

ENGINEERING GEOLOGY

FINAL ASSIGNMENTS

Question#1

Answer

CAUSES OF EARTHQUAKE:

An earthquake is caused by a sudden slip on 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 earthquake that releases energy in waves that travel through the earth's crust and causes the shaking that we feel.

Some says that earthquake are the results of after shocks of earth plates.

(2)

CONSEQUENCES OF 8 & ABOVE RICHTER MAGNITUDE:

Earthquake richter magnitude having 8 and above it can cause bad results including destruction of buildings, bridges and roads etc.

PRIMARY WAVES:

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

SECONDARY WAVE:-

Secondary waves lag behind primary wave as they travel 1.7 times slower. However they do more damage because they are bigger and shake the ground vertically and horizontally.

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(3)

Question#2

Answer

ROLE OF GEOLOGY IN SELECTION OF SITES FOR

DAMS AND RESERVOIRS:-

Engineers and Geologists have to keep in mind the following factors for selecting the site for Dams and reservoirs;

- ⇒ 1.- The geology of dams site including the foundation for the dam itself and sites for the other sites also.
- ⇒ 2.- The geology of the area to be occupied by the reservoirs once the dam is completed, whether the storage area is watertight or are these areas of cavernous limestone or gypsum which might lead to the dam not retaining water.

(4)

⇒ 3.- Stability of the slopes in the dam site and reservoirs area whether landslides into the reservoirs are possible which might cause a wave of water to be pushed over the top of the dam.

⇒ 4.- Finding sources of the construction materials which will be needed to build the dam in nearby areas of the dam site, including all required types like; aggregates of different types and sizes, filling materials in the core and both surfaces (if the dam is of earth filled type).

⇒ 5.- Geology plays very important role for selecting the site of dam construction which is clear from the fact that while constructing dam there must be geologists.



QUESTION # 3

What are the different type of mass wasting?
Also explain the protective measure of land
slide.

ANSWER.

Types of mass wasting.

1) Slumps.

Rock & Debris Fall

Rock & Debris Slides

2) Flow

3) Creep

Subsidence.

Permafrost.

1) Slumps: It is that type of mass wasting slides wherein downward rotation of rock occurs along a curved surface due to over make excessively steep.

2) Flow: The flow of soil and regolith containing a large amount of water, is called flow.

3) Creep: It is the gradual downhill movement of soil and regolith.

Solifluction: It is that type of mass wasting when the flow of saturated soil move downslope at a rate of few millimeters or a few centimeters per day or per year. it called Solifluction.

Permafrost: The slow landslide due to slowly melting of permanently frozen ground is called permafrost.

Protective measure of land slide.

Reinforcement of floor slabs and external wall in existing building. The installation of drainage pipe for rainwater. Slope drainage. The planting of slopes that are vulnerable to landslide with deep rooted trees and shrubs.

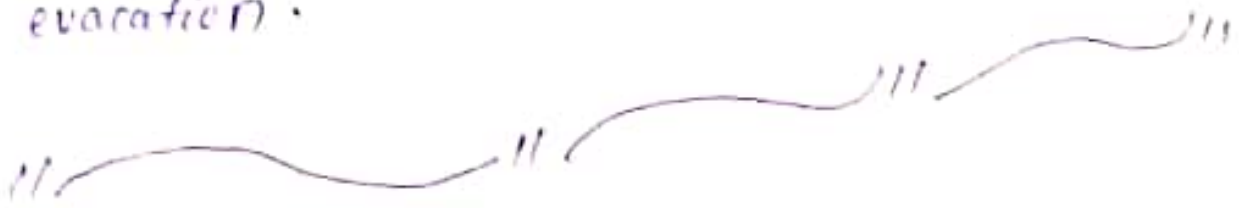
Biological measure: Drainage and/or grading of slope profiles increase the shear resistance. Supporting structures such as anchors and piles (pinning of the soil plane) can restrain and. Slides removal of material in the driving section or material deposition in the breaking section.

Can prevent further descent of the sliding body. Planing measure and local protection.

The use of slopes prone to land slide must be avoided, or uses suitably modified hydraulic and electrical connection must be flexible.

Organizational measure:

The relatively long advance warning period permits timely evacuation.



(5)

Question #5

Answer

TUNNELING ON THE BASIS OF GEOLOGY:-

There are two types of tunneling on the basis of geology; which are given below:

- 1- Hard Rock Tunnel.
- 2- Soft Rock Tunnel.

HARD ROCK TUNNELS:-

Hard rock tunneling through hard rock almost always involves blasting, because they are very hard to break and go through that.

SOFT ROCK TUNNELS:-

Soft ground or earth workers dig soft-ground tunnel through clay, silt, sand, gravels or mud etc.

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(6)

GEOLOGICAL INVESTIGATION FOR TUNNELS:-

These determine to a large extent solutions to following engineering problems connected with tunneling:

1. SELECTION OF TUNNEL ROUTE:-

There might be available many alternate alignments that could connect two points through a tunnel. There should be careful selection for the route.

2. SELECTION OF EXCAVATION METHOD:-

Tunneling is a complicated process at all, but the excavation method need more attention.

3. SELECTION OF DESIGN FOR TUNNEL:-

The ultimate dimensions and design parameters of a proposed tunnel are controlled, beside other factors, by geological constitution of the area along the alignments.

4. ASSESSMENT OF COST AND STABILITY:-

5. ASSESSMENT OF ENVIRONMENTAL HAZARDS:-

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