

1. Fill the numbers of correct statements concerning optical networks in the following simple table.

The following recommendations for Passive Optical Networks refer to XG-PON by ITU-T G.987 (2010):

1
2
3
6

- 1 – Transmission rate options: 10Gbps / 2.5Gbps asymmetric **(yes)**
2 – Four attenuation classes **(yes)**
3 – Wavelengths used for the downstream: 1575-1580 nm **(yes)**
4 – Wavelengths used for the downstream: 1260-1260 nm **(no, this is for upstream)**
5 – Physical reach: up to 100 km **(no it's 20 km)**
6 – Physical reach: up to 20 km (in future, 40 km) **(yes)**
7 – Max. splitting ratio: 1:64 **(no, it's is up to 1:256)**

2. Modify the following texts so that the statements are true.

In Multi-mode Graded Index fibres, the index of refraction of a core is (~~constant~~ / **not constant**); it (~~increases~~ / **decreases**) gradually as a function of distance from the core.

There is (**refraction** / ~~reflection~~) on couple of layers and finally the beam is (~~refracted~~ / **reflected**) at specific layer or at the boundary between the last core layer and the cladding.

The mode propagating along axis of symmetry has the (**shortest** / ~~longest~~) trajectory, but its speed is (~~fast~~ / **slow**), because the centre of a core is a (~~low-index~~ / **high-index**) material, whereas beams propagating along (~~shorter~~ / **longer**) trajectories are gradually getting to the (**low-index** / ~~high-index~~), “fast” material.



3. Assign the terms from the left column to the corresponding definitions on the right.

Material dispersion	The change of mode shape at certain distance and is strictly associated with the fibre geometry, which causes the change of group velocity (the shape of the whole pulse “envelope”) as a function of wavelength
Waveguide dispersion	Each mode passes through the fibre to its output along different trajectory, Particular beams (modes) reach the fibre end at different time instants
Modal dispersion	Originates because of different refractive index for “x” axis and “y” axis. There is so-called fast axis and slow axis, each reaching fibre end at different time instant
Polarization mode dispersion	It is due to the bandwidth of a laser source. Each frequency component (each colour) is then propagated at different phase velocity and reaches the end of a fibre at different time instant

