

15. (a) A rectangular air filled copper waveguide with a $a = 2.28$ cm and $b = 1.01$ cm cross section and $l = 30.48$ cm is operated at 9.2 GHz with a dominant mode. Find the cut off frequency, guide wavelength, phase velocity and characteristic impedance.

Or

- (b) Explain the principles of the following :
- (i) Excitation of waveguides.
 - (ii) Guide termination and resonant Cavities.