University of Mumbai

Program: Electronics and Telecommunication Engineering
Curriculum Scheme: Rev 2016
Examination: BE Semester VII

Course Code: ECC703   and Course Name: Optical Communication
Time: 2 hour 30 minutes   Max. Marks: 80

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Who proposed the idea of transmission of light via dielectric waveguide structure?
Option A:	Christian Huygens
Option B:	Karpon and Bockham
Option C:	Hondros and debye
Option D:	Albert Einstein
2.	The _____ ray passes through the axis of the fiber core.
Option A:	Reflected
Option B:	Refracted
Option C:	Shew
Option D:	Meridional
3.	Light incident on fibers of angles_____the acceptance angle do not propagate into the fiber.
Option A:	Less than
Option B:	Greater than
Option C:	Equal to
Option D:	Less than and equal to
4.	Meridional rays in graded index fibers follow
Option A:	Curved path along the axis
Option B:	Straight path along the axis
Option C:	Path where rays changes angles at core-cladding interface
Option D:	Helical path
5.	A permanent joint formed between two different optical fibers in the field is known as a _____
Option A:	Fiber connector
Option B:	Fiber splice
Option C:	Fiber attenuator
Option D:	Fiber dispersion

6.	The optical fiber incurs a loss in signal power as light travels down the fiber which is called as _____
Option A:	Scattering
Option B:	Attenuation
Option C:	Absorption
Option D:	Refraction
7.	Rayleigh scattering and Mie scattering are the types of _____
Option A:	Linear scattering losses
Option B:	Non-linear scattering losses
Option C:	Fiber bends losses
Option D:	Splicing losses
8.	For no overlapping of light pulses down on an optical fiber link, the digital bit rate BT must be _____
Option A:	Less than the reciprocal of broadened pulse duration
Option B:	More than the reciprocal of broadened pulse duration
Option C:	Same as that of than the reciprocal of broadened pulse duration
Option D:	Negligible
9.	The frequency of the absorbed or emitted radiation is related to difference in energy E between the higher energy state E_2 and the lower energy state E_1. State what h stands for in the given equation? $$E = E_2 - E_1 = hf$$
Option A:	Gravitation constant
Option B:	Planck's constant
Option C:	Permittivity
Option D:	Attenuation constant
10.	_____ is used when the optical emission results from the application of electric field.
Option A:	Radiation
Option B:	Efficiency
Option C:	Electro-luminescence
Option D:	Magnetron oscillator

Q2	Solve any Four out of Six	5 marks each
A	Differentiate LED and LASER.	
B	Explain different types of fibers with their refractive index profile and-mention its dimensions.	
C	Draw and explain fusion splicing.	
D	Derive expression for cut off wavelength for single mode step index fiber	
E	Explain Quantum Well Laser	
F	Write a short note on Optical Switches	

Q3.	Solve any Two Questions out of Three	10 marks each
A	Explain in detail working, principle of RAPD. Why it is called reach through APD and compare its working with PIN diode?	
B	Explain in brief VAD and MCVD fiber fabrication techniques	
C	Explain linear and non-linear scattering losses in optical fiber.	

Q4.	Solve any Two Questions out of Three	10 marks each
A	If a multimode step index fiber having the core refractive index of 1.5, cladding 10 refractive index of 1.38, core radius of 25 μm operates at a wavelength of 1300 nm. Calculate - (i) Numerical Aperture. (ii) Normalized frequency (iii) Solid acceptance angle. (iv) Total no. of modes entering the fiber.	
B	Draw and explain block diagram of cutback method of attenuation measurement.	
C	Explain working principle of EDFA with diagram .	