1. What are tides? How do tides form? Explain. What is the significance of tides for marine ecology? Discuss.

Demand of the question:

It expects candidates to write about the tides and mechanism of their formation. It also expects to write how tides play an important role in marine ecology.

Introduction:

Tides are the periodic rise and fall of the oceans water level, once or twice a day, caused by the combined effects of the gravitational forces exerted by the sun, the moon and the rotation of the earth.

Body:

Formation of tides:

- Combined effects of the gravitational forces exerted by the Moon and the Sun and the rotation of Earth cause occurrence of tides in oceans.
- Hence, the mechanism of tides formation could be understood by understanding the gravitational force of the Sun and the Moon.
- These bodies experience the gravitational pull over each other depending upon their mass and the distance between them.
- Since the Sun is far away from the Earth as compared to the Moon. Hence, the Sun's gravitational pull is lesser over the Earth than the moon. Thus, the moon determines the magnitude of the tide.
- It is supposed that only the water bodies are pulled by the gravitational pull, however, it is not the fact.
- It is both the land and water bodies that get pulled by the gravitation. Since the relative pull of the land is less in comparison to that of water, the effect of gravitation on the water bodies is more.
- Following Figure 1 represents mechanism of tide formation.

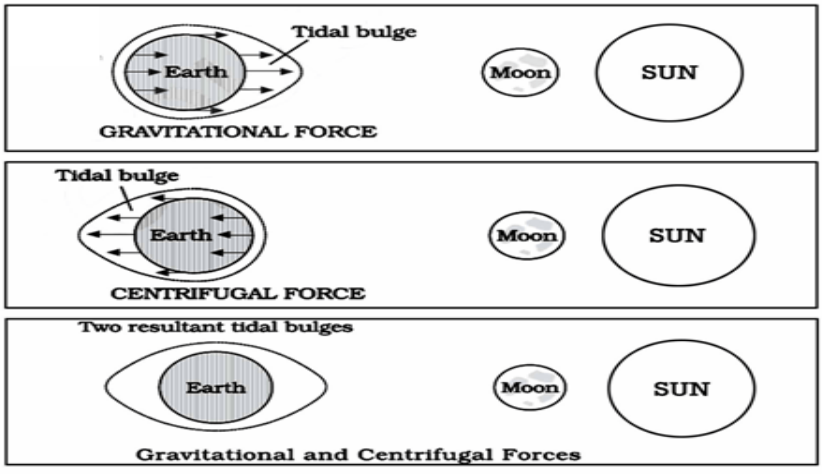

Figure 1

Significance of tide for marine ecology:

- Marine ecology is the study of living things in the ocean and how they interact with their environment.

- Sustenance of life: Tides affect various aspects of oceanic life, including the reproductive activities of fish and ocean plants. Floating plants and animals ride the tidal currents between the breeding areas and deeper waters.
- Source of habitat and food: Sea creatures like Crabs, mussels, snails, seaweed etc. inhabit the tidal zone and the most important point to be remembering that without the regular washing of the tides, these complex and abundant creatures would die and food resources would diminish.
- Moderate temperature: The tides and tidal currents mix arctic water that can't absorb sunlight when compared with warmer tropic water that does. Tides stir the ocean water that makes habitable climatic condition and help in maintaining the temperatures around marine ecological habitat.
- Tides removes pollutants and circulate nutrients required for survival of ocean plants and animals. e.g. Seawater in and out of tidal bays and estuaries.
- Tides play vital role for the growth and formation of mangroves, its canopy and formation of zone in the mangrove ecosystem and associated diversity.
- Tides also help to maintain mudflats that provide habitation for flora and fauna.

Conclusion:

In this way tides play an important role by contributing for sustenance of vital life processes around the marine ecology and helps to conserve the rich biodiversity of the marine ecology of planet earth.

2. What do you understand by Business Process Outsourcing (BPO)? What were those factors that made India a hotspot for BPOs? What is the future of BPOs in India? Examine.

Demand of the question:

It expects candidates to write about what they understood by the term Business Process Outsourcing (BPO). It also expects to write about characteristics of India due to which hotspot for BPOs was created and the future of BPOs in India.

Introduction:

Business process outsourcing (BPO) is a method of subcontracting various business-related operations to third-party vendors. Although BPO originally applied solely to manufacturing entities, such as soft drink manufacturers that outsourced large segments of their supply chains, BPO now applies to the outsourcing of services, as well.

Body:

Many businesses, from small startups to large companies, opt to outsource processes, as new and innovative services are increasingly available in today's ever-changing, highly competitive business climate. The Business Process Outsourcing industry in India caters mostly to Western operations of multinational corporations. Annual revenues from BPOs are around $11 billion, around 1% of GDP.

Factors that made India a hotspot for BPOs:

- Availability of Cheap labour: Initially, India was chosen as an apt alternative to in-house processing considering many favourable factors including large English-speaking workforce and availability of tech-savvy manpower.
- Cost advantage: it is the operational cost reduction by outsourcing the business process services to India that makes the country a suitable destination. Companies are enjoying as much as 50-60 percent of cost reduction by outsourcing to India.
- Competent Talent Pool: Despite the stiff competition from The Philippines, Vietnam and other Asian countries, the Indian BPO industry still remains an attractive destination because of the availability of vast skilled labor and their proficiency in understanding progressive technology.
- Leveraging Cost-advantage From Tier II Cities: The existence of a large number of tier II cities in the country is the biggest advantage for the Indian business process outsourcing companies which find working in such cities to be cost-effective. Besides, the mounting cost of living in these cities has forced the companies to begin operations in the rural regions as it seemed to be promising to significantly reduce the overhead costs in the long run.
- Human Resource Advantage: Though some of the Asian countries are rising to be at par with India in providing cost-effective BPO services, these countries lack sufficient human resources to cater to the global market. India, on the other hand, with its large competent professionals is driving the BPO

industry, thereby proving it to be an ideal destination for outsourcing services.

Future of BPO's in India:

- The rapidly growing industry requires growth in infrastructure as well. However, this is an area where India lacks, and this issue need to be addressed to keep up with the competition.
- Even though India has been established itself as a world leader in the business of outsourcing, in the near future, there are chances of facing tougher challenges. South-Asian countries like Malaysia, Indonesia, Singapore, Vietnam, Philippines, Thailand and others are trying to improve their position so as to become alternative offshore locations.
- Companies are branching out to Tier II cities where they would be able to take advantage of low labour costs.
- Other South-Asian countries have been able to challenge the competitiveness of India by offering cheaper labour in business processing skills. India, on the other hand is experiencing a rise in the labour costs along with high attrition which is of course of concern and thereby need to be addressed as soon as possible.

Despite these challenges following Interesting facts about the Indian BPO industry make the industry more attractive destination for investment:

- The BPO sector in India is estimated to have reached a 54 per cent growth in revenue.
- The demand for Indian BPO services has been growing at an annual growth rate of 50%.
- The BPO industry in India has provided jobs for over 74,400 Indians. This number is continuing to grow on a yearly basis. The Indian BPO sector is soon to employ over 1.1 million Indians
- Indian BPOs handle 56% of the world's business process outsourcing.
- Also Ministry of Electronics and IT has started India BPO promotion scheme and North East BPO Promotion Scheme, which aims to aims to incentivize establishment of BPO firms and their extension to Tier II and Tier III cities (as per census 2011) to provide employment, distributed across various states in proportion to population of state with financial support in form of Viability Gap Funding (VGF).

Conclusion:

BPO as its a footloose industry can be set up anywhere, and it has a tremendous potential for growth and development in the Indian market and hence, if the respective policies and schemes implemented in right manner then India can surely emerge as a global leader in the BPO sector.

3. How do changes in the pattern of the Asian Monsoon affect various parts of the world? Explain with the help of recent examples.

Demand of the question:

It expects candidates to write in detail the effect of change in pattern of the Asian monsoon on various parts of the world with relevant recent examples.

Introduction:

The Asian monsoon is one of the most vigorous climatic phenomena on Earth and also one of the most societal important. The monsoon drives vital seasonal rainstorms that water crops and forests as well as damaging typhoons and floods

Body:

In a typical year, 80%–85% of the rain in the affected regions, often totalling 1.5–2.5 meters, falls during the summer monsoon season. On longer timescales, scientists have often cited the evolution of this seasonal wind flow over millions of years as one major cause of past changes in the environments, biosphere, and oceanography of this region, which includes the Indian subcontinent, Southeast Asia, China, Korea, and Japan. Following changes are observed in the pattern of the Asian Monsoon:

- The onset of the monsoon has been delayed almost every year since 1976, when there was a regime shift in climate around the world – from a weak to a strong El Niño period.
- Monsoons have also been ending sooner – almost a week from the end of September – so the length of the rainy season has been compressed.
- During the monsoon season, there are usually random "break periods" when there is hardly any rainfall. These periods are associated with systems moving northwards from the equatorial region. All available data and models-blended-with-data (known as reanalysis) indicate that global warming is shortening the length of the "active periods" when it does rain, while lengthening the break periods.

Effect of change in pattern of the Asian monsoon on various parts of the world:

- Indian monsoon is considered a 'textbook phenomenon' clearly defined which has not changed much in the preceding century.
- However this process has hit an erratic front, with floods in the northwest and the northeast and rainfall deficit in southern part of the nation.
- Rainfall extremes have increased threefold over the last few years and now extend over all of central India – from Gujarat to Odisha.
- Onset of monsoon has delayed every year since 2002 and it also lasts for shorter duration, compressing the Indian monsoon.
- The interspersed breaks in the monsoon have increased resulting in larger drier periods in the monsoon itself.
- Rainfall intensity, duration, frequency and spatial distribution have significantly undergone change in the past decade or two.
- Cycles of droughts and floods have become more common in many parts of India and their intensity has changed over the time. e.g. Cyclone Amphan.

- Also now cyclones are also started to occur on the western coast of the countries. e.g. Cyclone Vayu.
- Areas that have traditionally received plenty of rainfall are often remaining dry, while places that are not expected to get a lot of monsoon rain have sometimes been getting flooded.
- The intensity and amount of rainfall over the region has increased drastically. For instance, Typhoon Kammuri in Phillipines and Flooding in parts of China.
- The agricultural cycle of sowing to harvesting is facing tremendous challenge as unprecedented breaks and excess rainfall in short period of time making difficulty to set sowing pattern.
- Many of the metro cities are receiving excessive rainfall as compared to their average normal. e.g. Recent flooding in Mumbai.
- Also some experts opined that Australian bushfires partly due to late monsoon ending in India.
- The lack of water in other areas has hit water table levels. By 2030, India is expected to require almost 1.5 trillion m3 of ground water, where the current supply is only 740 billion m3, putting a huge pressure on the river basins, which are facing challenges of their own due to fast-disappearing glaciers and reduced rainfall.

In recent times it is proved that monsoons are (nearly) unpredictable natural disasters. Hence, following steps are needed to tackle this crisis:

- Need to change crop cycles, credit cycles, create storage infrastructure to deal with flooding.
- We need to invest in developing the state of the art technology to predict the accurate data regarding the monsoon cycle.
- Also, we need modification in the approach of handling of disasters by NDRF and SDRF as the intensity of the rainfall is extreme in some cases.
- Change in the type and variety of crops and change in the kind of inputs used by farmers to deal with the altered reality is needed of the hour.

Conclusion:

The effect of change of monsoon cycle over different parts of the world is wide scale. However, adoption of state of the art technology and investing more in research to know how the change in Asian monsoon will surely help to tackle this challenge successfully and avoid any loss in future.