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Q1:- What causes earthquakes? if the Richter magnitude reachs at 8 or above what will be the consequences.? Differentiate primary and secondary waves?

Ans:- Causes of earthquakes:- Some time faults develop in the plates of earth move, shake and rub against each other causing earthquakes in those areas.

⊙ Earthcrust and the dislocated parts of earthsurface moves up and down or to the sides. due to the friction of the earth surface vibrates.

⇒ if the richter magnitude reaches at 8 or above so the distruction is more and total distruction of buildings, bridges and roads.

⇒ Differentiate primary and secondary waves ?

Primary waves (P-waves)	Secondary waves (S-waves)
◎ High frequency	◎ High frequency.
◎ short wave length	◎ short wavelength.
◎ Longitudinal waves	◎ Transverse waves
◎ pass through solids and liquids	◎ cannot move through liquid.
◎ Move forwards and backwards and it compressed and ~~depress~~ decompressed	◎ Move in all direction from their source
◎ it is faster	◎ & it is more slower than primary waves

Q2:- Describe the role of geology in of sites for dams and reservoirs?

Ans:- ◎ Geology of the dam site including the foundation of the dam itself and other structure such as spillways, diversion tunnels and outlet works. To cheele the whether the dam foundation has sufficient strength and stability to support the proposed of dam, whether the foundation is a water bush, especially when there are rocks in this place and deep horizon are erased.

◎ After the completion of dam, the geology of the area will be taken over by the reservoir. whether the storage area of water tight are cavernous limestone or gypsum areas due to which the dam cannot retain water.

◎ The stability of the slopes in the dam site and reservoir areas if landslides are possible in the reservoir due to which

the water wave can push to the top of the dam.

The construction material are required to a build a dam in the vicinity of the dam site which includes all the required types such as aggregate, fill material etc.

Q3:- What are the different types of mass wasting ? And also explain the protective measures of landslides. ?

Ans:- Types of mass wasting :-

(1) Fast movements :- (i) slumps
(ii) Rock and debris fall
(iii) Rock and debris slides
(iv) flow.

(2) Slow movements :- (i) creep.
(ii) Solifluction
(iii) permafrost.

(1) :- (i) slumps :- A type of slides where in downward rotation of rock or regolith occurs along a curve surface due to overstepening.

(ii) Rock and Debris fall :- Happens when a piece of rock falls down the slope Debris fall are similar expect they

involve a mixture of soil, regolith and rocks. At the base there is an accumulation of fallen material term talus

(iii) Rock and Debris slides :- Happens when rocks or debris slides down a preexisting surface

(iv) Flows :- Flow of soil and regolith containing a large amount of water.

(2) :- (i) Creep :- The gradual downhill movement of soil and regolith.

(ii) solifluction :- if a flow of saturated soil downslope at a rate of few millimeter or a few centimeters per day or per year.

(iii) permafrost :- Slow landslide due to slowly melting of permanently frozen ground.

⇒ protection measures of landslides:

- Drainage of water from slopes.
- Revegetation with plants that have deep roots.
- Terracing redistributed mass along a slope and reduces the slope angle
- Retaining wall can be catch debris or stabilize regolith.
- Rock bolts can be used to stablize coherent masses.

Q48. Differentiate fault joint and fold?

Ans: Folds: These are bends in rocks that are due to compressional forces. They are formed when heat and pressure in applied in the rocks.

Fault.s: if the internal strength of rock is less than the pressure applied to a rock undergoing fold, faults are formed.

Joints :- Joint is a fractures along which there has been no appreciable displacement parallel to the fracture and only slight movement normal to the fracture plane.

(a) What do the normal faults cause to the crust of the earth.

Ans:- When movement occurs along a normal fault, the hanging wall slips down relative to the footwall.

(b):- Folds develops in which type of rock?

Ans:- Folds develops in sedimentary rocks

(c) what is the effect of faulting on outcrop?

Ans:- Dip faults have their strike parallel to the dip of the adjacent rock beds and the most prominent effect observed after faulting and erosion of the upthown block is

a horizontal shift b/w the two parts of the outcrop.

(d):-

Ans:- Must be avoided to possible ~~exist~~ extent to built on all three.

The location of civil engineering project should avoid mistakes or fault or joint issue. but there is no way the same place can be treated in the necessary way and then plan can be implemented.

Q5:- Describe tunneling on the basis of geology? Also determine geological investigation for tunnels?

Ans:- Tunnels:- Tunnels is the underground routes or passages driven through the ground without disturbing the overlying soil or rock cover.

Types of tunnels on the basis of geology:- (i) Hard rock tunnels:-

Tunneling through hard rock almost always involves blasting.

(ii): Soft rock tunnels:- Soft ground workers dig soft-ground tunnels through clay silt, sand, gravel or mud.

Geological investigation for tunnels:-
These determine to a large extent solutions to following engineering problems connected with tunneling.

(1) :- Selection of Tunnel route :- These might be available many alternate alignments that could connect two points through a tunnel. However, the final choice would be greatly dependent on geological construction along and around different alternative the alignment having least geologically negative factors would be the obvious choice.

(2) Selection of excavation Method :- Tunneling is complicated process in any situation and involves huge costs which would multiply manifolds if proper planning is not exercised before starting the actual excavation. And the excavation methods are intimately linked with the types of rocks to be excavated. Choice of the right method will therefore, be Possible on when the nature of the rocks and and the ground all along the alignment is fully known. This is one of the most important aim and object of geological investigations.

(3) Selection of Design of for tunnels :-

The ultimate dimensions and design parameters of a proposed tunnel are controlled besides other factors, by geological constitution of the area along the alignment. whether the tunnel is to be a circular, D-shaped horse-shoe shape or rectangular or combination of one or more of these outlines is more often dictated by the geology of the alignment than by any other single factor.

(4) Assesment of cost and stability :-

These aspects of the tunneling projects are also closely interlinked with the first three ~~conditi~~ considerations. Since geological investigations will determine the line of actual excavation as also the supporting system of the excavation all estimates about the cost of the project would depend on the geological details.

(5) Assessment of environmental Hazards:-

The process of tunneling whether through rock or through soft ground and for what soever purpose, involves distrubing the environment of an area in more than one way. The tunneling methods might involved vibrations induced through blasting or ground cutting and drilling producing abnormal quantities of dust and last but not the least interference with water supply system of nearby areas.

The End