Q.1) Pattiseema Lift Irrigation Project was in news recently. It connects

a) Mahanadi and Godavari
b) Krishna and Mahanadi
c) Krishna and Godavari
d) Periyar and Krishna

Q.1) Solution (c)

Pattiseema Lift Irrigation Scheme which has interlinked rivers **Godavari and Krishna in West Godavari district of Andhra Pradesh**, has now got national level acknowledgment.

It is registered in Limca Book of Records for integrating Krishna and Godavari rivers within a year time.

Important: It is South India's first River Integration Project.

Q.2) Consider the following regarding Seaweeds

1. Seaweeds are rich in vitamins and minerals and are consumed as food in various parts of the world
2. They are also used for the production of phytochemicals, viz., agar, carrageenan and alginate.
3. Seaweed can be potentially used as organic fertilizers

Which of the given statements is/are correct?

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

Q.2) Solution (d)

Seaweed cultivation, as a diversification activity in mariculture, has tremendous potential all along the Indian coast. **Seaweeds are rich in vitamins and minerals** and are consumed as **food in various parts of the world** and **used for the production of phytochemicals**, viz., agar, carrageenan and alginate, which are widely employed as gelling, stabilizing and thickening agents in several industries of food, confectionery, pharmaceutical, dairy, textile, paper, paint, etc.

In India, seaweeds are used as raw materials for the production of agar, alginate and liquid seaweed fertilizer (LSF).

There are a few agar industries, algin industries and LSF industries situated at different places in the maritime states of Tamil Nadu, Karnataka, Andhra Pradesh and Gujarat.

The red algae Gelidiella acerosa, Gracilaria edulis, G. crassa, G. foliifera and G. verrucosa are used for agar manufacture and brown algae Sargassum spp., Turbinaria spp. and Cystoseira trinodis for the production of alginates and liquid seaweed fertilizer.

The quantity of seaweeds exploited is inadequate to meet the raw material requirement of Indian seaweed industries.

http://www.thehindu.com/todays-paper/tp-national/tp-andhrapradesh/seaweed-cultivation-will-be-encouraged/article17791027.ece

Q.3) Consider the following about applications of Super Absorbent Polymers (SAP) in Agriculture

1. SAPs are polluting and non-biodegradable and don't helps in reducing irrigation frequency and water consumption.
2. They improves soil quality and resists drought stress
3. SAPs can reduce overuse of fertilizers and pesticides in fields.
4. SAPs act as soil matter flocculants.

Which of the given statements are correct?

a) 1, 3 and 4 Only
b) 2, 3 and 4 Only
c) 2 and 3 Only
d) 1, 2, 3 and 4

Q.3) Solution (b)

Super Absorbent Polymers, also known as SAP, hydrogel, absorbent polymers, absorbent gels, super soakers, super slurpers, water gel, is a new type of macro molecular synthetic water absorbing polymer material.

It has a water uptake potential as high as 100,000% of its own weight in a short period of time by osmosis and form granules in soil to enhance soil properties.

SAPs are generally white sugar-like hygroscopic materials that swell in water to form a clear gel made of separate individual particles and can retain moisture even under pressure without risk of conflagration or rupturing/blasting.

Super Absorbent Polymers used in agriculture are mostly prepared from acrylic acids and a cross-linking agent like potassium by solution or suspension polymerization. The polymer so **formed is called a polyacrylate** whose swelling capacity and gel modulus depends greatly on the quantity and type of cross-linker used.

Polyacrylates are non-toxic, non-irritating and non-corrosive in nature and tested to be biodegradable with a degradation rate of 10%-15% per year. They demonstrate high water absorbance potential and can freely release 95% of the same under suction pressure by plant roots.

The three most common soil conditions that hinder plant growth and crop yield are low water retention capability, high evapo-transpiration rate and soil moisture leaching. Apart from these, factors like unforeseen drought conditions, degradation and salination, overuse of synthetic fertilizers and pesticides and improper irrigation practices severely affect soil and plants, often rendering permanent damage to soil biota as well.

Desirable characteristics for applications in agriculture

- High absorption capacity in saline and hard water conditions
- Optimized absorbency under load (AUL)
- Lowest soluble content and residual monomer
- Low price
- High durability and stability in the swelling environment and during storage
- Gradual biodegradability without formation of toxic species
- pH-neutrality after swelling in water
- Photostability
- Re-wetting capability

Hydrogel agriculture technology, as it is popularly called, has the following advantages.

- Improves soil quality, preserves water and resists drought stress
- Increases seed sprouting and seedling development leading to better farm success
- From the environmental aspects, it is non-polluting and biodegradable, helps in reducing irrigation frequency and water consumption and creates a simple cyclic process to provide water directly to roots and prevent soil compaction.
- In agriculture and agroforestry, SAPs act as micro water reservoirs at plant roots. They absorb natural and supplied water 400-500 times their own weight and release it slowly on account of root capillary suction mechanism thus preventing water loss in soil by leaching and evaporation.

- SAPs form a consistent cyclic process of absorption and release of water; the water so released can provide optimum moisture for quick germination and seedling maturation. Thus it reduces seedling mortality by several folds in nurseries.
- In cold regions, death during germination and maturation is common due to moisture freezing in & around plant root tissue. Absorbed moisture in hydrogels does not freeze and makes easy accessibility to plants. It also regulates seedling growth temperature preventing death by freezing.
- SAPs can help save water and labor by reducing irrigation frequency, help overcome drought conditions and act as soil conditioners, prevent leaching in sandy soils, runoffs in mountainous and sloping fields, improve virescence efficiency and restore soil biota.
- SAPs can reduce overuse of fertilizers and pesticides in fields. The chemicals so absorbed with water are slowly released thus extending the operational life and uptake efficacy by root systems.
- SAPs act as soil matter flocculants. They closely bind loose soil thus forming loams that can help better root latching. Simultaneously, the repeated absorb-release mechanism prevents over compaction of soil minerals and provides space for aeration and development of soil edaphon.
- It has a wide area of application ranging from agriculture, forestry, industrial planting, municipal gardening, drought management, water conservation, It helps reduce soil erosion by surface run-offs, fertilizer and pesticide leaching to ground water, reducing cost of water and irrigation and success rate at growth and high yields of crops.

Q.4) Plant nutrition is a term that takes into account the interrelationships of mineral elements in the soil or soilless solution as well as their role in plant growth. Consider the following

1. Nickel
2. Molybdenum
3. Copper
4. Boron
5. Sulphur
6. Silicon
7. Vanadium

Which of the given above has a role of essential and beneficial mineral nutrients that are crucial for plant nutrition and growth?

a) 2, 3, 5 and 6
b) 1, 2, 3, 4, 5 and 7

c) 2, 3, 4, 5, 6 and 7
d) 1, 2, 3, 4, 5, 6 and 7

Q.4) Solution (d)

The following is a brief guideline of the role of essential and beneficial mineral nutrients that are crucial for growth. Eliminate any one of these elements, and plants will display abnormalities of growth, deficiency symptoms, or may not reproduce normally.

Macronutrients

Nitrogen is a major component of proteins, hormones, chlorophyll, vitamins and enzymes essential for plant life. Nitrogen metabolism is a major factor in stem and leaf growth (vegetative growth). Too much can delay flowering and fruiting. Deficiencies can reduce yields, cause yellowing of the leaves and stunt growth.

Phosphorus is necessary for seed germination, photosynthesis, protein formation and almost all aspects of growth and metabolism in plants. It is essential for flower and fruit formation. Low pH (<4) results in phosphate being chemically locked up in organic soils. Deficiency symptoms are purple stems and leaves; maturity and growth are retarded. Yields of fruit and flowers are poor. Premature drop of fruits and flowers may often occur. Phosphorus must be applied close to the plant's roots in order for the plant to utilize it. Large applications of phosphorus without adequate levels of zinc can cause a zinc deficiency.

Potassium is necessary for formation of sugars, starches, carbohydrates, protein synthesis and cell division in roots and other parts of the plant. It helps to adjust water balance, improves stem rigidity and cold hardiness, enhances flavor and color on fruit and vegetable crops, increases the oil content of fruits and is important for leafy crops. Deficiencies result in low yields, mottled, spotted or curled leaves, scorched or burned look to leaves.

Sulfur is a structural component of amino acids, proteins, vitamins and enzymes and is essential to produce chlorophyll. It imparts flavor to many vegetables. Deficiencies show as light green leaves. Sulfur is readily lost by leaching from soils and should be applied with a nutrient formula. Some water supplies may contain Sulfur.

Magnesium is a critical structural component of the chlorophyll molecule and is necessary for functioning of plant enzymes to produce carbohydrates, sugars and fats. It is used for fruit and nut formation and essential for germination of seeds. Deficient plants appear chlorotic, show yellowing between veins of older leaves; leaves may droop. Magnesium is leached by watering and must be supplied when feeding. It can be applied as a foliar spray to correct deficiencies.

Calcium activates enzymes, is a structural component of cell walls, influences water movement in cells and is necessary for cell growth and division. Some plants must have calcium to take up nitrogen and other minerals. Calcium is easily leached. Calcium, once deposited in plant tissue, is immobile (non-translocatable) so there must be a constant supply for growth. Deficiency causes stunting of new growth in stems, flowers and roots. Symptoms range from distorted new growth to black spots on leaves and fruit. Yellow leaf margins may also appear.

Micronutrients

Iron is necessary for many enzyme functions and as a catalyst for the synthesis of chlorophyll. It is essential for the young growing parts of plants. Deficiencies are pale leaf color of young leaves followed by yellowing of leaves and large veins. Iron is lost by leaching and is held in the lower portions of the soil structure. Under conditions of high pH (alkaline) iron is rendered unavailable to plants. When soils are alkaline, iron may be abundant but unavailable. Applications of an acid nutrient formula containing iron chelates, held in soluble form, should correct the problem.

Manganese is involved in enzyme activity for photosynthesis, respiration, and nitrogen metabolism. Deficiency in young leaves may show a network of green veins on a light green background similar to an iron deficiency. In the advanced stages the light green parts become white, and leaves are shed. Brownish, black, or grayish spots may appear next to the veins. In neutral or alkaline soils plants often show deficiency symptoms. In highly acid soils, manganese may be available to the extent that it results in toxicity.

Boron is necessary for cell wall formation, membrane integrity, calcium uptake and may aid in the translocation of sugars. Boron affects at least 16 functions in plants. These functions include flowering, pollen germination, fruiting, cell division, water relationships and the movement of hormones. Boron must be available throughout the life of the plant. It is not translocated and is easily leached from soils. Deficiencies kill terminal buds leaving a rosette effect on the plant. Leaves are thick, curled and brittle. Fruits, tubers and roots are discolored, cracked and flecked with brown spots.

Zinc is a component of enzymes or a functional cofactor of a large number of enzymes including auxins (plant growth hormones). It is essential to carbohydrate metabolism, protein synthesis and internodal elongation (stem growth). Deficient plants have mottled leaves with irregular chlorotic areas. Zinc deficiency leads to iron deficiency causing similar symptoms. Deficiency occurs on eroded soils and is least available at a pH range of 5.5 - 7.0. Lowering the pH can render zinc more available to the point of toxicity.

Copper is concentrated in roots of plants and plays a part in nitrogen metabolism. It is a component of several enzymes and may be part of the enzyme systems that use carbohydrates and proteins. Deficiencies cause die back of the shoot tips, and terminal

leaves develop brown spots. Copper is bound tightly in organic matter and may be deficient in highly organic soils. It is not readily lost from soil but may often be unavailable. Too much copper can cause toxicity.

Molybdenum is a structural component of the enzyme that reduces nitrates to ammonia. Without it, the synthesis of proteins is blocked and plant growth ceases. Root nodule (nitrogen fixing) bacteria also require it. Seeds may not form completely, and nitrogen deficiency may occur if plants are lacking molybdenum. Deficiency signs are pale green leaves with rolled or cupped margins.

Chlorine is involved in osmosis (movement of water or solutes in cells), the ionic balance necessary for plants to take up mineral elements and in photosynthesis. Deficiency symptoms include wilting, stubby roots, chlorosis (yellowing) and bronzing. Odors in some plants may be decreased. Chloride, the ionic form of chlorine used by plants, is usually found in soluble forms and is lost by leaching. Some plants may show signs of toxicity if levels are too high.

Nickel has just recently won the status as an essential trace element for plants according to the Agricultural Research Service Plant, Soil and Nutrition Laboratory in Ithaca, NY. It is required for the enzyme urease to break down urea to liberate the nitrogen into a usable form for plants. Nickel is required for iron absorption. Seeds need nickel in order to germinate. Plants grown without additional nickel will gradually reach a deficient level at about the time they mature and begin reproductive growth. If nickel is deficient plants may fail to produce viable seeds.

Sodium is involved in osmotic (water movement) and ionic balance in plants.

Cobalt is required for nitrogen fixation in legumes and in root nodules of nonlegumes. The demand for cobalt is much higher for nitrogen fixation than for ammonium nutrition. Deficient levels could result in nitrogen deficiency symptoms.

Silicon is found as a component of cell walls. Plants with supplies of soluble silicon produce stronger, tougher cell walls making them a mechanical barrier to piercing and sucking insects. This significantly enhances plant heat and drought tolerance. Foliar sprays of silicon have also shown benefits reducing populations of aphids on field crops. Tests have also found that silicon can be deposited by the plants at the site of infection by fungus to combat the penetration of the cell walls by the attacking fungus. Improved leaf erectness, stem strength and prevention or depression of iron and manganese toxicity have all been noted as effects from silicon. Silicon has not been determined essential for all plants but may be beneficial for many.

Vanadium may be required by some plants, but at very low concentrations. It may also be substituting for molybdenum.

N - synthesis of proteins and part of chlorophyll molecule

P - energy transfer

K - carbohydrate metabolism, water relations

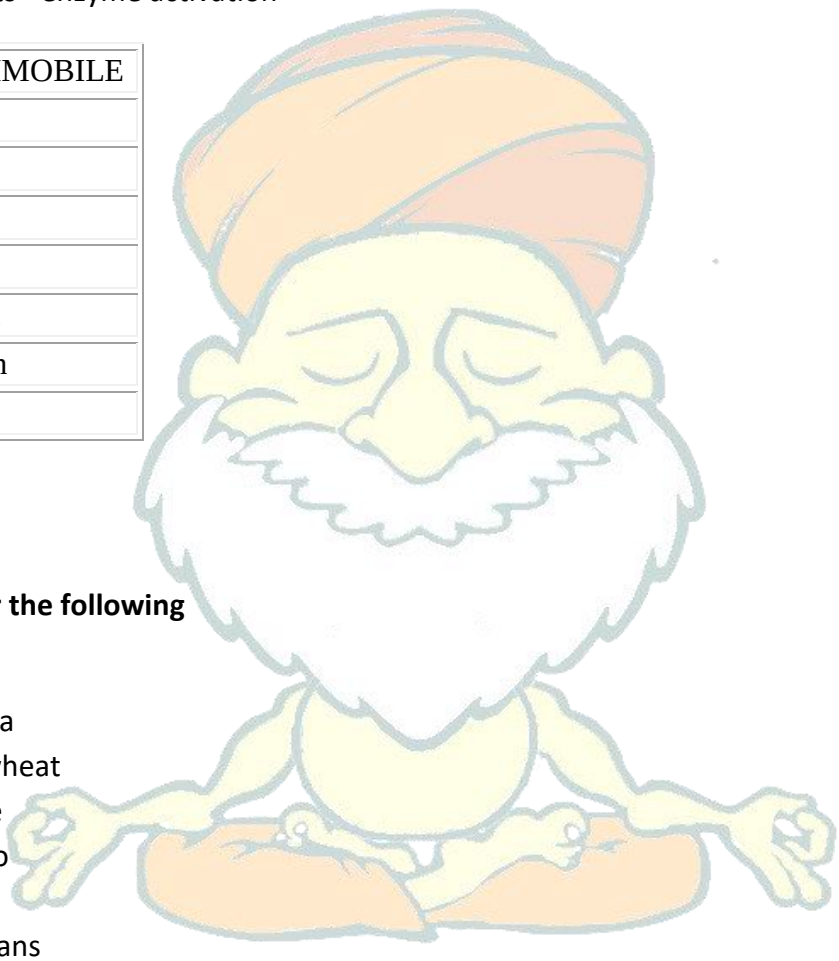
Mg - chlorophyll molecule

S - proteins

Ca - strength of cell wall

Micronutrients - enzyme activation

MOBILE	IMMOBILE
N	Ca
P	S
K	B
Mg	Fe
	Cu
	Mn
	Zn



Q.5) Consider the following

1. Apple
2. Banana
3. Buckwheat
4. Coffee
5. Mango
6. Carrot
7. Soybeans

Which of the given above are not self-pollinated?

a) 1, 2, 3, 4, 5 and 6
b) 2, 3, 6 and 7
c) 1, 3, 4, 5 and 6
d) 1, 3, 5, 6 and 7

Q.5) Solution (c)

The most essential staple food crops on the planet, like corn, wheat, rice, **soybeans** and sorghum, need no insect help at all; they are wind-pollinated or self-pollinating.

Other staple food crops, like **bananas** and plantains, are sterile and propagated from cuttings, requiring no pollination of any form, ever.

Name	**Pollinators**	
Buckwheat	Fagopyrum esculentum	Honey bees, Solitary bees
Apple	Malus domestica, or Malus sylvestris	Honey bees, orchard mason bee, Bumblebees, Solitary bees , Hover flies
Coffea spp. Coffea arabica, Coffea canephora	Coffea spp.	Honey bees, Stingless bees, Solitary bees
Mango	Mangifera indica	Honey bees, Stingless bees, Flies, Ants, Wasps
Carrot	Daucus carota	Flies, Solitary bees, Honey bees

Hint- http://www.thehindu.com/life-and-style/food/new-buzz-in-town/article17846880.ece

http://www.thehindu.com/todays-paper/tp-national/tp-kerala/mango-farmers-rue-fall-in-price/article18263086.ece

http://www.thehindu.com/opinion/columns/Decline-of-pollinators-threatens-food-supply/article14181840.ece

Q.6) Consider the following regarding *Parthenium*

1. It is a highly prevalent weed endemic to India
2. It is highly poisonous and severely reduces the crop productivity besides loss to biodiversity and environment.
3. The weed causes dermatitis and asthma to human beings.

Which of the given statements is/are incorrect?

a) 1 and 3
b) 2 Only
c) 1 Only
d) None

Q.6) Solution (c)

Parthenium hysterophorus L., commonly known as carrot weed, white top or congress grass in India, is a herbaceous, erect and annual plant belonging to the family Asteracae (compositae).

It is most popularly known as gajar ghas due to its appearance like carrot plant. **The origin of Parthenium is considered to be from Mexico, America, Trinidad to and Argentina**. After noticeable occurrence of Parthenium in Pune (Maharashtra) in 1956, it has spread like a wild fire throughout India. At present it has invaded about 35 million hectares of land in India. It is a nuisance on road sides and railway tracks, vacant lands, wastelands, industrial areas, on the sides of open drainage system and irrigation canals besides invading agricultural crop.

In general, parthenium is a poisonous, pernicious, problematic, allergic and aggressive weed posing a serious threat to human beings and livestock. **In India and Australia, this weed has been considered as one of the greatest source of dermatitis, asthma, nasal-dermal and nasal-bronchial types of diseases.** Besides ill effects, it also causes several other problems like blockage of common pathways and reduces the aesthetic values of parks, gardens and residential colonies.

Parthenium also infest every type of crop, orchards, plantations and forest. It severely reduces the crop productivity besides loss to biodiversity and environment.

http://www.thehindu.com/news/cities/Madurai/Efforts-needed-to-eradicate-parthenium/article14574270.ece

http://timesofindia.indiatimes.com/citizen-reporter/stories/they-came-across-an-important-thing-is-this-morning-tee/crshow/57413527.cms

Q.7) Readiness for Investment in Sustainable Energy (RISE) is developed by

a) World Bank Group
b) United Nations Development Programme
c) United Nations Environment Programme
d) International Energy Agency

Q.7) Solution (a)

Readiness for Investment in Sustainable Energy (RISE), developed by the World Bank Group, is a suite of indicators that assesses the legal and regulatory environment for investment in sustainable energy. It establishes a framework for better depicting the national enabling environment to attract investment into sustainable energy.

RISE is aimed at policymakers who focus on actions within their control. Creating this environment is directed by policymakers—the primary constituency RISE aims to influence. RISE supports the achievement of the objectives of the Sustainable Energy for All (SE4ALL) initiative.

Q.8) The decisions on REDD+ enumerate some "eligible activities" that developing countries may implement to reduce emissions and enhance removals of greenhouse gases. Identify the activities

1. Reducing emissions from deforestation
2. Reducing emissions from land degradation
3. Conservation of forest carbon stocks
4. Sustainable management of non-renewable energy
5. Enhancement of forest carbon stocks

Select the correct code

a) 1, 2, 3 and 5
b) 1, 3 and 5
c) 1, 2, 3, 4 and 5
d) 2, 3, 4 and 5

Q.8) Solution (b)

What is REDD+?

Reducing emissions from deforestation and forest degradation in developing countries and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) encourages developing countries to contribute to climate change mitigation in the forest sector through the following activities:

- reducing emissions from deforestation
- reducing emissions from forest degradation
- conservation of forest carbon stocks
- sustainable management of forests
- enhancement of forest carbon stocks

Q.9) Consider the following statements regarding National Mission on Sustainable Habitats:

1. It is one of the missions under National Action Plan on Climate Change.
2. It works for the development and protection of natural habitats, especially of those species which are at the verge of extinction due to habitat loss.
3. The mission works on development of green corridors to connect protected areas of India.

Which of the above statements are incorrect?

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

Q.9) Solution (b)

The National Mission on Sustainable Habitat is one of the missions under National Action Plan on Climate Change and aims to make cities sustainable through improvements in energy efficiency in buildings, management of solid waste & shift to public transport.

Q.10) Consider the following regarding Methanogens

1. They are found in ruminants of animals and human
2. They play significant role in anaerobic wastewater treatment
3. They produce oxygen, carbon dioxide, hydrogen sulphide and methane

Which of the given statements is/are correct?

a) 1, 2 and 3
b) 1 and 2
c) 2 and 3
d) None

Q.10) Solution (b)

They are common in wetlands, where they are responsible for marsh gas, and in the digestive tracts of animals such as ruminants and humans, where they are responsible for the methane content of belching in ruminants and flatulence in humans.

Moreover, the methanogenic archaea populations play an indispensable role in anaerobic wastewater treatments. They are anaerobic organisms and cannot function under aerobic conditions

Q.11) Match the following list of bioactive substances and their roles

Bioactive Substance	Role
1. Statin	i. Removal of oil stains
2. Cyclosporin A	ii. Removal of clots from blood vessels
3. Streptokinase	iii. Lowering of blood cholesterol
4. Lipase	iv. Immuno-suppressive agent

Choose the correct match:

a) 1-iii, 2-iv, 3-ii, 4-i
b) 1-ii, 2-iv, 3-iii, 4-i
c) 1-i, 2-ii, 3-iii, 4-iv
d) 1-iv, 2-iii, 3-ii, 4-i

Q.11) Solution (a)

Q.12) World Sustainable Development Summit (WSDS) is a flagship initiative by

a) Food and Agriculture Organization (FAO)
b) United Nations Development Programme (UNDP)
c) The Energy and Resources Institute's (TERI)
d) UNESCO

Q.12) Solution (c)

The World Sustainable Development Summit (WSDS), **TERI's flagship** event, has been conceptualized as a single platform to accelerate action towards sustainable development and especially climate change. The WSDS series seeks to bring together the finest minds and leading thinkers of the world to focus attention on the challenge of sustainable development and has emerged as a landmark event addressing issues pertinent to the future of humanity.

WSDS builds on the 15 years legacy of the Delhi Sustainable Development Summit (DSDS) which was the leading forum for discussing sustainable development issues. The DSDS held under the aegis of the Ministry of Environment, Forest and Climate Change with support from the Ministry of External Affairs, Government of India was an epitome of Track 2 diplomacy .

With an aim of expanding the scope and reach of the Summit to the global community, DSDS has now transitioned to WSDS.

WSDS 2016 was held in New Delhi from October 5-8, 2016 under the broad rubric of **'Beyond 2015: People, Planet & Progress'**, and it broadly focused on actions, on accelerated implementation of SDGs and NDCs.

Q.13) United Nations has declared_____as the International Year of Sustainable Tourism for Development

a) 2014
b) 2015
c) 2016
d) 2017

Q.13) Solution (d)

http://media.unwto.org/press-release/2017-01-03/2017-international-year-sustainable-tourism-development

Q.14) National Mission for Sustaining the Himalayan Ecosystem comes under

a) Ministry of Earth and Science
b) Ministry of Environment and Forest
c) Ministry of Science and Technology
d) Ministry of Agriculture

Q.14) Solution (c)

http://knowledgeportal-nmshe.in/NAPCC.aspx

Q.15) The United Nations General Assembly formally adopted the "universal, integrated and transformative" 2030 Agenda for Sustainable Development, a set of 17 Sustainable Development Goals (SDGs). Identify the correct goals

1. Gender Inequality
2. Affordable and clean energy
3. Combat desertification
4. End of nuclear energy
5. Clean water and sanitation
6. Food security

Select the correct code

a) 1, 2, 3, 4, 5 and 6
b) 2, 3, 5 and 6
c) 1, 2, 3, 5 and 6
d) 1, 2, 3, 4 and 5

Q.15) Solution (b)

- Goal 1: No Poverty
- Goal 2: Zero Hunger
- Goal 3: Good Health and Well-being
- Goal 4: Quality Education
- Goal 5: Gender Equality
- Goal 6: Clean Water and Sanitation

- Goal 7: Affordable and Clean Energy
- Goal 8: Decent Work and Economic Growth
- Goal 9: Industry, Innovation and Infrastructure
- Goal 10: Reduced Inequalities
- Goal 11: Sustainable Cities and Communities
- Goal 12: Responsible Consumption and Production
- Goal 13: Climate Action
- Goal 14: Life Below Water
- Goal 15: Life on Land
- Goal 16: Peace, Justice and Strong Institutions
- Goal 17: Partnerships for the Goals

Q.16) Consider the following statements

1. Northern Lights are result of collisions between gaseous particles in the Earth's atmosphere with charged particles released from the sun's atmosphere
2. Northern Lights are also called 'Aurora australis'

Select the correct statement

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

Q.16) Solution (a)

The bright dancing lights of the aurora are actually collisions between electrically charged particles from the sun that enter the earth's atmosphere. The lights are seen above the magnetic poles of the northern and southern hemispheres. They are known as 'Aurora borealis' in the north and 'Aurora australis' in the south.

Auroral displays appear in many colours although pale green and pink are the most common. Shades of red, yellow, green, blue, and violet have been reported. The lights appear in many forms from patches or scattered clouds of light to streamers, arcs, rippling curtains or shooting rays that light up the sky with an eerie glow.

The Northern Lights are actually the result of collisions between gaseous particles in the Earth's atmosphere with charged particles released from the sun's atmosphere. Variations in colour are due to the type of gas particles that are colliding. The most common auroral

color, a pale yellowish-green, is produced by oxygen molecules located about 60 miles above the earth. Rare, all-red auroras are produced by high-altitude oxygen, at heights of up to 200 miles. Nitrogen produces blue or purplish-red aurora.

Northern Lights can be seen in the northern or southern hemisphere, in an irregularly shaped oval centred over each magnetic pole. The lights are known as 'Aurora borealis' in the north and 'Aurora australis' in the south. Southern auroras are not often seen as they are concentrated in a ring around Antarctica and the southern Indian Ocean.

'Aurora borealis', the lights of the northern hemisphere, means 'dawn of the north'. 'Aurora australis' means 'dawn of the south'.

Source: http://www.thehindu.com/sci-tech/energy-and-environment/NASA-satellite-spots-stunning-view-of-northern-lights/article16958151.ece

Q.17) What is the Arab Peace Initiative?

a) Proposal for an end to the Arab–Israeli conflict
b) Proposal to end the Shia-Sunni conflict
c) End of Operation Defensive Shield in West Bank
d) Iraq's invasion of Kuwait

Q.17) Solution (a)

The Saudi-brokered Arab Peace Initiative, which was endorsed by the Arab League's 22 members during the March 2002 Beirut summit, outlined comprehensive steps to ending the Palestinian-Israeli conflict.

Arab leaders collectively offered Israel recognition of its right to exist and a normalisation of diplomatic ties in exchange for its complete withdrawal from Arab lands captured since 1967.

The plan, first floated by King Abdullah, then crown prince of Saudi Arabia, called for the restoration of a Palestinian state with east Jerusalem as its capital and a "fair solution" for the 3.8 million Palestinian refugees, including but not limited to the Syrian Golan Heights and Israeli-occupied territory in southern Lebanon.

The Saudi plan is based on UN resolutions 242 and 338 which collectively called for Israeli withdrawal in exchange for peaceful ties with its Arab neighbours and the "respect for the right of every state in the area to live in peace within secure and recognised boundaries".

Source: http://www.livemint.com/Opinion/jkAIxh8lvmRV0MmKS683VP/Abdullah-Gul--A-Middle-East-peace-agenda-for-2017.html

Q.18) Consider the following Operations

1. International Security Assistance Force (ISAF)
2. Operation Resolute Support
3. Operation Enduring Freedom

It is associated with which of the following countries?

a) Sri Lanka
b) Afghanistan
c) Iraq
d) Somalia

Q.18) Solution (b)

The U.S. government used the term "Operation Enduring Freedom – Afghanistan" to officially describe the War in Afghanistan, from the period between October 2001 and December 2014. Continued operations in Afghanistan by the United States' military forces, both non-combat and combat, now occur under the name Operation Freedom's Sentinel.

International Security Assistance Force (ISAF) was a NATO-led security mission in Afghanistan, established by the United Nations Security Council in December 2001 by Resolution 1386, as envisaged by the Bonn Agreement. Its main purpose was to train the Afghan National Security Forces (ANSF) and assist Afghanistan in rebuilding key government institutions, but was also engaged in the 2001–present war with the Taliban insurgency.

Resolute Support or Operation Resolute Support is a NATO-led train, advise, and assist mission consisting of over 13,000 troops in the Islamic Republic of Afghanistan, which began on January 1, 2015.

Source: http://www.thehindu.com/todays-paper/tp-opinion/Afghanistan-India-and-Trump/article16952231.ece

Q.19) 'Atal-Amrit Abhiyan' health insurance scheme which will provide coverage against several critical illnesses was lauched by which of the following states?

a) Rajasthan

b) Maharashtra
c) Assam
d) Uttar Pradesh

Q.19) Solution (c)

Assam rolled out 'Atal-Amrit Abhiyan' health insurance scheme which will provide coverage against several critical illnesses.

Both Below Poverty Line (BPL) and Above Poverty Line (APL) families, with annual income below Rs 5 lakh, are eligible for the scheme.

The scheme will offer coverage against 437 illnesses in six disease groups, namely, cardiovascular, cancer, kidney, neo-natal, neurological conditions and burns.

Atal-Amrit Abhiyan is an endeavour of the government to make quality health care affordable to every individual member of a family

A separate society will also be set up under the Department of Health and Family Welfare which will be responsible for administration of the scheme.

Source: http://economictimes.indiatimes.com/news/politics-and-nation/assam-launches-health-insurance-scheme-atal-amrit-abhiyan/articleshow/56170511.cms

Q.20) FC-31 Gyrfalcon, a stealth fighter is from

a) United States of America
b) France
c) China
d) India

Q.20) Solution (c)

Source: http://economictimes.indiatimes.com/news/defence/china-tests-latest-stealth-fighter-aircraft-fc-31-its-answer-to-us-f-35-jets/articleshow/56180243.cms

Q.21) Kuchipudi' dance originated in

a) Odisha
b) Tamil Nadu

c) Kerala
d) Andhra Pradesh

Q.21) Solution (d)

Kuchipudi is one of the ten major Indian classical dances.

It originated in a village of Krishna district in modern Indian state of Andhra Pradesh. It derives its name from this village.

It is a dance-drama performance art, with its roots in the ancient Hindu Sanskrit text of Natya Shastra. Like all major classical dances of India, it was also developed as a religious art linked to traveling bards, temples and spiritual beliefs.

The Kuchipudi style was conceived by Siddhendra Yogi, a talented Vaishnava poet of 17th century.

It begins with an invocation to Lord Ganesha followed by nritta (non-narrative and abstract dancing); shabdam (narrative dancing) and natya.

The dance is accompanied by song which is typically Carnatic music. The singer is accompanied by musical instruments like mridangam, violin, flute and tambura.

Like other classical dances, Kuchipudi also comprises pure dance, mime and histrionics but it is the use of speech that distinguishes Kuchipudi's presentation as dance drama.

Source: http://www.thehindu.com/news/cities/Vijayawada/6117-Kuchipudi-dancers-put-A.P.-in-Guinness-book/article16943005.ece

Q.22) Chillai Kalan is

a) Harshest 40 day period of winter in Kashmir
b) Harvest festival in Kashmir
c) A newly built dam on Teesta River
d) None of the above

Q.22) Solution (a)

Chillai-Kalan, is the 40-day period of harsh winter. Chillai-Kalan begins from December 21 and ends on January 31 next year.

Source: www.thehindu.com/todays-paper/tp-national/Kashmir-braces-for-'Chillai-Kalan'/article16908581.ece

Q.23) Consider the following statements about Smart Anti-Airfield Weapon (SAAW)

1. It is jointly developed by DRDO and BAE Systems
2. It is capable of engaging ground targets with high precision up to a range of 100 kms

Which of the following statements is/are correct?

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

Q.23) Solution (b)

SAAW, an indigenously designed and developed 120 kg. class smart weapon, developed by DRDO, is capable of engaging ground targets with high precision up to a range of 100 kms. The light weight high precision guided bomb is one of the world class weapons systems.

Source: http://pib.nic.in/newsite/PrintRelease.aspx?relid=155817

Q.24) Consider the following statements about International Borders

1. India and Pakistan is separated by a hard border
2. Schengen area is an example of soft border

Which of the following statements is/are correct?

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

Q.24) Solution (c)

Border types can be classified into soft and hard borders. Soft borders include open and regulated and controlled frontiers. Hard borders/fortified borders, include wire fenced borders; wire fenced and walled borders; walled borders; and militarized borders.

Hard Fortified Borders – http://www.siue.edu/GEOGRAPHY/ONLINE/Vogeler/FortifiedBorders.htm

Controlled Borders – http://www.siue.edu/GEOGRAPHY/ONLINE/Vogeler/ControlledBorders.htm

Open Borders –

http://www.siue.edu/GEOGRAPHY/ONLINE/Vogeler/OpenBorders.htm

Read More - http://www.geocurrents.info/geopolitics/international-land-borders-hard-and-soft

Source: http://www.thehindu.com/news/international/%E2%80%98Soft-border-approach-can-bring-India-into-CPEC%E2%80%99/article16943237.ece

Q.25) Consider the following statements about 'Axial Seamount'

1. It is the youngest volcano and current eruptive centre of the Cobb-Eickelberg Seamount chain
2. It is caused by the movement of two tectonic plates in the region that are gradually spreading apart

Select the correct statements

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

Q.25) Solution (c)

Scientists record live video of underwater volcanic eruption which had erupted last year (2015) and twice in the past in 1998 and 2011. Axial Seamount is the world's most active and studied underwater volcano, located at 300 miles from Oregon coast, rising from Juan de Fuca Ridge. Axial Seamount is caused by the movement of two tectonic plates in the region that are gradually spreading apart (divergent plate margin). The convergent plate margin is located between the North American Plate and Juan de Fuca Plate. Axial Seamount is the youngest volcano and current eruptive center of the Cobb-Eickelberg Seamount chain.

Source: http://indianexpress.com/article/technology/science/scientists-record-live-video-of-underwater-volcanic-eruption-4431497/