the surface of the Earth.	Remember	CO3	CLO9	ACEB05.09
5	Define strike	Strike is a geographic direction given by the line of intersection of a horizontal plane with a bedding plane of a layer of rock. It is measured in field with the help of a compass	Understand	CO3	CLO9	ACEB05.09
6	Define Dip	It is defined as the max angle of inclination with the horizontal. It is expressed both in terms of degree of inclination and direction of inclination. The amount of dip is called angle of inclination, which a bedding plane makes with a horizontal plane.	Understand	CO3	CL9	ACEB05.09
7	Define true Dip	when the dip of the layer is measured in a direction that is essentially at right angles to the strike of the particular layer, then It is called TRUE DIP.	Understand	CO3	CLO9	ACEB05.09
8	Define apparent Dip	When the dip of the layer is measured in any other direction which is not a right angles to the strike direction is called APPARENT DIP.	Remember	CO3	CLO6	ACEB05.06
9	Define fold	Folds are one of the most common geological structures found in rocks. When a set of horizontal layers are subjected to compressive forces, they bend either upwards or downwards. The bends noticed in rocks are called folds.	Remember	CO3	CLO10	ACEB05.10
10	What is anticline and syncline?	When beds are bent upwards, the resulting fold is called Anticline. This fold is convex upwards. (Anti= Opposite, Cline= Inclination) Syncline is just opposite to anticline on its nature, when the beds are bent downwards the resulting fold is called Syncline.	Understand	CO3	CLO10	ACEB05.10
11	What is symmetrical and fold?	When the axial plane divides a fold into two equal halves in such a way that one half is the mirror image of another, then such fold is called Symmetrical fold.	Understand	CO3	CLO10	ACEB05.10
12	What is asymmetrical and fold?	If the two halves are not mirror images, then the fold is called Asymmetrical fold. IF the compressive forces responsible for folding are not of the same magnitude, asymmetrical folds are formed.	Remember	CO3	CLO10	ACEB05.10

S No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
MODULE - IV						
1	Define Earth Quake	A sudden violent shaking of the ground, typically causing great destruction, as a result of movements within the earth's crust or volcanic action	Understand	CO 4	CLO13	ACEB05.13
2	What is seismic waves?	Seismic waves are waves of energy that travel through the Earth's layers, and are a result of an earthquake, explosion, or a volcano that gives out low-frequency acoustic energy.	Remember $\frac{\mu.Fv}{Fh}$	CO 4	CLO13	ACEB05.13
3	What do you mean by tectonic earthquake?	Tectonic earthquake are exclusively due to internal causes, due to disturbances or adjustments of geological formations taking place in the earth's interior, they are less frequent, but more intensive and hence more destructive in nature.	Understand	CO 4	CLO13	ACEB05.13
4	What do you mean by non-tectonic earthquake?	Non Tectonic earthquake on the other hand, is generally due to external or surficial causes. This type of earthquake is very frequent, but minor in intensity and generally not destructive in nature.	Remember	CO 4	CLO13	ACEB05.13
5	What is primary waves (P-Waves)?	Primary waves are compressional waves that are longitudinal in nature. P waves are pressure waves that travel faster than other waves through the earth to arrive at seismograph stations first, hence the name "Primary".	Understand	CO 4	CLO14	ACEB05.14
6	What is secondary Waves (S-Wave)?	Secondary waves (S-waves) are shear waves that are transverse in nature. Following an earthquake event, S-waves arrive at seismograph stations after the faster-moving P-waves	Understand	CO 4	CLO14	ACEB05.14
7	What is Richter magnitude scale?	The Richter magnitude scale (also Richter scale) assigns a magnitude number to quantify the energy released by an earthquake.	Understand	CO 4	CLO14	ACEB05.14
8	Define dam?	A dam is a barrier that impounds water or underground streams.	Understand	CO 4	CLO13	ACEB05.13
9	What is Reservoir?	The dams constructed across the rivers create artificial lakes which are known as reservoirs.	Remember	CO 4	CLO13	ACEB05.13
10	What is landslides?	If a mass of earth or rock moves along a definite zone or surface the failure is called as Landslide. The foremost force responsible for the occurrence of landslide is due to the action of gravity.	Understand	CO 4	CLO14	ACEB05.14
11	Define tsunami?	A Tsunami is a giant wave (or series of waves) created by an undersea earthquake, volcanic eruption and landslide. Tsunamis are often called as tidal waves but this is not accurate description because tides have little effect on giant tsunami waves.	Remember	CO 4	CLO14	ACEB05.14

S.NO	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
12	Define Volcanoes?	A Volcano is a vent (hole) in the earth's crust through which lava, steam, ashes and etc., are expelled.	Remember	CO 4	CLO14	ACEB05.14
13	What is AVALANCHES?	An Avalanche is any amount of snow sliding down a mountainside. Another term for avalanche is snow slide.	Remember	CO 4	CLO14	ACEB05.14
14	What is flood?	A Flood is an overflow of water that submerges the land which is usually dry.	Remember	CO 4	CLO14	ACEB05.14
15	What do you mean by water tightness?	Water at the site of reservoir and dam tends to percolate to underground through fractures and voids, this leakage may results in decrease in water level at reservoir so a reservoir must be made with sufficient water tightness.	Remember	CO 4	CLO16	ACEB05.16
MODULE - V						
1	What is buried river channel?	This is generally present as a glaciers below the surfaces it may not decrease the water tightness.	Understand	CO5	CLO17	ACEB05.17
2	What is electromagnetic method ?	In the principles of electromagnetic field an alternating magnetic field is formed in ground with help of an appropriate source. The formed electromagnetic field induces eddy currents in conductive ore bodies in sub-surface and these produces secondary electromagnetic fields. The magnetic element of secondary electromagnetic field is examined at surface to find underground ore deposits.	Remember	CO5	CLO17	ACEB05.17
3	What is electromagnetic method ?	In the principles of electromagnetic field an alternating magnetic field is formed in ground with help of an appropriate source. The formed electromagnetic field induces eddy currents in conductive ore bodies in sub-surface and these produces secondary electromagnetic fields. The magnetic element of secondary electromagnetic field is examined at surface to find underground ore deposits.	Understand	CO5	CLO17	ACEB05.17
4	What is self-potential method ?	Self-potential method is also known as spontaneous polarization method which is based on electrical potentials naturally present in earth. Pyrite, Pyrhotieans sulphideores which indicates spontaneous polarization. Apart from these graphite produces strong SP method.	Remember	CO5	CLO17	ACEB05.17
5	What is Subsidence?	Underground mining is the most widespread cause of subsidence by direct removal Removal causing changes in local or regional groundwater system either by natural or anthropogenic causes	Understand	CO5	CLO18	ACEB05.18
6	What is uplift?	Uplift: changed land conditions due to expansive soils	Remember	CO5	CLO17	ACEB05.17
7	What is arch dam?	Arch dams are concrete dams which are curved or convex upstream in plan. It is dependent upon the arch action for its strength.	Understand	CO5	CLO17	ACEB05.17

S.NO	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
8	What is gravity dam?	Gravity dams are the dams which resist the horizontal thrust of water entirely by their own weight ,they use their weight to hold back the water in the reservoir Made of earth or rock fill or concrete	Remember	CO5	CLO17	ACEB05.17
9	What is buttress dam?	Buttress dams are dams in which the face is held up by a series of supports.	Understand	CO5	CLO18	ACEB05.18
10	What is well Foundation?	Well foundation is a type of deep foundation which is generally provided below the water level for bridges.	Remember	CO5	CLO19	ACEB05.19
11	What are the elements of well Foundation?	Basic Elements of A Well Foundation Well-cap, Steining, Well curb, Bottom plug, Top plug and Intermediate plug.	Understand	CO5	CLO20	ACEB05.20
12	What is the shape of well?	Round Wells, rectangular or square wells.	Remember	CO5	CLO21	ACEB05.21
13	What is a caisson in construction?	In geotechnical engineering a caisson is a watertight retaining structure used, for example, to work on the foundations of a bridge pier for the construction of a concrete dam, or for the repair of ships	Understand	CO5	CLO22	ACEB05.22
14	What is caisson foundation?	A caisson foundation also called as pier foundation is a watertight retaining structure used as a bridge	Remember	CO5	CLO23	ACEB05.23

Signature of the Faculty **HOD, CE**