Sri vidya college of ENGINEERING and technology
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
SUBJECT NAME: OPTICAL COMMUNICATION AND NETWORKING
SUBJECT CODE: EC2402
CLASS: IV YEAR ECE
Unit-1
Part-A
1. A point sorce of ligth is 12 cm below the surface of a large body of water (n = 1.33). What is the radius of the largest circle on the water surface through whichthe light can emerge?
2. Consider a parabolic index waveguide with n1 =1.75 ,n2 = 1.677 and core radius 25 micro meter. Calculate the numerical aperture at the axis and at a point 20 micro meter from the axis
3. Define numerical aperture of a step index fiber
4. Define mode-field diameter
5. Commonly available single mode fibers have beat lengths in the range 10 cm < Lp <2 m . What range of refractive index diffrences does this correspond to? (for wavelength = 1300 nm)
6. Define mode field diameter
7. What is the fundamental parameter of a single mode fiber?
8. A step index fiber has a normalized frequency V = 26.6 at 1300 nm wavelength. If the core radius is 25 pm, find the numerical aperture
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Part-B
9. (i) Diacuss the signal distortion in single mode fibers
(ii) Discuss pulse broadening in graded index fibers with necessary equations
10. (I) Discuss the propagation modes in single -mode fiber
(ii) Discuss the structure of graded index fiber
11. (i) What is meant by 'material dispersion'? Derive its expression
(ii) Discuss the pulse broadening in graded index fiberss
12. (a) What are fiber modes? Explain mode theory for optical fibers in detail.
Or
(b) Compare Single mode fibers and Graded index fibers. Explain the requirements
for fiber materials.