Chapter: 1.1 Energy Scenario

Part-I: Objective type questions and answers

1.	The energy sources, that are either found or stored in nature are a) Secondary Energy Sources b) Primary Energy Sources c) both (a) and (b) d) none of the above
2.	Which of the following is commercial energy source? a) Electricity b) Coal c) Oil d) All the above
3.	Inexhaustible energy sources are known as a) commercial Energy b) renewable Energy c) primary energy d) secondary energy
4.	Which country has the largest share of the global coal reserves? a) Russia b) China c) USA d) India
5.	The % of gas reserves for Russian Federation, when compared to world reserve is considered at a) 10 % of World reserve b) 20 % of World reserve c) 30 % of World reserve d) 40 % of World reserve
6.	World oil reserves are estimated to last over a) 45 years b) 60 years c) 200 years d) 75 years
7.	World gas reserves are estimated to last over a) 45 years b) 65 years c) 200 years d) 75 years
8.	The global primary energy consumption (2002) was equivalent to a) 21,842 Mtoe b) 15,360 Mtoe c) 9405 Mtoe d) 12,396 Mtoe
9.	The primary energy consumption of India is a) 1/29 of the world b) 1/16 of the world c) 1/7 of the world d) 1/20 of the world
10.	The world average per person energy consumption is equivalent to _____tonnes of coal a) 3 b) 2.2 c) 4.5 d) 1.0
11.	Which fuel dominates the energy mix in Indian energy scenario?– a) Oil b) Natural gas c) Coal d) Nuclear
12.	The fourth largest producer of coal and lignite in the world is _____ (**EM/EA)** a) USA b) Russia c) India d) China
13.	Indian per capita energy consumption is ____ of the world average. a) 4% b) 20% c) 1% d) 10%

14.	Energy consumption per unit of GDP is called as: a) Energy Ratio b) Energy intensityc) Per capita consumption d) None
15.	India's energy intensity is ___ times of world average. a) 1.5 b) 2.5 c) 3.6 d) 10
16.	India's current percentage peak demand shortage for electricity is: **(EM/EA)** a) 1% b) 3% c) 10% d) 14%
17.	Name the Act, which is proposed to bring the qualitative transformation of the electricity sector: a) Regulatory Commission Act 1998 b) Indian Electricity Act 1910 c) Supply Act 1948 d) Electricity Act 2003
18.	Which of the following is highest contributor to the air pollution? a) Carbon Monoxide b) Hydro Carbons c) Sulphur Oxides d) Particulates
19.	Projected temperature increase in degree centigrade 2100 due to climate change is: a) 2 b) 4 c) 6 d) 8 Increase
20.	Acid rain is caused by the release of the following components from combustion of fuels. a) SO_x and NO_x b) SO_x and CO_2c) CO_2 and NO_x d) H_2O

Part – II: Short type questions and answers

1.	Classify the types of the energy available on the earth? Energy can be classified into several types based on the following criteria as: • Primary and Secondary energy • Commercial and Non commercial energy • Renewable and Non-Renewable energy
2.	Briefly mention about primary sources of energy? Primary energy sources are those that are either found or stored in nature. Common primary energy sources are coal, oil, natural gas and biomass. Other primary energy sources found on earth include nuclear energy from radioactive substances, thermal energy stored in earth's interior and potential energy due to earth's gravity.
3.	What is renewable energy and list at least three renewable energy sources? Renewable energy is the energy obtained from sources that are essentially inexhaustible but has limited potential for exploitation. Examples of renewable resources include wind power, solar power, geothermal energy, tidal power and hydro electric.
4.	Name the five states in India, where coal production is concentrated. Coal production is concentrated in Andhra Pradesh, Bihar, Madhya Pradesh, Maharashtra, Orissa, Jharkhand and West Bengal

5.	Define Reserve to 'Production Ratio'? Ans. It is the ratio of fuel reserves remaining at the end of the year to the production in that year.
6.	How do you define 'Final Energy Consumption'? Final energy consumption is the actual energy demand at the user end. This is the difference between primary energy consumption and the losses that takes place in transport, transmission, distribution and refinement.
7.	Why developed countries have been able to maintain low ratio of energy to GDP? This is because they have been able to focus on two important issues like, energy efficiency and lower energy intensity routes.
8.	What is Energy intensity and what it indicates? Energy intensity is energy consumed per unit of GDP and it indicates the development stage of that country.
9.	Mention the parameters on which the high tension and low tension consumers are charged by electricity boards. Generally, high tension consumers are charged based on both demand (kVA) and energy (kWh) while the low tension consumers are charged based on only energy consumed (kWh).
10.	What is main objective of Electricity Act, 2003? The main objective of Electricity Act, 2003 is to create liberal framework of development for the power sector by distancing Government from regulation.
11.	List down the major sources of pollutants in Air? The major sources of pollutants in Air are fuel combustion in transport, industry, forest fires, and solid waste disposal.
12.	What is greenhouse gas effect? The heating up of earth's atmosphere due to trapping of long wavelength infrared rays by the carbon di- oxide layer in the atmosphere is called green house effect.
13.	What are the key greenhouse gases driving global warming? Carbon-dioxide, CFC, methane, Ozone, Nitrous oxide etc.
14.	What are the two major anthropogenic causes for the generation of Carbon dioxide in the atmosphere? 1. Combustion of fossil fuels 2. Changes in land use
15.	List down at least three effects of acid rain? The effects of acid rains are as follows: ♦ Acidification of lakes, streams and soils. ♦ Direct and indirect affects (release of metals, for e.g. aluminium which washes away plant nutrients ♦ Killing of wild life. ♦ Decay of building materials, paints, statues and sculptures. ♦ Health problems (respiratory, burning skin and eyes)

16.	What is the basis for aim of Energy Security for any country? The basic aim of energy security for a nation is to reduce its dependency on the imported energy sources for its economic growth.
17.	Differentiate between Energy Conservation and Energy Efficiency? Energy conservation is achieved when growth of energy consumption is reduced, measured in physical terms. Whereas the energy efficiency is achieved when energy intensity in a specific product, process or area of production is reduced without affecting output, consumption or comfort levels.
18.	How a nation benefits from Energy Efficiency programs? Through energy efficiency, energy imports will be reduced, which helps in conserving limited resources and lead to improved energy security.
19.	How Bureau of Energy Efficiency (BEE) facilitates energy efficiency programs in India? BEE facilitates Energy efficiency programs in India by preparing standards and labels of appliances, developing a list of designated consumers, specifying certification and accreditation procedures, preparing building codes, maintaining central EC fund and undertaking promotional activities in coordination with centre and state level agencies.
20.	List down at least five designated consumers specified by the BEE? Aluminium, Fertilizers, Iron and Steel, Cement, Pulp and Paper etc.,

Part-III: Long type questions and answers

1.	List the strategies for better energy security of the nation? Some of the strategies that can be used to meet future challenges to Nation's energy security are: • Building stockpiles • Diversification of energy supply sources • Increased capacity of fuel switching • Demand restraint • Development of renewable energy sources • Energy efficiency • Sustainable development
2.	Mention some of the long-term energy strategies available for the better energy secured nation? ➢ Efficient generation of energy resources • Efficient production of coal, oil and natural gas • Reduction of natural gas flaring ➢ Improving energy infrastructure • Building new refineries • Creation of urban gas transmission and distribution network

	• Maximizing efficiency of rail transport of coal production. • Building a new coal & gas fired power stations. • Maximizing efficiency of rail transport of coal production. • Building new coal and gas fired power stations. ➢ Enhancing energy efficiency • Improving energy efficiency in accordance with national, socio-economic, and environmental priorities • Promoting of energy efficiency and emission standards • Labeling programmes for products and adoption of energy efficient technologies in large industries ➢ Deregulation and privatization of energy sector • Reducing cross subsidies on oil products and electricity tariffs • Decontrolling coal prices and making natural gas prices competitive • Privatization of oil, coal and power sectors for improved efficiency. ➢ Investment legislation to attract foreign investments. • Streamlining approval process for attracting private sector participation in power generation, transmission and distribution
3.	How do an Industry, nation and globe would benefit from energy efficiency programs? Energy efficiency benefits for industry, nation and globe are as follows: **Industry**: • Reduced energy bills • Increased competitiveness • Increased productivity • Improved quality • Increased profits **Nation**: • Reduced energy imports • Avoided costs can be used for poverty reduction • Conservation of limited resources • Improved energy security **Globe**: • Reduced GHG and other emissions • Maintains a suitable environment
4.	How energy pricing is done in India? *Coal*: Grade wise basic price of coal at the pithead excluding statutory levies for run-of-mine (ROM) coal are fixed by Coal India Ltd from time to time. The pithead price of coal in India compares favourably with price of imported coal. In spite of this, industries still import coal due to its higher calorific value and low ash content. *Oil*: As part of the energy sector reforms, the government has attempted to bring prices for many of the petroleum products (naphtha, furnace oil, LSHS, LDO and bitumen) in line with international prices. The most important achievement has been the linking of diesel prices to international prices and a reduction in subsidy. However, LPG and kerosene, consumed mainly by domestic sectors, continue to be heavily subsidised. Subsidies and cross-subsidies have resulted in serious distortions in prices,

	as they do not reflect economic costs at all in many cases. *Natural Gas*: The government has been the sole authority for fixing the price of natural gas in the country. It has also been taking decisions on the allocation of gas to various competing consumers. *Electricity*: Electricity tariffs in India are structured in a relatively simple manner. While high tension consumers are charged based on both demand (kVA) and energy (kWh), the low-tension (LT) consumer pays only for the energy consumed (kWh) as per tariff system in most of the electricity boards. In addition to the base tariffs, some of the State Electricity Boards have additional recovery from customers in form of fuel surcharges, electricity duties and taxes.
5.	Briefly describe the economic reforms in Coal, oil and natural gas and electricity sectors. Since the initiation of economic reforms in India in 1991, there has been a growing acceptance of the need for deepening these reforms in several sectors of the economy, which were essentially in the hands of the government for several decades. It is now been realized that if substance has to be provided to macroeconomic policy reform, then it must be based on reforms that concern the functioning of several critical sectors of the economy, among which the infrastructure sectors in general and the energy sector in particular, are paramount. **Coal** The government has recognized the need for new coal policy initiatives and for rationalization of the legal and regulatory framework that would govern the future development of this industry. One of the key reforms is that the government has allowed importing of coal to meet our requirements. Private sector is now allowed to participate in the extraction and marketing of coal. The ultimate objective of some of the ongoing measures and others under consideration is to see that a competitive environment is created for the functioning of various entities in this industry. This would not only bring about gains in efficiency but also effect cost reduction, which would consequently ensure supply of coal on a larger scale at lower prices. Competition would also have the desirable effect of bringing in new technology, for which there is an urgent and overdue need since the coal industry has suffered a prolonged period of stagnation in technological innovation. **Oil and Natural Gas** Since 1993, private investors have been allowed to import and market liquefied petroleum gas (LPG) and kerosene freely; private investment is also been allowed in lubricants, which are not subject to price controls. Prices for naphtha and some other fuels have been liberalized. In 1997 the government introduced the New Exploration Licensing Policy (NELP) in an effort to promote investment in the exploration and production of domestic oil and gas. In addition, the refining sector has been opened to private and foreign investors in order to reduce imports of refined products and to encourage investment in downstream pipelines. Attractive terms are being offered to investors for the construction of liquefied natural gas (LNG) import facilities. **Electricity** Following the enactment of the Electricity Regulatory Commission Legislation, the Central Electricity Regulatory Commission (CERC) was set up, with the main objective of regulating the Central power generation utilities. State level regulatory bodies have also been set up to set tariffs and promote competition. Private investments in power generation were also allowed. The State SEBs were asked to switch over to separate Generation, Transmission and Distribution corporations. While, India currently does not have a unified national power grid, the country plans to link the SEB grids eventually, and has set up a state company, Powergrid, to oversee the unification.