NAME: SANGEEN KHAN

ID: 16098

SECTION:A

2ND SEMESTER

CIVIL ENGINEERING

FINAL EXAM

SUBMITTED TO: SIR IMTAIZ

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QUESTION: 01

what causes earthquakes? if the Richter...............?

ANSWER:

CAUSES OF EARTHQUAKES:

An earthquake is caused by a sudden Slip on a fault.The TECTONIC PLATES are always slowly moving, but they get stuck at their edges due to FRICTION. When the strees stress on the edge overcomes friction, there is an earthquake that relases energy in waves that travel through the earths crust and causes the shaking that we feel.

 Earthquake do not occure randomly on Earth.The pattern of earthquake locations can be explained by assuming the earths surface is made up from rigid plates that are in motion relative to each other.

IF THE RICHTER MAGNITUDE REACHES AT 8 OR ABOVE WHAT WILL BE THE CONSEQUENCES:

Magnitude is important, but a key factor is where a quake stricks. The ones most people care about strick under or near heavily populated areas.

 Generally, earthquakes of magnitude 6 and above are the ones for concern. When nearby, they can causes shaking intensities that can begain to break chimneys and cause considerable damage to the most seismically vulnerable structures, such as non-retrofitted brick buildings.

 Earthquakes of magnitude 7 and above can overturn heavy furniture and inflict considerable damage in ordinary buildings.

 Intensity 8; severe- damage slight in specially designed structures; considerable damage in ordinary substabtail buildings with partial collapse. Damage great in poorly built structures. fall of Chimneys, walla, columns, Monuments, Factory. heavy furniture overturned.

DIFFERENTIATE BETWEEN PRIMARY AND SECONDARY WAVES:

PRIMARY WAVES:

 Primary waves are also called P WAVES or PUSH WAVES, travel the fastest and thus are the first to arrive. travelling at an average speed of 6 km per/s.

SECONDARY WAVES:

 secondary waves or s waves or SHAKE WAVES, arrive the next, moving at lesser speeds than the P waves .These waves produce a stronge shaking effect.

P WAVES S WAVES

* First wave to hit second waves to hit

seismograph. seismograhs.

* They are compressive they are shear wave

waves.

* Can move through solid can only move

and liquid. through solids.

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QUESTION: 02

 Describe the role of geology in selection of sites for dams.....?

ANSWER:

Dams are engineering structures constructed for different purposes. They are of different sizes, shapes, and types. In all cases, many essential studies should be carried out before deciding the location, type and size of dam.

 Among those studies is the geological investigations which should be carried out of deduce the geological conditions in the most relevant site, depth of the foundation and their types of the expected geological hazards.

 Without proper geological investagations, the sitting of a dam will cause serious hazards during construction and during commissioning of the dam.

 The location of the dam site and its foundations are built over a highly Karstified area, where gypsum and limestone beds are exposed and exist deep under the ground surface, and even deeper than the foundation.

 Geological investagation for selecting and locating dam sites is one of the most significant studies which should be carried out in different scales and stages before beciding the best location for a dam.

 Therefore, an adequate assessment of site geologic and geotechnical conditions is one of the most significant aspects of a dam safety evaluation.

 evaluation of the safty of a new dam requires, among other things, that its site, abutment, foundation and reservoir have been adequately examined, explored, and investgated so that the geological conditions are fully understood as much as possible.

 THE GEOLOGICAL INVESTAGATION SHOULD INVLUDE FOUR MAIN POINTS:

* The geology of the dam site including the foundation for the dam itself and the site for the other stuctures such as spillway, diversion tunnel and outlet work.
* The geology of the area to be occupied by the reservoir ance the dam is completed. Whether the storage area is watertight or are there areas of cavernous limestone and or gypsum which might lead to the dam not retaining water.
* Stability of the slopes in the dam site and reservoir area wheather landslides into the reservoir are possible which might cause a wave of water to be pushed over the top of the dam
* Finding sources of the construction materials which will be needed to built the dam site including all required types .
* The important requirement here is that there should be no fear of leakage when the ground in under preesure with full head of water in the RESERVOIR. Generally at many sites suitable for impounding reservoirs, we find superficial deposits such as peat, alluvium and even even glacial drifts are present and these overly the solid rocks.peat should be avoided and since its thickness aften may be difficult to estimate expect from many bore holes.Ifconsiderable amount of peat is present , its removel is necessary.

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QUESTION: 03

WHAT ARE THE DIFFERENT TYPES OF MASS WASTING?...........

ANSWER:

TYPES OF MASS WASTING:

ROCKFALLS:

Rockwalls occure when pieces of rock break loose from a steep rock face or cliff. These result from the rock face being undercut by river or wave action.

ROCKSLIDES:

ROCKSLIDES USUALLY FOLLOW a zone of weakness, such as bedding plane or foliation plane. seperation of the rock is more likely along these planes because of their reduced shear strenght.water also tends to be channeled along these planes, which increase slippage.

MUDFLOW:

a mudflow is a liquidy mass of soil, rock debris, and water that moves quickly down the well-defined channel.Generally viscous and muddy colored, it can be powerful enough to move large automobiles and buildings.

CREEP:

A slow, gradual movement of soil or regolith downhill over time is called creep. velocities are typically less than a centimetres per year.Frezing and thawing contirbute to soil creep by progressively moving soil particlas down the hills.

SLUMP:

Earth materials that has moved as a unit along a curved surface is called slump.a slumped mass af sediments is typically clay rich.

SOLIFLUCTION:

A variety of earthflow called solifluction is the flow of watersaturated earth materials over an impermeable surface such as permafrost.

MEASURE AGANIST LANDSLIDES:

PERSONAL MEASURE:

* Rainforcement of floor slabs and external walls in existing buildings.
* Installation of drainage pipes for rainwater, slope drainage.
* Planting of slopes that are vulnerable to landslides with deep-rooted trees and shrubs.

BIOLOGICAL MEASURE:

* Drainage and /or grading of slop profiles increases the shear resistance.
* Supporting structures such as anchors and piles an restrain landslides.
* Protective forest.

PLANNING MEASURE AND LOCAL PROTECTION:

* Hydraulic and electrical connections must be flexible.
* The use of slope prone to landslide.

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DIFFERENTIATE FAULT, JOINT AND FOLD......?

ANSWER:

JOINT:

A joint is a break of natural origin in the continuity of either a layer or body of rock that lacks any visible or measurable movenment pararlle to the surface of the fracture.Joints are amoung the most universal geologic structures as they are found in most every exposure of rock.

FOLD:

In structural geology, a fold occures when one or a stack of originally flat and planar surfaces, such as sedimentary strata, are bent or curved as a result of perment deformation.Flods form under various conditions of strees, hydrostatic pressure, pore pressure and temperature gradient.

FAULT:

A fault is a crack in the earth crust. Typically, faults are associated with, or form, the boundries between Earth tectonic plates. In an active fault, the piece of the earths crust along a fault over time. The rock can cause earthquake.

A:

Faults are fractures in earth crust where rocks on either side of the crack have slid past each other.

 some times these cracks are tiny, as thin as hair, with barely noticeable movement between the rock layers. but fault can also be hundreds of miles long, such as the San Andreas Fault in California and the Anatolian Fault in Turkey , both of which are visble from space.

B:

In stuctural geology, a fold occurs when one or a stack of originally flat and planar surface, such as SEDIMENTARY STRATA, are bent or curved as a result of permant deformation. Synsedimentary flods are those due to sluping of sedimentary materials before it is lithified.

C:

In dip faults which occure parallel to the outcrop, the most prominted effect observed after faulting and erosion of the upthrown block is horizontal shift between two parts of the outcrop.

 Large fault within the earths crust result from the action of plate tectonic froces, with the largest forming the boundries between plates, such as subduction zones or transform faults.

D:

(d): must be avoided to possible extent to be built on all three.

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QUESTION:05

DESCRIBE TUNNELING ON THE BASIS OF GEOLOGY?.......?

ANSWER:

TUNNELING ON THE BASIS OF GEOLOGY:

Tunnels and underground excavation, horizontal underground passageway produced by excavation or occasionally by nature actions in dissolving a soluble rock, such as limestone. a vertical openning is usually called a Shaft.Tunnels have many uses: for mining ores, for transportion- including road vechiles, trains etc.

 A major tunnel project must start with a comprehensive investigation og ground conditions by collecting samples from boreholes and by other geophyiscal techniques.an informed choice can then be made of machinery and methods for excavtion and ground support, which will reduce the risk of encountering unforeseen ground conditions.In planning the route, the horizontal and vertical aligments can be selected to make use of the best ground conditionds.

 GROUND WATER control is very important in tunnel construction. water leaking into tunnel or vertical shaft will greatly decrease stand-up time, causing the excavation to become unstable and risiking collpse.

 Very effective but expansive technology is ground freezing, using pipes which are inserted into the ground surrounding the excavation, which are then cooled with special refrigerent fluids.

 Tunnel CROSS\_ SECTIONAL SHAPE is also very important in determining stand-up time. if atunnel excavation is winder than it is high, it will have a harder time supporting itself, decreasing its stand-up time.

* GEOLOGICAL INVESTIGATION FOR TUNNELS:

Geological investigation are very essential in tunneling projects,

SELECTION OF TUNNEL ROUTE:

ther might be availabe many alternate alignments that could connect two points through tunnel. The alignment having least geologcially negative factors would be the obvise choise.

SELECTION OF EXCAVATION METHOD :

Tunnelling is a complicated process in any situation and involves huge costs which would multiply manifolds if proper planning is not exercised before starting the actual excavation.This is one of the most important aim and object of geological investigation.

SELECTION OF DESIGN FOR TUNNELS:

The ultimate dimensions and design parameters of a proposed tunnel are controlled, besides other factor, by geological constitution of the area along the alignments.wheather the tunnel is to be circular, D-shaped, horse-sheo shaped or rectangular .

ASSESSMENT OF COST AND STABILITY;

These aspects of the tunnelling projects are also closely interlinked with the first three considerations. since geological investigations will determine the line of actual excavation, the method of excavation and the dimensions of excavation as also the supporting system of the excavation, all estimate about the cost of the project would depend on the geological details.

ASSESSMENT OF ENVIRONMENTAL HAZARDS:

The process of tunnelling, wheather through rocks or through soft ground, and for whatsoever purpose, involves disturbing the environment of an area in more than one way. The tunnelling methods may involve vibrations induced through blasting or ground cutting etc.

 A correct apprection og geological set up of the area, espically where tunnel aligments happen to be close to the populated area and implementing plans aimed at minimizing the environment hazards in a successful manner.

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