

**DETAILS EXPLANATIONS****Paper Code: RPSCEE23 | RPSCE23 | RPSCEM23****[PART : A]**

1. National solar mission, is an initiative of the government of India and state government to promote solar power. The mission is one of the several initiatives that are part of the national action plan on climate change. It was inaugurated by former Prime Minister Manmohan Singh on 11 Jan, 2010.
2. World Bank uses the income criteria i.e. per capita income to compare countries.
3. United Nations Development programme (UNDP) publishes HDI every year.
4. Coal is a non-renewable resource.
5. The following are the Six things that people may look for growth and development, besides income.
  - Freedom
  - Respect
  - Health
  - Security
  - Quality of life
  - Education
6. Economic Groups Vulnerable to Poverty :
  - Rural Agricultural labour households.
  - Urban casual labour households.
7. Few Examples of Environmental Degradation :
  - Deforestation
  - Soil erosion
  - Falling levels of ground water
  - Depletion of the ozone layer and combustion from automobiles causing extreme air pollution
  - Water pollution
8. Various human activities have resulted in a decline of forest cover. Vast tracts of forest had been cleared to make way for farmland and for making new houses, factories and infrastructure. Mining is another human activity which has destroyed forest in vast area.
9. Water that is used primarily ends up in the sea. From there, it enters the hydrological cycle in the form of water vapour. Fresh water is renewed by this cycle when precipitation occurs. Hence, water is a renewable resource.
10. Water scarcity or water stress occurs when water availability is not enough to match the demand for water.

11. Business activity between two or more parties is called trade. The trade within the country is called local trade or domestic trade. The trade between two countries is called international trade.
12. We shall use LPG/CNG gas or electricity for heating our food because these are efficient ways of supplying energy. Thermal efficiency of the energy source is large, there is less pollution and the source can be used easily.
13. PMGSY-II Focuses consolidation of rural road network by upgrading of existing selected rural road based on their economic potential and their role in facilitating growth of rural market centers and rural hubs.
14. Two
15. Appropriate technology is an ideological movement that involves. Small scale, labor intensive, energy efficient, environmentally sound, people centred and locally controlled projects.
16. 1<sup>st</sup> April 1949.
17. Drought create acute shortage of water, food, fodder, crop failure and employment, thus affecting lives of people in drought affected areas.
18. Rainwater harvesting is a method of water conservation in which rain water is stored in appropriate storage places for times of scarcity of water.
19. Life cycle costing, is the process of estimating how much money you will spend on an asset over the course of its useful life. Life cycle costing covers an asset's costs from the time you purchase it to the time you get rid of it.
20. The National Environmental Policy Act (NEPA) was signed into law on January 1, 1970. NEPA entails federal agencies to evaluate the environmental effects of proposed actions before making decisions and to suggest alternatives.

### [PART : B]

21. The issue of sustainability is important for development because development must be in tandem with the future. If natural resources are not sustained, then development will stagnate after a point of time. Exploiting resources unethically will ultimately undo the development that a country may have achieved. This is because in the future, those resources will not be available for further progress.

22. "The impact of globalisation has not been uniform." It has only benefitted skilled and professional person in urban not the unskilled persons. The industrial and service sector has much gained in globalisation than in agriculture. It benefitted MNCs on domestic producers and the industrial working class. Small producers of goods such as batteries, capacitors, plastics, toys, tyres, dairy product & vegetable oil have been hit hard by competition from cheaper imports.
23. • **Air Pollution :**  
Air pollution is caused by a combination of factors which lowers, the air quality. It is mainly due to carbon mono-oxide emitted by automobiles, smoke and other chemicals from manufacturing plants which are released in the air.
- **Land Pollution :**  
Land pollution is caused by the dumping of toxic wastes on land which damages the quality of land making it unfit for agriculture or plantation.
24. Houses in the semi arid regions of Rajasthan have traditionally constructed tanks for storing drinking water. They are big and are a part of the well developed rooftop rainwater harvesting system. The tanks are constructed inside the main house or the courtyard, and are connected to the sloping roofs of the houses through a pipe. The rain falling on the rooftop travels down and is stored in the tanks. The first spell of rain is not collected as this water cleans the roofs and the pipes. The rainwater from the subsequent spell is collected this water is used till the next rain season, and is a reliable source of water even after other sources have dried up. The tanks also help in cooling the houses as room built around them have generally low temperature due to construction.
25. The workmen's compensation act, 1923 is one of the important social security legislations. It aims at providing financial protection to workmen and their dependents in case of accidental injury by means of payment of compensation by the employers.
26. The purpose of depreciation is to match the cost of a productive asset (that has a useful life of more than a year) to the revenues earned from using the asset. Since it is hard to see a direct link to revenues, the asset's cost is usually allocated to the years in which the asset is used. Depreciation systematically allocates or moves the asset's cost from the balance sheet to expense on the income statement over the asset's useful life.

27. *To reduce environment pollution we should take following measures:*
- Reducing use of CFC
  - Disposing off waste safely
  - Reducing use of polythene
  - Not disposing off waste in water bodies
  - Making automobiles pollution free
  - Tree plantation in school, around residence
  - Prevention of noise pollution by using fire crackers/TV/Musical instruments at permissible limit
28. The carbon trading concept came about the KYOTO protocol in 1999. It was an international agreement whose main aim was to reduce carbon dioxide emission and the presence of greenhouse gases between the year 2008 and 2012.
29. *Advantage of NHDP :*
- Saving in vehicle operating costs.
  - Benefits to trade.
  - Faster, comfortable journeys.
  - Reduced maintenance costs.
  - Reduced Fuel consumption.
  - Safer travel.
  - All round development of areas.
30. Calcareous stone waste is generated during mining and processing of the calcareous stone. The waste is a serious environmental hazard which is affecting the land and population over a large area. It adversely affects the fertility of the soil as these wastes are deficient in plant nutrients, contaminates the water resources, increases the drainage problem when dumped along the drainage passage and causing serious air pollution as the dry powder becomes air borne on windy days. It contains excessive salts and heavy metal phytotoxicants destroying young plants by sand blasting and lack in normal microbial activity. It Contamination of water resources and creates problems for extension of mines, when dumped in mining area.
31. The rural infrastructure of India is not very adequate. The status of rural infrastructure in india is stated below :
- The women in rural areas still use bio fuels to meet their energy requirements.
  - They have to travel for for the basic necessity like water.
  - There is a lack of availability of clean drinking water.
  - The sanitation facilities are also not properly developed.

32. Energy is very important for the development process of any nation. It is essential for industrial, agriculture and other related areas. The development in which results in infrastructure development and the energy is also used for domestic purposes.

*The basic differences between commercial & non-commercial sources of energy are :*

Commercial Energy	Non-Commercial Energy
It is available to the users for some price.	It is available to the users free of cost.
This form of energy is used for commercial purposes.	This form of energy is for domestic purpose.
<i>Example:</i> Coal, petroleum & Electricity etc.	<i>Example:</i> Firewood, agricultural waste, animal waste etc.

### [PART : C]

33. Human poverty is a concept that goes beyond the limited view of poverty as lack of income. It refers to the denial of political, social and economic opportunities to an individual to maintain a “reasonable” standard of living. Illiteracy, lack of job opportunities, lack of access to proper healthcare and sanitation, caste and gender discrimination, etc., are all components of human poverty.

*There are various reasons for poverty in India which are outlined below :*

*(i) Prolonged Colonial Administration:*

The policies of British Colonial government shattered the Indian economy so much that it could not be revived until the 1980s.

*(ii) Unabated Population Growth :*

The failures to promote both the required economic growth and population control have been the main cause of poverty today.

*(iii) Illiteracy :*

Illiteracy is also an important cause of poverty in our country.

*(iv) Disparity in the Ownership of Land-holdings :*

The unequal distribution of land, lack of land resources and failure in the proper implementation of land reform policies have been the major causes of poverty in rural areas.

*(v) Unemployment :*

Lack of job security and unemployment are other causes.

*(vi) Widening Inequalities of Income :*

This is a feature of high poverty. Money has been concentrating in fewer hands, thus rendering a majority of people poor.

**(vii) Slow Growth of Employment Opportunities :**

Despite the implementation of various employment generating programmes our government has failed to provide the necessary employment opportunities.

**(viii) Socio-cultural Factors :**

In order to fulfil social obligations such as marriage etc. and religious ceremonies people in India including the poor spend a lot of money which makes some people even poorer.

34. *Meri Sadak* is a mobile application, was launched to enable citizens to register complaints regarding the quality and pace of construction of PMGSY roads.

**OBJECTIVES :**

- The primary objective of the PMGSY is to provide Connectivity, by way of an All-weather Road (with necessary culverts and cross-drainage structures, which is operable throughout the year), to the eligible unconnected Habitations in the rural areas, in such a way that all Unconnected Habitations with a population of 1000 persons and above are covered in three years (2000-2003) and all Unconnected Habitations with a population of 500 persons and above by the end of the Tenth Plan Period (2007). In respect of the Hill States (North-East, Sikkim, Himachal Pradesh, Jammu & Kashmir, Uttaranchal) and the Desert Areas (as identified in the Desert Development Programme) as well as the Tribal (Schedule V) areas, the objective would be to connect Habitations with a population of 250 persons and above.
  - The PMGSY will permit the Upgradation (to prescribed standards) of the existing roads in those Districts where all the eligible Habitations of the designated population size have been provided all-weather road connectivity. However, it must be noted that Upgradation is not central to the Programme and cannot exceed 20% of the State's allocation as long as eligible Unconnected Habitations in the State still exist. In Upgradation works, priority should be given to Through Routes of the Rural Core Network, which carry more traffic.
35. The word 5 's' was generalized in 1980's in manufacturing sector in Japan, as Toyota production system (TPS) became famous in the sector and "5S" activities were set as one of the bases of TPS. Service industry started to used "5S" in 1990's.

**■ What 5S Can Do?**

- Team work improvement through every one's participation.
- Identify abnormalities.
- Identify wastes and reduce the wastes.

**Wastes:**

- |                      |                |
|----------------------|----------------|
| (i) Overproduction   | (ii) Inventory |
| (iii) Waiting        | (iv) Motion    |
| (v) Transportation   | (vi) Rework    |
| (vii) Overprocessing |                |

- Improve productivities.
- Improve safety.

**If No 5S Activities**

- Looking for Necessary items.
- Making Mistake.
- Remember what/how to do
- Hesitate what to do.

**■ Details of "5S" Approach**

5S : Sort – Set – Shine – Standardize – Sustain

- **S1 : Sort** : Focuses on eliminating unnecessary items from the work place.

Categorize equipment, Furniture, tool in your working place into the following 3 categories.

- (i) Necessary
- (ii) Unnecessary
- (iii) May not necessary

- **S2 : Set** :

"Set" is based on finding efficient and effective storage of necessary items.

Apply "Can see, can take out and can return" philosophy.

This will save time and energy to look for something.

- **S3 : Shine**

Cleaning up one's workplace daily so that there is no dust on floors, Machines or equipment.

It will create ownership and build pride in the workers.

- **S4 : Standardize** :

Maintain an environment where S1 to S3 are implemented in the same manner throughout the organization.

- **S5 : Sustain** :

Maintain S1 - S4 through discipline, commitment and empowerment.

It focuses on defining a new mindset and a standard in workplace.

**36. Advantages of Switching to Solar :**

- **Environment Friendly** : Solar energy is environment-friendly. When in use, it does not release CO<sub>2</sub> and other gases which pollute the air. Hence it is very suitable for India, India being one of the most polluted countries of the world.

Varied use

Solar energy can be used for a variety of purposes like as heating, drying, cooking or electricity, which is suitable for the rural areas in India. It can also be used in cars, planes, large power boats, satellites, calculators and much more such items, just apt for the urban population.

- **Abundant & Secure** : Solar power is inexhaustible. In energy deficient country like India, where power generation is costly, solar energy is the best alternative means of power generation.
- **Grid Independent** : You don't need a power or gas grid to get solar energy. A solar energy system can be installed anywhere. Solar panels can be easily placed in houses. Hence, it is quite inexpensive compared to other sources of energy. Reduced dependence on fossil fuels.

#### Dis-Advantages :

- **Weather Dependent** : During daytime, the weather may be cloudy or rainy, with little or no sun radiation. Hence, this makes solar energy panels less reliable as a solution.  
Sunny area required  
Only those areas that receive good amount of sunlight are suitable for producing solar energy.
- **High Upfront Cost** : Solar panels also require inverters and storage batteries to convert direct electricity to alternating electricity so as to generate electricity. While installing a solar panel is quite cheap, installing other equipment becomes expensive.
- **High Surface Area Required** : The land space required to install a solar plant with solar panel is quite large and that land space remains occupied for many years altogether and cannot be used for other purposes. India is already a highly populous and land starved country.  
Energy production is quite low compared to other forms of energy.
- **Maintenance** : Solar panels require considerable maintenance as they are fragile and can be easily damaged. So, extra expenses are incurred as additional insurance costs.



### 37. *Thermal comfort Aspects of Housing :*

Thermal comfort is a condition of mind that expresses satisfaction with the thermal environment. Thermal comfort is different for every individual. It is maintained when the heat generated by the human metabolism is allowed to dissipate at a rate that maintains thermal equilibrium in the body. Any heat gain or loss beyond this generates substantial discomfort. Essentially, to maintain Thermal comfort, heat produced must equal heat lost.

Thermal comfort refers to a number of conditions in which the majority of people feel comfortable. Thermal comfort is rated amongst the most important conditions for improving comfort and satisfaction of occupants with their indoor environment. It has been long recognized that the sensation of feeling hot or cold is dependent on more than just air temperature.

In fact six primary variables both are **environmental and personal** affecting thermal comfort. These factors may be independent of each other, but together contribute to an employee's thermal comfort.

#### *Environmental Factors :*

- Ambient temperature (air temperature)
- Radiant temperature (the temperature of the surfaces around us)
- Air velocity (the rate at which air moves around and touches skin)
- Humidity (measurement of the water vapor in an air -water mixture)

#### *(i) Air Temperature :*

Air temperature is the temperature of the air surrounding the body. It is usually given in degrees Celsius (°C).

#### *(ii) Radiant Temperature :*

- Radiant temperature or Thermal radiation is the heat that radiates from a warm object. Radiant heat may be present if there are heat sources in an environment. Radiant temperature has a greater influence than air temperature on how we lose or gain heat to the environment. Examples of radiant heat sources include: the sun, fire, electric fires, ovens, kiln walls, cookers, dryers, hot surfaces and machinery, molten metals etc.

#### *(iii) Air Velocity:*

This describes the speed of air moving across the employee and may help cool them if the air is cooler than the environment. Air velocity is an important factor in thermal comfort for example: still or stagnant air in indoor environments that are artificially heated may cause people to feel stuffy.

Moving air in warm or humid conditions can increase heat loss through convection without any change in air temperature. Small air movements in cool or cold environments may be perceived as a draught as people are particularly sensitive to these movements. Physical activity also increases air movement so air velocity may be corrected to account for a person's level of physical activity.

**(iii) Humidity :**

If water is heated and it evaporates to the surrounding environment, the resulting amount of water in the air will provide humidity. Relative humidity is the ratio between the actual amount of water vapour in the air and the maximum amount of water vapour that the air can hold at that air temperature. Relative humidity between 40% and 70% does not have a major impact on thermal comfort. In non-air conditioned offices or where weather conditions outdoors influence the thermal environment indoors, relative humidity can reach above 70%, which makes it hard for employees to cool down.

If a work environment has high humidity it means there is a lot of water vapour in the air. This prevents the evaporation of sweat from the skin. In hot environments, humidity is important because less sweat evaporates when humidity is high (80 %+).

The evaporation of sweat is the main method of heat reduction.

**38. Main Impacts of Intense Agriculture on Environment :**

The following points highlight the main impacts of intense agriculture on environment. The impacts are:

**(i) Degradation of Land :**

— The degradation of land is matter of serious concern endangering sustainability of agriculture. Faulty cultural practices in the forest and other plain areas expose the soil to water and wind erosions. The water logging due to rising water table, particularly along the rivers, rendering soil unfit for cultivation. Increased dependence on intensive agriculture and irrigation also resulted in salination, alkalination and water logging in the some irrigated area of the country.

Therefore apart from soils erosion problem the following are the kinds of land degradations taking place:

- Deficiency of soil nutrients due to intensive cultivation.
- Imbalance in soil nutrients particularly the deficiency of micro-nutrients.

- Decline in the organic matter in the soil.
- Deforestation and overgrazing causing exposure of soil to water and wind erosion.
- Decline in underground water due to over exhaustion for high water using crops, increase in cropping intensity and increase in cultivated area.
- Increase in water level in the cotton belt of north-western part of the country endangering cultivation of cotton crop due to pumping out of brackish water resulting in accumulation of salts on earth surface.
- High uses of nitrogen and water have caused percolation of nitrogen up to water table thus polluting it even for human consumption.

**(ii) Health Related Issues :**

Agricultural pollution is the main source of pollution in water and lakes. Chemicals from fertilizers and pesticides make their way into the groundwater that end up in drinking water. Health related problems may occur as it contributes to blue baby syndrome which causes death in infants. Oil, degreasing agents, metals and toxins from farm equipment cause health problems when they get into drinking water.

**(iii) Biodiversity**

India is a country with wide variety of agro-climatic conditions which includes a wide variety of animals and plants. As agriculture is becoming more and more commercialized, a number of plant and animal species are becoming extinct. Fertilizers, manure, waste and ammonia turns into nitrate that reduces the amount of oxygen present in water which results in the death of many aquatic animals. The depletion of vegetative cover such as grass lands and forest tree species and similarly extinction of wild animals, birds and insects is matter of concern.

**(iv) Pest Problem**

With the shift in crop pattern, increase in area under irrigation and higher cropping intensity the pest problem has become very severe. The seriousness of pests has further increased by way of indiscriminate and increased use of pesticides. Once they have been sprayed, it does not disappear completely. Some of it mixes with the water and seeps into the ground. The rest of it is absorbed by the plant itself. As a result, the local streams that are supplied water from the ground become contaminated, as do the animals that eat these crops and plants.

The predatory birds and insect population has dwindled at a sharp rate causing lack of natural control of pests. The direct effects of high use of dangerous pesticides have created health hazards on human and animal.

(v) *Disposal of Agricultural Wastes :*

The use of by-products such as paddy straw and rice husk has not been made properly. The burning of such by-products creates increase in carbon dioxide and carbon-monoxide in the atmosphere resulting in respiratory problems for animals and human beings. There is need for recycling the agricultural wastes by having enterprises like dairy, poultry, fishery etc. processing of by-products and ploughing in the field as organic matter. The mechanisation of agriculture requires various energy resources such as diesel, electricity, petrol and higher use of fertilizers as well, has negative impact on the ecology of the country by air pollution, water pollution and soil pollution.

Intense agriculture is good at feeding populations but it is not sustainable. Over the last decade governments have become stricter about enforcing regulations. Farmers are also becoming more aware of the damage and are looking for solutions. Many farms are moving back to traditional manure, direct irrigation from local water bodies and organic means of keeping pest populations in check. Big Ag farmers are also seeking ways to scale preventative measures without widespread business disruption. Governments emphasise the need to use land and resources more efficiently, creating more produce from the same amount and making the agricultural process more cost-effective.

Organic farming is a sustainable agriculture set of practices that can have a lower impact on the environment at the small scale. Organic farms tended to have higher soil organic matter content and lower nutrient losses (nitrogen leaching, nitrous oxide emissions and ammonia emissions) per unit of field area.

Organic farming has shown to have on average 30% higher species richness than conventional farming.

39. In nature, there exists an ecological balance. The activities of various organisms are balanced. The interactions between abiotic and biotic components are so fine tuned that there exists equilibrium in nature. As years passed by, human activities interfered with this equilibrium. Uncontrolled human activities caused damage to the environment.

(i) *Over Exploitation of Natural Resources :*

Rapidly growing population results in over exploitation of natural resources. Over exploitation of natural resources reduce the productivity of natural ecosystems.

- Rapidly growing population results in excessive burning of coal, wood, kerosene, petrol etc. release toxic gases such as SO<sub>2</sub> (sulphur dioxide), NO<sub>x</sub> (oxide of nitrogen), CO (carbon monoxide) and hydrocarbons in the air. These gases pollute air which adversely effects human health and plants.
- Growing population is responsible for deforestation, over grazing, intensive cultivation, over irrigation etc. which results in the loss of top soil and fertility of the land. Prolonged degradation of land leads to desertification.
- Forests are natural resources but they have been cut down for use by humans for converting them into the cultivable fields, for building houses and for taking away logs for making shelters and furniture or fuel. The rate at which trees are cut far exceeds the rate at which trees grow, so forests are getting denuded. Trees lose lot of water through transpiration. This helps in forming rain clouds. Cutting of trees and clearing of forest reduced rainfall in the area. Forests are natural habitats of wild life. Extinction of wild life species is on the rise because their natural habitats are being destroyed due to deforestation.
- Increasing Population also responsible for over harvesting of edible fishes reduces their reproductive rate and their population start reducing in number and may become completely extinct after some time and imbalance the marine eco system.
- Growing population results in excessive use of rivers, lakes, ponds, estuaries and oceans. These rivers and other water bodies are being used for disposal of all liquid effluents and all other kinds of wastes. Acid water from mines, toxic waste of industries, chemical fertilizers and pesticides from agricultural fields also responsible for polluted rivers and other water bodies.
- Growing population increases the use of fossil fuels which is a leading cause of increasing levels of CO<sub>2</sub> and other green house gases in the atmosphere. Atmospheric build up of green house gases have caused considerable heating of the earth leading to global warming. Global warming is causing melting of glaciers and rise in the sea level.

- The problem of soil pollution is also increasing due to faulty disposal of solid and liquid wastes generated from households and industries. Thus humans have spoilt the environment by causing pollution to natural water bodies and land.

**(ii) Clearing Land for Cultivation to Grow More Food :**

Forests and natural grasslands have been converted to farmlands. Wetlands have been drained and arid lands have been irrigated. These changes have been made to grow more food and more raw materials. But in doing so, the natural resources have been depleted and the landscapes have undergone drastic changes.

For example, forests have been cleared over large for cultivation of agriculture crops. Many mangrove forests known to reduce erosion and stabilize shorelines have been cleared use for growing food crops to meet the needs of the growing population.

**(iii) Water Scarcity :**

Water received as rainfall, flows into rivers, lakes and other water bodies. Some of it seeps into the ground and reaches the ground water. At certain depth of the soil, all the pore spaces between soil particles are saturated with water. This depth is called water table. The water table may remain stable if the drawn from the ground water is replenished by the seepage of the rain water. But if water withdrawal exceeds beyond the rate of replenishment of the ground, water table keep on receding and resulting in drying out of wells. In many areas excessive withdrawal has depleted ground water resources causing acute water scarcity.

**(iv) Need For Human Settlements :**

Apart from excessive land use changes for growing food, large population means greater requirement for shelter. To make houses for so many, stones and other building materials have to be quarried more rocks have to be blown off and more water to be used.

**(v) Need for Transport :**

Elaborate network of transport is required to fulfil the growing need of millions people. Various modes of transports have been developed which consume growing quantities of fossil fuels such as coal, gas and petroleum polluting the atmosphere.

**(vi) Need for Various Commodities :**

Articles of everyday use such as plastic vessels, mugs, buckets etc., agricultural implements, machinery, chemicals, cosmetics etc are manufactured in factories. The raw materials and fossil fuels and water needed to run industries for manufacturing these products lead to their depletion. Rapid industrialization has also led to pollution from dumping of industrial effluents into rivers and other water bodies. Rapid industrialization has caused much damage to the environment. Mining activities have depleted stock of mineral resources particularly fossil fuels.

**(vii) Slum Development :**

Over populated areas result in congested roads and slum formation which lack basic amenities like drinking water, drainage, waste disposal, lack of hygienic conditions and filthy environment create potential conditions for public health problems including spread of epidemic diseases. Discharge of untreated effluents and throwing of waste into water bodies have polluted most of the lakes and rivers.



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