

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
MSc DEGREE EXAMINATION DECEMEER 2024
(First Semester)

Branch- **ENVIRONMENTAL SCIENCE**

ENERGY RESOURCES AND CONSERVATION

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry **EQUAL** marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	The most widely accepted definition of a natural resource is ____ (a) A resource that cannot be replenished (b) A material created by humans for industrial use (c) A resource created by technological processes (d) A material or substance occurring in nature which can be used for economic gain	K1	CO1
	2	Land resources are conserved by the following methods (i) Afforestation (ii) Over grazing (iii) Regulating pesticides and fertilizers for agriculture (iv) Desertification. Choose the correct pair. (a) (i) only (b) (i), (ii) and (iii) (c) (i) and (iii) only (d) (i), (ii) and (iii)	K2	CO1
2	3	Heat transfer due to bulk movement of molecules within fluids is called as (a) Conduction (b) Convection (c) Radiation (d) Convention	K1	CO2
	4	Earth's energy budget describes the (a) Absorption of Solar Radiation by Atmosphere (b) Absorption of Solar Radiation at Earth's Surface (c) balance between the radiant energy that reaches Earth from the sun and the energy that flows from Earth back out to space (d) Infrared Radiation Emitted from Earth's Surface to Space	K2	CO2
3	5	_____ is the most common nuclear reactor type and currently makes up around 70% of nuclear reactor fleet in the world. (a) Boiling Water Reactors (b) Pressurized Water Reactors (c) Small Modular Reactor (d) Pressurized heavy water reactors	K1	CO3
	6	Which of the following energy resource is correctly matched with its correct energy value? Energy Source Energy Value (i) Sub Bituminous Coal 17.4-23.9 MJ/kg (ii) LPG 16 MJ/kg (iii) Natural gas 500 GJ/kg (iv) Uranium 50-55 MJ/kg (a) (i) only (b) (i) and (ii) (c) (i),(ii) and (iii) (d) None	K2	CO3
4	7	The simplest and fastest type of energy audit is called as (a) walk-through energy audit (b) target energy audit (c) detailed energy audits (d) None of these	K2	CO4
	8	Which of the following is a key feature of green building design? (a) Maximum use of non-renewable energy resources (b) Minimizing the energy efficiency (c) Minimizing environmental impacts (d) Design and maximizing the cost for interior	K1	CO4
5	9	_____ number of new initiatives are covered under the National Mission for Enhanced Energy Efficiency (NMEEE). (a) 2 (b) 3 (c) 4 (d) 6	K1	CO5

Cont...

5	10	The main objective of the IREDA is (a) To provide energy for specific projects and schemes (b) To give financial support to specific projects and schemes for generating electricity (c) To promote measures to accelerate conservation of petroleum products (d) To provide petroleum products for industrial projects and schemes	K2	CO5
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SECTION - B (35 Marks)Answer **ALL** questions**ALL** questions carry **EQUAL** Marks (5 × 7 = 35)

ALL questions carry EQUAL Marks (3 × 7 = 21)				
Module No.	Question No.	Question	K Level	CO
1	11.a.	Analyze the factors influencing the availability and distribution of natural resources.	K4	CO1
	(OR)			
	11.b.	Evaluate the challenges associated with the overutilization of surface and groundwater resources.		
2	12.a.	Define and explain mass and energy transfer across interfaces, and their applications in energy systems.	K3	CO2
	(OR)			
	12.b.	Summarize the Indian energy scenario with sector wise consumption needs.		
3	13.a.	Describe the principles of nuclear energy generation. How do nuclear reactors work, and what are the environmental concerns with nuclear waste?	K5	CO3
	(OR)			
	13.b.	Discuss the principles and applications of geothermal energy. What are the advantages and limitations of harnessing this energy?		
4	14.a.	Analyze the need for an energy audit and categorize the types of energy audits commonly conducted in industries.	K4	CO4
	(OR)			
	14.b.	Compare different types of lighting fixtures (CFL, LED, Halogen, Metal Halide) and their energy-saving potential.		
5	15.a.	Explain the significance of the Energy Conservation Building Code (ECBC) and its impact on energy consumption in buildings.	K5	CO5
	(OR)			
	15.b.	Examine the impact of international initiatives like the International Solar Alliance (ISA) on global energy conservation efforts.		

SECTION - C (30 Marks)Answer **ANY THREE** questions**ALL** questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Categorize the different forest resources and its future demand with reference to the Indian scenario.	K4	CO1
2	17	Discuss Earth's energy budget and the significance of the balance between incoming and outgoing energy.	K5	CO2
3	18	Discuss the physico-chemical characteristics, energy content and environmental impacts of fossil fuels such as coal, petroleum, and natural gas.	K4	CO3
4	19	Explain the role of energy managers in industries, and how do energy monitoring, auditing, and targeting contribute to sustainable energy management?	K5	CO4
5	20	Elaborate on the Perform, Achieve, and Trade (PAT) scheme and its role in industrial energy efficiency in India.	K6	CO5