

Part I

Comprehension ability (30 marks)

Questions 1 to 6: Read the passage below and answer the questions 1 to 6 in 4-5 sentences.

The radiation from the sun – solar energy – produces heat, causing chemical reactions, or generating electricity. The amount of solar energy falling on Earth is in excess of the world's current and future energy requirements. There is a potential to satisfy all future energy needs, if this highly diffused source can be suitably harnessed. Current century sees solar energy as an increasingly attractive source of renewable energy because of its inexhaustible supply and its non-polluting character. This is in stark contrast to the finite fossil fuels – coal, petroleum, and natural gas. The sun is an extremely powerful source of energy, and sunlight is by far the largest source of energy received by Earth, but its intensity at Earth's surface is quite low. This is because of the enormous radial spreading of radiation from the distant sun. A relatively minor additional loss is due to Earth's atmosphere and clouds, which absorb or scatter as much as 54 percent of the incoming sunlight. The sunlight that reaches the ground consists of nearly 50 percent visible light, 45 percent infrared radiation, and smaller amounts of ultraviolet and other forms of electromagnetic radiation. The potential for solar energy is enormous, since about 200,000 times the world's total daily electricity-generating capacity is received by Earth every day in the form of solar energy. Unfortunately, though solar energy itself is free, the high cost of its collection, conversion, and storage still limits its exploitation in many places. Solar radiation can be converted either into thermal energy (heat) or into electrical energy, though the former is easier to accomplish.

Electricity generation

Solar power plants use two technologies. One of them – Photovoltaic (PV) systems – use solar panels, either on rooftops or in ground-mounted solar farms, converting sunlight directly into electric power. Solar radiation may be converted directly into electricity by solar cells (photovoltaic cells). In such cells, a small electric voltage is generated when light strikes the junction between a metal and a semiconductor (such as silicon) or the junction

between two different semiconductors. The power generated by a single photovoltaic cell is typically only about two watts. By connecting large numbers of individual cells together, however, as in solar-panel arrays, hundreds or even thousands of kilowatts of electric power can be generated in a solar electric plant or in a large household array. The array of a photovoltaic power system, or PV system, produces direct current (DC) power which fluctuates with the sunlight's intensity. For practical use this usually requires conversion to certain desired voltages or alternating current (AC), using inverters.

Small photovoltaic cells that operate on sunlight or artificial light have found major use in low-power applications—as power sources for calculators and watches, for example. Larger units have been used to provide power for water pumps and communications systems in remote areas and for weather and communications satellites. Classic crystalline silicon panels and emerging technologies using thin-film solar cells, including building-integrated photovoltaics, can be installed by homeowners and businesses on their rooftops to replace or augment the conventional electric supply. In certain applications such as satellites, lighthouses, or in developing countries, batteries or additional power generators are often added as back-ups. Such stand-alone power systems permit operations at night and at other times of limited sunlight.

The second technology is the Concentrated solar power (CSP, also known as "concentrated solar thermal") plants that use solar thermal energy to make steam, which is thereafter converted into electricity by a turbine. Concentrated solar power plants employ concentrating, or focusing, collectors to concentrate sunlight received from a wide area onto a small blackened receiver, thereby considerably increasing the light's intensity in order to produce high temperatures. The arrays of carefully aligned mirrors or lenses can focus enough sunlight to heat a target to temperatures of 2,000 °C (3,600 °F) or more. This heat can then be used to operate a boiler, which in turn generates steam for a steam turbine electric generator power plant. For producing steam directly, the movable mirrors can be arranged to concentrate large amounts of solar radiation upon blackened pipes through which water is circulated and thereby heated.

A wide range of concentrating technologies exists: among the best known are the parabolic trough, the compact linear Fresnel reflector, the dish Stirling, and the solar power tower. A parabolic trough consists of a linear parabolic reflector that concentrates light onto a receiver positioned along the

reflector's focal line. The receiver is a tube positioned along the focal points of the linear parabolic mirror and is filled with a working fluid. The reflector is made to follow the sun during daylight hours by tracking along a single axis. Compact Linear Fresnel Reflectors are CSP-plants which use many thin mirror strips instead of parabolic mirrors to concentrate sunlight onto two tubes with working fluid. This has the advantage that flat mirrors can be used which are much cheaper than parabolic mirrors, and that more reflectors can be placed in the same amount of space, allowing more of the available sunlight to be used. The Stirling solar dish combines a parabolic concentrating dish with a Stirling engine which normally drives an electric generator. The advantages of Stirling solar over photovoltaic cells are higher efficiency of converting sunlight into electricity and longer lifetime. A solar power tower uses an array of tracking reflectors (heliostats) to concentrate light on a central receiver atop a tower.

Many industrialized nations have installed significant solar power capacity into their grids to supplement or provide an alternative to conventional energy sources. An increasing number of less developed nations have turned to solar energy to reduce dependence on expensive imported fuels. Long distance transmission allows remote renewable energy resources to displace fossil fuel consumption.

1. What limits the exploitation of solar power?
2. What is meant by the statement that “solar radiation may be converted directly into electricity by solar cells”?
3. Where are the photovoltaic cells used?
4. Why concentrated solar power is named such?
5. What is the core idea of concentrated solar power technologies?
6. Can the dependency on non-renewable energy be ever decreased?

Part II

English Language Proficiency (30 marks)

Questions 1 to 6: Choose the most appropriate Prepositions for the following.

1. The road runs _____ hill and plain.

- A. at
- B. on
- C. until
- D. through

2. She has sprung _____ noble parentage.

- A. off
- B. on
- C. to
- D. from

3. Never try to divest your daughter _____ her share of property.

- A. of
- B. to
- C. with
- D. from

4. Outer core is _____ the mantle.

- A. off
- B. on
- C. below
- D. between

5. The spirited officer did not submit, but threw _____ his office.

- A. with
- B. upon
- C. up
- D. on

6. He is stuck _____ the sea and the devil.

- A. among
- B. on
- C. below
- D. between

Questions 7 to 12: Pick up most appropriate word for the blank.

7. Fan : Air :: Stove : _____

- A. Cook
- B. Kerosene
- C. Heat
- D. Boil

8. Slight : Hurt :: Lag : _____

- A. Braggart
- B. Tardiness
- C. Heft
- D. Haste

9. Guileless : Cunning :: Shameless : _____

- A. Modesty
- B. Guile
- C. Winning
- D. Shameful

10. _____ : Deciduous :: Pine : Coniferous

- A. Tree
- B. Oak
- C. Forest
- D. Cone

11. Folderol : _____ :: Benevolence : Charity

- A. Cash
- B. Greed
- C. Nonsense
- D. Event

12. Abandon : Reclaim :: Abate : _____

- A. Abolish
- B. Debate
- C. Rise
- D. Level

Questions 13 & 18: Read the following and choose the most appropriate word (A, B, C, or D) to fill the blanks below.

Through the centuries, coffee has become ___13___ popular. It is the world's most ___14___ traded tropical agricultural commodity, according to the International Coffee Organization (ICO). Some 70 countries ___15___ coffee, in 2010 global coffee sector employment was about 26 million people in 52 producing countries and ___16___ of 93.4 million bags in 2009-10 were worth an estimated \$15.4 billion. Global production for 2014-15 is forecast at 149.8 million bags, according to a December 2014 USDA analysis.

The worldwide demand and cultural ___17___ of coffee as more than a morning ritual made it an easy choice to include on our list of foods that changed the world. Consider it a caffeine jolt, perhaps, but it took coffee ___18___ centuries than the other foods we've explored so far in our series

— grapes, olives, or tea — to change cultures and regional and global economies.

13. A. increase B. increased C. have increased D. increasingly
14. A. widen B. widely C. wider D. in wide
15. A. produce B. product C. produced D. of production
16. A. exported B. exporting C. exports D. export
17. A. popular B. popularity C. was popular D. have popular
18. A. few B. fewer C. fewest D. in few

Questions 19 to 24: Rewrite the sentences correctly.

19. Shyam, that you met the other day, is my uncle.
20. I stayed with my friend Lila, where Aunt you met the other day.
21. I have seen her yesterday.
22. Neither of the girls have returned.
23. He discussed about the whole matter with them.
24. He is intelligent but he lacks of motivation.

Questions 25 to 27: Select the word that is Closest in meaning to the given word, from among the choices and write down the answers.

25. *Adjourn*
- A. Decide
- B. Hasten
- C. Postpone
- D. Continue

26. *Sway*

- A. Control
- B. Pressure
- C. Deviation
- D. Weight

27. *Sinister*

- A. Serious
- B. Threatening
- C. Gloomy
- D. Sorrowful

Questions 28 to 30: Select the word that is opposite in meaning to the given word, from among the choices and write down the answers.

28. *Mesmerize*

- A. Disenthral
- B. Spellbind
- C. Double-cross
- D. Rivel

29. *Obvious*

- A. Patent
- B. Tenacious
- C. Dubious
- D. Callous

30. *Probity*

- A. Father
- B. Villainy
- C. Affinity
- D. Probate

Part III

Writing Skills (40 marks)

Write a note on any **two** topics given below in **not more than three-four paragraphs**.

1. Books and reading
2. Life in COVID-19 pandemic
3. Women: Pre and Post Independent India