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School of Basic Sciences
Bachelor of Science Honours in Physics
Mid Term Examination - Mar 2024

Duration : 90 Minutes
Max Marks : 50

Sem VI - C1UD602T - Astronomy and Astrophysics

General Instructions

Answer to the specific question asked

Draw neat, labelled diagrams wherever necessary

Approved data hand books are allowed subject to verification by the Invigilator

- 1) A galaxy of absolute magnitude $M = -20$ is at a distance of 700 kpc. Would it be visible to the unaided eye, explain. K2 (2)
- 2) Define Stellar Radii by the use Stefan-Boltzmann law of radiation. K1 (3)
- 3) If a star at 40 pc is brought closer to 10 pc, i.e., 4 times closer, Compare its brightness in terms of the magnitude. K2 (4)
- 4) The distance modulus of the star Vega is -0.5 . Interpret the distance from us. K2 (6)
- 5) Construct a relationship between apparent and absolute magnitudes of a star with definition of them. K3 (6)
- 6) Utilize the direct method of determining the radii of stars. Given the luminosity, effective temperature and absolute magnitudes of two stars, obtain an expression for the ratio of their radii as a function of their temperature and absolute magnitude. K3 (9)
- 7) Inspect the celestial sphere showing the ecliptic, vernal equinox and autumnal equinox. Determine the declination (δ) of ecliptic north pole. K4 (8)
- 8) Sketch the H - R diagram showing all groups of stars. Inspect the location of the Sun on the diagram. What information does the H - R diagram provide about stars ? K4 (12)

OR

Simplify, luminosity and the radiant flux. Using Stefan-Boltzmann law of radiation, obtain the ratio of radii R_1 and R_2 of two stars with surface temperatures T_1 and T_2 and of absolute magnitudes M_1 and M_2 , respectively. K4 (12)