GULF SAHODAYA EXAMINATION --FEBRUARY 2014

CLASS-XI

GEOGRAPHY-(THEORY)

Time: 3Hours **Max.marks:70**

General Instructions:

- All the questions are compulsory and marks are indicated against each questions.
- Questions from 1 to 9 are of very short type and carry 1 marks each.
- Questions from 10 to 16 are short type and carry 3 marks each,
- Questions from 17 to 20 are long type and carry 5 marks each.
- **Question 21 is related to Open Text Book Material with Analysis (OTBA), read the given abstract and answer.**
- Question 22 and 23 are related to map work on world and India map provided with question paper, must be attached with your answer booklet.

1. What is ' terrestrial radiation' ? 1
2. List any two form of condensation. 1
3. What do you understand by ' break in Monsoon' ? 1
4. Name the only two river of India flowing through a rift valley. 1
5. Differentiate between orogeny and epeirogeny. 1
6. Name the first biosphere reserve of India. 1
7. State any two distinct features of Great Indian Desert. 1
8. List any two subfield of human geography. 1
9. What do you understand by ' intrusive form' ? 1
10. What do you understand by ' exotic species? Mention four reasons behind loss of biodiversity from the different part of the world. 1+2=3
11. Where do we find black soil in India ? Black soil is also known by which name? Explain any two characteristics of it. 1+1+1=3
12. Mention three stages involved in disaster mitigation and management. 3*1= 3
13. Briefly discus the three stages in development of universe considered in the concept of 'the Big Bang Theory. 3

14. Explain the meaning of sub continent with example. What is the total length of coast line in ... of Indian mainland.

15. Name the two type of ocean current based on temperature. What are the factors that influence the distribution of temperature of ocean water. 1+2=3

16. State three characteristic feature of Himalayan drainage system. Also give two name of Indian river belongs to this category. 2+1=3

17. Define 'natural vegetation'. What is farm forestry ? Mention four characteristics of tropical deciduous forest. 2+1+2=5

18. How does relief rainfall occur ? What is global warming? List two important greenhouse gases causing global warming. What is Normal lapse rate of temperature? 2+1+2=5

19. Define the term 'petrology'. Classify the rocks on the basis of occurrence with example in each. 1+4=5

20. List major physiographic division of India. Write a short note on the Eastern hills and Mountains (Purvanchal Range). 3+2=5

21. The ~~following~~ questions are from **open text book material**, provided with question paper. Answer the questions with the help of given abstract. Refer to the attached abstract (OTBA)

21.1 Expand the : a) ITBP b) IMD 1

21.2 What do you understand by cloud burst ? 1

21.3 What was the effect of confluence of two branches of monsoon. 3

21.4 Discuss the role of Indian Army personnel who rescued and helped the stranded locals and Pilgrims affected by flash floods in Uttarakhand. 5

22. Five geographical features are shown on the outline political map of world .Identify these and write their names on the line given in the map. 5*1=5

a) a hot spot centre b) warm current c) cold current

d) a major tectonic plate e) smallest continent

23. Locate and label the following on the given outline political map of India. 5*1=5

I. Highest peak of Himalayas

II. Sunderban Biosphere reserve

III any one of the peninsular river draining into Bay of Bengal

IV Gulf of Mannar

V area under arid soil

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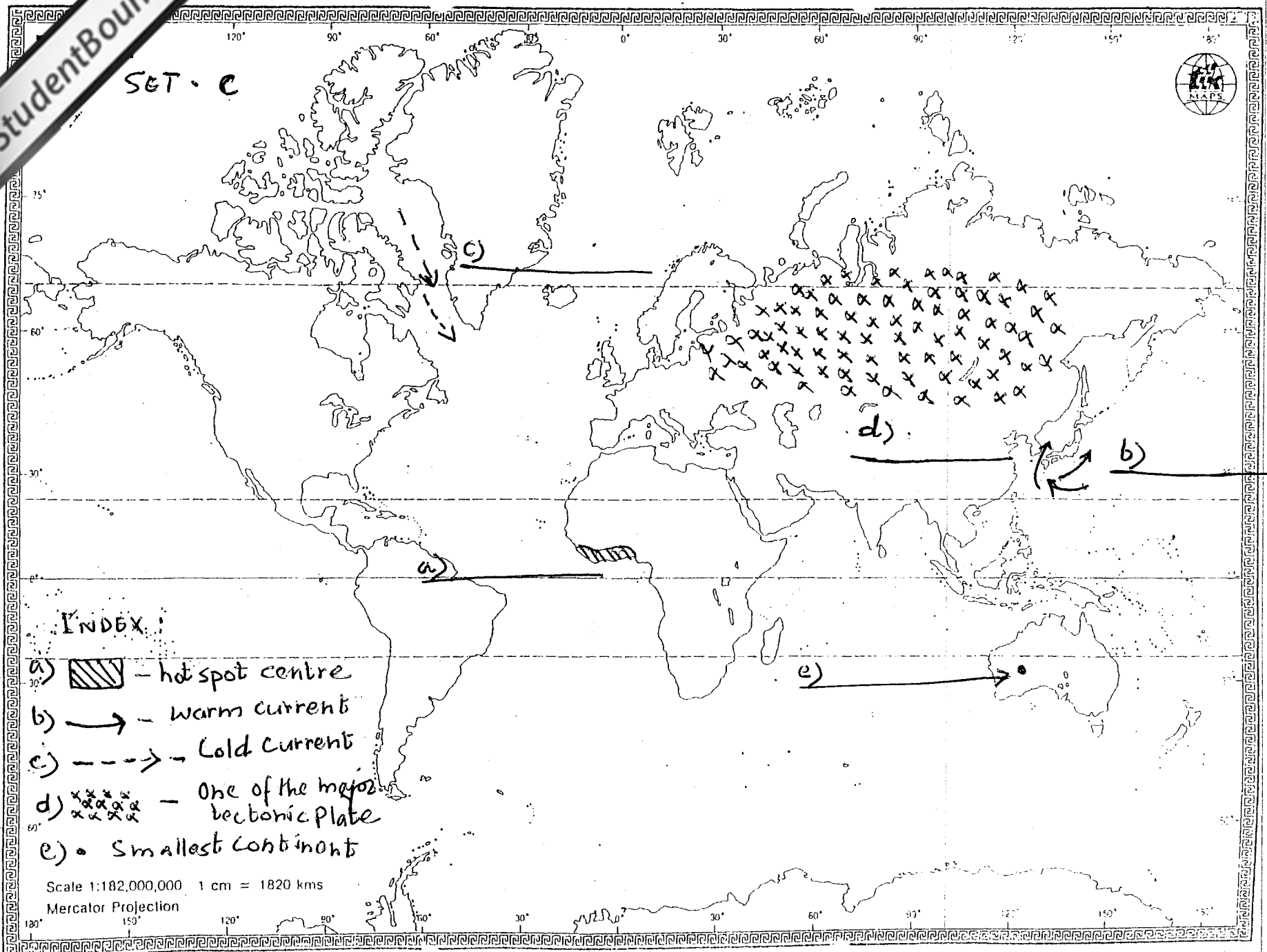
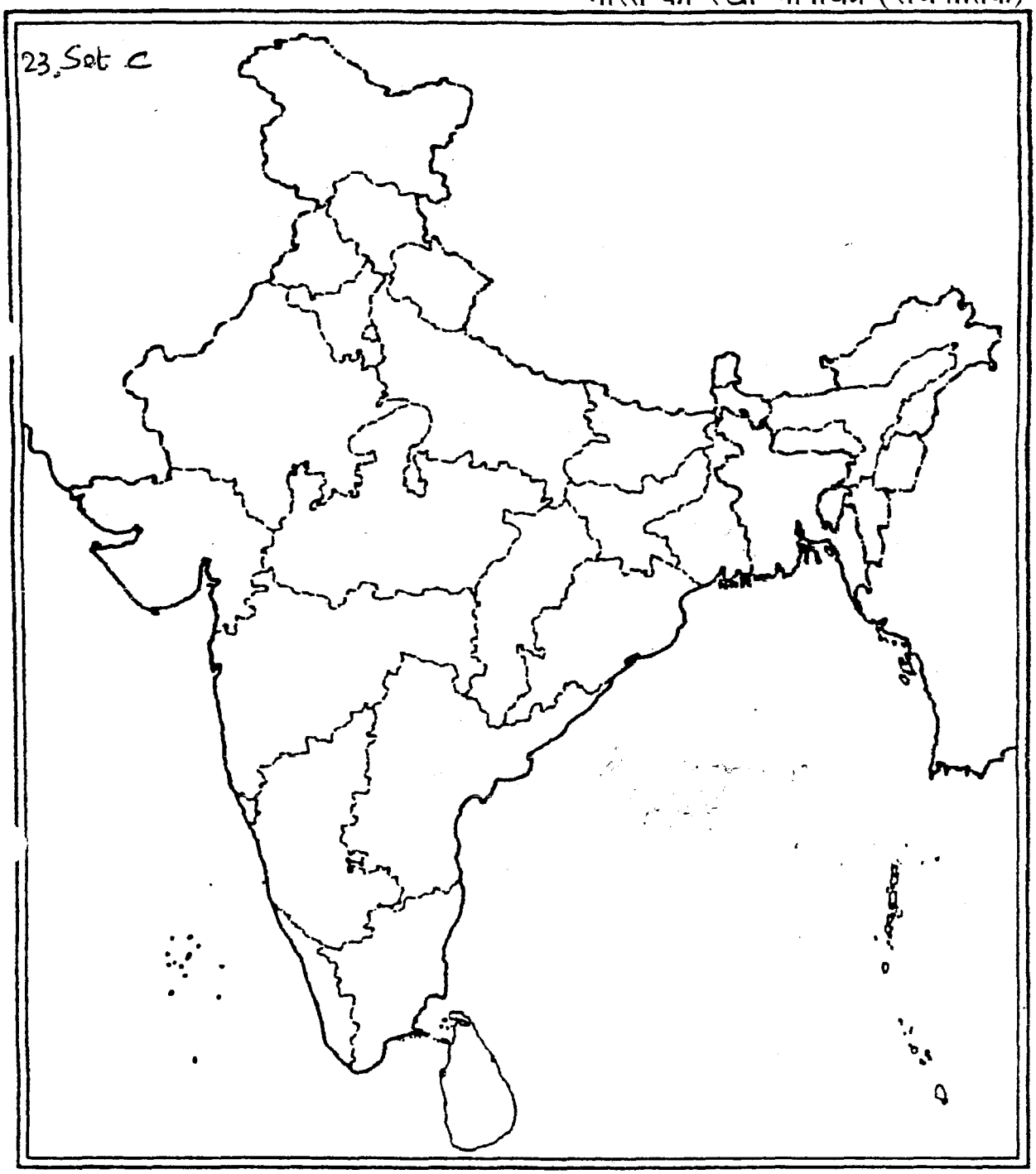


Outline Map of India (Political)

भारत का रेखा-मानचित्र (राजनीतिक)



2. Theme – *Krakatau Volcano: Fear of East Indies*

Abstract:

Krakatau eruption is one of the most cataclysmic volcanic eruptions in the recorded history of mankind. It was so strong that it shook the entire world and generated calamitous Tsunami waves that devastated the Islands of Java and Sumatra. After a few years of the eruption, nature took its own course and a wide variety of flora and fauna flourished over the remnants of Krakatau Islands. The emergence of Anak Krakatau and its perpetual volcanic activity has further attracted attention of tourists and scientists in Krakatau, which has now become a brand in Indonesia to conserve biodiversity and promote eco-tourism.

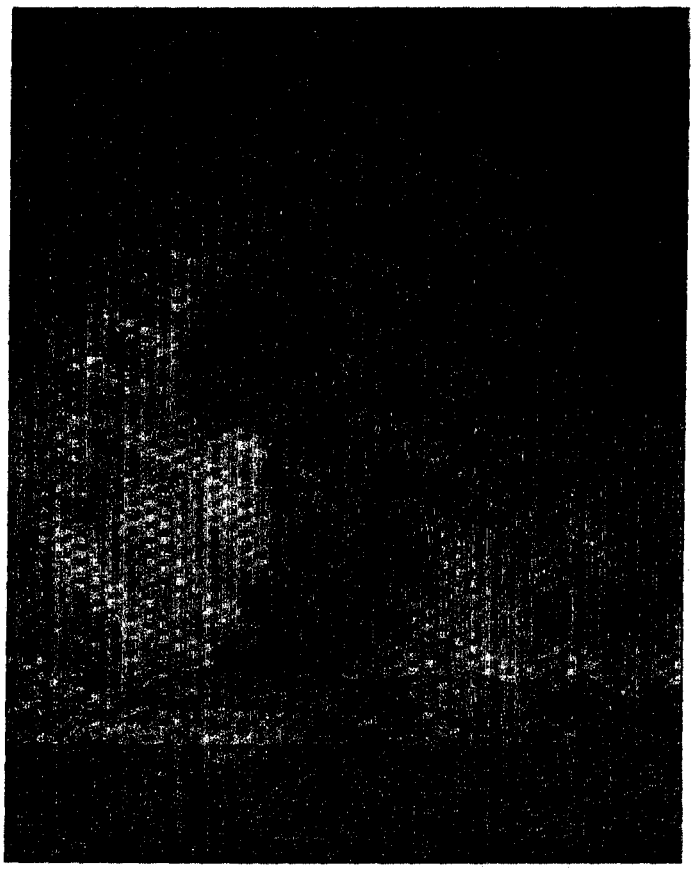


***Figure 2.1:** A 1988 lithograph of 1883 Krakatau Eruption*[1]

On 20th May 1883 the German warship *'Elizabeth'* reported an 11 km high cloud of ash coming out of an uninhabited island of Krakatau between Java and Sumatra Islands of East Indies (Indonesia).

It was the first documentation of any volcanic eruption in Indonesia. Similar sights have been noted by crews on commercial vehicles and sightseers on charted ships for over two months. The sound of explosion and churning, the cloud of black ash and pumice, mesmerised local inhabitants and sightseers. It created a near festive environment. However, they failed to realise that these events are just a prelude to one of the largest volcanic eruptions of historic times. During that period no one lived on Krakatau because it was too small to attract settlers. It was a hiding place for pirates, who used the island as a base to rob trading ships. Krakatau volcanoes have been dormant for generations. The Dutch officials had examined the burned out craters earlier and thought the volcanoes were extinct.

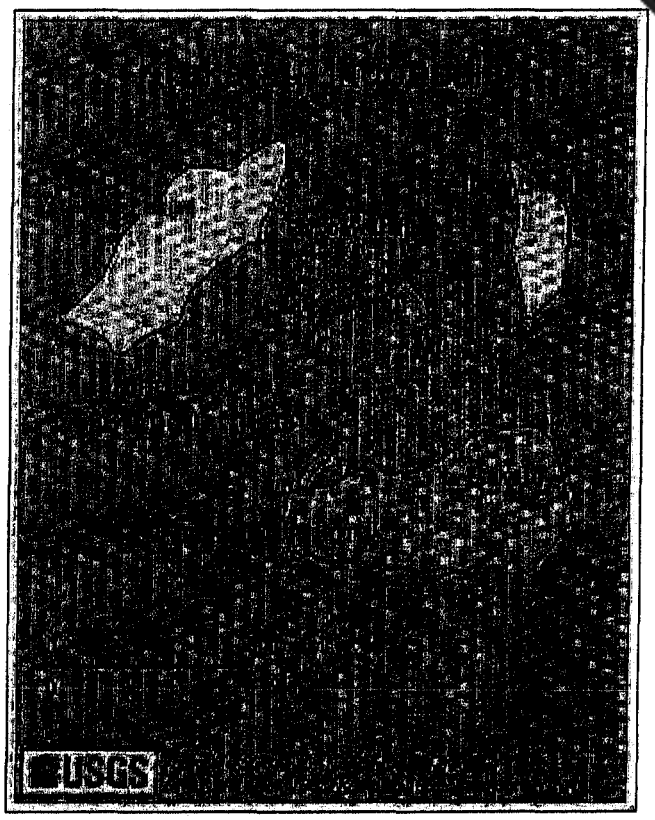


Figure 2.2: *Krakatau Islands*[2]

Largest Explosive Eruptions of the 19th and 20th Centuries[4]

Year	Volcano	First Historical?	Deaths
1991	Cerro Hudson (Chile)	No	0
1991	Pinatubo (Philippines)	Yes	>740
1982	El Chichón (Mexico)	Yes	>2,000
1980	Mount St. Helens (USA)	No	57
1956	Bezymianny (Kamchatka)	Yes	0
1932	Cerro Azul/Quizapu (Chile)	No	0
1912	Novarupta/Katmai (Alaska)	Yes	2
1907	Ksudach (Kamchatka)	Yes	0
1902	Santa Maria (Guatemala)	Yes	>5,000
1886	Tarawera (New Zealand)	Yes	153
1883	Krakatau (Indonesia)	No	36,417
1875	Askja (Iceland)	Yes	0
1854	Shiveluch (Kamchatka)	Yes	0
1835	Cosiguina (Nicaragua)	No	5–10
1822	Galunggung (Indonesia)	Yes	4,011
1815	Tambora (Indonesia)	Yes	60,000

Table 2.1: *Largest Explosive Eruptions*[3]

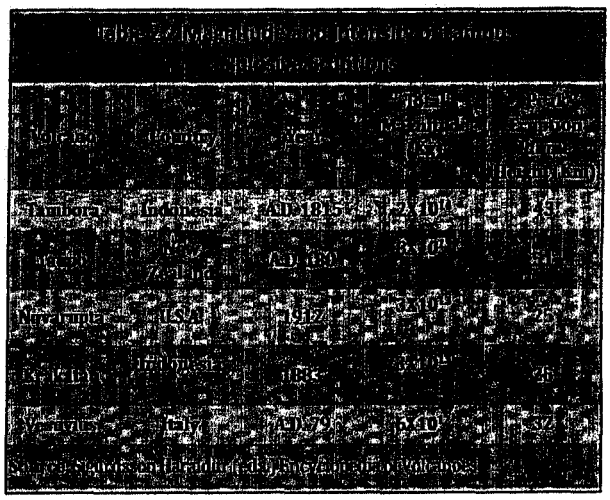
A series of cataclysmic explosions began at mid-day on August 27 with a stupendous paroxysmal eruption. The first smaller eruptions had opened the middle of the volcano to the sea. It allowed the seepage of water into the volcano, that turned the water into steam and raised the pressure manifold. Due to this huge pressure the mountain blew up into pieces. Red hot rocks as big as a house were thrown high into the sky.

Thousands of people died immediately on Java and Sumatra islands as they came under the onslaught of burning rock and ash. It was the most violent explosion ever witnessed by humans. The noise produced by the eruption was heard almost 3000 miles away from Krakatau. The explosion was so powerful that the volcano

collapsed into the sea. The undersea explosions produced huge ocean waves known as ***Tsunami.*** The Tsunami waves destroyed villages. About 34,000 people along the coast of Java and Su matra were drowned and more than 2000 people were burned to death. After the Tambora volcanic eruption the maximum number of deaths occurred in the Krakatau explosion of 1883 (see table no. 2.1).

Figure 2.3: *Volcanic ash coming out of Ejysfjallakokull volcano, Iceland, 2010*[4]

A volcano eruption is among a few spectacles in nature that are awesome and a delight to watch but violent eruptions such as the Krakatau eruption of 1883, could devastate the surrounding environment and completely change the nearby terrain. A ***Volcano*** has been defined as an opening in the crust of the earth out of which magma, ash, gases erupt, while *Volcanism* includes all the processes associated with the transfer of magma and volatiles from the interior of the earth to its surface. Magma beneath the crust remains under great pressure. Deep in the crust, faults and joints develop downward, reach the magma, and allow it to rise up and intrude into the crust. The magma then rises in conduits, forms bubbles and gives rise to volcanism. Eruptions may also vary in size and character. Krakatau eruption was an *explosive eruption,* in which pieces of molten and solid rock comes out violently into the air, while in *effusive eruptions* molten rock pours less violently into the surface as flowing streams. The variation in eruptive style is mainly the result of chemical and temperature differences in the magma beneath the surface. When basaltic magma is forced to the surface, the resultant eruption is effusive in nature. The cooler, more viscous silicic magma can produce explosive eruption. Molten material that solidify in-flight and solid lava fragments are termed as *Pyroclastic* materials, (also referred as *tephra*), that vary in size - from volcanic ash to gravel sized cinders (2-4mm), lapilli (4-64mm) and blocks (>64 mm). It may also include large sized *volcanic bombs* and clay and silt filled volcanic ash.



In Krakatau explosion the superheated stream carried the pyroclastic flows up to 40 km at speed of 100 kph. The eruption has been assigned a rating of 6 on the Volcanic Explosion Index and the magnitude of the explosion was $3x10^{13}$ (see table no 2.2) and is estimated to be equal to the explosive force of 200 megatons of TNT. Tephra and hot volcanic gasses took the lives of many victims. The peak eruption plume height was also among the top five volcanic eruptions. The explosions hurled an estimated 45 cubic kilometres of debris into the atmosphere and produced 442 Km of darkening skies. In the immediate vicinity, the dawn did not return for three days. The ash and gasses released by *Eyjafjallajokull* volcano of Iceland in April 2010 (see figure no. 2.3) had plumes that reached the height of 10 Km. It spewed over 9.5 billion cubic feet of ash over the course of several months that paralysed the air traffic and flights in Europe for many days.

Volcanic Tsunamis

Tsunamis (also called tidal waves) are sometimes caused by volcanic eruptions. However, about 5 per cent of all historic tsunamis are caused by volcanic eruptions. The largest tsunami waves ever seen on earth were produced by volcanic explosions or other volcanic processes. More than 20 tsunamis of volcanic origin have been recorded in the world oceans during the last 200 years, while relatively more volcanic eruptions are recorded on the land surface. Volcanic tsunamis typically occur with little warning, and can be very destructive to coastal areas at considerable distances. Some of the most notable tsunamis were caused by volcanic eruptions (see Table 2.3). The wave height produced by the Krakatau eruption was around 35 metres and the waves travelled to the distance of around 500 km. This was the most catastrophic event in recent history.

Table 2.3 Major Volcanic Tsunamis

Volcano	Country	Year	Wave Height	Travel Distance (km)
Unzen	Japan	A.D.1782	10-55 m	20-50
Tambora	Indonesia	A.D.1815	10m	<100
Krakatau	Indonesia	A.D.1883	5-35 m	800
St. Augustine	U.S.A.	A.D.1883	7.6 m	>100
MESt. Helens	U.S.A.	A.D.1980	260 m	4

Source: Sigurdsson Haraldur (ed.), Encyclopedia of Volcanoes

Volcanic activity is inherently related to plate tectonics. Most of the volcanoes are found near divergent and convergent plate boundaries. The *subduction zones* of the world have the most number of explosive volcanoes. Subduction zones are characterised by deep oceanic trenches and chains of volcanoes. Indonesia contains over 130 active volcanoes, which is the highest concentration in the world. They comprise the axis of the Indonesia island arc system, which is generated by north eastern subduction of the Indo-Australian plate. The great majority of these volcanoes lie along the topographic crest of the arc's two largest islands Java and Sumatra. The islands are separated by the *Sunda Strait*, which is located at a distinct bend in the axis of the island arc volcanoes, from a nearly east-west orientation in Java to the northwest-southeast orientation in Sumatra. Krakatau is one of several volcanic islands in the Sunda Strait, located above an active north-northeast trending fault zone (see figure no. 2.4), an orientation quite distinct from the main island arc trend. Most of the world's best known volcanoes are *composite cones*, formed when formative eruptions are sometimes effusive and sometimes explosive. It is composed of a combination that represents a composite of lava and Pyroclastic materials.

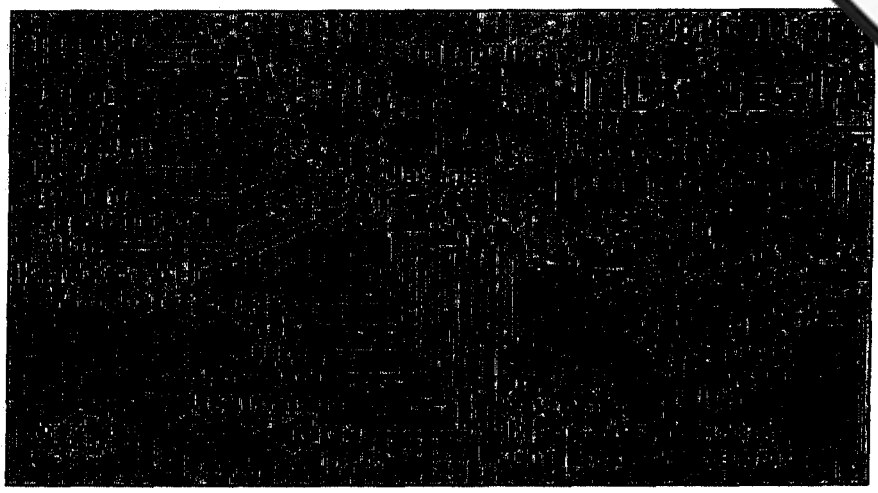


Figure 2.4: *Volcanoes in and around Indonesia Fault Zone*[5]

Table 2.4 Major Composite Cone Volcanoes

Fujiyama	JAPAN
Cotopaxi	EQUADOR
Vesuvius	ITALY
Etna	ITALY
Mount Rainer	U.S.A.
Mt. St. Helena	U.S.A.
Krakatau	INDONESIA

Source: Sigurdsson Haraldur.(eds.) Encyclopedia of Volcanoes

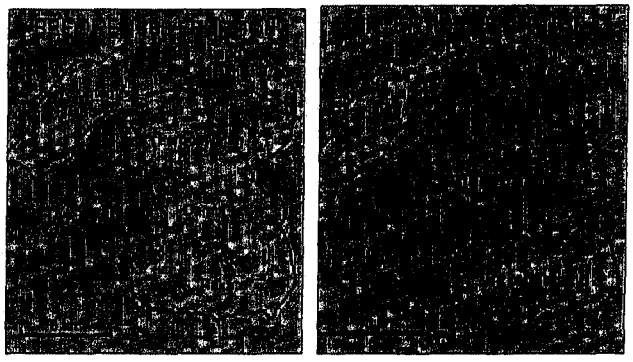
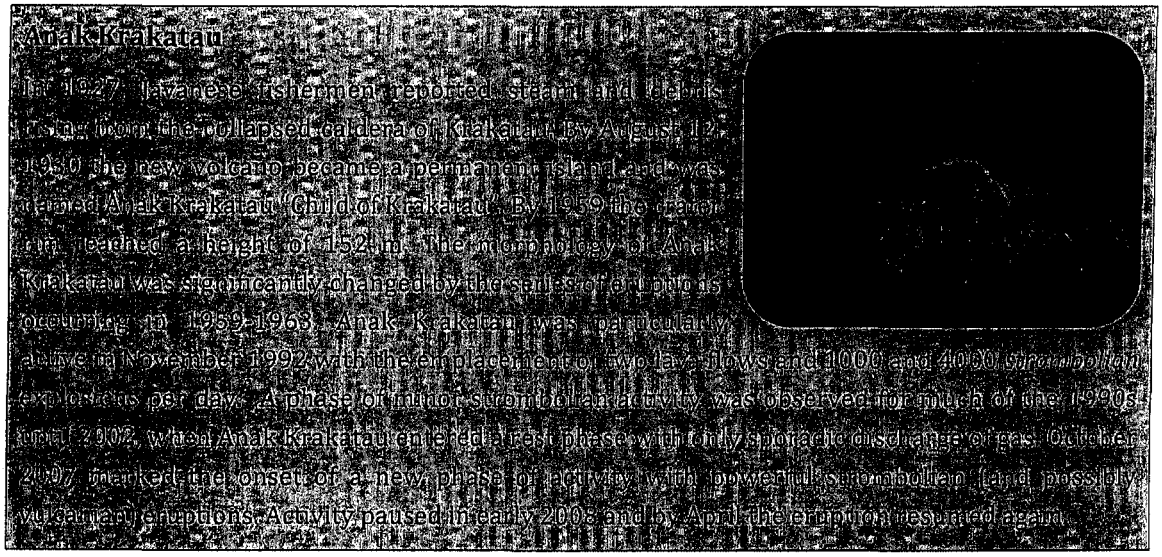


Figure 2.5: *Physiography before and after the explosion of 1883*[6]

The pre-eruption island of Krakatau was composed of three coalesced volcanoes aligned along north-northwest directions, parallel to the volcanoes of Sumatra. From north to south these were *Perboewatan, Danan* and *Rakata*. During the eruption, Perboewatan, Danan and north half of Rakata

appears to have collapsed (see figure no. 2.5) into the vacating magma chamber, thus forming a submarine caldera and destroying the northern two third of the island. Eruptions since 1927 have built a new cone called Anak Krakatau in the centre of 1883 caldera.



For a hundred years since the enormous volcanic eruption rocked Krakatau and surrounding areas, the island has been left undisturbed and un-inhabitated. Currently, the island has been covered with lush green tropical rain forest, including a dense canopy of trees. The regeneration of rain forests was rapid. Beginning in 1884, a Dutch survey documented the re-introduction of the tropical flora and fauna, continuing through until the 1930s. A. Ernst in his work on the *New Flora of the Volcanic Island of Krakatau, on his* 1906 expedition to these islands, has mentioned the remarkable progress made by the vegetation. The whole south side from the beach to the summit and to the edge of the steep promontory was covered with green trees. They recognised numerous grey-green *Casuarina* trees. Isolated trees and shrubs were seen on the low lying ground. They also found several species of typical strand plants; it included *Ovate fruits* or *Cerbina Odollam,* strand palm or *Nipa Fruticans,* Pandamus, the large four sided fruits of *Barragtoria Speciosa* etc. In 1998 forty species of orchids were recorded in Krakatau.

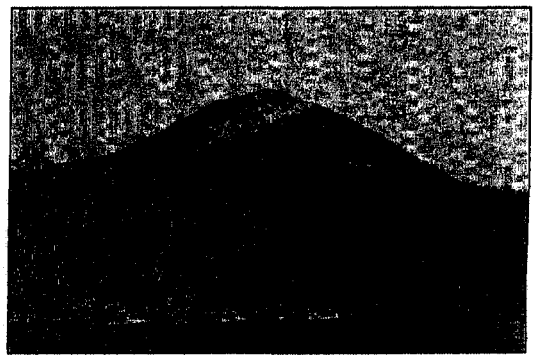


Figure 2.7: *Tropical rain forest in and around Krakatau Island*[8]

Figure 2.8: *Eco Travel Krakata*[9]

The Anak Krakatau wildlife is also very diverse, with 206 species of fungi, 13 of ferns and 25 speci of plants, including pine trees, faunal life includes spiders, insects, rats, snakes and monitor lizards. But most of the rainforest of the island is dominated by vast stands of three tree species.

This suggests that rain forest is only in the early stages of succession, though it is over hundred year old. Krakatau islands now comprise of Rakata or Krakatau Besan (large Krakatau), Panjang or Krakatau Kecil (small Krakatau), Sertung and the Anak Krakatau. While the island of Rakata, Sertung and Panjang are remnants of the old Mount Krakatau, Anak Krakatau is an active volcano. The name Krakatau, once a synonym for terror for the local inhabitants for the fatalities associated with its explosion, is now becoming a famous tourist destination for domestic and international tourists. In 1991 UNESCO acknowledged Ujung Kulun National Park and Krakatau Island as an integrated Natural World Heritage site. The island's name has become a 'tourism brand' for Indonesia. Many tour operators are conducting eco-tourism to various destinations around Krakatau under the banner of Krakatau eco-tour. Travel to Anak Krakatau for watching active volcano is also catching up with domestic and international tourists. Anak Krakatau is providing an opportunity to the travelers to witness one of the most spectacular events produced by nature.

How to deal with a volcanic eruption

As students one should understand that volcanic activity is a part of the natural system or cycle that first leads to destruction and then paves the way for natural reconstruction and re-colonisation. So, it is important for all of us to stay alert and remain prepared to tackle any volcanic activity in our vicinity. Students can also do many things to protect themselves and their family from the dangers of volcanic eruptions. The best way to protect yourself and your family is to follow the advice of local officials. Local authorities will provide you with information on how to prepare for volcanic eruptions. **There are different ways in which you can protect yourself from volcanic eruptions in different scenarios.**

If the lava flow is headed towards you:

- ☆ Leave the area immediately.
- ☆ If available, take a vehicle to evacuate quickly.

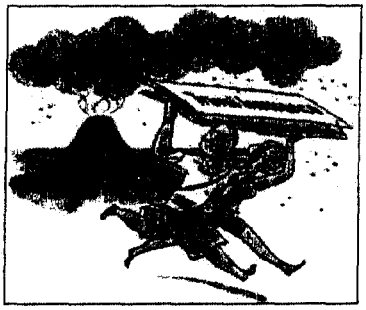


Figure 2.9[10]

If you are indoors:

- ☆ Close all windows, doors and fireplace
- ☆ Turn off all electrical appliances, heating and air conditioning system.
- ☆ Bring pets to a closed shelter.

If you are outdoors:

- ☆ Seek shelter outdoors

- ☆ If caught in a rock fall, roll into a ball to protect your head.
- ☆ Seek care for burns immediately
- ☆ Move away from the area immediately

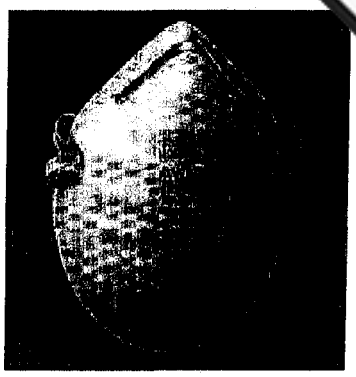


Figure 2.9[10]

Protect yourself from Ash-fall:

- ☆ Wear long sleeved shirts and long pants
- ☆ Use goggles to protect your eyes
- ☆ Use dust masks (see figure no. 2.10) or holds a damp cloth to cover your face to help breathing
- ☆ Keep car and truck engine off

The International Day for Disaster Reduction has been annually celebrated on 13th October, initiated by the United Nations International Strategy for Disaster Reduction Secretariat (ISDR). Every year, on that day, activities and events are organised worldwide, aiming at a global understanding of disasters, including natural disasters such as earthquake, floods, tsunamis, fires, volcanic eruptions etc. and for the sensitization towards preparedness mechanisms in order to minimize their disastrous effects.

***Figure 2.11:** Volcanism through Simulation*[12]

There is a need to carry out presentations and lectures in the school on volcanism and its impacts, since a guided tour is not possible in countries without active volcanoes. Students need to be trained through simulations of this complex cataclysmic natural phenomenon by breaking it down into sequenced simultaneous components and their effects, visualizing through dramatic simulations. Volcanism is a natural phenomenon which cannot be controlled, but its impact could be minimised through preparedness. It always reminds human beings not to interfere with the natural processes and systems of degeneration and regeneration, but to try and live in harmony with it as far as possible.

A. Suppose a fissure develops in the fi[illegible]illage and then a plume of smoke rises from the fissure. Afterwards red hot lava spews from the fissure. The lava and other pyroclastic material are deposited around the fissure. Slowly and slowly a mound develops. This volcanic activity continues for a long time. In the mean time the tourists start coming to view this awesome and delightful spectacle. What type of economic activities formed volcano. Give a vivid description of the different activities. 5 marks

B. How are explosive volcanic eruptions different from effusive eruptions with reference to their nature and pyroclastic materials. Explain 5 marks