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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- Oct 2018

B.Tech 5th Semester

COURSE CODE: 17B11EC512

MAX. MARKS: 25

COURSE NAME: Microwave Devices & Antenna Design

COURSE CREDITS: 4

MAX. TIME: One Hr 30 Min

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

1. What is Gunn Effect. Explain in detail Gunn modes of Oscillations. (CO-3, 4 4 Marks)
2. What are the applications of Magnetron. Derive Hull's cut off voltage equation in Magnetrons. (CO-3, 4 Marks)
3. A TWT Operates under the following parameters:
Beam Voltage (V_0) = 3 KV, Beam Current (I_0) = 30 mA, Characteristics impedance of Helix (Z_0) = 10 Ohm, Circuit Length (N) = 50 and Frequency (f) = 10 GHz.
Determine:
(a) The gain parameter C.
(b) The output power gain A_p in dB.
(c) All four propagation constants. (CO-4, 3 Marks)
4. In an H-Plane Tee junction, 20 mW power is applied to port 3 that is perfectly matched to the junction. Calculate the power delivered to load 60 Ohm and 75 Ohm connected to port 1 and port 2. (CO-3, 2 Marks)
5. What is Reflex klystron. Calculate its efficiency and derive the expression of bunching parameter. (CO-3, 5 Marks)
6. Calculate the ratio of circular waveguide cross sectional area to rectangular waveguide cross sectional area for TE modes. Assume that TE dominant mode of rectangular waveguide has equal cutoff frequency as that of TE dominant mode of circular waveguide. (CO-2, 3 Marks)
7. Calculate the total no of modes of propagation for frequencies below 20 GHz with guide radius of 1 cm. (CO-2, 2 Marks)
8. Explain the working of Hybrid ring with its S-parameter matrix. (CO-3, 2 Marks)