

Q.1) An ecosystem consists of both biotic and abiotic factors. Which of the below are abiotic factors?

1. Protists
2. Light
3. Water
4. Soil or substrates

Choose the correct option from below

- a) 1 only
- b) 1, 2 and 4 only
- c) 2, 3 and 4 only
- d) 1, 3 and 4 only

Q.1) Solution (c)

An ecosystem depends on the interactions of the living and nonliving elements in the system.

Biotic factors	Abiotic factors
Decomposers Plants Herbivores Fungus Protists: Protists generally are one-celled microscopic organisms, Animal-like protists such as paramecia and amoebas eat bacteria and smaller protists, so they form part of the food chain. Fungus-like protists often serve as decomposers in the ecosystem.	Air Soil or substrate Water Light Salinity Temperature

Q.2) Ecology focuses on the larger scales in biology, from the individual organism through populations, communities, ecosystems, and the Biosphere. Match the levels with their properties given below

1. Population	Inter - breeding groups of individuals of the same species, generally living in the same contiguous habitat.
2. Communities	Interacting populations of different species.
3. Ecosystem	They contain both the broad biological community and all the physical processes
4. Biosphere	Includes all the biological and physical processes that allow for and influence life on Earth.

Which of the above is/are correctly matched?

- a) 1 only
- b) 1, 2 and 4 only
- c) 1, 2 and 3 only
- d) All of the above

Q.2) Solution (d)

Levels of organization in ecology	Properties.
Populations	Are interbreeding groups of individuals of the same species, generally living in the same contiguous habitat.
Communities	Are interacting populations of different species
Ecosystems	Are comprised of both the biotic (living) and abiotic (non-living) factors in a given area; they contain both the broad biological community and all the physical processes (such as weather, soil, hydrology, nutrients, energy flow etc.) that influence that community.
Biosphere	Is global in scale, and includes all the biological and physical processes that allow for and influence life on Earth.

Q.3) Natural selection is the driving force of adaptation and evolution, Consider the following statements:

1. Natural selection occurs only on the scale of the individual organism
2. Natural selection means that those heritable traits that increase the fitness of an individual organism have a greater probability of being present in future generations within the population

Which of the above statement is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) None of the above

Q.3) Solution (b)

Statement-1: Incorrect	Statement-2: correct
Biologists generally agree that natural selection occurs predominantly on the scale of the individual organism (Williams	Natural selection means that those heritable traits that increase the fitness of an individual organism have a greater

1966), although some argue that it can theoretically occur at other scales as well (Wilson 1980). Each individual organism acts to maximize its own survival and ability to produce offspring that are in turn able to survive and reproduce (called fitness by biologists), even at the expense of other organisms of the same species.

probability of being present in future generations within the population. The fact that selection is nearly always strongest on the scale of the individual organism has important ramifications for understanding ecology (Levin 2002)

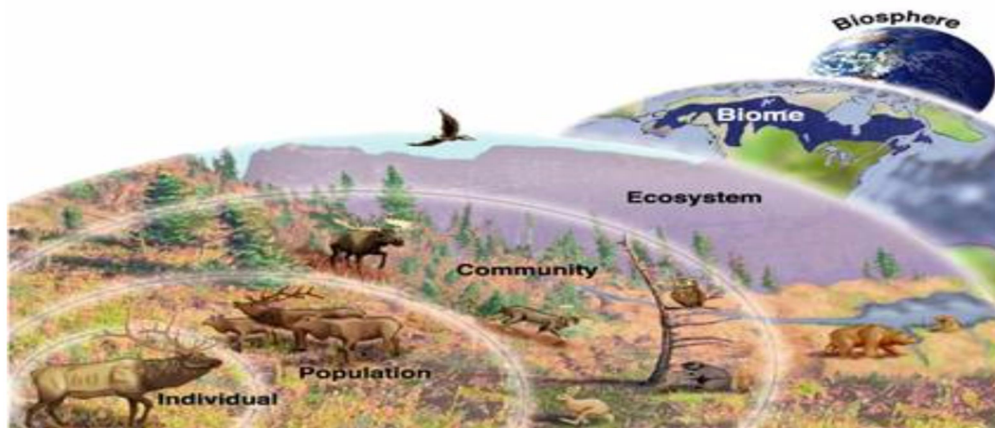
Q.4) Level of organisation is important in study of ecosystem, Arrange the following in increasing order in organisation of ecosystem

1. Individual
2. Community
3. Population
4. Biome
5. Ecosystem
6. Biosphere

Choose correct option from below:

- a) 1-2-3-4-5-6
- b) 1-3-2-4-5-6
- c) 1-3-2-5-4-6
- d) 1-2-3-4-5-6

Q.4) Solution c)



Q.5) Consider the following statement about Ecotone:

1. Ecotone is a zone of junction between two or more diverse ecosystems
2. It is non-linear as it shows progressive decrease in species of incoming community from the outgoing species
3. Some organisms in ecotone may be totally different from the adjoining communities

Which of the above statement is/are incorrect?

- a) 1 only

- b) 2 only
- c) 1 and 3 only
- d) All of the above

Q.5) Solution (b)

Statement-1 and 3: correct	Statement-2: incorrect
<p>An Ecotone describes an area that acts as a transition or boundary between two ecosystems. This could be, for example, an area of marshland between a river and the riverbank, the transition between Arctic Tundra and Forest biomes in Northern Siberia</p> <p>As this area is inevitably Influenced by the two bordering ecosystems, it is therefore a consequence of this that a higher density of organisms and variety of species can be found within an Ecotone.</p>	<p>It is linear as shows progressive increase in species composition of one in coming community and a simultaneous decrease in species of the other outgoing adjoining community</p>

Q.6) Natural ecosystems have been misused by the human being as a result of which the biodiversity and wild life has been threatened. Consider the methods that can be used to protect natural ecosystems

1. Humans should move towards sustainable utilisation of resources
2. Introduction of the species from the other parts of the world and the human interference should be reduced to minimum into natural ecosystems.
3. Making buffer zones or transitional zones around the protected area.

Which of the above statement is/are correct?

- a) 1 only
- b) 1 and 2 only
- c) 1 and 3 only
- d) All of the above

Q.6) Solution (d)

Protection of natural ecosystem demands management of human use of the biosphere resources such that they give maximum benefits to the present human generation while maintaining its potential to meet the needs of future human generations.

- Introduction of the species from the other parts of the world and the human interference should be reduced to minimum into natural ecosystems.
- Some of the areas should be earmarked as protected or reserve zones. This can be achieved by making buffer or transitional zones around the protected area. (Buffer zone

- and transitional zones are where only a limited humans are permitted to enter)
- Species in the detrimental habitats should be shifted to their unexploited natural habitat.

Q.7) Ecosystem services are the direct and indirect contributions of ecosystems to human well-being, Consider the following pairs:

1. Provisioning services	Benefits obtained from the ecosystem processes such as water purification and waste management, pollination or pest control.
2. Regulating services	Products obtained from ecosystems such as food, fresh water, wood, fiber, genetic resources and medicines
3. Habitat services	Highlight the importance of ecosystems to provide habitat for migratory species and to maintain the viability of gene-pools.
4. Cultural services	Include non-material benefits that people obtain from ecosystems such as spiritual enrichment, intellectual development, recreation and aesthetic values.

Which of the above pair is/are incorrect?

- 1 and 2 only
- 2 and 3 only
- 1, 2, and 3 only
- 1, 2, 3 and 4

Q.7) Solution (a)

Provisioning services	Products obtained from ecosystems such as food, fresh water, wood, fiber, genetic resources and medicines.
Regulating services	Defined as the benefits obtained from the regulation of ecosystem processes such as climate regulation, natural hazard regulation, water purification and waste management, pollination or pest control.
Habitat services	Highlight the importance of ecosystems to provide habitat for migratory species and to maintain the viability of gene-pools.
Cultural services	Include non-material benefits that people

	obtain from ecosystems such as spiritual enrichment, intellectual development, recreation and aesthetic values.
--	---

Q.8) Food chain and food web play crucial roles in functions of ecosystem, Consider the following statements about them.

1. The distinction between Grazing food chain and Detritus food chain is the source of energy at the first level
2. Grazing and detritus food chains are not interlinked.

Which of the above statement is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.8) Solution (a)

Statement-1: correct	Statement-2: incorrect
In grazing food chain primary source of energy is living plant Biomass. Whereas in detritus it is dead organic matter	Both chains are interlinked: the initial energy source for detritus food chain is the waste materials and dead organic matter from the grazing food chain

Q.9) Consider the following statements with respect to flows in ecosystem:

1. Energy flow in decomposition is bi-directional, where energy is recycled by decomposers
2. The number and energy of organisms gradually decrease with each trophic level in grassland ecosystem.
3. Pyramid of biomass is always upright

Which of the above statement is/are incorrect?

- a) 1 only
- b) 1 and 2 only
- c) 1 and 3 only
- d) 1, 2 and 3

Q.9) Solution (c)

Statement-1 and 3 : incorrect	Statement-2: correct
Decomposers which include bacteria, fungi, molds, worms, and insects break down wastes and dead organisms, and return the nutrients to the soil, which is then taken up by the producers. Energy is not recycled	The number, energy gradually decreases with each step from producer level to consumer level in grassland ecosystem.

during decomposition, but it is released-
nutrients are recycled

In aquatic ecosystem the producers are small organisms with least biomass and the biomass gradually increase towards the apex of the pyramid. Thus the **pyramid of biomass of aquatic ecosystems is inverted in shape.**

Q.10) Consider the following statements about ecological succession:

1. Ecological succession is the observed process of change in the species structure of an ecological community over time
2. Climate change may impact the ecological succession process
3. The climax community represents a stable end product of the successional sequence

Which of the above statement is/are correct?

- a) 1 only
- b) 2 only
- c) 1 and 3 only
- d) All of the above

Q.10) Solution (d)

Ecological succession is the process of change in the species structure of an ecological community over time. The community begins with relatively few pioneering plants and animals and develops through increasing complexity until it becomes stable or self-perpetuating as a climax community. Succession may be initiated either by formation of new, unoccupied habitat, such as from a lava flow or a severe landslide, or by some form of disturbance of a community, such as from a fire, severe windthrow, or logging. Succession that begins in new habitats, uninfluenced by pre-existing communities is called primary succession, whereas succession that follows disruption of a pre-existing community is called secondary succession.

Ecological succession may also occur when the conditions of an environment suddenly and drastically change. A forest fires, wind storms, and human activities like agriculture all greatly alter the conditions of an environment. These massive forces may also destroy species and thus alter the dynamics of the ecological community triggering a scramble for dominance among the species still present.

Q.11) Biotic interactions have marked effect on survival of organisms. Consider the following pairs:

1. Mutualism: positive interaction, both species are benefitted
2. Commensalism: positive interspecies interaction

3. Predation: negative interaction
4. Ammensalism: antagonistic interspecies interaction

Which of the above statement is/are correct?

- a) 1 only
- b) 1 and 2 only
- c) 2 and 4 only
- d) All of the above

Q.11) Solution (d)

Mutualism	Commensalism	Predation	Ammensalism
It is the name given to associations between pairs of species that bring mutual benefit	A relationship between individuals of two species in which one species obtains food or other benefits from the other without either harming or benefiting the latter.	Predation is a biological interaction where one organism, the predator, kills and eats another organism, its prey.	It is an interaction where one species suffers and the other interacting species experiences no effect

Q.12) Consider the following statements:

1. Bioaccumulation is concentration of degradable pollutant in the first organism of trophic level
2. In Biomagnification pollutants increase from one trophic level to other
3. In order to biomagnify, pollutant must be long-lived, soluble in fats and biologically active

Which of the above statement is/are correct?

- a) 1 only
- b) 2 and 3 only
- c) 1 and 3 only
- d) All of the above

Q.12) Solution (b)

Statement-1: incorrect	Statement-2 and 3: correct
Bioaccumulation is increase in concentration of a pollutant from the environment to the first organism in a food chain, pollutants should be non-biodegradable	Biomagnification is increase in concentration of a pollutant from one link in a food chain to another. In order for biomagnification to occur, the pollutant must be: 1.long-lived 2.mobile

	3.soluble in fats 4.biologically active
--	--

Q.13) Which of the bio-geochemical cycle is majorly driven by solar energy?

- a) Nitrogen cycle
- b) Water cycle
- c) Sulphur cycle
- d) Phosphorus cycle

Q.13) Solution (b)

Hydrological cycle	Nitrogen cycle	Sulphur cycle	Phosphorus cycle
Water cycle is continuous circulation of water in the earth-atmosphere system which is driven by solar energy	This cycle is accomplished in three different ways: By microorganisms, industrial processes and atmospheric phenomenon's like thunder and lighting	It is sedimentary cycle, where sulphur is released by erosion, decomposition etc.	It is sedimentary cycle and enters the cycle from erosion and mining activities

Q.14) Nitrogen is essential constituent of protein and is basic building block of all living tissues.

1. Nitrogen has to be converted in to ammonia, nitrites and nitrates before it can be taken by plants
2. Nitrifiaing bacteria promote transformation of ammonia into nitrates
3. Upon decomposition nitrogen is returned to the soil as nitrogen gas.

Which of the above statement is/are correct?

- a) 1 only
- b) 1 and 2 only
- c) 1 and 3 only
- d) None of the above

Q.14) Solution (a)

Statement-1: correct	Statement-2 and 3: incorrect
Nitrogen in the elemental form cannot be directly used by living organisms. Nitrogen needs to be fixed	Nitrifiaing bacteria: ammonia to nitrite. Nitrobacter: nitrites in to nitrates. During excretion and upon the death of all the organisms nitrogen is returned to the soil in the form of ammonia

Q.15) The rate of biomass production in an ecosystem is called productivity. Which of the

following statements are correct?

1. Net primary productivity (NPP) is less than Gross primary productivity (GPP).
2. Net Primary Productivity (NPP) is the available biomass for the consumption of heterotrophs
3. Ecological succession is characterised by increased productivity

Choose correct option from below:

- a) 1 and 2 only
- b) 2 and 3 only
- c) 1 and 3 only
- d) All of the above

Q.15) Solution (d)

- Primary production is defined as the amount of biomass or organic matter produced per unit area over a time period by plants during photosynthesis.
- Gross primary productivity of an ecosystem is the rate of production of organic matter during photosynthesis.
- Net primary productivity (NPP): Gross primary productivity minus respiration losses
- Net primary productivity is the available biomass for the consumption to heterotrophs (herbivores and decomposers)
- Ecological succession is characterised by increased productivity as with each seral stage more stable species get a foot hold over the space till climax specie is reached.

Q.16) Consider the following statements about the process of secondary succession?

1. Secondary succession is much slower than the primary succession.
2. Secondary succession begins in areas where natural vegetation has been destroyed.

Which of the above statement is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) None of the above

Q.16) Solution (b)

Statement-1: incorrect	Statement-2: correct
Secondary succession begins in areas where natural biotic communities have been destroyed such as in abandoned farm lands, burned or cut forests, lands that have been flooded. Since some soil or sediment is present, succession is faster than primary succession.	Secondary succession begins in areas where natural biotic communities have been destroyed such as in abandoned farm lands, burned or cut forests, lands that have been flooded.

Q.17) Consider the following pairs:

1. Autogenic succession: succession in which green plants dominate
2. Allogenic succession: change brought by outside forces
3. Autotrophic succession: succession brought by living inhabitants of community itself
4. Heterotrophic succession: heterotrophs are greater in quantity

Which of the above is/are correctly matched?

- a) 1 and 2 only
- b) 2 and 4 only
- c) 2 and 3 only
- d) None of the above

Q.17) Solution (b)

Successional change can be caused by either endogenous or exogenous factors depending upon whether the change is caused by the actions of the plants themselves or by external factors.

Autogenic:	Changes caused by endogenous factors (the living inhabitants themselves)
Allogenic succession:	changes caused by exogenous factors are termed allogenic
Autotrophic:	A succession in which green plants or the autotrophs dominate, so that there is a continuous energy flow during the whole process, is known as Autotrophic succession.
Heterotrophic:	succession wherein heterotrophs such as bacteria, fungi, actinomycetes or even animals dominate and there is a continuous decline in the energy flow is known as Heterotrophic succession

Q.18) Consider the following statements:

1. Niche is the unique functional role of a species in ecosystem.
2. Niche plays an important role in the conservation of organisms

Which of the above statement is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) None of the above

Q.18) Solution (c)

An **ecological niche** is the role and position a species has in its environment; how it meets its needs for food and shelter, how it survives, and how it reproduces.

For a species to maintain its population, its individuals must survive and reproduce. Certain combinations of environmental conditions are necessary for individuals of each species to tolerate the physical environment, obtain energy and nutrients, and avoid predators. The total requirements of a species for all resources and physical conditions determine where it can live and how abundant it can be at any one place within its range. These requirements are termed abstractly the ecological niche.

Niche plays an important role in conservation of organisms as it tells the ideal conditions in which an organism can sustain a healthy life.

Q.19) Dispersal, colonization and recruitment, establishment, facilitation and inhibition are terms related to:

- a) Primary succession
- b) Secondary succession
- c) Climax community
- d) All of the above

Q.19) Solution (a)

The above terms are features and are related with the primary succession

Features of Primary Succession:

- Dispersal: it is arrival of seeds to the barren land -Small seeds arrive first, generally through wind, birds, migratory animals and water.
- Colonization and Recruitment -pioneer species mostly shrubs and nitrogen fixers dominate and facilitate the environment or habitable conditions. This are function of (soil moisture, temperature, competition (light/soil moisture)).
- There are some different models of primary succession they are-Establishment, Facilitation and Inhibition

THE FACILITATION: Pioneers modify a site by their presence, for instance, by regenerating the soil with organic material, thus making the area more attractive for invasion by other species.

Eventually, new species move in, edging out the pioneers as they do so. This process may repeat itself several times, until the ecosystem reaches the climax stage,

INHIBITION: all species have equal opportunity to establish populations after a disturbance. In the inhibition model, however, some of the early species actually make the site less suitable for the development of other species.

Q.20) Consider the following about Tundra Biome:

1. It is devoid of trees except stunted shrubs
2. It is found in near northern and southern poles

Which of the above statement is/are correct?

- a) 1 only
- b) 2 only

- c) Both 1 and 2
- d) None of the above

Q.20) Solution (c)

Characteristics of tundra include:

- Extremely cold climate
- Low biotic diversity
- Simple vegetation structure
- Limitation of drainage
- Short season of growth and reproduction
- Energy and nutrients in the form of dead organic material
- Large population oscillations

Q.21) Consider the following statements with respect to 'International Development Association (IDA)'

1. It aims to reduce poverty by providing loans and grants for programs that boost economic growth, reduce inequalities, and improve people's living conditions.
2. It is a member of the World Bank Group.

Select the correct statements

- a) 1 Only
- b) 2 Only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.21) Solution (c)

The International Development Association (IDA) is the part of the World Bank that helps the world's poorest countries. Overseen by 173 shareholder nations, IDA aims to reduce poverty by providing loans (called "credits") and grants for programs that boost economic growth, reduce inequalities, and improve people's living conditions.

IDA complements the World Bank's original lending arm—the International Bank for Reconstruction and Development (IBRD). IBRD was established to function as a self-sustaining business and provides loans and advice to middle-income and credit-worthy poor countries. IBRD and IDA share the same staff and headquarters and evaluate projects with the same rigorous standards.

Q.22) Which of the following is/are associated with 'BRICS'?

1. Asian Development Bank
2. Contingent Reserve Arrangement
3. Fortaleza Declaration

Select the correct code:

- a) 1 and 2
- b) 2 and 3
- c) 1 and 3
- d) All of the above

Q.22) Solution (b)

Currently, there are two components that make up the financial architecture of BRICS, namely, the New Development Bank (NDB) or sometimes referred to as the BRICS Development Bank and the Contingent Reserve Arrangement (CRA). Both of these components were signed into treaty in 2014 and became active in 2015.

BRICS nations signed BRICS Contingent Reserve Arrangement (CRA) in 2014 as part of Fortaleza Declaration at Sixth BRICS summit.

Q.23) Which of the following pairs is/are correctly matched?

- 1. Rohingyas – Myanmar
- 2. Uighurs – Nepal
- 3. Yazidis – Libya

Select the correct code:

- a) 1 Only
- b) 1 and 2
- c) 2 and 3
- d) 1, 2 and 3

Q.23) Solution (a)

Rohingyas – Myanmar

Uighurs – China

Yazidis – Iraq

Q.24) Consider the following statements with respect to 'Goods and Service Tax Council'.

- 1. It is a constitutional body for making recommendations to the Union and State Government on issues related to Goods and Service Tax.
- 2. It is chaired by the Union Finance Minister.

Select the correct statements

- a) 1 Only
- b) 2 Only
- c) Both 1 and 2

d) Neither 1 nor 2

Q.24) Solution (c)

Goods & Services Tax Council is a constitutional body for making recommendations to the Union and State Government on issues related to Goods and Service Tax. The GST Council is chaired by the Union Finance Minister and other members are the Union State Minister of Revenue or Finance and Ministers in-charge of Finance or Taxation of all the States.

Q.25) Which of the following Tiger Reserves was the best managed according to the '4th cycle of the Management Effectiveness Evaluation of Tiger Reserves (MEETR)'?

- a) Pench Tiger Reserve
- b) Bandipur Tiger Reserve
- c) Tadoba-Andhari Tiger Reserve
- d) Corbett Tiger Reserve

Q.25) Solution (a)

The Prime Minister released a report of the 4th cycle of the Management Effectiveness Evaluation of Tiger Reserves (MEETR) with Pench Tiger Reserve, Madhya Pradesh scoring the highest and Sathyamangalam Tiger Reserve, Tamil Nadu showing the highest increment in management since the last cycle for which the latter was awarded.

Q.26) Consider the following statements with respect to 'River Yamuna'.

1. It flows through three states only.
2. Tons is the largest tributary of the Yamuna.

Select the correct statements

- a) 1 Only
- b) 2 Only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.26) Solution (b)

The Tons is the largest tributary of the Yamuna and flows through Garhwal region in Uttarakhand, touching Himachal Pradesh.

Flows Through - Uttarakhand, Himachal Pradesh, Uttar Pradesh, Haryana, Delhi

Tributaries

- Left Hindon, Tons, Giri, Rishiganga, Hanuman Ganga, Sasur Khaderi
- Right Chambal, Betwa, Ken, Sindh, Baghain

Q.27) Which of the following rivers are 'Antecedent Rivers'?

1. Subansiri
2. Kosi
3. Sutlej

Select the correct statements

- a) 1 and 2
- b) 2 and 3
- c) 1 and 3
- d) All of the above

Q.27) Solution (d)

Antecedent Rivers had established their drainage networks well before the Himalayas came into existence as a mountain barrier. These rivers were past their youthful stage when the mountain ranges began rising across their paths.

Many Himalayan rivers are good examples of antecedent origin. These rivers originated well before the Himalayan region was uplifted. The rivers Indus, Brahmaputra, Sutlej, Kosi and Subansiri originated on the Tibetan side and now traverse the existing mountain ranges, cutting deep gorges.

Q.28) 'Vikramshila Gangetic Dolphin Sanctuary' is located in

- a) Assam
- b) West Bengal
- c) Bihar
- d) Uttar Pradesh

Q.28) Solution (a)

Vikramshila Gangetic Dolphin Sanctuary is located in Bhagalpur District of Bihar.

Q.29) 'Agreement on Reciprocal Logistics Support (ARLS)' is associated with which of the following countries?

- a) United States of America
- b) Japan
- c) Russia
- d) Australia

Q.29) Solution (c)

The Military Logistics Support Agreements (MLSA) with Japan is called the Acquisition and

Cross-Servicing Agreement (ACSA) and with Russia, the Agreement on Reciprocal Logistics Support (ARLS).

Q.30) Consider the following statements with respect to 'International Seabed Authority (ISA)'

1. All Parties to the United Nations Convention on the Law of the Sea (UNCLOS) are members of ISA.
2. The headquarters of the ISA is located in Geneva, Switzerland.

Select the correct code:

- a) 1 Only
- b) 2 Only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.30) Solution (a)

It is an intergovernmental body based in Kingston, Jamaica, that was established to organize, regulate and control all mineral-related activities in the international seabed area beyond the limits of national jurisdiction, an area underlying most of the world's oceans. It is an organization established by the United Nations Convention on the Law of the Sea.

The International Seabed Authority (ISA) is comprised of 167 Member States, and the European Union. All Parties to the 1982 United Nations Convention on the Law of the Sea (UNCLOS) are members of ISA. ISA is mandated as the organization through which Parties to UNCLOS shall organize and control all mineral-related activities in the international seabed area, known also as "the Area."