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PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2022
(Fourth Semester)

Branch – **PHYSICS**

DISCIPLINE SPECIFIC ELECTIVE-II: APPLIED SOLAR ENERGY

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 x 1 = 10)

1 Which among the following is responsible for the absorption of solar radiations on earth's surface?
(i) Ozone (ii) Water Vapours
(iii) Carbon-di-oxide (iv) All of the above

2 Identify the correct answer for global radiation.
(i) direct radiation – diffuse radiation
(ii) direct radiation + diffuse radiation
(iii) direct radiation / diffuse radiation
(iv) diffuse radiation / direct radiation

3 State how we can improve the efficiency of flat plate collectors.
(i) putting a selective coating on the plate
(ii) evacuating the space above the absorber plate
(iii) both (i) and (ii)
(iv) None of the above

4 Which method is used to overcome the heat loss in liquid plate collectors?
(i) by insulation (ii) by casing
(iii) by the transparent cover (iv) from provided tubes

5 The functions of a solar collector is the convert
(i) Solar energy into electricity
(ii) Solar energy radiation into magnetic energy
(iii) Solar energy into nuclear energy
(iv) Solar energy into chemical engergy

6 Most widely used solar material is _____
(i) Arsenic (ii) Cadmium
(iii) Silicon (iv) Steel

7 Which of the following major disadvantages do the solar cells have?
(i) Variable power (ii) high cost
(iii) lack of availability (iv) large area requirement

8 Identify the types of driers in use
(i) stationary and rotary (ii) water and steam
(iii) conduction and convection (iv) Direct and indirect

9 Which of the following is used to pump water for irrigation?
(i) Solar furnace (ii) Solar Pump
(iii) Solar power generator (iv) Solar driers

10 A Solar green house is
(i) less expensive
(ii) optimizes the received sunlight and heat
(iii) Provides environmentally controlled plant growth facility
(iv) All of the above

Cont...

SECTION - B (35 Marks)

Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 7 = 35)

11 a Explain the importance of solar energy and the energy scenario in India.

OR

b With a neat diagram, discuss the design of a sunshine recorder.

12 a Discuss in detail about the estimation of direct and diffused radiation during days with no clouds.

OR

b State the thermal losses of a solar collector and explain them briefly.

13 a Classify the orientation systems, made on the basis of manual and mechanized operations.

OR

b Interpret the meaning of sun tracking.

14 a How are the Solar dryers useful in the heating and drying of agricultural products? Give an example.

OR

b Fabricate a Pn junction and explain its working.

15 a Explain the application of solar energy in space.

OR

b Explain about solar green house.

SECTION - C (30 Marks)

Answer any **THREE** Questions
ALL Questions Carry **EQUAL** Marks (3 x 10 = 30)

16 Construct a Pyrhelio meter and explain its working. Draw the necessary diagram.

17 Describe a solar water heater with a neat diagram and explain installation details.

18 Classify the concentrating collectors and based on these classifications, explain the possible focusing system configuration.

19 Critically analyse the advantages of photo-voltaic solar energy conversion and derive its conversion efficiency.

20 Explain the design of a solar pump and discuss in its system components.

Z-Z-Z END