1088/AP1 **OCTOBER 2010**

Paper I — INTRODUCTION TO COSMOS

Time : Three hours Maximum : 100 marks

PART A — (8 × 5 = 40 marks)

Answer any EIGHT questions.

1. What are trignometric functions? Find the value cos 75°.
2. How do you determine the length of an arc and the area of a circular sector?
3. Give a note on electromagnetic spectrum.
4. How the lenses are used in image orientation?
5. State and explain the Newton's law of gravitation.
6. Explain the different motions of earth in space.
7. Write a note on Indian calendar.
8. What are constellations? Give examples.
9. Explain the terms :
   (a) Astronomical unit
   (b) Light year
   (c) Parsec.
10. State and explain the Kirchoff's laws in spectroscopy.

PART B — (4 × 15 = 60 marks)

Answer any FOUR questions.

11. (a) State and prove the Pythagorean theorem.
    (b) With usual notation prove that $b^2 = c^2 + a^2 - 2ca\cos\theta$.
12. Explain in detail X-ray, UV and Radio astronomies. Also write down their importance.
13. Write in detail about atoms, molecules, atomic nucleus, isotopes, spectra with examples.
14. Explain the models of the universe and their limitations.
15. Describe the motions of earth and stars in the celestial sphere with diagram.
16. (a) Explain the different radiations from space.
    (b) Write a note on Doppler effect.
17. Describe the occurrence of eclipses of sun and Moon with diagram.

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1089/AP2 **OCTOBER 2010**

Paper II — SOLAR SYSTEM STUDIES

Time : Three hours Maximum : 100 marks

PART A — (8 × 5 = 40 marks)

Answer any EIGHT questions.

1. Distinguish between stars and planets.
2. What are sunspots? How are they formed?
3. What do you mean by solar eruptions and solar neutrinos?
4. Briefly write about the tides.
5. What are Phobos and Deimos?
6. Give an account of artificial and natural satellites.
7. List down the properties of Jupiter.
8. List down the names of all the planets. Why Pluto is not considered as a planet?
9. Write a note on Kuiper Belt.
10. What are asteroids and meteroids?

PART B — (4 × 15 = 60 marks)

Answer any FOUR questions.

11. Describe the internal structure and outer layers of the sun with diagram.
12. Explain :
    (a) How energy is produced inside the sun?
    (b) How the energy is transmitted outside?
13. Describe the internal structure, atmospheres and properties of the Earth.
14. Compare in detail the different properties and atmospheres of Mercury, Venus and Mars.
15. Write an essay on the planet Saturn.
16. Explain the origin, structure and properties of comets.
17. Discuss the origin, parameters and topography of Moon.

1090/AP3 **OCTOBER 2010**

Paper III — STELLAR ASTRONOMY

Time : Three hours Maximum : 100 marks

PART A — (8 × 5 = 40 marks)

Answer any EIGHT questions.

1. How the distance to stars are measured?

2. Give an account of classification of stars according to magnitude.

3. What are proto stars and T-tauri stars?

4. How do stars generate energy?

5. Distinguish between white dwarf and brown dwarf.

6. Write notes on electron degeneracy pressure and Chandrasekar's limit.

7. What do you mean by Nova and Supernova?

8. Briefly write on Helium capture.

9. Explain the binary stars.

10. What are pulsars? List down their properties.

PART B — (4 × 15 = 60 marks)

Answer any FOUR questions.

11. Draw the Hertsprung-Russel diagram and explain the different parts.

12. Explain in detail about the interstellar matter and formation of stars.

13. Discuss :
    (a) Core hydrogen burning.
    (b) Hydrogen shell burning.
    (c) Helium burning.

14. Explain the various star clusters.

15. Write an essay on the evolution of low mass and high mass stars.

16. Describe the formation and properties of (a) Neutron stars (b) Black holes.

17. Explain the following :
    (a) X-ray and Gamma ray bursters.
    (b) Schwarzschild radius.

1091/AP4 **OCTOBER 2010**

Paper IV — GALAXIES AND COSMOLOGY

Time : Three hours Maximum : 100 marks

PART A — (8 × 5 = 40 marks)

Answer any EIGHT questions.

1. State and explain the Hubble's law.
2. What is dark matter? Give its significance.
3. Give the Pully-Fisher relationship and explain.
4. What are Seyfert Galaxies?
5. Give a note on Radio galaxies.
6. Mention the mass-energy relation and its importance.
7. Write about the Olber's paradox.
8. What is Cosmic Microwave Background? How it is measured?
9. Draw the Planck's radiation cure and explain.
10. Distinguish between radiation era and matter era.

PART B — (4 × 15 = 60 marks)

Answer any FOUR questions.

11. Describe the structure and dynamics of milkyway galaxy.
12. Explain the different types of galaxies according to shape.
13. Write an essay on Active Galaxies.
14. What are Quasars? Discuss the cosmological probes and evolution of quasars.
15. Describe the various models of the universe.
16. Explain the following in detail :
    (a) Cosmological constant
    (b) Grand unified theories.
17. Discuss the possible geometries, age and evolution of the universe.

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