Assignment - III

I 2 marks

1. define energy

energy is the quantitative property that must be transferred to an object in order to perform work on, or to heat, the object. Energy is a conserved state that energy can be converted in form, but not created or destroyed.

2. what you mean energy conventional

conventional sources of energy can be described as non-renewable sources of energy which have been used since a long time. conventional sources of energy are used extensively by mankind and the magnitude of usage is so high that the reserves have got depleted to a great extent. **Example :** coal, petroleum, natural gas

3. write any two sources of conventional energy

oil
coal
petroleum
natural gas and
nuclear energy

4. give two example (or) two sources of non-conventional energy

Solar Energy
wind Energy
Tidal Energy and bio energy

5 mark

1. List out various factors determining demand for energy

i supply Energy from nuclear, coal, gas, oil and renewable sources reacts quickly in response to demand. prices fluctuate hourly as a result

ii demand

demand for heating, cooling light and processes varies with activity in the us economy, technology and efficiency measures

iii gas storage

Represents energy inventory [since you can't store electricity], i,e the difference between supply and demand. gas injections and withdrawals are announced weekly.

iv weather forecasts

This is a major factor affecting spot market prices and short-term futures contracts. whether the forecasts become reality is less critical to long-term prices.

v generation changes

1. Nuclear Retirement of older plants as they require re-licensing

11. coal coal plant conversions to

natural gas to avoid scrubbing-technology costs.

vi Transport

Across the U.S there are severe constraints in gas pipline and electrical transmission capacity, which take time and investment to reverse.

vii Global Factors

Despite the massive growth in shale gas production, major changes in global oil supplies can affect U.S domestic energy costs.

viii Imports and Exports

Global oil and gas prices determine relative profits suppliers can make selling fuels domestically or overseas. All energy prices are connected to some degree

ix Government Regulation

Federal [FERC] and state [PUCS] regulations can change both supply and demand costs quickly and significantly.

x Financial speculation

Like most other traded commodities, energy prices can be affected significantly by financial speculation, which is the least transparent factor of a

2. define energy shortage. what are the effects of energy shortage in India.

All these shortages, especially the energy shortage, have severely been affecting the country's economy.

The energy crisis is the concern that the world's demands on the limited natural resources that are used to power industrial society are diminishing as the demand rises.

The effects of energy shortage

The growth of human civilization has led to an increase in the consumption of traditional sources of energy. The very basic source of energy is precious fossil fuels. The usage of all these sources is bound to produce certain effect.

i. Environmental Effects

Energy is produced by the burning of non-renewable fossil fuels. This does not only affect the global resources of fossil fuels, but it also affects the environment. The burning of fossil fuels releases greenhouse gases like carbon dioxide and others.

These gases create a blanket on the earth's surface, which prevents the release of the short rays of the sun by night. Thus the energy crisis facilitates making the earth a warmer place by promoting global warming.

ii. Increasing prices of the fuel Resources

As the use of fossil fuels increases the cost of these resources increases too. We must remember that the quantity in which these fossil fuels are available is limited. As we keep on using these resources, the amount of these fossil fuels further decreases.

With every passing day, the demand for these fuels increases daily while their available quantity decreases every day. This leads to an immense increase in the price of fossil fuels, causing the price to increase day in and day out. this creates a huge economic disturbance across the globe.

iii. political disturbances

The fact that the energy crisis creates some socio-economic disturbances, also tell us that this global energy crisis also creates a lot of political disturbances across the globe. The quest for fossil fuels is one of the major causes of the same.

Besides, with the failure of the energy markets, we see a crash in not only the global economy but also a crash of the energy available. All these are enough to give rise to the various socio-political disturbances.

iv. The Effect on the Tourism Industry

The tourism industry is largely dependent on the rise and fall of fuel prices. The tremendous rise of the fuel prices that comes as a result of the energy crisis affects the tourism industry pretty adver

with the increase in fuel prices, there is an increase in the costs of tourism as well. as a result of this, there are many who cannot afford the same. And as a result of all this. It is the tourism industry the suffers.

3. write a short note on energy conservation

Energy conservation the effort made to reduce the consumption of energy by using less of an energy service. This can be achieved either by using energy more efficienty [using less energy for a constant service] or by reducing the amount of service used [for example, by driving less]. Energy conservation is a part of the concept of Eco-sufficiency. Energy conservation measures [ECMs] in building reduce the need for energy services and can result in increased environment quality, national security, personal financial security and higher savings. It is at the top of the sustainable energy hierarchy. It also lowers energy costs by preventing future resource depletion

Energy can be conserved by reducing wastage and losses, Improving efficiency through technological upgrades and improved operation and maintenance. on a global level energy use can also be reduced by the stabilization of population growth.

Energy can only be transformed from one form to other, such as heat energy to motive power in cars, or kinetic energy of water flow to electricity in hydroelectric power plants. However machines are required to transform energy from one form to other. The wear and friction of the components of these machine while running cause losses of very high amounts of energy and very high related costs. It is possible to minimize these losses by adopting green engineering practices to improve life cycle of the components.

The petroleum conservation Research Association [PCRA] is an Indian government body created in 1978 that engages in promoting energy efficiency and conservation in every walks of life. In the recent past PCRA has done mass-media campaigns in television, radio, and print media. This is an impact-assessment survey by a third party revealed that due to these larger campaigns by PCRA, the public's overall awareness level has gone up leading to saving of fossil fuels worth crores of rupees, besides reducing pollution.

The Bureau of Energy Efficiency is an Indian government organisation created in 2001 that is responsible for promoting energy efficiency and conservation.

protection and conservation of Natural Resources is done by community Natural Resources management [CNRM]

4. List out various objectives new energy policy in India

The National Energy policy [NEP] aims to chart the way forward to meet the government's bold announcement is the energy domain. The four key objectives of the new energy policy are access at affordable prices, improved energy security and independence, greater sustainability and economic growth. The policy is being discussed by NITI Aayog with different stake holders. This was stated by shri piyush goyal, union minister of state [IC] for the ministry power, coal, New and Renewable Energy and mines in a written replay to a question in Rajya sabha today.

The Minister further stated in the reply that NEP builds on the achievement of the earlier omnibus energy policy - the Integrated Energy policy [IEP], and sets the new agenda consistent with the redefined role of emerging developments in the energy worlds. There is a need to support the trends which usher in efficiency by a pro-active policy.

In view of the fact, that energy is handled by different ministries that have the primary responsibility of setting their own sectoral agenda, an omnibus policy is required to achieve the

goal of energy security through coordination between these sources. This is also expected to mainstream emerging energy technologies and provide consumer energy choices, Shri Goyal added.

While steps have already been taken by the Government to embed many such developments in the sectoral energy policies, however, it is desirable to develop a clear roadmap so that there is clarity amongst all the stakeholders on the Government's long-term energy agenda. Long term investors, both on supply and demand sides, need clarity on stable energy policy outlook.

Replying to a question on the difference between the old and new policies, the minister informed that the new policy differs from the previous policy while including the issue related to sharp decline of crude oil prices, change in solar energy technology, heightened concern of climate change issues, ambitious target of Renewable energy and rural electrification agenda adopted by the Government.

Clearing a misconception about the aligning of domestic coal prices with the international prices, Shri Goyal informed that the proposed policy does not call for any such alignment. Further the policy is being discussed by NITI Aayog with different Stake-holders, he added.

The Minister further stated that all the census villages are planned to be electrified by 2019, and universal electrification is to be achieved, with 24x7 electricity by 2022. our INDCs target at reduction of emissions intensity by 33%-35% by 2030, achieving a 175 GW renewable energy capacity by 2022, and share of non-fossil fuel based installed capacity in the electricity mix is aimed at above 40% by 2030.

5. what are the features of energy policy in India

This article provides information about the salient features of the Integrated Energy policy recently approved by the government and its implications on the energy security needs of the country.

India recently adopted the Integrated Energy policy. This is a comprehensive policy on energy for India. The Integrated policy is expected to explore alternative technologies and possible synergies that would increase energy system efficiency and meet requirement for energy services.

It would allow for relative pricing of different fuels taking into account both their efficiency in use and convenience as well as the amount of pollution they

generate. As per report, an integrated policy is also expected to bring in a level playing field for all energy players large or small, public or private, domestic or foreign.

The policy envisages a competitive energy market and market-determined energy prices. Today, the price is decided by the government and which increases burden on public sector oil companies. To reduce this burden a policy is formed.

Allocation of energy resources shall be based on competition. This policy of pricing and allocation will reduce amount of PoL subsidies and thus bring down fiscal deficit.

Though there will be subsidies, but they will be based on transparent and target oriented system. policy seeks to reduce black-marketing of subsidised petroleum products.

The policy seeks optimal exploitation of domestic energy resources and also vigorous exploration and acquisition of energy assets abroad, so that energy security can be attained effectively

The policy aims to meet energy demands of all sectors. Therefore, not only production of energy will be increased but also its transfer will be made cost-effective consideration of environment is also taken into account.

The Integrated Energy Policy is formed under the expert Panel of Planning commission. The IEP was need of the hour because if India wants to continue its economic growth trajectory at high rate, it must have sufficient energy sources to meet demands of economic as well as non-economic activities. Again, according to the IEP, energy should be sustainable and reasonably cost-effective.

10 marks

1. explain role of energy in the process of economic development

energy development is the field of activities focused on obtaining sources of energy from natural resources. These activities include production of conventional alternative and renewable sources of energy, and for the recovery and reuse of energy. that would otherwise be wasted. Energy conservation and efficiency measures reduce the demand for energy development, and can have benefits to society with improvement to environmental issues.

societies use energy for transportation manufacturing, illumination, heating and air conditioning, and communication, for industrial, commercial, and domestic purposes. Energy resource maybe classified as primary resources, where the resource can be used in substantially its original

form, or as secondary resources, where the energy source must be converted into a more conveniently usable form. Non-renewable resources are significantly depleted by human use, whereas renewable resources are produced by ongoing processes that can sustain indefinite human exploitation

Thousands of people are employed in the energy industry. The conventional industry comprises the petroleum industry, the natural gas industry, the electrical power industry, and the nuclear industry. New energy industries include the renewable energy industry comprising alternative and sustainable manufacture, distribution and sale of alternative fuels

Energy economics is a broad scientific subject area which includes topics related to supply and use of energy in societies. Due to diversity of issues and methods applied and shared with a number of academic disciplines, energy economics does not present itself as a self-contained academic discipline, but it is an applied subdiscipline of economics. From the list of main topics of economics, some relate strongly to energy economics

- computable general equilibrium
- Econometrics
- Environmental Economics
- Finance
- Industrial organization
- Input-output model

microeconomics
macro economics
operations research
Resource economics

Energy economics also draws heavily on results of energy engineering, geology, political sciences, ecology etc. Recent focus of energy economics includes the following issues

climate change and climate policy
demand response
Elasticity of supply and demand in Energy market
Energy and economic growth
Energy derivatives
energy elasticity
energy forecasting
energy markets and electricity markets -liberalisation [de-or re-] regulation
Economic of energy infrastructure
Energy policy
Environmental policy
Risk analysis and security of supply
sustainability

Some institutions of higher education [universities] recognise energy economics as a viable career opportunity, offering this as a curriculum. The university of

cambridge, magachusetts institute of technology and the vrije universiteit Amsterdam are the top three research universities, and Resources for the future the top research institute. There are numerous other research departments, companies and professionals offering energy economics studies and consultations.

2. Bring explain factors determining energy conservation

i Turn your refrigerator down

Refrigerators account for as much as 13.7% of the total household energy use. To increase energy savings, set your fridge to 37 degrees Fahrenheit and your freezer to 3 degrees Fahrenheit

ii use energy-efficient light-bulbs

Install energy-saving CFL or LED bulbs in your lighting fixtures to use 25-35 percent less energy, compared to regular incandescent bulbs

iii clean or replace air filters as recommended

The air conditioner and heater are the biggest energy users in most homes, and these appliances have to work even harder with dirty air filters. write the date of installation on the filter to help you remember when it needs to be replaced.

iv Do full loads

make sure your dishwasher and washing machine are full before running them to get the most energy-saving use from each run cycle.

v. use smart power strips

Even when not it use household electronics still draw power from outlets This phenomenon is called "phantom load" energy-saving smart power strips, which shut down appliances that have gone into standby mode, help you cut down on phantom-load costs, potentially resulting in money and energy savings.

vi. Air-dry dishes and clothes

instead of using your dishwasher's drying feature, consider letting the dishes air-dry. And instead of using the dryer on a nice day, hand your clothes outside to dry.

vii. Bake with glass or ceramic pans

you can set the oven's temperature 25 degrees lower than indicated in the recipe when you do this

viii. cook using the right-sized burner

conserve energy by using your stove's small burners for small pots and large burners for large pots.

ixi cut down on air leaks in your home.

you're paying for warm air in the winter and cool air in the summer - don't let that money escape! check your windows and doors for cracks and gaps, and seal them up with new weather stripping or caulk.

X Keep your house a little hotter in the summer and little cooler in the winter

opt for wearing lighter clothes in the summer and wearing a few extra layers in the winter in exchange for those few degrees' change in temperature. A good rule of thumb is to set the thermostat to 68 degrees Fahrenheit in the winter and 78 in the summer.

3. explain sources of both conventional and non-conventional energy.

conventional sources of energy

These sources of energy are also known as non-renewable sources of energy and are available in limited avantity apart from hydro-electric power. Further, it can be classified under commercial and non commercial energy

commercial energy source

coal, electricity and petroleum are known as commercial energy since the consumer needs to pay its price to buy them

a) coal

coal is the most important source

of energy. There are more than 148790 coal deposits in India. Between 2005-2006, the annual production went up to 343 million tons. India is the fourth-largest coal-producing country and the deposits are mostly found in Bihar, orissa, Madhya pradesh and Bengal

b) oil and Natural Gas

Today oil is considered to be liquid gold and one of the crucial sources of energy in India and the world. oil is mostly used in planes, automobiles, trains and ships. It is mainly found in Assam, Gujarat and Mumbai.

The total production of oil in india was 0.3 million tons in 1950-51, which increased up to 32.4 million tons in 2000-01.

c) Electricity

Electricity is a common form of energy and used for domestic and commercial purposes. It is mainly utilized in electrical appliances like fridge, T.V, washing machine and air conditioning

The major sources of power generation are mentioned below

I. Nuclear power
II. Thermal power
III. Hydro-electric power

1. Thermal power

Thermal power is generated at various power stations by means of oil and coal. It is a vital source of electric current and its share in the total capacity of the

national in 2004-05 was 70 percent

II. Hydroelectric power

Hydroelectric power is produced by constructing dams above flowing rivers like damodar valley project and Bhakra Nangal project. The installed capacity of hydroelectric power was 558.4 MW in 1950-51 and went up to 19600 MW in 2004-05

III. Nuclear power

The fuel used in nuclear power plants is uranium, which costs less than coal. Nuclear power plants can be found in Kaiga [Karnataka], Kota [Rajasthan] Narowra [UP] and Kalapakam [Chennai]

Non-commercial energy sources

Generally, the energy sources that are freely available are considered non-commercial energy sources. The example of non-commercial energy sources are straw, dried dung, firewood.

advantages of conventional energy sources

conventional energy sources are also known as a non-renewable energy source and have the following advantages

The efficiency of the energy source is high

This energy source is a well-known source

The production expenses are low

disadvantage of conventional energy sources

Following are the two disadvantage of conventional energy sources

It is not environmentally friendly when used on a longer run, can deplete soon.

Non-conventional Sources of Energy

These non-conventional sources are also known as renewable sources of energy. Examples include Solar energy, bioenergy, tidal energy and wind energy

I. Solar Energy

This is the energy that is produced by sunlight. The photovoltaic cells are exposed to sunlight based on the form of electricity that needs to be produced. The energy is utilized for cooking and distillation of water.

II. Wind Energy

This kind of energy is generated by harnessing the power of wind and mostly used in operating water pumps for irrigation purposes. India stands as the second-largest country in the generation of wind power

III. Tidal Energy

The energy that is generated by exploiting the tidal waves of the sea is known as tidal energy. This source is yet to be tapped due to the lack of cost-effective technology.

advantages of non-conventional sources of energy.

Below are some advantage of non-conventional sources of energy

These sources of energy are environmentally friendly

They are inexhaustible

They are easy to operate

Importance of the non-conventional source of energy

Non-conventional sources of energy are considered to be important as they are renewable, pollution-free, availability of them is in abundance, and they are environmentally friendly.