

SECTION D — (2 × 10 = 20 marks)

Answer ALL questions, choosing either (a) or (b).

21. (a) Derive expression for volume forces in the electrostatic field.

Or

(b) Calculate the value of poynting vector at the surface of the sun if the power radiated by the sun is 3.8×10^{26} watts and its radius is 7×10^8 Km. Find the solar energy incident on the earth, if the average distance between the sun and earth is 1.5×10^{11} meters.

22. (a) Derive expression for energy flow due to a plane electromagnetic wave in free space.

Or

(b) Explain the phenomenon of Normal and anomalous dispersion.