

# DD-765

## M. A./M. Sc. (Fourth Semester) EXAMINATION, 2020

MATHEMATICS

(Optional—B)

Paper Third

(Cosmology—II)

*Time : Three Hours*

*Maximum Marks : 80*

**Note :** Attempt any *two* parts from each question. All questions carry equal marks.

### Unit—I

1. (a) State and explain static cosmological model.  
(b) Write a note on Mach's principle.  
(c) Explain Einstein's model of universe and compare with actual universe.

### Unit—II

2. (a) Obtain the line element for de-Sitter's cosmological model.  
(b) Write Einstein's concept of homogeneous and isotropic universe.

- (c) Obtain the line element for Einstein universe and discuss its property.

**Unit—III**

3. (a) Obtain the line element for Robertson's non-static cosmological model.  
(b) Derive Hubble's law from Robertson walker's metric.  
(c) State and explain red-shift in Robertson Walker's line element.

**Unit—IV**

4. (a) State and explain Friedmann's model of the universe.  
(b) Find present age of the universe in closed FRW space time.  
(c) Write a short notes on open and closed universe.

**Unit—V**

5. (a) Find expression for particle horizon for closed universe.  
(b) State and explain Einstein-de Sitter's model.  
(c) State and explain steady state cosmology in brief.