



THE AMERICAN COLLEGE, MADURAI

(An Autonomous Institution Affiliated to Madurai Kamaraj University)
Re-accredited (2nd Cycle) by NAAC with Grade "A", CGPA – 3.46 on a 4-point scale

Backlog Arrear Examination, March 2021

Course Code : PHY 3594/3680
Course Title : Astronomy and Astrophysics

Time: 3 Hrs
Max : 75 marks

Part-A

Answer any Five Questions

5 X 15 =75

1. Describe the birth of Modern astronomy with relevant explanation of Ptolemy, Copernicus, Kepler and Newton.
2. Describe the working of the various types of reflecting type, refracting type, IR and UV telescopes with neat diagram
3. Explain Spectral classification and also describe H-R diagram. Hence comment on star magnitudes of stars.
4. Discuss origin and evolution of galaxies. Explain the types of galaxies with neat diagram.
5. With neat diagram, explain the birth and death of stars. Also comment on the fate of the stars.
6. Elaborate the theory of the expanding universe based on the Hubble's law and cosmic microwave background radiation.
7. a) Calculate the mass of each of the following planets from the data of their satellites as given below .Give the mass in solar units and in mass of the Earth $M_{\text{sun}}=1.99 \times 10^{30} \text{kg}$, $M_{\text{earth}}= 5.98 \times 10^{27} \text{kg}$. $G = 6.67 \times 10^{-11} \text{ Nm}^2/ \text{ Kg}^2$.

Planet	Satellite	a (km)	Period (days)
Mars	Deimos	23,500	1.262
Jupiter	Europa	6,71,400	3.551

- b) The total luminosity of the Sun is 3.9×10^{26} watts and its radius is $6.96 \times 10^8 \text{m}$. $\sigma = 5.67 \times 10^{-8} \text{J/m}^2 \text{sdeg}^4$. Assume that the sun radiates like a black body. Calculate the surface temperature.