DETAILS EXPLANATIONS

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[PART : A]

1. *Disadvantages of EIA :*

- Time required.
- Money required.

2. Carbon sequestration is the process of capturing and storing atmospheric carbon dioxide. It is one method of reducing the amount of carbon dioxide in the atmosphere with the goal of reducing global climate change.

3. It was established in August 2002 by merging Rajasthan Energy Development Agency (REDA) and Rajasthan State Power Corporation Limited (RSPCL).

4.

- SAFAR (System for air quality and weather forcasting and Reasearch).
- WAYU (Wind Augmentation and Purifying Unit)

5. Fluorimeter is an instrument developed by department of atomic energy to check level of uranium in ground water.

6. Extensive farming is a farming technique, in which large farms are being cultivated, with relatively lower inputs i.e., capital and labor.

7. A solar thermal energy collector is an equipment in which solar energy is collected by absorbing radiation in an absorber and then transferring to a fluid.

8. Relative poverty defines poverty in relation to the economic status of other members of the society. People are poor if they fall below prevailing standard of living in a given societal context.

9. Drip irrigation is also called trickle irrigation and involves dripping water onto the soil at very low rates from a system of small diameter plastic pipes fitted with outlets called emitters.

10. Thar desert, also called Great Indian desert, it is an arid region of rolling sand hills on the Indian Subcontinent. It is located partly in Rajasthan State, north-western India and partiy in Punjab and Sindh (Sind) Provinces, eastern Pakistan.

11. M-Governance, is the use of mobile or wireless to improve governance services and information "any time, any where". Mobile applications also rely on good back office ICT infrastructure and work processes.

12. Chandrayaan-II is the latest mission of ISRO. It was launched on 22 July, 2019.

13. The primary components of a project Management are :
- Schedule
- Budget
- Quality
- Communication
- Human Resources plan
- Procurement plan
- Scope statement etc.

14. PMGSY was introduced in 2000 by the then-prime minister of India late shri Atal Bihari Vajpayee. PMGY stands for "pradhan Mantri Gramodaya Yojana."

15. ***Reason for volcanic eruption :***
- Movement & splitting of the major and minor plate of the earth.
- Origin of magma because of lowering of melting point inside the earth caused by reduction in the pressure due to splitting of plates and their movements in opposite direction.

16. ***In our experience, 3 challenges seem :***
- Limited Funding
- Dependent Population
- Sparsely Populated areas

17. Solar energy is used for :
- Water heating
- Power generation
- Distillation
- Drying

18. Break-even analysis attempts to find break-even volume by analyzing relationships between fixed and variable costs on the one hand and business volume, pricing and net cash flow on the other.

19. ***Disadvantages of Intensive Farming :***
- Chemical pesticides, insecticides and fertilizers are used during intensive farming.
- Cancer rates are increasing and research shows direct relation to intensive farming.

20. The concept of carbon credit for manufacturers originated with the kyoto protocol agreement of 1997.

[PART : B]

21. ***Limitations of Wind Energy :***

- Wind turbine design is complex and need more research and development work due to widely varying atmospheric conditions.
- Large Units have less capital cost per kwh.
- It has low energy density.
- It is generally favourable in geographic locations which are away from cities.
- It is variable, insteady, irregular and intermittent type of energy resource.

22. ***Natural disasters can be classified under four categories :***

- **Atmospheric :** Cyclone, drought, heat wave, loo, cold wave, lightening etc.
- **Terrestrial :** Earthquake, volcanic eruptions, land slides, soil erosion etc.
- **Aquatic :** Floods, Tidal waves, Tsunami etc.
- **Biological :** Insects infestation, bacterial & viral diseases etc.

23. ***The quality of life can be improved through Individual efforts, is given below :***

- By achieving maximum level of literacy.
- By improving individual capacity of work and producing more than total improvement.
- Access to prevention and curative medicine.
- Security of life and property.
- Adequate housing and clothing.

24. ***The key benefits of 5s include :***

- Less waste (improved efficiency)
- Reduced space used for storage.
- Improved maintenance.
- Improved safety
- Improved quality.

25. Migration is becoming a very important subject for the life of cities. Many opportunities and attraction of big cities pull large numbers of people to big cities. Migration can have positive as well as negative effects on the life of the migrants.

Positive impacts of Migration :

- Unemployment is reduced and people get better job opportunities.
- Migration helps in improving the quality of life of people.
- It helps to improve social life of people as they learn about new culture, customs, and languages which helps to improve brotherhood among people.

- Migration of skilled workers leads to a greater economic growth of the region.
- Children get better opportunities for higher education.
- The population density is reduced and the birth rate decreases.

26. ***Some of the main benefits private partners can bring are :***

- Construction of projects on time and on budget.
- Overall more efficient and effective management of the entire project.
- Development of more innovative ways of delivering services.
- Better use of appropriate technologies.
- Lifecycle optimization (better relationship between design and construction, and operation and maintenance over time).
- Better exploitation of direct and secondary project assets.
- Private financing.
- Better delivery capacity.

27. ***DFCCIL's mission is :***

- To build a corridor with appropriate technology that enables Indian railways to regain its market share of freight transport by creating additional capacity and guaranteeing efficient, reliable, safe and cheaper options for mobility to its customers.
- To Set up Multimodal logistic parks along the DFC to provide complete transport solution to customers.
- To support the government's Initiatives toward ecological sustainability by encouraging users to adopt railways as the most environment friendly mode for their transport requirements.

28. Droughts in the indian sub continent are mainly due to failure of rainfall from southwest monsoon. The root cause for failure of mansoon rainfall is cued to the widespread, persistent atmospheric subsidence, which results from the general circulation of the atmosphere. Recent studies on interactions between global circulations and drought showed that the El Nino phase of the Southern Oscillations (EN SO) has the largest Impact on india though drought.

29. ***Features of NREGA 2005 :***

- The MGNREGA was initiated with the objective of "*enhancing livelihood security in rural areas by providing at least 100 days of guaranteed wage employment in a financial year, to every household whose adult members volunteer to do unskilled manual work*". Another aim of MGNREGA is to create durable assets (such as roads, canals, ponds, wells).

Employment is to be provided within 5 km of an applicant's residence, and minimum wages are to be paid. If work is not provided within 15 days of applying, applicants are entitled to an unemployment allowance. Thus, employment under MGNREGA is a legal entitlement.

- MGNREGA is to be implemented mainly by Gram Panchayats (GPs). The involvement of contractors is banned. Labour-intensive tasks like creating infrastructure for water harvesting, drought relief and flood control are preferred.
- NREGA can help in protecting the environment, empowering rural women, reducing rural-urban migration and fostering social equity, among others.

30. Straight Line Method is the simplest depreciation method. It assumes that a constant amount is depreciated each year over the useful life of the property.

The formulas for Straight Line Method are: :

- Annual Depreciation $= \dfrac{(FC - SV)}{n}$

  Where, FC = Fixed Cost
  SV = Salvage Value
  n = Useful life

- Total Depreciation after five years $= \dfrac{[(FC - SV)(5)]}{n}$
- Book Value = FC – Total Depreciation

31. Net present value (NPV) is the present value of an investment's expected cash inflows minus the costs of acquiring the investment.
NPV = (Cash inflows from investment) – (cash outflows or costs of investment)
NPV is used to analyze an investment decision and give company management a clear way to tell if the investment will add value to the company. Typically, if an investment has a positive net present value, it will add value to the company and benefit company shareholders.

32. The National eGovernance Plan (NeGP) is an initiative by the government of India to connect eGovernance systems throughout the country and create a nation-wide network for electronic delivery of government services.
The goals of the eGovernance plan are to increase the efficiency of service delivery, empower citizens by providing information, and create an environment of transparency. The eGovernance plan aims to make the government more accessible to citizens and businesses alike and foster a more open atmosphere.

[PART : C]

33. ***Biomagnification :***

Biomagnification can be defined as a process by which the concentration of substances like the *organochlorines*, increases as they pass from one trophic level to the next in food chain. Organochlorines such as DOT; aldrin and dieldrin which are used as pesticides are hazardous. They are cumulative toxins and cause acute problems in food chain. Once consumed by an organism, they pass along the entire food chain, affecting all levels of food chain. DDT used as pesticides on plants seems to most historic and common chemical which affects the food chain. DDT affects human body adversely and causes hypertension, ***cerebral hemorrhage,*** cancer and liver damage.

Differences between Natural Ecosystems and Artificial Ecosystems :

S.No.	Natural Ecosystems	Artificial Ecosystem
1.	These are rich in biotic diversity with less synchronisation of growth	Biotic diversity is less and growth synchronisation is higher. They are often monocultures.
2.	These have complex trophic structure.	Trophic structure is simple.
3.	These are less vulnerable to catastrophic changes.	Catastrophic changes have severe effects on these.
4.	These are adapted for weather changes.	These are largely influenced by weather changes.
5.	Incidence of out breaks of insects, pests and diseases are not commonly found.	Such incidences are of common occurrence.
6.	These are more stable and self perpetuating.	These are less stable being controlled by man through artificial practices.
7.	Vegetation is naturally selected, & are thus continuous in space & time.	Vegetation is selected by man & is thus discontinuous in space & time.
8.	These run for long duration, say for 50 or more years.	These are of short duration sometimes of 3-4 months only.
9.	These are permanent in nature.	These are of temporary nature.
10.	A kind of natural balance is maintained.	Natural balance is not found.
11.	These are relatively low productive.	These are often highly productive.
12.	Pressure of herbivores on producers is higher	Herbivores pressure is found low.
13.	They are mature from succession point of view.	As succession is disrupted by man, they are not allowed to mature.
14.	These provide wild life habitat.	Wild life habitat is destroyed.
15.	These enrich the soil fertility.	These destroy the soil fertility

34. *AIR POLLUTION CONTROL*

Air pollution control is more difficult compared to water pollution because air is more diffusive. It is, therefore suggested that any control technology for air pollutants will be more effective at the source rather than after dispersion into the environment. Ofcourse air pollution control is costly but appears to reap huge economic benefits far in excess of the cost of control. As already stated that the chief pollutants present in air are particulate matter, gaseous pollutants SO_X and NO_X etc., so control technology applied for checking and finally bringing these to or within permissible limits are discussed below :

(i) ***Dilution of Particulates and Gases :*** Tall stacks are used to dilute particles present in the air. Pollutants released from taller stacks easily disperse and their low ground level concentrations are observed. Tall stacks penetrate the inversion layer and disperse the contaminants easily so that the ground level concentrations are less harmful.

(ii) ***Using Air Pollution control Devices :*** Studies reveal that air pollutants originate primarily from industrial processes. Past observations show that more than 18 million tonnes of contributed by industries alone. Keeping this information in view, following devices are divided into five major groups in vogue be used.

- Gravitational settling chambers.
- Cyclones
- Fabric filters
- Electrostatic precipitators
- Scrubbers or Wet collectors

Use of above devices depends upon the size distribution, shape, density, stickiness and hygroscopicity and electrical properties of particulate matter.

(iii) ***Controlling gaseous pollutants :*** The principal gases of concern in air pollution control are sulfur oxides (SO_X), nitrogen oxides (NO_X) and hydro-carbons (HC). *To control these gases, the mechanisms are chemical engineering unit operations which include absorption, condensation and combustion.*

(iv) ***SO_X Control Technique :*** SO_X include six different gaseous compounds of sulphur namely Sulphur monoxide, (SO); Sulphur dioxide, (SO_2); Sulphur Trioxide, (SO_3); Sulphur tetraoxide, (SO_4); Sulphur sesquioxide, (S_2O_3) and Sulphur heptaoxide, (S_2O_7). *Out of these SO_2 and SO_3 are the most significant in air pollution.* Following control and removing technologies are used to check and control emissions of SO_X.

- Natural dispersion by dilution
- Using alternate fuels
- Desulfurization
- Process modification
- Control of SO_X in the combustion process
- Treatment of flue gas emissions

(v) ***NO_X Control Technology :*** NO_X is one of the four major of photochemical smog. Nearly 30% acid is caused due to NO_X. Over 90% or all the man made nitrogen oxides that either our atmosphere are produced by the combustion of various fuels. The real danger posed by NO_X at the concentrations found in megacities is photochemical reactions leading to smog formation. NO_X control technologies to reduce NO_X emission from flue gases are as under :

- Dilution in atmosphere by increasing stack height.
- Modification of operationg and design conditions.
- Treatment of flue gases.

(vi) ***Raw Material Changes :*** It is the main air pollutants produced by burning of fuels. Fuels like wood have very little sulphur, whereas coals have 0.5 - 3% sulphur. Oils generally have more sulphur but less than coal. If we burn these fuels, the sulphur in them mostly forms sulphur dioxide.

$$S + O_2 \rightarrow SO_2$$

35. Radio-activity is measured in curies. One gram of pure 220 radium gives off one curie per second, which is approximately 37 billion spontaneous disintegrating into particles and radiation. These particles are radiation. These particles and radiations are collectively known as radioactive emissions. It is mentioned that any material in and around the reactor may also be converted to unstable isotopes and can become radio-active by absorbing neutrons from the fission process. These indirect products of fission alongwith direct products are the radio-active wastes of nuclear energy.

Radioactive wastes are materials which come from the preparation and use.of radioactive substances in medicine, industry and research and from the use of nuclear power to generate electricity. The wastes are classified in terms of their level or radioactivity, high intermediate or low level.

The details of classification is given below:

- ***High-level waste :*** Also known as **radwaste** is the unrequired fission material remaining from the burning of uranium or plutonium. A typical nuclear power station generating 1000 megawatts of electrical energy produces 30 tonnes of spent fuel per year. Spent fuel is not a waste. It is dissolved in acid, and uranium and plutonium separated for future reuse leaving behind about 1 tonne of high level waste. almost all the radioactivity origionally in the spent fuel ends up in this high-level waste.
- ***Intermediate Waste*** is far less radioactive than high level waste and it includes metal cans which contain the nuclear fuel in the reactor and contaminated equipment.
- ***Low-Level Waste*** includes laboratory refuse such as protective clothing, gloves, used syringes and tissues.

Precautions : Disposal of Nuclear Waste :

Following methods are being adopted :

- ***Waste Immobilization Plant*** (WIP) has been commissioned at Tarapore.
- Regular supervision is necessary for the disposal sites of waste.
- Preventing erosion of radioactive waste disposal.
- Periodic monitoring of naturally occurring uranium rich rocks.
- Anti-nuclear demonstration.
- Decommissioning old nuclear plants.
- **Fusion reactors** is more safe and environmentally acceptable.
- Use of nuclear weapons must be stopped and nuclear test suspended.
- Ocean dumping of nuclear wastes should be checked strictly.
- Proposed nuclear power station should be suspended.

36. ***Poverty Gap :***

According to the World Bank, poverty gap is the mean shortfall from the poverty line (counting the non-poor as having zero shortfall), expressed as a percentage of the poverty line. Poverty gap measures the intensity of poverty. It shows the extent to which individuals on average fall below the poverty line. The concept of poverty gap was developed by the World Bank and is extensively used to measure the incidence of poverty in different countries, As per the World Bank, India's poverty gap was 4.8 per cent in 2011.

CAUSES OF POVERTY :

- ***Underdevelopment of the Indian Economy :*** The root cause of poverty is the under development of the Indian economy. The under development is manifested by the relative backwardness of agriculture and industrial sector. Widespread infrastructural bottle necks are result of slow pace of development. Nearly 20% of the population is still living below the poverty line. Rapid growth of population, particularly among the poor, is responsible for the problem of poverty in the country.
- ***High Level of Unemployment :*** Poverty is caused by unemployment or unemployment coupled with a low rates of wages. More than six decades economic planning has failed to generate adequate employment opportunities in the industrial and service sector. Large unemployment has resulted in low levels of income and a large share of population lies below the minimum subsistence levels.
- ***Inequalities of Income :*** An important cause of poverty in India is the existence of large inequalities in distribution of national income and concentration of economic power (both in rural and urban sectors of the economics). Efforts to reduce inequalities have been ineffective. The benefits of growth have been appropriates by the rich section and have not reached the poorest of the poor. So the rich become richer as their income rise and assets expanded.
- ***Political Factors :*** Before Independence, India was exploited under the British rule. After Independence other political factors have adversely affected economic progress. Economic policies are formulated to promote the interest of the richer section of the society & poor people are suffers in the process.
- ***Inflation:*** The steep and continuous rise in price, particularly of essential commodities has added to the miseries of the poor.
- ***High Illiteracy Rate :*** Lower education result in lower income as there is a positive correlation between the two.
- ***Underutilization of Resource :*** Due to the unexploitation natural resources of the country, poverty spreads throughout the country. Labour and land productivity continue to be low in India. Consequently, most of the farmers live in a state of poverty.

37. *The major types of risk in BOT project are: :*

(i) Advantages of BOT project :

- Use of private sector financing to provide new sources of capital, which reduces public borrowing and direct spending and which may improve the host government's credit rating.

- Ability to accelerate the development of projects that would otherwise have to wait for, and compete, for sovereign resources.
- Use of private sector capital, initiative and know-how to reduce project construction costs, shorten schedules and improve operating efficiency.
- Allocation to the private sector of project risk and burden that would otherwise have to be borne by the public sector.
- The involvement of private sponsors and experienced commercial lenders, which ensures an in-depth review and is an additional sign of project feasibility.
- Technology transfer, the training of local personnel and the development of national capital markets.
- In contrast to privitisation, government retention of strategic control over the project, which is transferred to the public at the end of the contract period.
- The opportunity to establish a private benchmark against which the efficiency of similar public sector projects can be measured and the associated opportunity to enhance public management of infrastructure facilities.

(ii) Disadvantages of BOT :

- Transaction costs are high, they amount to 5-10% of total project cost.
- Not suitable for smaller projects. Victorian Government of Australia has suggested that projects with a value of less than Australian dollar $15 are unlikely to gain benefits from BOT delivery method.
- The success of BOT project depends upon successful raising of necessary finance. Various costs such as cost of construction, equipment, maintenance should be committed during the life of the project.
- BOT projects are successful only when substantial revenues are generated during the operation phase.

38. ***National Solar Mission or Jawaharlal Nehru National Solar Mission (JNNSM) :***

- It was launched on 11th January 2010 Apex ministry: Ministry of New and Renewable Energy (MNRE).
- India's Solar capacity in 2010: 17.8MW
- Grid connected solar power in 2016: 8GW

Challenges in Solar Power :

The solar energy is the least efficient but easily accessible of all the renewable energies. Here are some challenges faced by solar energy:

- ***Initial High Capital Cost:*** Solar parks are capital intensive to setup.
- ***Lack of Cheap Financing :*** Innovative financial solutions required. e.g. Indian government launched green bonds to finance renewable energy projects.
- ***Require Large Area:*** Lack of adequate land is problem. Solution: rooftop solar energy, offshore solar energy plants, vertical solar plants.
- ***Intermittent Nature of Electricity :*** Works in daytime and varies with solar insolation.
- ***Grid Stability:*** When solar energy becomes significant proportion of total electricity mix then grid stability is a concern because of its intermittent nature. Investments in new technological solutions to maintain grid stability required.
- ***Lack of Trained Manpower :*** Shortage of skilled manpower in R & D, manufacturing, construction and maintenance sector of solar energy.

39. ***Some of the major sectors in rural economy of India have been listed below :***

(i) **Poultry Business in India:** Poultry Business is one of the major contributors to the growing economy of rural and semi-urban India. India has witnessed a remarkable growth in the egg and poultry meat industry in the recent period. States of Andhra Pradesh, Karnataka, Kerala and Tamil Nadu contribute to around 45 % of the total egg production in India whereas the eastern and central parts of India contribute to around 20% of the same. India is the seven largest poultry producer all over the world.

(ii) **Sericulture Business in India:** Sericulture is one of the rural based agro industries in India. Silk production activity has accounted for a total income from export production of more than USD 600 million. Sericulture offers agro based, ecologically and economically sustainable activity for the poor, small and marginal farmers which also include women. 60 % of the pre-cocoon and post-cocoon sector activities are carried out by women.

(iii) **Rubber Business in India:** Rubber is one of the significant commercial crops in India. Rubber Industry in India has accounted for a production of 7.15 lakh tons for the year 2017-18. Places in India where rubber is cultivated include areas of southwest Konkan and Malabar Coast in Kerala and in some areas of Tamil Nadu.

(iv) **Fisheries in Rural India:** The fish production rate in India have witnessed remarkable growth. The National Program of Developing Fish Seeds, Fish Farmers' Development Agencies and Brackish Water Fish Farmers' Development Agencies have been the major contributors to the growth in fisheries in rural India. A diversified range of fishing methods along with processed fish products have been introduced in the Indian rural market through an Integrated Fisheries Project.

(v) **Tobacco Business in India:** India is one of the most predominant producers as well as consumers of tobacco in India. It ranks third in terms of tobacco production around the world. Tobacco leaves are highly exported in the overseas countries which has accounted for a 99 % increase in the revenue from exports.

(vi) **Jute Business in India:** Jute is one of the most prime products in terms of exporting to the overseas nations and it brings in maximum foreign exchange earnings. The delta of the river Ganges in West Bengal is perfect for jute cultivation. A wide range of gunny bags, shopping bags, handicrafts, carpets, and many more other items are made from Jute.

(vii) **Horticulture Business in India:** India has a diverse soil and climate which provides a promising opportunity for horticulture. Some of the crops cultivated in the horticultural sector comprise of fruits, vegetables, root and tuber crops, flowers, ornamental plants, medicinal and aromatic plants, spices, condiments, plantation crops and mushrooms.

(viii) **Tea Business in India:** The tea business has been ruling Indian economy for the past 170 years. The chief areas of tea production in India include rural hills and backward areas of Northeastern and southern states like Assam, West Bengal, Tamil Nadu and Kerala. India mainly manufactures tea variants such as black tea, Orthodox tea and green tea.

(ix) **Sugar Industries:** Sugar is one of the oldest commodities in the world and traces its origin in 4thcentury AD in India. In those days sugar was manufactured only from sugarcane. The production of traditional sweeteners gur and khandsari is quite substantial. Though the trends indicate a progressive shift from traditional sweeteners to white sugar over the years. Sugar companies have been established in large cane growing states like Uttar Pradesh, Maharashtra, Tamil Nadu, Karnataka, Punjab and Gujarat.