

Question paper pattern for soft core (3 credits) and open elective

PATTERN

Each soft/open elective theory paper syllabus is divided into 3 units. The semester ending examination will be aimed at testing the student's proficiency and understanding in every unit of the syllabus. The blue print for the question paper pattern is as follows: Each question paper will consist of 4 parts I, II, III and IV. Each of the parts from Part I to Part III carries 18 marks. Each Part consists of two questions and one question from each part is to be chosen. Part IV is compulsory which consists of six questions (two from each part) and four questions are to be answered. Part IV carries 16 marks. The model question paper is given below.

M.Sc. Degree Examination

PHYSICS

PHYS YYY: Model paper (CBCS)

(Soft core (3 credits/Open elective))

Time: 3 Hours

Max.Marks: 70

Note: Answer any **three** questions choosing **one** from each of the Parts **I** to **III** and **four** questions in Part **IV**.

PART - I

1

(18)

OR

2.

.

(18)

PART - II

3

(18)

OR

4

(18)

PART - III

5

(18)

OR

6

(18)

PART IV

9 Answer **any four** of the following:

(4x4=16)

- a)
- b)
- c)
- d)
- e)
- f)

PHE 455: ENERGY STUDIES (Open elective)

(39 Hrs.)

Unit I

Renewable energy resources: Energy and Thermodynamics, Forms of Energy, Conservation of Energy, Entropy, Heat capacity, Thermodynamic cycles: Brayton, Carnot Diesel, Otto and Rankin cycle; Fossil fuels, time scale of fossil fuels and solar energy as an option. Solar Energy for Clean Environment Sun as the source of energy and its energy transport to the earth, Extraterrestrial and terrestrial solar radiations, solar spectral irradiance, Measurement techniques of solar radiations, Estimation of average solar radiation **[13 hrs]**

Unit II

Basics of the Wind energy: Wind Energy Origin and classification of winds, Aerodynamics of windmill: Maximum power, and Forces on the Blades and thrust on turbines; Wind data collection and field estimation of wind energy, Site selection, Basic components of wind mill, Types of wind mill, Wind energy farm, Hybrid wind energy systems: The present Indian Scenario. **[13 hrs]**

Unit III

Biomass energy and biogas technology: Nature of Biomass as a fuel, Biomass energy conversion processes, Direct combustion: heat of combustion, combustion with improved Chulha and cyclone furnace; Dry chemical conversion processes: pyrolysis, gasification, types of gasification Importance of biogas technology, anaerobic decomposition of biodegradable materials, Factors affecting Bio-digestion, Types of biogas plants, Applications of biogas. **[13 hrs]**

References

1. Peter A., 'Advances in energy systems and technology', (Academic Press, USA, 1986).
2. Neville C.R., 'Solar energy conversion: The solar cell', (Elsevier North-Holland, 1978).
3. Dixon A.E. and Leslie J.D., 'Solar energy conversion', (Pergamon Press, New York, 1979).
4. Ravindranath N.H., 'Biomass, energy and environment', (Oxford University Press, 1995).
5. Cushion E., Whiteman A. and Dieterle G., (World Bank Report, 2009).