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SUBJECT CODE NO:- B-2152
FACULTY OF SCIENCE AND TECHNOLOGY
B.Sc. T.Y (Sem.-VI) Examination OCT/NOV 2019
Physics Paper-XX
(Non -Conventional Energy Sources and Optical Fiber)

[Time: 1:30 Minutes] **[Max. Marks:50]**

Please check whether you have got the right question paper.

N.B i) Solve all questions.
ii) Draw the neat diagram whenever necessary.

Q.1 (a) What is wind turbine? Explain its different parts with suitable diagrams. 10

(b) Describe the elements of simple photovoltaic system and write down its advantages. 10

OR

(a) Explain high purity silica optic fibre used in ultra violet and Infrared regions. 10

(b) Give any two methods of optic fibre fabrication techniques. 10

Q.2 (a)

(i) Write a short note on Ocean energy. 05

(ii) Calculate Wind Power density is $738\ w/m^2$ and Wind Velocity is $12\ m/s$. 05

(b)

(i) Write a short note on stepped index mono mode optic fibre 05

(ii) Calculate the acceptance angle of a optic fibre with core of Refractive index 2.24 and cladding R.I 2.15 when fibre is surrounded by air. 05

OR

(a)

(i) Write short note on optic fibre cables in telephones. 05

(ii) Calculate the frictional coefficient between cable and duct if tensile load is 180 kg and pulling tension is 45 kg at the entrance weight of the cable 100m long is 20 kg. 05

(b)

(i) write short note on electron hole pair generation by photon absorption in a PN junction. 05

(ii) Calculate maximum theotical effiaency of a solar cell if maximum power is 0.85w when solar energy of $1400\ w\ /m^2$ is falling cell area $16\ cm^2$ 05

Q.3 Choose the correct answer 10

1. winds having following speeds are suitable to operate wind turbine.

(a) 2 – 10 m/s
(b) 1 – 5 m/s
(c) 5 – 25 m/s
(d) 0-15 m/s.

2. The current produce by solar cell can be given in terms of photo current diode current and shunt current as

(a) $I_L + I_D - I_{SH}$
(b) $I_L + I_D + I_{SH}$
(c) $I_L - I_D + I_{SH}$
(d) $I_L - I_D - I_{SH}$

3. The acceptance angle of step index fibre of NA 0.35 and core R.I as 1.7 in air is

(a) $15.5°$ (b) $20.8°$ (c) $11.8°$ (d) $18.3°$

4. The Numerical Aperture of optic fibre of core sefraetive index 1.78 and fractional difference between core and cladding R. I is 0.24

(a) 1.532 (b) 1.233 (c) 1.783 (d) 1.921

5. In which of the following there is minimum distortion

(a) Glass fibre
(b) single index fibre
(c) Multimode fibre
(d) Graded index fibre

6. Output of a solar cell is of the order of

(a) 5 w (b) 50 w (c) 1W (d) 0.05w.

7. In graded index multimode fibre the number of modes (N) is proportional to

(a)λ (b)λ^2 (c) $\frac{1}{\lambda}$ (d) $\frac{1}{\lambda^2}$

8. Typical Numerical Aperture of internal CVD method fibre is

(a) 0.56 (b) 0.22 (c) 0.85 (d) 0.75

9. Band width of step index optic fibre is

(a) $500MH_3$ (b) $50H_3$ (c) $50MH_3$ (d) $50KH_3$

10. Which of the following optic fibre exhibits lowest loss

(a) Multimode fibre
(b) Single Mode fibre
(c) Bath a and b
(d) neither a nor b.