RTDC_T6_PRUEBA_EXTERNA_2022

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Parte 1 de 1 - 10.0 / 10.0 Puntos

Preguntas 1 de 6	1.66
1.66 Puntos	

For a heterogeneous multicore fiber link:

- [ ] A. The intercore crosstalk does not depend on the correlation length.
- [ ] B. The difference in the phase propagation constant between adjacent cores increases continuosly when the bending radius increases.
- [x] C. In the non-phase-matching region, the crosstalk is strongly dependent on the link length and, therefore, the crosstalk is dominated by the statistical properties.
- [ ] D. The minimum transfer of energy from one core to another dissimilar core takes places when the phase-matching condition is satisfied.

Preguntas 2 de 6	1.66
1.66 Puntos	

In homogeneous multicore fibers:

- [x] A. The fiber nonlinearity increases when the refractive index contrast increases, (if the core radius is kept constant).
- [ ] B. The intercore crosstalk is reduced if we dope the fiber core with fluorine.
- [x] C. If we fix the core radius and operating optical wavelength, an increase in the numerical aperture will result in a better confinement of the fundamental mode.

Preguntas 3 de 6	1.7
1.7 Puntos	

Select the correct statements for multiplexing/demultiplexing devices in SDM transmission:

- [ ] A. By reprogramming the pixel array of a phase plate, it is possible to generate or detect the required spatial LP mode field.
- [x] B. Photonic lanterns can excite individual modes of the few-mode fiber (instead of combinations of modes) if the size of the cores that comprise the lantern are different.
- [ ] C. In FMF transmission systems that use MIMO processing, we can excite combinations of modes at the FMF input as long as these combinations are not unitary.
- [ ] D. In the case of multicore fibers, the most widely used fan-in/fan-out devices are the ones based on free-space optics.
- [ ] E. Spatial light modulators introduce lower losses than multiplexers schemes based on phase plates

Preguntas 4 de 6	1.66
1.66 Puntos	

In mode-division multiplexing systems based on few-mode fibers (FMFs):

- [x] A. If there is strong discrete coupling along the FMF link, differential mode atenuation and differential mode gain can be minimized regardless the difference between the phase propagation constants of adjacent modes.
- [x] B. When we design a FMF, it is preferable to select a normalized frequency V sligthly above the value that corresponds to the cut-off wavelength of the non-desired higher-order mode, so that the desired propagated modes are more confined.
- [ ] C. If we operate in the strong mode coupling regime, the time spread raised by the mode differential group delays can be reduced if there is not discrete coupling along the deployed FMF link.

Preguntas 5 de 6	1.66
1.66 Puntos	

In few-mode fiber links:

- (•) A. It is benefitial to allow the excitation of a highly lossy, technically still bound, mode just above the cladding index.
- ( ) B. Microbending loss for the lowest bound mode does not depend on the phase mismatch between this mode and the adjacent highly lossy mode.
- ( ) C. It is challenging to design a FMF to promote mixing between multiple bound modes while simultaneously maximizing the loss of the lowest bound mode.
- ( ) D. The coupling between degenerate modes is lower than the coupling between symmetrical and asymmetrical LP modes.

Preguntas 6 de 6	1.66
1.66 Puntos	

Which of these fibers require MIMO processing using digital signal processing after photodetection?

- [ ] A. Few-mode fiber with weak coupling between the N spatial modes
- [ ] B. Homogeneous singlemode multicore fiber with uncoupled cores
- [x] C. Heterogeneous multicore fiber where all the cores transmit 3 LP modes strongly coupled
- [ ] D. Heterogeneous singlemode multicore fiber with uncoupled cores