

21.10.2009 / T. Tuuva

BM30A0601 Optoelectronics

Calculator is allowed, but no other material. Answer only to 4 questions. You can also answer in Finnish.

1. a) Explain the operational principle of an optical fiber.
b) What defines the maximum acceptance angle for an optical fiber?
2. Describe operation of the Fabry-Perot optical cavity.
3. What is the conductivity σ at the room temperature of n-type Si crystal of uniform phosphorus doping $N_d = 10^{16} \text{cm}^{-3}$, when mobility $\mu_e = 1350 \text{cm}^2/\text{Vs}$ and $q_e = 1,6 \cdot 10^{-19} \text{C}$?
4. Describe structure and operation of a photodiode.
5. Explain the principal operation of a laser diode.