Sources of Energy

Multiple Choice Questions

- 1. Which one of the following does not relate to the solar energy?
 - (a) Nuclear energy
- (b) Wave energy
- (c) Wind energy
- (d) Tidal energy
- The major cause of environmental pollution is 2. the use of
 - (a) Biomass energy
- (b) Fossil fuels
- (c) Ocean energy
- (d) Hydrogen as a fuel
- 3. The coal reservoirs in our country are expected to last for another
 - (a) 1000 years
- (b) 250 years
- (c) 400 years
- (d) 500 years
- 4. A tree usually matures in more than
 - (a) 15 years
- (b) 100 years
- (c) 50 years
- (d) 60 years
- The energy received by the Earth directly 5. from the Sun is approximately which percentage of the Sun's total energy output?
 - (a) 0.0000005%
- (b) 0.00005%
- (c) 1%
- (d) 0.001%
- The approximate value of solar constant is 6.
 - (a) 1.4 kW/m^2
- (b) 1.4 kW/min
- (c) 1.4 kJ/m^2
- (d) 1.4 kW/min
- 7. The percentage of the solar energy reaching the Earth received by the plants is
 - (a) 10%
- (b) 0.1%
- (c) 5%
- (d) 1%
- 8. An example of renewable source of energy is
 - (a) Sun
- (b) Natural gas
- (c) Coal
- (d) Petroleum
- 9. What percentage of solar energy that strikes the periphery of the Earth is trapped by Earth?
 - (a) 15%
- (b) 100%
- (c) 75%
- (d) 47%
- 10. The fraction of sunlight which consists of infrared radiation is

- 11. The heat in the sunlight is due to
 - (a) visible radiation
 - (b) entire solar radiation
 - (c) ultra-violet radiation
 - (d) infra-red radiation
- 12. Efficiency of modem solar cells is
 - (a) 60%
- (b) 25%
- (c) 100%
- (d) 90%

- 13. The production of solar cookers on a commercial scale in India began in
 - (a) 1962
- (b) 1980
- (c) 1950
- (d) 1970
- 14. A good fuel is one which possesses
 - (a) moderate ignition temperature
 - (b) high ignition temperature
 - (c) high calorific value (d) both (a) and (c)
- **15**. Which of the following variety of coal contains the highest percentage of carbon?
 - (a) Anthracite
- (c) Lignite
- (d) Bituminous
- 16. The main constituent of natural gas is
 - (a) hydrogen
- (b) oxygen
- (c) butane
- (d) methane
- LPG consists mainly of
 - (a) butane

17.

- (b) liquid hydrogen
- (c) methane
- (d) ethane
- The fraction of the total solar energy received 18. by the Earth is
 - (a) one billionth
- (b) one millionth
- (c) one hundredth
- (d) one thousandth
- 19. The approximate temperature of the surface of the Sun is
 - (a) 6000°C
- (b) 10,000°C
- (c) 3000°C
- (d) 30,000°C
- 20. Which of the following is a primary fuel?
 - (a) Petrol
- (b) Diesel
- (c) Kerosene
- (d) Wood
- 21. Which of the following is a secondary fuel?
 - (a) Diesel
- (b) Natural gas
- (c) Wood
- (d) Coal
- 22. The device which harnesses solar energy directly is
 - (a) Solar cell
- (b) Biogas plant
- (c) Coal gas plant
- (d) Natural gas plant
- 23. U-235 content in natural uranium is (a) 99.2%.
 - (b) 100%
 - (c) 0.006%
- (d) 0.714%
- 24. Energy released in the fission of one nucleus of U-235 is about
 - (a) 200 MeV
- (b) 2000 MeV
- (c) 1 MeV
- (d) 20 MeV
- 25. Energy released in the fission of 1 kg of U-235 is equivalent to energy obtained from burning of coal weighing
 - (a) 2500 ton
- (b) 25000 ton
- (c) 25 ton

26.

- (d) 250 ton One MeV of energy is equivalent to
- (a) $1.6 \times 10^{13} J$
- (b) $1.6 \times 10^{19} J$
- (c) $1.6 \times 10^{-13} J$
- (d) $1.6 \times 10^{-19} J$

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13	30.		$_{13}$ $\Lambda \iota$ and $_{52}$ Ie	47		-
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27.

One unified atomic mass unit (u) is equivalent

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- n increase in the osphere?
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- nal, wind, and enewable sources enewable because
 - ly into heat and
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- energy source nost energy?

	(a) wind	(b) solar		(a) the core of the earth
	(c) geothermal	(d) hydropower		(b) the commercial nuclear reactor
48.	How much of the	energy in burning coal		(c) the atmosphere of the sun
	reaches the consume	er as electricity		(d) the eruption of a volcano
	(a) 1/3 (one-third)	(b) 1/2 (one-half)		
	(c) 3/4 (three-quarte	rs) (d) 9/10 (nine-tenths)		EILL IN THE DIANIZO
49.	In a nuclear power p	lant, uranium atoms		FILL IN THE BLANKS
	(a) combine and give	off heat energy	1.	An area of 5 m ² receive solar energy for
	(b) split and give off	heat energy	1.	
	(c) burn and give off	heat energy	2	2 hour if the solar constant is 1.4 kW m^{-2} .
	(d) split and give off	electrons	2.	A heap of wet wood if burnt, produces lot of
50.	A substance which p	produces a log of heat on		smoke and leaves a residue. This residue is
	burning is called	_•	_	called
	(a) oxidizing agent	(b) biogas	3.	Biogas is a mixture of
	(c) biomass	(d) fuel	4.	The device used for obtaining energy from
51.		the earth's surface by the		flowing water is called
		ganic matter is called	5.	is the best fuel in terms of energy
	(a) organic fuel	(b) biogas		liberated per gram of fuel.
	(c) fossil fuel	(d) underground fuel	6.	Coal gas is a mixture of and
52.	• •	owing causes the least	7.	The efficiency of the modem solar cells from
	pollution when burn	_		selenium is up to
	(a) Petrol	(b) Diesel	8.	Fly ash is used to make
	(c) Coal	(d) Natural gas	9.	Bright black variety of coal containing the
53.	• •	ed by a hot furnace are		highest carbon content is
.	(a) ultra-violet	(b) infra-red	10.	The combustible components of biogas
	(c) X-rays	(d) microwaves		are and
54.	• •	ng is not combustible?	11.	is a complex mixture of a large number
J	(a) oxygen	(b) hydrogen		of organic compounds.
	(c) butane	(d) methane	12.	Commercial unit of crude oil is
55.		are used in the sea to	13.	Renewable sources of energy are also called
JJ.	harness	are asea in the sea to		sources of energy.
	(a) tidal energy		14.	1 calorie is Joule.
	(b) wave energy		15.	The ratio of S.I. units to CGS units of energy is
	(c) hydel energy		16.	Crude petroleum oil is refined by the process
	(d) energy from OTE	C nower plant		known as
56.	·	I mixed with gases in the	17.	is obtained by distinctive distillation of
J 0.	mantle of the earth i	_		wood.
	(a) core	(b) lava	18.	is added to LPG for detection of
	(c) geyser	(d) magma		leakage.
57.		first carried out critical	19.	The main component of LPG is
<i>37</i> .	nuclear fission reacti		20.	Calorific value of natural gas is
	(a) Otto Hahn	(b) Enrico Fermi		
	(c) Hans Bethe			TRUE OR FALCE
58.		(d) Einstein first underground nuclear		TRUE OR FALSE
50.	•	inst underground nuclear	1	A combustible substance serves as the food
	device at	(h) Danahi	1.	for fire.
	(a) Kota	(b) Ranchi	2.	Wood contains more moisture and volatile
ΕO	(c) Jaipur	(d) Pokhran	۷.	impurities than charcoal.
59.	The energy of a theri		3.	The solar energy is always available uniformly
	(a) 0.025 eV	(b) 0.25 eV	э.	all the time and at all places.
	(c) 0.0025 eV	(d) 0.00025 eV		an the time and at an places.

4.

Respiration is a slow combustion process.

happens

60.

Nuclear

spontaneously in

fusion

reactions

- **5.** The excessive use of solar energy will pollute the air.
- **6.** Petroleum is a renewable source of energy.
- **7.** Coal gas in an example of primary fuel.
- **8.** Aerobic thermal degradation of wood is called carbonization.
- One atom of uranium produces 10 times the energy produced by the combustion of an atom of carbon from coal.
- **10.** The approximate value of solar constant is 1.4 J per second.
- **11.** Bioenergy is the solar energy stored by the plants through photosynthesis.
- **12.** Sources of energy which are inexhaustible are called chewable sources of energy.
- **13.** The solar energy is the cause of wind and storm, ocean waves, rain and snowfall.
- **14.** Tidal energy is an exhaustible and non-renewable source of energy.
- **15.** Geothermal energy carried by natural geysers is utilized for generating electricity.
- **16.** The earth surface absorbs about 34% of the total solar radiation reaching the top of the atmosphere.
- 17. The minimum wind velocity for a wind mill to function is 15 km h^{-1} .
- **18.** Natural gas is not an environment friendly fuel
- **19.** Natural gas mainly consist of butane.
- **20.** LPG is a byproduct of petroleum refining.

Matrix Match Type

In this section each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in Column-I have to be matched with statements (p, a, r, s) in Column-II.

1.

<u>-</u> '	
Column I	Column II
(A) Petroleum	(p) Plant nutrient
(B) Crude oil	(q) Wind mill
(C) Spent dung distillation	(r) Fractional
(D) Moving air	(s) Kerosene

2.

Column I	Column II
(A) Sewage	(p) Charcoal
(B) Wood	(q) Compressed natural gas
(C) Hydropower	(r) Methane gas
(D) Clean fuel	(s) Dam

3.

••			
Column II			
(p) Involves weak			
(q) Involves conversion of			
matter into energy			
(r) Atoms of higher atomic			
number an used			
(s) Atoms of lower atomic			
number are used			

4.

Column I	Column II
(A) α – decay	(p) $_{92}^{235}U +_{0}^{1}n \rightarrow$
	$\int_{56}^{141} Ba + \int_{36}^{92} Kr + 3 \left(\int_{0}^{1} n \right) + Q$
(B) β – decay	(q) ${}_{1}^{3}H + {}_{1}^{2}H \rightarrow {}_{2}^{4}He + Q$
(C) Nuclear fission	(r) $_{88}^{230}Th \rightarrow_{88}^{226}Ra + {}_{2}^{4}He + Q$
(D) Nuclear fusion	(s) ${}^{137}_{55}Cs \rightarrow {}^{137}_{56}BaBa$
	$+e^-+\overline{V}+Q$

5.

Column I	Column II
(A) Coke	(p) Methane
(B) CNG	(q) Candles
(C) Paraffin wax	(r) Gasoline
(D) Petrol	(s) Carbon

ASSERTION & REASON QUESTIONS

Directions: In each of the following questions, a statement of Assertion (A) is given followed by a corresponding statement of Reason (R) just below it. Of the statements, mark the correct answer as

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If assertion is false but reason is true.
- **1. Assertion:** Biomass 'is not considered as an effective source of energy.

Reason: Biomass contains large proportions of water as moisture.

2. Assertion: Nuclear forces are independent of charges.

Reason: Nuclear force is not a central force.

3. Assertion: Binding energy (or mass defect) of hydrogen nucleus is zero.

Reason: Hydrogen nucleus contain only one nucleon.

4. Assertion: The rest mass energy of a nucleus is smaller than the rest mass energy of its constituent nucleons in Free State.

Reason: Nucleons are bound together in a nucleus.

5. Assertion: U²³⁵ nucleus, by absorbing a slow neutron undergoes nuclear fission with the evolution of a significant quantity of heat.

Reason: During nuclear fission a part of the original mass of U²³⁵ is lost and gets converted into heat.

6. Assertion: Charcoal needs lesser preheating than wood for burning.

Reason: The ignition temperature of charcoal is high.

7. Assertion: Aerobic thermal degradation of wood is termed as carbonization.

Reason: Wood under the affect of high temperature and pressure and p the absence of air gets converted in to coal.

8. Assertion: Non-renewable sources of energy are also called exhaustible source of energy.

Reason: Non-renewable sources of energy do not get exhausted by norm a human activity.

9. Assertion: Gases like carbon dioxide methane, nitrous oxide etc. are called greenhouse gases.

Reason: They are not responsible for the warming of the planet,

10. Assertion: Chemical reaction is a kind of nuclear reaction.

Reason: No new atom is formed during the reaction.

11. Assertion: Nuclear radiations are harmful because of their high ionization and penetrating powers.

Reason: If nuclear radiation fall on us, the molecules are ionised which disrupts the biochemical process.

12. Assertion: Nuclear fusion produce more energy than nuclear fission

Reason: The technical problems of achieving controlled fusion are however very much greater than with fission.

13. Assertion: The sun's energy comes from the fusion of hydrogen nuclei in to helium nuclei, which is going on inside it, all the time.

Reason: The nuclear fusion reaction taking place in the sun which releases a tremendous amount of energy is the fusion of 4 hydrogen

- atom nuclei to form a bigger nucleus of helium atom.
- **14. Assertion:** Wind energy is an environment friendly and efficient source of energy.

Reason: Wind energy farms can be established everywhere.

15. Assertion: Solar cells are used to convert solar energy in to electrical energy.

Reason: The radiant heat present in solar energy does not change in to electrical energy.