

DETAILS EXPLANATIONS**[PART : A]**

1. Energy consumption refers to the amount of energy consumed in a process or system, or by an organization or society.
2. Poverty refers to a state in which an individual is unable to fulfill even the basic necessities of life. The maximum requirement includes food, clothing, shelter and health facilities.
3. International Organization for Standardization (ISO) is an independent, non-governmental international organization with a membership of 164 national standard bodies. Founded on 23 February, 1947.
4. 5s is a philosophy and way of organizing and managing the workspace and work flow with the intent to improve efficiency by eliminating waste, improving flow and reducing process unreasonableness.
5. DFCCIL stands for "Dedicated Freight Corridor Corporation of India." DFCCIL has been registered as a company under the companies act 1956 on 30 October 2006.
6.
 - Improves the efficiency of the city public transport and road networks.
 - Reduces Journey time.
7. HPCL Rajasthan Refinery Limited (HRRL).
8. Debt is an amount of money borrowed by one party from another. Debt is used by money corporations and individuals as a method of making large purchase, that they could not afford under normal circumstances.
9. It is the management of large amount of money, especially by governments or large companies.
10. Generally there are 5 types of sand dunes :
 - Transverse
 - Linear/longitudinal
 - Star
 - Barchan
 - Parabolic
11.
 - Deendayal Upadhyaya Gram Jyoti Yojana. (DDUGJY)
 - Pradhan Mantri Sahaj Bijli Har Ghar Yojana (Saubhagya)
12. The causes of deforestation are agriculture, forest fires, mining, infrastructure projects and increased logging.

13. Soil conservation is the prevention of soil loss from erosion or reduced fertility caused by over usages, acidification, salinization or other chemical soil contamination.
14. All weather road is one which is negotiable in all seasons of the year. This implies that the road bed is drained effectively. A gravel road can also be an all weather road.
15. Technology assessment has been defined as a form of policy research that examines short and long term consequences of the application of technology.
16. The problems faced by trade unions in india
 - Uneven Growth
 - Multiplicity of Union
 - Inter Union Rivalry
 - Weak Financial Position
 - Lack of Public Transport
17. Mahatma Gandhi National Rural Employment Guarantee Act.
18. CPM stands for "Critical path method", CPM is a step by step methodology, technique for planning projects with numerous activities that involves interdependent interaction.
19. Break even analysis can be used to determine the following :
 - Whether to accept an order or not.
 - Quantity required to be produced to have desired profit.
20. Green technology is also known as sustainable technology, is one that has a "Green" purpose. Green is a reference to nature, but Green technology in general is one that takes into account the long and short term impact an invention has on the environment.

[PART : B]

21. Science means, a systematic study where facts are observed and classified for a particular phenomena. Science formulates quantitative laws and verify them for application through instruments and apparatus. Technology means application of mind for learning methods and techniques of completing a given job or work efficiently. Technology applies science & scientific facts and achieve the benefits for mankind. Use of technology extend the ability of man beyond natural capacity of his mind. But all these depends on Scientific laws and researches by scientists in labs and verifications made by them. So science and technology are incomplete without each other.

22. Continuous and persistent rise in any system is known as sustainable growth. It means continuous rise in the GNP of the country resulting into the rising trend in per capita income of the country. The objective of sustainable development is to promote development which in turn reduces the disparities in life styles. Improve global consumption and in maintaining a beautiful local environmental and thereby contributing towards solving critical global environmental management problem.
23. (i) CITES : The convention on international trade in Endangered species.
(ii) GATT : General Agreement on Trade & Tariff.
(iii) CSIR : Council of Scientific and Industrial Research.
(iv) UNDP : United Nation's Development programme.
(e) TRAI : Telecom Regulatory Authority of India.
24. **Amartya Sen :**
Famous for noble prize in welfare economics won by him and his work for removal of poverty.
V.V. Giri :
Third Vice-President and was Fourth President of India. Awarded Bharat Ratna in 1975.
25. The different Sources of Air pollutions are given below :
- Motor vehicle are the main cause of air pollution in the city. This is the reason Kolkata and Delhi are the most air polluted.
 - Industrial chimney and petroleum refineries are the major source of gaseous pollutant.
 - Organic and Inorganic pollutants present in industrial effluent.
 - Agriculture discharges.
 - Sewage and other wastes including food processing plants.
26. PERT and CPM have been used for a variety of projects, including the following:
- Construction of a new plant.
 - Research and development of a new product.
 - NASA space exploration projects.
 - Movie production.
 - Building a ship.
 - Relocation of Major facility.

27. Radio-active waste is a byproduct from nuclear reactors, Fuel processing plants, hospitals and research Facilities.

Steps Involved in the management of Radioactive waste :

- Pre-treatment
- Treatment
- Conditioning
- Disposal.

28. Technology assessment is the study & evaluation of new technologies. It assumes a global perspective and is future oriented. It consider its task as an interdisciplinary approach to solving already existing problems and preventing potential damage caused by uncritical application and the commercialization of New technologies. Technology assessment is a helpful tool in the decision making process, it is considered as a powerful technique for an organization in examine new some of the major fields of technology assessments are information technology, hydrogen technology, nuclear and molecular technology, the internet & many more.

29. "Information" means any material in any form, including records, documents, memos, e-mails, opinions, advices, press releases, circulars, orders, logbooks, contracts, reports papers, samples, models, data material held in any electronic form and information relating to any private body which can be accessed by a public authority under any other law for the time being in force.

30. Disadvantage of Build-Operate-Transfer (BOT) are given below :

- Transaction costs are high.
- Not suitable for smaller projects.
- 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 operational phase.

31. Major reasons for non-acceptability of a solar cooker are :

- It is too expensive for an individual family ownership.
- It is incompatible with traditional cooking practices.
- It requires comparatively more time and menu has to be preplanned.
- It is to be used outdoors (except community and advance cookers)

32. Carbon footprint can be defined as the total amount of greenhouse gases produced to directly and indirectly by an individual, a family, an event, an organization or even an entire nation support. It is expressed in terms of the amount of carbon dioxide or its equivalent of other green house gases emitted. The carbon footprint seen as a subset of the ecological footprint.

[PART : C]

33. **FACTORS DETERMINING DEVELOPMENT PROCESS:**

Development may be steady but not very much easy task. A large number of economic and non-economic factors are needed in order to influence the process of development. These factors are discussed turn by turn as follows :

- **Natural resources :**

This is the principal factor of economic growth and process of development. Land is the main natural resource and includes in it fertility of land, its situation, composition, forest wealth, minerals, climate, water resources, oil resources etc. Proper utilisation of unutilised and underutilised resources with full exploitation can effect development. Improved technology and increased knowledge can help in this direction. Japan is one such country which is deficient in natural resources but is one of the most advanced countries of the world because it has been able to discover new uses for its limited resources.

- **Human resources :**

Human Resources Development (HRD) which refers to how many trained, educated and skilled people do we have in our country is an important issue because it is only these resources on which the rate of development depends. So there should be human capital formation that is labour force should be trained and educated. Human capital is the process of increasing knowledge, technical know-how, efficiency, skill and other capacity of the people of the country to exploit the resources. The level of the education is quite low in underdeveloped countries due to lack of investment in human capital which keeps the productivity of physical capital low. Thus educated and trained labour force leads to the process of development.

- **Capital formation :**
Stock of physical reproducible factors of production refer to capital. When the capital stock increases with the passage of time, this is called capital formation or accumulation. Process of capital formation depends upon existence of real savings, existence of credit financial institutions to mobilise savings and using these savings for investment in capital goods. The process of capital formation leads to the increase in national output in a number of ways.
 - **Technological factors :**
Process of development needs technological changes as the world is developing very fast. Changes in technological factors leads to increased level of labour productivity. Technological improvement has a number of uses such as facilitating discovery of unknown resources, extraction of raw materials and decreasing the cost of processing the raw materials.
 - **Social factors/Non-economic factors :**
An authority on the process of development called Nurkse who rightly pointed out that process of development has much to do with human endowments, social attitudes, political conditions and historical accidents. Capital is necessary for process of development but is not a sufficient condition. Cultural attitudes, social values and institutions, caste system institutional changes, political and administrative changes have much to do with the process of development.
- 34.** Intellectual property rights or IPR are right given to people over the creations of their minds. These rights are given by society through the state as an incentive to produce and disseminate ideas and expressions that will benefit society as a whole. Unlike Fundamental rights of citizens which are guaranteed by the constitution of a country, IPR are statutory rights enacted by the law making authority in a country. Conventionally, many Forms of IPRs are recognised. They are traditionally classified into two main categories.

(i) Copyright and Related Rights :

Copyright and Related Rights i.e., right granted to authors of literary and artistic works, and the rights of performers, producers of phonograms and broadcasting organizations.

The main purpose of protection of copyrights and related rights is to encourage and reward creative work. The distinguishing feature of this category of rights is that they protect only the tangible expression of an ideal itself.

(ii) Industrial Property :

This category includes

- The protection of distinctive signs such as trademarks and geographical indications.
- Industrial property protected primarily to stimulate innovation, design and creation of technology which are protected through laws on protection of inventions (Patents), industrial designs & trade secrets.

IPRs grant protection to the owner as they give the creator an exclusive right over the use of his/her intellectual creation generally for a limited period of time.

However, in the case of certain categories of IPRs the rights e.g., trade secrets and geographical indication can exist indefinitely so long as the right holder takes steps to protect his right. In the case of certain other time limited IPRs, it is possible to renew the rights periodically either for an indefinitely long period as in the case of trademarks or for a pre-specified maximum limit as in the case of industrial designs.

35. Wind power generation :

The kinetic energy of the wind can be used to do work. This energy was harnessed by windmills in the past to do mechanical work. For example, in a water-lifting pump, the rotatory motion of windmill is utilised to lift water from a well. Today, wind energy is also used to generate electricity. A windmill essentially consists of a structure similar to a large electric fan that is erected at some height on a rigid support.

To generate electricity, the rotatory motion of the windmill is used to turn the turbine of the electric generator. The output of a single windmill is quite small and cannot be used for commercial purposes. Therefore, a number of windmills are erected over a large area, which is known as wind energy farm. The energy output of each windmill in a farm is coupled together to get electricity on a commercial scale.

Benefits of Off-shore Wind Energy Generation :

- Consistent winds are found over the Oceans and there is also no Physical Obstruction to wind flow making the Energy Generation easier and Efficiency of Production.
- The Farms are situated in Deep Sea far from land hence they do not disrupt the Beach View which could be a hindrance for tourism otherwise.

- India has a large coastline of 7600 Kilometers, the large area could be well utilised for Energy Generation.
- The Off-shore requires more Employment opportunities as compared to on-shore Wind Energy Generation Projects.

Challenges :

- The Off-Shore Wind Projects require more Powered Turbines and other costly Equipments. India currently does not manufacture such big Equipments and hence these equipments are to be imported increasing the costs of Project.
- We also need Trained Labour that have expertise in the Field.
- There is no clarity on grid and how the energy generated would be transmitted to desired place.
- Wave actions particularly in Heavy Storms and Hurricanes can destroy the Turbines.
- There are no reports available for impact of Off-Shore Wind Energy Generation Plants on Aquatic life.

India is planning to achieve 5GW project Capacity by 2022, making Wind Energy a vital component in India's Energy needs.

The World currently generates 15000 MW of Energy by Off-Shore Wind Energy Generating Plants. If India achieves target, it would be a huge Success in such big mission.

The need of hour is proper Research and Development Followed by Policies framed in accordance with India's needs to Generate via renewable Source of Energy.

36. *Supervision*

Supervision means literally, the "overseeing" (not the "overlooking") of people within a work unit, with the purpose of achieving maximum productivity through them. Supervision is a process which aims to support, assure and develop the knowledge, skills and values of the person being supervised team or project group. It is a process by which one worker is given responsibility by the organisation to work with another workers in order to meet certain organisational, professional and personal objectives which together promote the best outcomes for service users.

It is an accountable, two-way process, which supports, motivates and enables the development of good practice for individual social care workers. As a result, this improves the quality of service provided by the organisation. It provides accountability for both the supervisor and supervisee in exploring practice and performance. It also enhances and provides evidence for annual performance review or appraisal.

To plan is to act according to decision all works with planning if well defined, goals and objective are achieved whether it is an individual firm, professional body, governments, corporate sector or any other unit involved in economics growth, intersectional coordination social welfare and social relations.

Types of Supervision

(i) Direct Supervision :

It is a term that is used to refer to situations in which a supervisor is present at all times. The supervisor oversees activities as they occur and provides constant direction, feedback, and assistance.

(ii) Indirect Supervision :

Indirect supervision is characterized by some form of authority over the work of employees not under direct supervision. In other words, the “supervisor” who provides indirect supervision is responsible for the work, but not for the worker.

(iii) Autocratic or Authoritarian supervision :

Autocratic supervision, also known as authoritarian leadership, is a leadership style characterized by individual control over all decisions and little input from group members. Autocratic leaders typically make choices based on their ideas and judgments and rarely accept advice from followers. Under this type, the supervisor wields absolute power and wants complete obedience from his subordinates. He wants everything to be done strictly according to his instructions and never likes any intervention from his subordinates. This type of supervision is resorted to tackle indisciplined subordinates.

(iv) Laissez-faire or free-rein supervision :

This is also known as independent supervision. Under this type of supervision, maximum freedom is allowed to the subordinates. The supervisor never interferes in the work of the subordinates. In other words, full freedom is given to workers to do their jobs. Subordinates are encouraged to solve their problems themselves.

(v) Democratic Leadership :

The democratic leadership is a very open and collegial style of running a team. Ideas move freely amongst the group and are discussed openly. In democratic leadership supervisor acts according to the mutual consent and discussion or in other words he consults subordinates in the process of decision making. This is also known as participative or consultative supervision. Subordinates are encouraged to give suggestions, take initiative and exercise free judgment. This results in job satisfaction and improved morale of employees.

(vi) **Bureaucratic Supervision :**

Under this type certain working rules and regulations are laid down by the supervisor and all the subordinates are required to follow these rules and regulations very strictly. A serious note of the violation of these rules and regulations is taken by the supervisor. This brings about stability and uniformity in the organization. But in actual practice it has been observed that there are delays and inefficiency in work due to bureaucratic supervision.

37. **General Objectives for The Monitoring of Disposal Facilities:**

The monitoring of disposal facilities for radioactive waste has five broad objectives :

- To demonstrate compliance with regulatory requirements and with the licence conditions.
- To verify that the disposal system is performing as expected, as set out in the safety case. This means that the components of the disposal system are carrying out their functions as identified in the safety assessment.
- To verify that the key assumptions made and models used to assess safety are consistent with actual conditions.
- To establish a database of information on the disposal facility, the site and its surroundings. This database is used to support future decisions when proceeding from siting to construction, operation, closure and the period after closure. The database is also used to support decisions relating to updating concepts and procedures for monitoring.
- To provide information for the public.

Effects of Nuclear Waste Disposal

If disposed of properly, nuclear waste disposal need not have any negative effects. Instead, nuclear waste can lie in its storage place for many thousands of years until it is no longer radioactive and dangerous without being disturbed. However, if the nuclear waste is improperly disposed of or if the disposal methods are compromised, there can be serious consequences and effects of nuclear waste disposal.

• **Accidents**

Although most of the time a lot of emphasis is placed on the safe disposal of nuclear waste, accidents do occur. Throughout history there have unfortunately been a number of examples of times where radioactive material was not disposed of in the proper ways. This has resulted in a number of disastrous situations, including nuclear waste being spread by dust storms into areas that were

populated by humans and animals and contaminated of water, whether ponds, rivers or even the sea. These accidents can have disastrous knock on effects for the animals that reside in or around these areas or that rely on the water of lakes or ponds to survive.

- **Scavenging**

A particularly bad problem in developing nations, people often go scavenging for abandoned nuclear waste that is still radioactive. In some countries there is a market for these sorts of scavenged goods, which means that people will willingly expose themselves to dangerous levels of radiation in order to make money. Unfortunately, however, radioactive materials can be highly volatile and cause a number of problems.

- **Transportation**

Transporting nuclear waste from power plants can occasionally result in problems. If poor shipping casks are used for the containment of radioactive material, for instance, then a slight knock or bump or even crash could cause the contents to spill and affect a wide radius. Despite all the cautions that are put into place when transporting nuclear waste, accidents still occur and can have a devastating effect on all those in the vicinity of the crash.

- **Health Effects**

The biggest concern is the negative effects that can have on the human body when exposed to radiation. Long term effects to radiation can even cause cancer. It is interesting to know that we are exposed to radiations naturally by living our lives that comes from the ground below us. Radiation can cause changes in 'DNA' that ensures cell repair.

- **Expense**

If one of these accidents does occur, the cost of cleaning everything up and making everything safe once again for people, animals and plants is very high. There is no simple or easy route when trying to clean up spilled radioactive material instead, it can take years to ensure that an area is safe to live in or even to visit once again. In the case of very serious accidents, it may take many tens of years until things start growing or living normally once again.

38. **Science and Technology :**

The beginning of science and technology can be traced back to the days of primitive man who used fire in his day to day life. Science is concerned with the pursuit of knowledge about nature whereas the main objective of technology is putting knowledge so gained to some use. Though modern science and technology has given much

material benefits to the society yet its cruel and brutish results cannot be denied. People with more scientific power due to wealthy background are exercising havoc to the poor and marginal people. How modern science and technology is used as a brutish tool by rich and the powerful to dispossess the poor can be discussed as follows:

- (i) Scientific and technological methods used cause unemployment and computer is one amongst these.
- (ii) Nuclear radiation causes pollution by which the worst sufferers are the poor.
- (iii) Mechanised system of production developed through scientific knowledge and practice brutally exploit the workers and cause industrial slums too.

- ***Technology Development in Electronics :***

The department of electronic supports and finds technology development through its councils set up in various fields namely the technological development council for areas like components, computer communication and instrumentation.

- ***Institutional Development:***

Trained people called man-power is essential for a wide range of professional duties. Keeping this in view facilities are being provided for developing educational, technical and general science.

- (i) Diploma courses are offered to about 600 government recognized polytechnics where around 80,000 students get enrollment.
- (ii) Realising the importance of technicians government has launched massive project to be implemented and upgrading the polytechnic education system with the assistance of World Bank.
- (iii) Five national institution at Bombay, Kanpur, Chennai, Bangalore and New Delhi were opened called Indian Institute of Technology.
- (iv) Seventeen regional engineering colleges providing facilities for technical education in various branches of engineering and technology were started.
- (v) Four technical teachers training institute in Kolkata, Bhopal, Chandigarh and Chennai to train the technical teachers were opened.
- (vi) Four national level institutes called Indian Institute of Management (IIM's) at Ahmedabad, Kolkata, Bangalore and Lucknow were also opened to provide and meet the managerial man power requirement through post graduate programme.

39. Water pollution refers to the contamination of water bodies such as rivers, seas, lakes, groundwater etc. This pollution is caused by the discharge of pollutants directly or indirectly into water bodies without any concern for its toxicity or its effect on the environment.

The major sources of water pollution are :

(i) ***Domestic Effluents and Sewage :***

Man, for his various domestic purposes such as drinking, cooking, bathing, cleaning, cooling, etc., uses on an average 135 liters of water per day. About 70 to 80 per cent of this is discharged and drained out, which through municipal drains poured into, a river or lake.

The domestic waste water and sewage is the main source of the water pollution. This is the inevitable and unfortunate fallout of urbanisation. This organic waste depletes the oxygen from water and upsets the natural balance of the aquatic ecosystem.

The common organic materials found in sewage are soaps, synthetic detergents, fatty acids, and proteinaceous matters such as amines, amino acids, amides and amino sugars.

(ii) ***Industrial Effluents:***

Industrial activities generate a wide variety of waste products, which are normally discharged into water courses. Major contributors are the pulp and paper, chemicals, petrochemicals and refining, metal working, food processing, textile, distillery, etc. The wastes, broadly categorised as heavy metals or synthetic organic compounds, reach bodies of water either through direct discharge or by leaching from waste dumps.

From Delhi industrial area alone, more than 8 lakh tonnes of industrial waste is discharged into the river Yamuna.

(iii) ***Agricultural Effluents :***

Agricultural water pollution is caused by fertilisers, insecticides and pesticides, farm animal wastes and sediments. In recent years, use of chemical fertilisers has increased manifold. The green revolution in India is a reflection of the increased use of fertilisers. The chemicals used in fertilisers enter the groundwater by leaching and the surface waters by run-off.

The use of various types of pesticides and insecticides in agriculture is also one of the causes of water pollution. Their presence in water is highly toxic to both man and animals, because these entire have a high persistence capacity, i.e., their residues remain for long periods.

(iv) **Radioactive Wastes :**

Radioactive elements, such as uranium and radium, possess highly unstable atomic nuclei. This disintegration results in radiation emission which may be highly injurious. Eventually, some of the radioactive material, such as Strontium 90 (which can cause bone cancer), percolates down through the soil into groundwater reservoirs or is carried out into streams and rivers.

(v) **Thermal Pollution :**

Most of the thermal and electric power plants also discharge considerable quantities (about 66%) of hot effluent/water into nearby streams or rivers. This has resulted in thermal pollution of our water courses. Thermal pollution is undesirable for several reasons. Warm water does not have the same oxygen holding capacity as cold water.

Therefore, fishes like black bass, trout and walleyes, etc., which require a minimal oxygen concentration of about 4 ppm, would either have to emigrate from the polluted area or die in large numbers. When the temperature of the receiving water is raised, the dissolved oxygen level decreases and the demand for oxygen increases, hence anaerobic conditions will set in resulting in the release of foul gases.

Thermal pollution is considered hazardous for the whole aquatic ecosystem. Several industries have installed cooling towers, where the heated water is cooled. But even so, thermal pollution has become a serious problem for water bodies located near thermal plants.

(vi) **Oil Pollution :**

The spread of oil in the sea has become a common feature nowadays. Oil is transported across oceans through tankers and either due to some accident or leakage oil spills onto the water and causes the degradation of aquatic and marine environment.

The impact of this oil spill on the marine ecosystem in this area has not yet been remedied. Offshore drilling operations also contribute their share of oil to the sea. The total quantity of oil that finds its way into sea each year is very large. It has been estimated that about one million tonnes of oil spills into the ocean each year from tankers and oil drilling operations.

