



GS Advanced Program 2023

Generic Booklet

Test Name/Code/No. : 691046

Name	
Email ID.	
Roll No.	
Mobile No.	Date

Allotted Time : 60 Minutes

Instructions to Candidates -

- There are 7 Questions in this Question paper.
- All Questions are Compulsory.
- For all updates, please visit the noticeboard -
<https://noticeboard.forumias.com/gsap-2023/>

Important -

- Answers must be attempted in the QCA Booklet only.
- To upload the Answer Copies please visit to "My Course" section on -
<https://academy.forumias.com/>
- Only those copies will be evaluated which will be submitted before the next class.

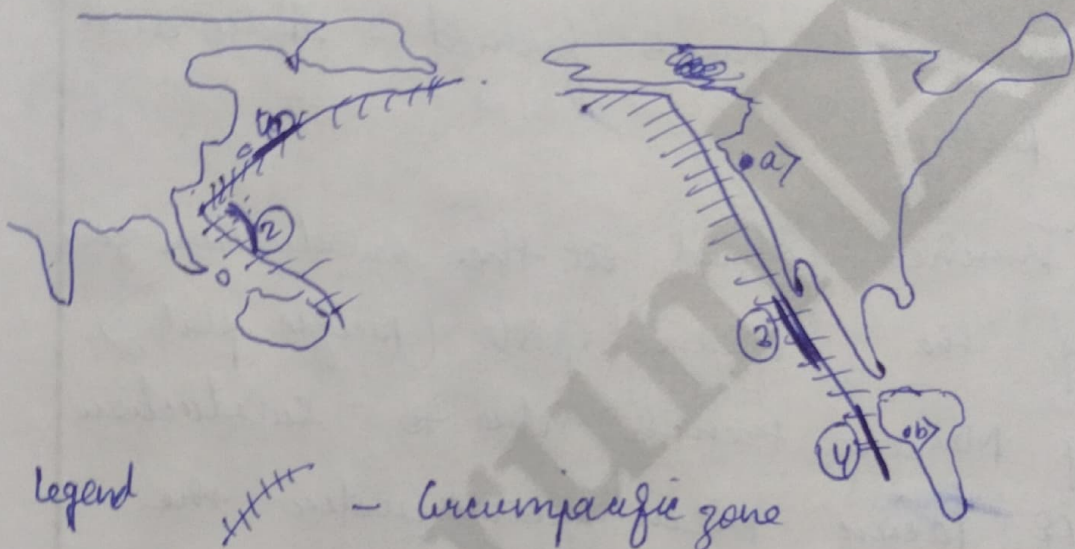
Q. No.	Grade/Score
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Start Writing Here

- 1) Circumpacific zone is located at the west of Pacific ocean, spanning across Asia, North America and South American continent and Australia.



Legend
 + + + + - Circumpacific zone
 / - Trenches
 • - Volcanoes

a) Mt St Helens ; b) Mt Cotopaxi

- (1) Japan trench (3) Mid America trench
 (2) Mariana trench (4) South America trench

Geophysical characteristics

- i) Earthquake - Majority of earthquakes take place here due to subduction of oceanic plate. eg Japan earthquake

20 11

- b) Volcanoes - formation of volcanic mountain due to rise of basalt ~~lava~~ turning to andesitic rocks.
eg Mt Cotopaxi in Ecuador
- c) Mountain chains formed - Andes and Rockies
- d) Trenches formed at the subduction zones of the oceanic plate (Pacific plate)
eg Mariana trench due to subduction of Pacific ocean plate under the Philippines plate.

The circum pacific zone should use the Sendai framework in ~~deals~~ mitigating the wrath of disasters.

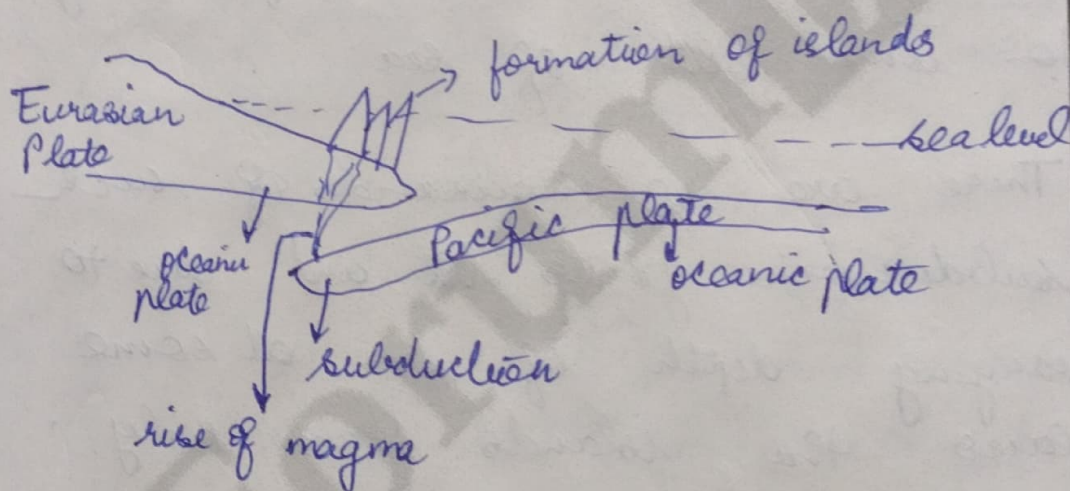
Overall Grading (✓)

Poor			Average			Good		
1	2	3	4	5	6	7	8	9

- Q.2) The formation of Indonesian and Philippines archipelagos can be explained on basis of Plate tectonics -

Formation .

- 1> Formed due to convergence of oceanic plates



- 2> oceanic part of Eurasian plates overrides the pacific plate
- 3> When the pacific plate subducts, the basalt rocks melts and basaltic magma formed
- 4> The basaltic magma being lighter rises .

- 5) As it hits the oceanic part of continental of Eurasian plate it gets converted to andesitic rock and tears apart the Eurasian plate due to its force
- 6) As it rises it solidifies in form of mountains which rise high enough to come out of sea
- 7) There are thousands of such subduction zones and due to varying depth of sea at some places the islands form only.
- Thus, explaining

Thus, explaining the 1000s of islands of Indonesia and Philippines.

Overall Grading (✓)

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Q.3) Arthur Holmes in 1930s gave his convection current hypothesis.

Convection current hypothesis —

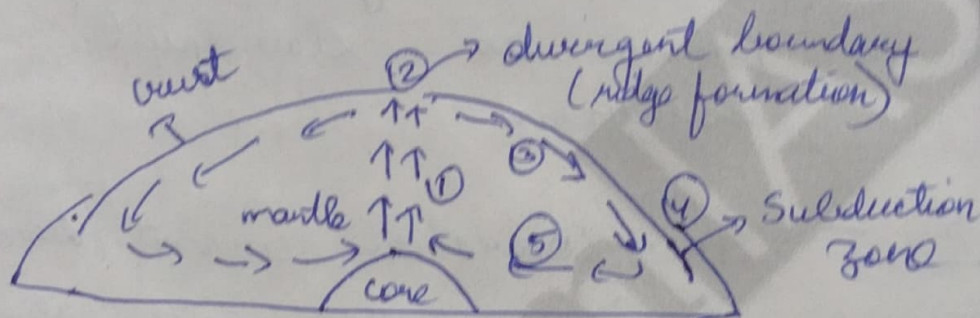


Figure — Convection current cell

Step ①

The residual heat and radioactive decay starts the process of convection current.

This rises above due to lighter density.

Step ②

The convection ascending limb puts pressure over the crust and ultimately ruptures it.

A ridge forms and the plate is pushed away (ridge push mechanism)

Step 3 - The crust floats over asthenosphere and moves ~~in~~ with the convection current due to friction force

Step 4 - The ~~to~~ ^{crust} ~~slab~~ is pulled downwards due to gravity and subducts known as slab pull mechanism.

Step 5 - The convection current (descending limb) meets with the ascending limb closing and forming loop called convection cell.

Thus, the theory is discussed.

Overall Grading (✓)

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Q.4) Harry Hess provided the sea floor spreading hypothesis.

Sea floor spreading hypothesis -

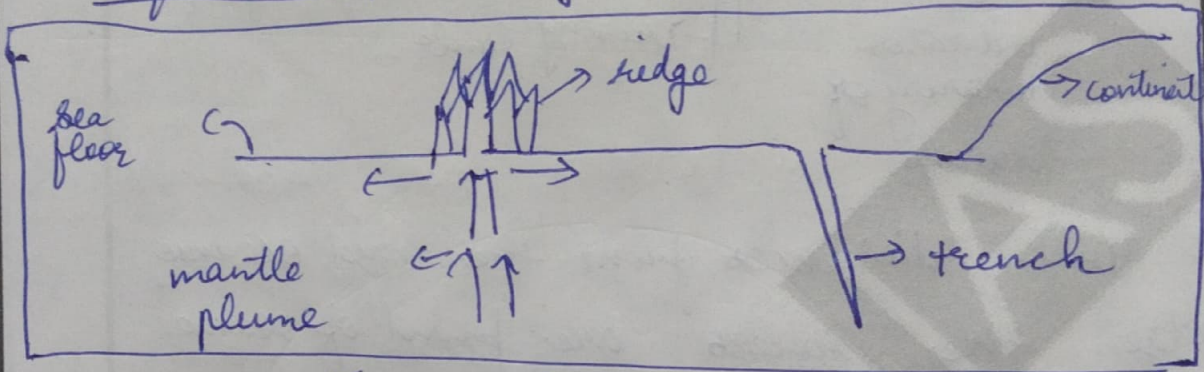
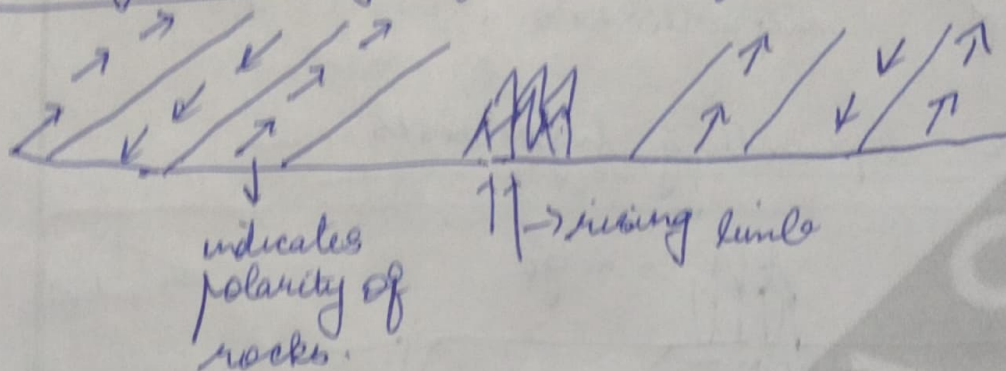


Figure - Sea floor spreading.

- 1) The mantle plume rises and at the diverging section of oceanic crust forms the ridges eg Mid Atlantic ridge. (creation of crust)
- 2) At the trench the oceanic crust is destroyed due to the subduction and subsequent melting (destruction of crust)
- 3) Rate of creation of crust is same as rate of destruction of crust.

Paleomagnetism justifies sea floor spreading as



1) At equal distances from the mid oceanic ridge the rocks are found of same polarity.

Info Justification : They were created at same time and are moving at same pace implying sea floor spreading.

2) Alternate polarity rocks are present.

Justification - ~~Justification~~

Thus, paleomagnetism justifies the sea floor spreading hypothesis.

Overall Grading (✓)

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Q.5) Fold mountains are those class of mountains which are formed due to ~~fold~~ warping of Earth's crust
eg Andes, Rockies, Himalayas

Reason for location along continent margin

- 1) Theory of plate tectonic can help in understanding it.
- 2) Fold mountains are formed due to convergence of ocean - continent plate and continent - continent plate.
- 3) Due to presence of ocean - continent plate the landform formed is bound to happen at the margin of continent. Formation of Andes and Rockies.
- 4) The case of continent - continent convergence ~~is not~~ is not observed as widely as ocean continent convergence. This leads to formation of mountain like Himalayas which are also

located at margin of subcontinent.

5) Formation of Andes has happened due to convergence of Nazca plate and ^{South} North American plate.

6) Formation of Rockies has happened due to convergence of Pacific ocean plate and North American plate.

Association between distribution of Earthquakes and Fold mountains

Prevalent Earthquake zones

1) Circumpacific region - presence of fold mountain like Rockies and Andes

2) Alpine Himalayan region - presence of Himalaya and Alps (^{both} fold mountains). Region start from Indonesia along Himalayan chain to the Mediterranean. Thus fold mountains ~~are~~ ^{present} leads to earthquakes.

Association between distribution of Fold Mountain and Volcanoes

- 1> North America's western coast - Mt McKinley and Mt St Helena in the Rockies
- 2> South America's ~~east~~ west coast - Mt Cotopaxi, Mt Chumborazo in Andes
- 3> Mediterranean region - Mt Vesuvius, Mt Etna in the Alps.

∴ Thus, nearly all fold mountains are associated with earthquakes but ~~not all~~ ^{only some} fold mountains are associated with Volcanoes like Himalaya, Ural not have Volcano.

Overall Grading (✓)

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Q.6)

Alfred Wegener proposed theory of continental drift in ~~1910s~~ early 20th century.

Theory of continental drift —

- 1) In Mesozoic era the entire landmass was united under Pangea, the entire watermass under Panthalassa.
- 2) The pangea was floating ~~on~~ over Panthalassa.
- 3) The pangea got divided into 2 parts Northern - Laurasia and southern part called Gondwana land.
- 4) The parts moved north west due to pole fleeing and tidal forces.
- 5) Their movements led to further break in them leading to present day continent system.

Evidence in its support

1) Tailite and placer deposit -

a) 1) The glacial marks at Talcher, Orissa leads to fact that India was at sometime in frigid zone

1.2) The placer deposits of gold in Odisha with its source being in Brazil.

This justifies that South America and Africa were connected

2) Jig saw fit - The shape of continents is such that they fit together - eg Eastern coast of South America and Western coast of Africa.

3) Fossil - presence of fossil of a fern across all the southern continents.

This leads to ~~the~~ that all the southern continents were once

connected together - ~~Arthur~~ ^{Wegener's}
Gondwana land

4) Structural fit - common rock ~~type~~ ^{age}
across continents eg Plateau of Borboruna
and Loma mountain of South America
and Africa respectively.

eg Kjoln mountain, Greenland, UK
and Appalachian mountain also have
same age and composition of rocks.

Wegener's theory ~~was an theory~~ provided
multiple insights which ultimately led
to proposal of plate tectonic theory.

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The plate tectonics theory was propounded by Morgan and Parker in 1960s.

Theory & proposal -

- 1) The plates float over asthenosphere
- 2) Oceanic and continental part are present combinedly in the plate
- 3) The ~~plates~~ Lithosphere is divided into seven major plates and many minor plates
- 4) The nature of plate (oceanic or continental) is determined by which part in the plate occupy more area. Only Pacific plate is the major plate which is oceanic.
- 5) The plates constantly moves
- 6) The movement of plate leads to collision

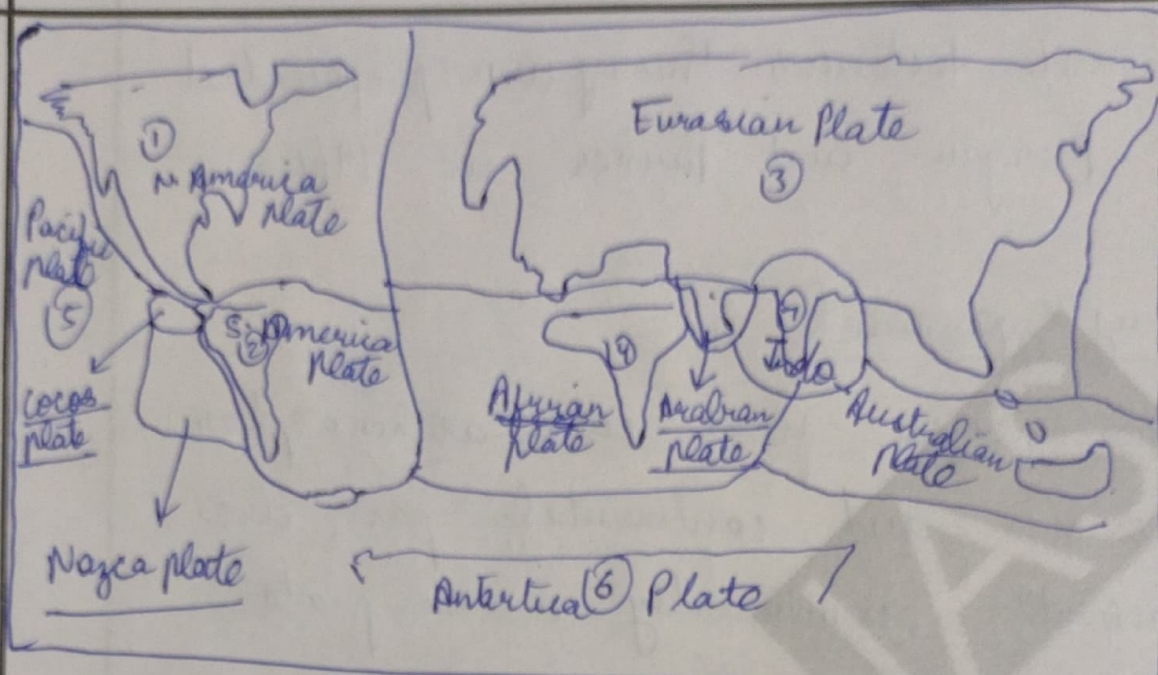
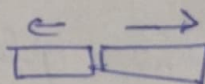


Figure - Tectonic plates.

Legend
 The encircled are major plates
 The underlined are minor plates

Formation of landforms explained by Plate tectonics

1) Divergent plates



~~① Divergent~~

- leads to formation of mid oceanic ridge, rift valley (African rift valley), nascent seas (Red sea)

2) Convergent plate

a) Ocean Ocean convergence - leads

to formation of islands. eg Japan, Philippines.

- b) Ocean - continent convergence — lead to fold mountain like Andes and volcanic mountain eg Mt. Colopance
- c) Continent - continent convergence — fold mountain - eg Himalayas.
- 3) Transform plate — the plates shear ~~and~~ eg. San Andreas fault.

Phenomena of earthquake, volcano etc are explained by plate tectonics

Unable to explain location, birth death of hotspots ← Criticism → Unable to explain Aravali, Vindhyachal mountain

~~Thus, it~~ The theory currently stands ~~as~~ as the most accepted theory.

~~of tectonics~~

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This Generic QCA booklet can be used to attempt all GS Advanced Program Tests.