

This question paper contains 2 printed pages]

**LB—117—2023**

**FACULTY OF SCIENCE**

**M.Sc. (Fourth Semester) EXAMINATION**

**APRIL/MAY, 2023**

**(CBCS/New Pattern)**

**PHYSICS**

**Paper PHY-402**

**(Microwaves and Measurements)**

**(Monday, 8-5-2023)**

**Time : 2.00 p.m. to 5.00 p.m.**

*Time—Three Hours*

*Maximum Marks—75*

*N.B. :— (i) Attempt all questions.*

*(ii) All questions carry equal marks.*

*(iii) Figures to the right indicate full marks.*

1. Discuss distribution parameters in case of two conductor transmission line.  
Establish the transmission line equation. 15

*Or*

(a) What do you mean by VSWR ? Derive equation for it. 8

(b) Define microwaves and discuss various bands in this frequency spectrum. 7

2. Give structure of circular wave guide and explain TE and TM mode propagation in it. 15

P.T.O.

Or

- (a) With neat diagram give structure of two hole directional coupler and explain its operation of working. 8
- (b) Explain construction and working of H-plane tee. 7
3. Describe with neat diagram two Cavity Klystron and explain velocity modulation and bunching process in it. 15
- Or
- (a) Explain construction and principle of operation of PIN diode. 8
- (b) Explain construction and working of Magnetron. 7
4. With neat diagram explain slotted line technique used for measurement of VSWR and reflection coefficient. 15
- Or
- (a) Draw block diagram of moving target indicator and explain each block in it. 8
- (b) What is antenna ? Explain the terms radiation pattern, efficiency and directivity of it. 7
5. Write short notes on any *three* : 15
- (a) Smith chart
- (b) Circulators
- (c) Gunn effect
- (d) Time domain reflectometry.