K22P 3327

Reg. No. : .....

Name : .....

IV Semester M.Sc. Degree (C.B.S.S. – Reg./Supple./Imp.) Examination, April 2022
(2018 Admission Onwards)
PHYSICS
PHY4E07 : Astrophysics

Time : 3 Hours Max. Marks : 60

SECTION – A

Answer **both** questions (either **a** or **b**) :

1. a) Draw and explain the Hertzsprung-Russell (H-R) diagram. Give the significance of C-M diagram in stellar photometry.

   OR

   b) Explain the structure of stars. Obtain the equation of state for stellar interior.

2. a) Explain Hubble's law. Describe how the Hubble's constant can be determined.

   OR

   b) Discuss the evolution of the radiation dominated universe. **(2×12=24)**

SECTION – B

Answer **any four** questions. **1** mark for part (a), **3** marks for part (b) and **5** marks for part (c) :

3. a) What is stellar parallax ?
   b) Distinguish between astronomical unit and Parsec.
   c) Draw and describe the celestial sphere.

4. a) What is a degenerate gas ?
   b) Explain the basic equilibrium conditions that must be satisfied by a astable stellar structure.
   c) Derive the conditions for radiative equilibrium.

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5. a) What are multiple stars ?
   b) Explain the characteristics of multiple stars with examples.
   c) Discuss the origin of binary stars.

6. a) What are galaxies ?
   b) What is meant by Normal Galaxy ?
   c) Explain the morphological classification of galaxies.

7. a) What is a black hole?
   b) What is Schwarzchild radius ? Calculate the mass of the milkyway if its Schwarzchild radius is 2.4×10^{15} metre.
   c) How does the black hole formation as a central engine that powers an active galactic nucleus ?

8. a) What is a cosmological principle ?
   b) Bring out the differences between relativistic cosmology and Newtonian cosmology.
   c) Obtain the Robertson-Walker metric. **(4×9=36)**
