ANANDARAM DHEKIAL PHOOKAN COLLEGE LIBRARY
Acc. No.
Date
Nagaon Assam

2026

PHYSICS

(Major)

Paper : PHY0600304

(Astronomy and Astrophysics)

Full Marks : 60

Time : 2½ hours

The figures in the margin indicate full marks for the questions.

1. Answer the following : 1×8=8

(a) What do you mean by Stellar parallex?

(b) Write the Chandrasekhar limit for white dwarf mass.

(c) Convert 1 parsec into light year.

(d) How does the life time of a star on the main sequence vary with mass?

(e) What is Aladin?

(f) Place the following spectral types in order of decreasing temperatures :

A, B, F, K, G, M, O

(g) What are Lenticular Galaxies?

(h) List the terrestrial planets.

2. Answer any *six* of the following : 2×6=12

(a) The distance of a star is 100 pc and its apparent magnitude is 6. Find its absolute magnitude.

(b) Draw a schematic ray diagram of a Newtonian reflecting telescope.

(c) Calculate the resolving power of a telescope having a diameter 2·34 m, when a radiation of wavelength 5500 Å is detected.

(d) Write the differences between asteroids and meteoroids.

(e) What is Kuiper belt? What is its shape?

(f) Write two major differences between elliptical galaxies and spiral galaxies.

(g) What are cosmic voids and how do they form?

(h) State the cosmological principle and its significance in cosmology.

(i) What is H-R diagram? Sketch H-R diagram showing all groups of stars.

(j) What is neutron star? What is its mass?

3. Answer any *four* of the following : 5×4=20

(a) Define apparent and absolute magnitudes of a star. Deduce the relation between them. 1+1+3=5

PHOOKAN COLLEGE LIBRARY ACC. No. Date Assam

(b) What is light gathering power of a telescope? Compare the light gathering power of the 8 m telescope and 0·8 m telescope. 2+3=5

(c) Using Stefan-Boltzmann law of radiation, obtain the ratio of radii of two stars in terms of their surface temperatures and absolute magnitudes.

(d) Explain the significance of Stellar mass in respect of evolution of stars. Estimate the life time of stars on the main sequence. 2+3=5

(e) Explain how the objects in the solar system are classified.

(f) What is Milky way? Mention its different components. Draw a schematic diagram of the Milky way showing all the components. 1+2+2=5

(g) State Hubble's law and explain how Hubble's constant indicates the age of the universe. 2+3=5

(h) What are Cepheid Variable Stars? Explain how the Cepheid Variable Stars can be used to find distances of nearby stars. 1+4=5

4. Answer any *two* of the following : 10×2=20

(a) *(i)* Explain how the distance of a nearby star can be determined using trigonometric parallex method. 5

(ii) Distinguish between reflecting and refracting telescope. What are the advantages of reflecting telescope over the refracting telescope? 3+2=5

(b) (i) What do you understand by hydrostatic equilibrium in a star? Derive the equation of hydrostatic equilibrium for a star. 2+4=6

(ii) Calculate the ratio of fluxes received from two stars whose apparent magnitudes differ by 2·5. 4

DIPHU PROKAN COLLEGE LIBRARY ACC. No. Date Nagaon Assam

(c) (i) What are the three principal layers of Sun's atmosphere? Explain the layers briefly. 2+6=8

(ii) What is Asteroid Belt? Where is it located? 1+1=2

(d) (i) Draw the Hubble's tuning fork diagram and describe the classification scheme of the galaxies. 3+4=7

(ii) Describe the Kant-Laplace nebular hypothesis for the formation of solar system. 3

(e) Write short notes on any *two* of the following : 5×2=10

(i) Oort cloud

(ii) Cosmic Microwave Background Radiation (CMBR)

(iii) PP and CNO cycle

(iv) Star clusters

(v) Virial theorem

★ ★ ★