

Total No. of Printed Pages:3

**SUBJECT CODE NO: - Y-2168**  
**FACULTY OF SCIENCE AND TECHNOLOGY**  
**B.Sc. (PATTERN-2013) (T.Y SEM VI)**  
**Examination April / May - 2024**

**Physics Paper-XX (Non -Conventional Energy Sources and Optical Fiber)**

[Time: 1:30 Hours]

[Max. Marks:50]

Please check whether you have got the right question paper.

N. B

- 1) Solve all questions.
- 2) Draw neat diagram whenever necessary

- Q.1**
- |           |   |           |
|-----------|---|-----------|
| <b>a)</b> | <b>Discuss in brief</b>                                 |           |
|           | (i) Solar energy                      (ii) Hydro-energy |           |
|           | (iii) Ocean energy and      (iv) Geothermal energy      | <b>10</b> |

- |           |  |           |
|-----------|--|-----------|
| <b>b)</b> | Explain in detail, the process of electron-hole pair production by photon absorption in solar cell. Explain operation of solar cell. | <b>10</b> |
|-----------|--|-----------|

OR

- |           |   |           |
|-----------|---|-----------|
| <b>a)</b> | Explain with suitable diagram stepped index mono-mode fiber. Give its advantages and disadvantages. | <b>10</b> |
| <b>b)</b> | Give brief account of OFC testing   | <b>10</b> |

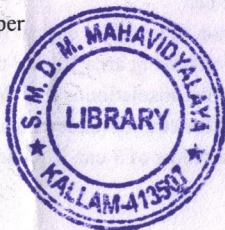
- Q.2**
- |           |  |          |
|-----------|--|----------|
| <b>a)</b> | Describe in detail mono-blade, horizontal axis wind turbine (HAWT)   | <b>5</b> |
| <b>b)</b> | Write a short note on Tapered fiber  | <b>5</b> |
| <b>c)</b> | Write a note on wind turbine. Generator units.   | <b>5</b> |
| <b>d)</b> | Compute the NA of an optical fiber from following data.<br>$\mu_1(\text{core})=1.55$ and $\mu_2(\text{cladding})=1.50$ | <b>5</b> |

OR

- |           |  |          |
|-----------|--|----------|
| <b>a)</b> | Explain the terms open circuit voltage, short circuit current and fill factor of a solar cell.   | <b>5</b> |
| <b>b)</b> | Give reason of losses in optical fiber.  | <b>5</b> |
| <b>c)</b> | A solar cell having area $10^{-2} \text{ m}^2$ produces voltage of 0.5 v and current of 2.5A. If solar insolation is $800 \text{ W/m}^2$ , calculate the efficiency of solar cell. | <b>5</b> |
| <b>d)</b> | Calculate the strain produced in an optical fiber on fiber on bending it through a radius of 3 cm. The radius of cladding is $150 \times 10^{-4} \text{ cm}$                       | <b>5</b> |

## 3. Choose the correct answer.

- Non-conventional sources of energy are \_\_\_\_\_
  - Renewable
  - Eco-friendly
  - Cost effective
  - All the above
- Sun produces energy by \_\_\_\_\_
  - Nuclear fission.
  - Nuclear fusion
  - Both (a) and (b)
  - None of the above
- Wind energy is \_\_\_\_\_
  - Intermittent
  - Clean
  - Useful at remote locations.
  - All of the above
- The output of a typical solar cell is of the order of \_\_\_\_\_
  - 1W
  - 5W
  - 10W
  - 20W
- Which of the following is commonly used material in solar cell?
  - Al
  - Gc
  - Si
  - Cu
- In which of the following are optical fibers commonly used \_\_\_\_\_
  - Communication
  - Musical instruments
  - Rocket technology
  - None of the above
- Optical fiber works on the phenomenon of \_\_\_\_\_
  - Total internal reflection
  - Polarization
  - Diffraction
  - Refraction
- Which optical fiber is preferred for long distance communication & \_\_\_\_\_
  - Step index single mode fiber
  - Graded index multimode fiber
  - Plastic fiber
  - None of the above



9. In OFC, water is prevented from filling in the spaces with \_\_\_\_\_ resistant compounds.

- (a) Moisture (b) Pressure  
(c) Temperature (d) Stress

10. In fabrication of optical fiber, choose the correct order of the following processes \_\_\_\_\_

(a) Drawing of fiber (b) production of pure glass  
(c) Pulling of fiber (d) Conversion of pure glass into preform.

- (a) BADC (b) BDAC  
(c) CADB (d) DBAC

