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**SUBJECT CODE NO:- B-2030**  
**FACULTY OF SCIENCE AND TECHNOLOGY**  
**B.Sc. T.Y (Sem-VI)**  
**Examination November/December- 2022**  
**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 the neat diagram whenever necessary
- Q.1
- a) Discuss in detail 'Biomass as source of non-conventional energy. Give it's merits and demerits' 10
  - b) Explain with suitable diagram the generation of electron-hole pairs in solar cell by photon absorption. 10
- OR
- a) What is optical Fibre? State types of optical fibre. Explain in detail with suitable diagrams 10
  - b) Describe with suitable sketch the external CVD technique of optical fibre fabrication. Give it's characteristics. 10
- Q.2
- a) Give merits of geothermal energy. 05
  - b) Write short note on Halide fibres. 05
  - c) What do you mean by
    - i) Wind farm
    - ii) Propeller
    - iii) Wind mill
    - iv) wind turbine generator unit
 05
  - d) Calculate numerical aperture and acceptance angle for symmetrical fibre having refractive index of core as 3.5 and that of cladding as 3.45 surrounding medium is air ( $\mu_o = 1$ ) 05
- OR
- a) Give merits and demerits of storage batteries 05
  - b) Discuss in brief criteria of optical fibre cable selection 05
  - c) Calculate maximum power of a solar cell giving short circuit current 4A and open circuit voltage 0.6V 05

- d) Estimate the strain produced in optical fibre when it bends along a circumference of 6cm [Given :radius of cladding  $150 \mu\text{m}$ ] 05

Q.3 Choose the correct answer

10

- 1) Ocean tides occurs due to -----
  - a) Gravitational force
  - b) Electrostatic force
  - c) Magnetic force
  - d) Nuclear force
- 2) In fixed dome type digester biogas plant the digester and gas collector are -----
  - a) Enclosed in same chamber
  - b) Enclosed in different chamber
  - c) Connected to each other
  - d) None of these
- 3) PV solar cell's are the standard source of power for -----
  - a) Space vehicles
  - b) submarines
  - c) Radio communication
  - d) None of these
- 4) In intrinsic semiconductors the fermi energy is -----of band gap energy
  - a) One half
  - b) one third
  - c) one fourth
  - d) one fifth
- 5) Optical fibre was invented in year -----
  - a) 1950
  - b) 1970
  - c) 1960
  - d) 1975
- 6) Light is guided within the core of a stepped index fibre by -----
  - a) Refraction
  - b) reflection
  - c) total internal reflection
  - d) diffraction
- 7) For fabrication of highly pure optical fibres which of the following technique is preferred.
  - a) External CVD
  - b) Internal CVD
  - c) AVD
  - d) None of these
- 8) As per the norms OFC should be laid at a depth of -----the road surface.
  - a) 1.5m
  - b) 1m
  - c) 1 feet
  - d) 1.5 feet
- 9) Refractive index of graded index optical fibre -----outwards from the axis.
  - a) Increases gradually
  - b) Decreases gradually
  - c) both a & b
  - d) none of these
- 10) The electrons in the outer most shell of the atom are called as -----
  - a) Free electrons
  - b) Valence electron
  - c) Conduction electrons
  - d) All of the above