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Subject

Geology

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Q No 1

What cause earth quakes? if the Richter magnitude reaches at 8 or above what will be the consequences? Differentiate primary and secondary waves?

ans:-

Cause of earth quakes

A earth quake 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 stress on the edge overcomes the friction there is an earth quake that releases energy in waves that travel through the earth crust and cause the shaking that we feel.

Richter magnitude

The Richter magnitude scale measure the amount of seismic energy released by an earthquake. The Richter magnitude is 7-8 many

building destroyed. and
8-up) the total destruction
of buildings, bridges and roads.

Primary wave:-

The first kind of body wave is the P-wave.

They travel through earth interior and can pass through both solid and molten rock. They shake the ground back and forth.

Typical speeds are 330m/s in air, 1450m/s in water about 5000m/s in granite.

Secondary wave:-

The second type of body wave is the S-wave or secondary wave. which is the second wave you feel in an earthquake. S-waves lag behind P-waves as they travel 1.7 times slower. However they do more damage because they are bigger and shake the ground vertically and horizontally.

Q No 2: Describe the role of geology in selection of sites for dam and reservoirs.

ans

Geological investigation for dam and reservoirs.

- Study of Geological Toposheet.
- Study of the area with reference to geology.
- Study of Rock types.
- Study of Structural Geology of the area.
- History of the area with reference to rainfall data.
- Study of stream channels with Diff. order.
- Study of seismic data of Area.
- Geomorphological study.

selection of site

Topographically:-

most suitable place must be chosen for construction.

Ideally it must be an arrow gorge or a small valley with enough

catchment area available behind so that calculated amount of water can be easily stored in the reservoir created upstream.

Possibility of river diversion during construction:-

The way, river can be diverted at a particular site for making way for construction of the dam may affect the design of the dam and also the construction schedule.

Sedimentation possibilities:-

The average quantity of sediment carried by the river has to be known, as precisely as possible, which would give an idea of the rate at which a proposed reservoir may get filled up.

Technically:-

The site must be sound as possible: strong impermeable and stable. Strong rocks make the job of designer easy. impermeable sites ensure better storage inventories.

Constructionally :-

The site should be far from the materials which will be used for construction.

Their non-availability will make the cost of project high.

Human welfare :-

Site selection should be done in such a way that it must cause minimum ~~damage~~ damage to public in the destruction or failure.

Q No 3

What are the different types of mass wasting? Also explain the protective measure of landslides?

ans

Mass wasting is main two type Fast moments and slow moment.

Fast moment are further divide in

- i) slumps
- ii) Rock & Debris fall
- iii) Rock & Debris slides
- iv) Flow

slow moments.

- i) Creep
- ii) solifluction
- iii) Permafrost

Protective measure of landsliding

- 1) Draining water from slopes
- 2) Revegetation with plants that have deep roots

3) Terracing redistributes mass along a slope and reduces the slope angle.

4) Retaining wall can catch debris & stabilize regolith.

5) Rock bolts can be used to stabilize coherent.

Q No 4

Differentiate fault, joint and fold?

ans:- Fault:-

Fracturing and displacement of rock strata.

Types:- i) Dip-slip faults ii) strike-slip faults
iii) oblique-slip faults.

Joint

Fractures along which no displacement has occurred.

Fold:-

In response to compression force the strata may bend and buckle these are called folds.

a) What are the normal faults cause to the crust of the earth?

ans:- A normal fault of the earth crust spreading apart. its occur at plate boundaries. but it can happen at faults in the middle of plates also.

b) Fold develop in which type of Rock.

ans:-

Fold occur when one or a stack of originally flat and planar surfaces, such as bedimentary strata.

c) What is the effect of faulting on out crop?

ans In dip faults which occur parallel to the dip of the out crop, the most prominent effect observed after faulting and erosion of the upthrown block is a horizontal shift between the two parts of the out crop.

Q Nos

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

ans:-

A tunnel is an underground passage way, dug through the surrounding soil/earth/rock and enclosed ~~by~~ except for entrance and exit, commonly at each end.

"Geological Investigation for tunnels"

a) Selection of Tunnel Route:-

There might be available many alternate alignment that could connect two points through a tunnel. However, the final choice would be greatly dependent on the geological constitution along and around different alternative.

b) selection of excavation Methods

Tunneling is a complicated process in any situation and involves huge costs which would multiply manifold if proper planning is not exercised before starting the actual excavation. and the excavation methods are intimately linked with the type of rocks to be excavated. choice of the right method will therefore, be possible only when the nature of the rock and the ground all along the alignment is fully known.

c) Selection of Design for the Tunnel.

The ultimate dimensions and design parameters of a proposed tunnel are controlled beside other factors, by geological constitution of the area along the alignment. whether the tunnel is to be circular, D shaped, horse-shoe shaped 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.

d) Assessment of cost and stability

These aspects of the tunneling projects are also closely interlinked with the first three considerations. Since geological investigation will determine the line of actual excavation, the method of excavation and dimension of excavation as also the supporting system (lining) of the excavation all estimates about the cost of the project would depend on the geological detail.

e) Assessment of environmental Hazard

The process of tunneling, whether through rocks or through soft ground, and for whatsoever purpose, involves disturbing the environment of an area in more than one way.

The tunneling method might involve 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 the nearby areas.