

No. of Printed Pages : 2

MED-003/MED-009

**POST GRADUATE DIPLOMA IN
ENVIRONMENT AND SUSTAINABLE
DEVELOPMENT (PGDESD)**

**Term-End Examination
June, 2012**

**MED-003/MED-009 : ENERGY AND
ENVIRONMENT**

Time : 2 hours

Maximum Marks : 50

Note : Question No. 1 is compulsory. Attempt any three questions from the remaining. Support your answer with suitable evidence wherever needed.

1. Attempt *any four* from the following :
- (a) Mention the three broad goals of energy 3 + 2 sustainability as defined by the World Energy Council. Explain any one of these in detail.
 - (b) Describe the salient features of 5 North - South debate related to "energy subsidies" in about 100 words.
 - (c) Explain the working of a biogas plant with 5 the help of a schematic diagram.
 - (d) Describe the process of electricity generation 3 + 2 in a thermal power plant through a schematic diagram. List its four major components.

- (e) What is Demand Side Management 1 + 4 (DSM) ? Write any four major applications of DSM in liberalised energy markets.
2. (a) What are the key objectives of sustainable 3 + 2 energy policy ? Describe how any two of these objectives can be met.
- (b) What are the key elements of energy 3 + 2 strategy ? List any two important ways of reducing energy demand at a national level.
3. State the operating principles of Solar Photovoltaic Technology (SPV). What are the key components of a SPV system ? In what different modes can SPV technology be used ? 3 + 4 + 3
4. (a) Name three different technologies used for 2 + 3 energy storage. Explain any one of these in detail.
- (b) What is Clean Development Mechanism ? Describe its two advantages and limitations. 1 + 2 + 2
5. List six ways of achieving energy efficiency in 5 + 5 buildings. Explain how energy can be conserved with respect to interior lighting use in a building.

No. of Printed Pages : 2

MED-003/MED-009

**POST GRADUATE DIPLOMA IN
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**Term-End Examination
December, 2012**

**MED-003/MED-009 : ENERGY AND
ENVIRONMENT**

Time : 2 hours

Maximum Marks : 50

*Note : Question No 1. is compulsory. Attempt any **three** questions from the remaining. Support your answers with suitable evidence wherever needed.*

-
1. (a) Describe the working of a small hydro power plant with the help of a schematic diagram. 5
- (b) What are the key challenges in rural energy planning in India ? Describe any two possible options to overcome these challenges. 3 + 2
- (c) Draw a schematic process diagram of electricity generation in a nuclear power plant and explain its working. 3 + 2
- (d) List the green house gases responsible for climate change and mention their key origin. 2 + 3

2. (a) What are three main categories of biomass feedstocks materials. Explain the conversion process of the industrial waste into useful energy. 3 + 3
(b) Discuss two main issues pertaining to biomass utilization 4
 3. (a) What are the major sources of energy on earth ? Describe any one of these in detail. 2 + 3
(b) Define energy carrying capacity of an eco-system. Explain briefly two different measures of human carrying capacity. 2 + 3
 4. What is the general economic approach to the energy problem ? Explain as to how sustainable development can be promoted ? 5 + 5
 5. (a) Which are the key stakeholders in the energy planning process ? 2 + 4
(b) Describe the role of any two of these. List the key activities of an energy planning process ? Explain briefly any one of these. 2 + 2
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No. of Printed Pages : 3

MED-003/MED-009

00302

**POST GRADUATE DIPLOMA IN
ENVIRONMENT AND SUSTAINABLE
DEVELOPMENT (PGDESD)**

**Term-End Examination
June, 2013**

**MED-003/MED-009 : ENERGY AND
ENVIRONMENT**

Time : 2 hours

Maximum Marks : 50

Note : Question 1. is compulsory. Attempt "any three" questions from the remaining. Support your answer with suitable evidence wherever needed.

Attempt any four from the following :

1. (a) Write four key goals of sustainable policy.
Explain any one in detail. 5(2+3)
- (b) Write any four energy options available to developing countries based on energy resource base of the earth. Explain any one in detail. 5(2+3)
- (c) What are three major challenges before energy planner and policy maker of energy of poor country ? Explain any one in detail. 5(3 + 2)
- (d) What is wind electricity generator ? List any two advantages and limitations of wind energy. 5(1+2+2)

- (e) Explain how electricity is produced in nuclear based thermal power plant. Draw schematic diagram showing different system component. **5(2+3)**
2. (a) What is environmental economics ? Name two methods of indirect data collection. Describe any one in detail. **6(2+2+2)**
- (b) Explain two ways of improving energy efficiency through dematerialization. **4(2x2)**
3. (a) What is energy planning ? Write any three limitations being faced by developing countries in evolving sustainable energy planning. **5(2+3)**
- (b) Write six broad aims of macro - level energy planning. Describe benefits of energy planning. **5(3+2)**
4. (a) Name any four applications of solar thermal collectors. Explain any one using schematic diagram showing its different components. **5(2+3)**
- (b) What is capacity range of small hydro plant ? List two main advantages and disadvantages of hydro power plant. **5(1+2+2)**

5. (a) Describe positive and negative impacts of following renewable energy. $6[(1+1)\times 3]$
- (i) hydro energy
 - (ii) biomass energy
 - (iii) wind energy
- (b) Name any four components of climate change system. Describe any one in detail. $4(2+2)$



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No. of Printed Pages : 2

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**Term-End Examination
December, 2013**

**MED-003/MED-009 : ENERGY AND
ENVIRONMENT**

Time : 2 hours

Maximum Marks : 50

Note : Question No.1 is compulsory. Attempt "any three" questions from the remaining. Support your answer with suitable evidence wherever needed.

Attempt **any four** from the following :

1. (a) Describe the principle underlying solar thermal technologies. Name two types of solar thermal collectors. Draw schematic diagram of any one. 2+1+2=5
- (b) What are two major factors that influence the energy demand ? Explain any one in detail. 2+3=5
- (c) Explain how electricity is produced from water in hydro power plant. Draw schematic diagram of cross section of hydro power plant showing different components. 2+3=5
- (d) List any four major energy consuming sectors. Write any three possible energy saving measures for one of the sectors. 2+3=5

- (e) What is co-generation ? Explain using schematic diagram showing different components of any cogeneration system. $2+3=5$
2. Describe any two main energy needs of urban areas. State any four key strategies that need to be applied in urban planning. Describe any two strategies in detail. $2+4+2\times2=10$
3. (a) Write four major benefits of energy planning. Describe any one in detail. $2+3=5$
(b) Name any two categories of biomass resources. Describe two main issues regarding use of biomass as energy resources. $1+2\times2=5$
4. (a) What do you mean by fossil and renewable energy resources ? Write any four sources each of fossil and renewable energy. $2+2+2=6$
(b) What is the difference between biomass combustion and biomass gasification. $2+2=4$
5. (a) What is energy efficiency of energy system ? Name two main ways of improving energy efficiency and explain any one in detail. $2+2+2=6$
(b) Name any two indirect methods of data collection in environmental economics. Describe any one in detail. $2+2=4$

No. of Printed Pages : 2

MED-003/MED-009

**POST GRADUATE DIPLOMA IN
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DEVELOPMENT (PGDESD)**

Term-End Examination

00595

June, 2014

MED-003/MED-009 : ENERGY AND ENVIRONMENT

Time : 2 hours

Maximum Marks : 50

Note : Question no. 1 is **compulsory**. Attempt any **three** questions from the remaining questions no. 2 to 5. Support your answers with suitable evidence wherever needed.

1. Attempt *all* parts :

- (a) Explain the concept of energy demand in relation to population growth. 5
- (b) Discuss the process of electricity generation in a thermal plant only with the help of diagram. 5
- (c) What are nuclear hazards ? Describe the problems associated with nuclear waste. 2+3
- (d) List the key objectives of energy policy. 5

2. (a) Discuss the effect of deforestation on carbon and hydrological cycles. 3+3
- (b) Explain the energy saving methods in your home. 4
3. What is energy planning ? Discuss various activities to be undertaken as a part of energy planning process. 4+6
4. Discuss the economics of supply of energy. What is the cost of reducing CO₂ emissions ? 5+5
5. (a) Describe the application of biomass technologies based on direct combustion. 5
- (b) Describe the process of pyrolysis and gasification for energy production. 5

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No. of Printed Pages : 2

MED-003/MED-009

**POST GRADUATE DIPLOMA IN
ENVIRONMENT AND SUSTAINABLE
DEVELOPMENT (PGDESD)**

Term-End Examination

June, 2017

01803

MED-003/MED-009 : ENERGY AND ENVIRONMENT

Time : 2 hours

Maximum Marks : 50

Note : *Question no. 1 is compulsory. Attempt any three questions from the remaining questions no. 2 to 7. Support your answers with suitable examples wherever necessary.*

1. Answer any **four** of the following :

- (a) Discuss the impact of Biomass energy use on environment. 5
- (b) Explain, citing suitable example, the 'Rebound Effect' in reference to energy efficiency improvement. 1+4=5
- (c) Analyse the Energy Policies of SAARC nations. 5
- (d) Write down the effects of deforestation on biodiversity. 5

- (e) Expand any **two** of the following giving a brief description of each : $2\frac{1}{2} + 2\frac{1}{2} = 5$

- (i) CDM
- (ii) JI
- (iii) DSM

2. What is meant by Wind Energy ? Compare modern wind turbines with those used earlier. Describe the advantages of modern turbines and their working. $2+4+4=10$

3. "The issues of Supply and Demand of Energy are significant for sustainable development." Elaborate the statement. 10

4. How is Energy Planning achieved ? Discuss the activities of Energy Planning process. $2+8=10$

5. Enlist the steps of an energy efficient building. How can energy efficiency be achieved in the industrial sector ? $3+7=10$

6. (a) Explain whether "Hydropower is clean energy or destroyer". 5

- (b) What are the key concerns for a sustainable energy policy in India ? 5

7. With the help of a well-labelled diagram, explain the process of electricity generation in a coal based thermal power plant. $3+7=10$

No. of Printed Pages : 2

MED-003/MED-009

**POST GRADUATE DIPLOMA IN
ENVIRONMENT AND SUSTAINABLE
DEVELOPMENT (PGDESD)**

Term-End Examination

December, 2017

00681

MED-003/MED-009 : ENERGY AND ENVIRONMENT

Time : 2 hours

Maximum Marks : 50

Note : Question no. 1 is **compulsory**. Attempt any **three** questions from questions no. 2 to 7. Support your answers with suitable examples wherever necessary.

1. Answer any **four** of the following :

- (a) Discuss the important features of Demand Side Management of energy use. 5
- (b) Describe the key elements of modern energy storage technologies. 5
- (c) Describe the various energy storage technologies. 5
- (d) Explain the principle underlying photovoltaic systems. List the most commonly used solar materials. 3+2=5
- (e) What are the steps to be taken to mitigate some of the adverse environmental consequences of fossil and nuclear fuel use ? 5

2. Write a detailed account of the United Nation's role on International Environmental and Energy Policies. 10
3. Elaborate the strategies that can be applied in Urban Energy Planning. 10
4. What do you understand by Good Governance ? How do we foster governance in the Energy sector ? 10
5. Explain the following with respect to biomass energy : $4 \times 2 \frac{1}{2} = 10$
- (a) Gasification
 - (b) Conventional Pyrolysis
 - (c) Fermentation
 - (d) Anaerobic Digestion
6. Describe in detail, the three broad goals of energy sustainability as defined by the World Energy Council. 10
7. Highlight the changes that have taken place in energy use and energy systems in the developed and developing nations during the second half of the twentieth century. How can the future goals of sustainable energy be achieved ? $5+5=10$

No. of Printed Pages : 2

MED-003/MED-009

**POST GRADUATE DIPLOMA IN
ENVIRONMENT AND SUSTAINABLE
DEVELOPMENT (PGDESD)**

Term-End Examination

00005

June, 2018

MED-003/MED-009 : ENERGY AND ENVIRONMENT

Time : 2 hours

Maximum Marks : 50

Note : Question no. 1 is **compulsory**. Attempt any **three** questions from questions no. 2 to 5. Support your answers with suitable examples wherever necessary.

1. Attempt **all** parts :

- (a) Explain the factors that need to be considered in energy economics. 5
- (b) What are the issues and challenges before rural energy planning in India ? 5
- (c) Discuss how energy efficiency can be improved in the transport sector. 5
- (d) Explain the basic principle of electricity generation in a nuclear power plant. 5

2. (a) What is the importance of governance for sustainable energy ? 5
- (b) Discuss the advantages and limitations of a small hydropower plant. 5
3. (a) Discuss briefly the types of solar thermal collectors. 5
- (b) Discuss urban energy planning in context to site planning and building design. 5
4. Discuss the environmental issues in the renewable energy sector. 10

OR

Outline the major concerns of a sustainable energy policy in India. 10

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

- (a) Carbon sequestration
- (b) Biomass energy
- (c) Gasification
- (d) Alternative energy supply
-

No. of Printed Pages : 2

MED-003/MED-009

**POST GRADUATE DIPLOMA IN
ENVIRONMENT AND SUSTAINABLE
DEVELOPMENT (PGDESD)**

Term-End Examination

December, 2018

00892

MED-003/MED-009 : ENERGY AND ENVIRONMENT

Time : 2 hours

Maximum Marks : 50

Note : *Question no. 1 is **compulsory**. Attempt any **three** questions from the remaining questions. Support your answers with suitable examples wherever necessary.*

1. Attempt *all* parts :

- (a) Discuss urban energy planning in context to land use and transportation planning. 5
- (b) Discuss wind energy applications in India. 5
- (c) Describe the role of resources for the sustainable carrying capacity of the Earth. 5
- (d) Discuss the economic approach to the energy problem. 5

2. (a) What are the key challenges in providing energy to the poor ? 5
- (b) Discuss the benefits of energy planning. 5
3. (a) Describe the applications of biomass technologies based on direct combustion. 5
- (b) What is home energy audit ? What are the major problem areas that are responsible for energy losses ? 5
4. "Population growth and industrialisation are the factors which drive the world-wide energy demand." Discuss. 10

OR

Discuss the role of various stakeholders in the energy planning process. 10

5. Write short notes on any *two* of the following : $2 \times 5 = 10$

- (a) Solar Photovoltaic Technology
- (b) Rebound Effect in the Supply of Energy
- (c) Nuclear Hazards
- (d) Fuel Switching
-

No. of Printed Pages : 2

MED-003/MED-009

**POST GRADUATE DIPLOMA IN
ENVIRONMENT AND SUSTAINABLE
DEVELOPMENT (PGDESD)**

Term-End Examination

June, 2019

02471

MED-003/MED-009 : ENERGY AND ENVIRONMENT

Time : 2 hours

Maximum Marks : 50

Note : Attempt any *five* questions.

1. (a) Briefly explain how electricity is produced in coal based thermal plant. 5
- (b) Discuss the broad aims of energy planning. 5
2. (a) What do you mean by professional energy audits ? 5
- (b) Citing an example from India, highlight the applications of wind energy. 5
3. (a) Throw light on demand substitution among energy commodities. 5
- (b) List the measures which need to be taken to meet the goals of Indian Energy Policy. 5

4. (a) What are the key initiatives of Indian Biomass Production Programme ? 5
- (b) Define carrying capacity. Differentiate between biophysical and social carrying capacity of Earth's energy base with suitable example. 5
5. (a) Analyse the energy use in agricultural and industrial sectors of any country. 5
- (b) Elaborate the key objectives of Energy Policy of developing countries. 5
6. (a) What is Clean Development Mechanism (CDM) ? Describe its any two advantages and limitations each. 1+4
- (b) "Environmental economics undertakes theoretical or empirical studies of the economic efforts of national or local environmental policies around the world." Justify the statement. 5
-
7. (a) What are the key components of solar photovoltaic technology ? 5
- (b) List any three factors causing deforestation in developing countries. Explain any two consequences of deforestation. 5
8. (a) Describe any one method for mitigating carbon emission from the atmosphere. 5
- (b) What are the impediments to technology transfer ? Give any three points. 5

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No. of Printed Pages : 3

MED-3/MED-9

**POST GRADUATE DIPLOMA IN
ENVIRONMENT AND SUSTAINABLE
DEVELOPMENT**

(PGDESD)

Term-End Examination

December, 2019

MED-3/MED-9 : ENERGY AND ENVIRONMENT

Time : 2 Hours

Maximum Marks : 50

Note : Attempt any five questions.

1. (a) Discuss any *three* energy related activities which cause air pollution. List any *two* ways by which the harmful affects of air pollution can be mitigated. 5
- (b) Discuss the issues and challenges of rural energy planning in India. 5
2. (a) Briefly explain fossil fuels as sources of energy. 5

[2]

MED-3/MED-9

- (b) Elaborate the key concerns for a sustainable energy policy in India. 5
3. (a) What aspects should be taken care of by the implementing agencies while generating clean, efficient and renewable energy ? 5
- (b) Draw a simplified well labelled diagram of a nuclear power plant. 3+2
4. (a) Write an explanatory note on Energy Infrastructure Development Guidelines. 5
- (b) Compare the demand side and supply side approaches of the energy problem. 5
5. (a) Outline the various scenarios of future energy uses. Discuss, which one is the most likely to occur in India ? 5
- (b) Describe various measures taken for some home appliances for saving energy. 5
6. (a) Describe any *five* factors which hinder in attracting investments in energy sector. 5
- (b) What is meant by "Small Hydropower Plant" ? Detail the working of such a plant. 5

[3]

7. (a) Define the terms energy and power.
Complete the following conversions of
energy units : 5

(i) 1 H.P. = watts

(ii) 1 kWh = Btu.

(iii) 1 W = J-s⁻¹

- (b) Discuss the solar PV utilization in context
of India. 5

8. (a) Make a list of biomass technologies. How
far these are useful in mitigating energy,
poverty in developing countries ? 5

- (b) What do you understand by "Demand-side
Management" of energy ? Explain in detail. 5

No. of Printed Pages : 3 **MED-003/MED-009**

**POST GRADUATE DIPLOMA IN
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DEVELOPMENT (PGDESD)**

Term-End Examination

June, 2020

MED-003/MED-009 : ENERGY AND ENVIRONMENT

Time : 2 Hours

Maximum Marks : 50

*Note : Question No. 1 is compulsory. Attempt any
three questions from Question No. 2 to 5.*

*Support your answer with suitable examples
wherever necessary.*

1. Attempt *all* parts : 5 each
 - (a) Discuss the demand of energy due to industrialisation.
 - (b) Explain the role of chemical energy in fossil fuels.
 - (c) Discuss the role of nuclear power plant in generation of energy in large quantities.

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[2]

MED-003/MED-009

- (d) Explain the use of energy storage technologies particularly in hydrogen as fuel cells.
2. (a) Discuss the infrastructure efficiency strategies with regard to power and water supply and use of waste water and recycling facilities. 5
- (b) Explain the concept of multi-use building and waste heat utilisation. 5
3. (a) Describe the role of non-hydro renewable energy sources in meeting the energy needs. 5
- (b) What are key concerns for a sustainable energy policy in India ? 5
4. Explain the environmental economics, essentially in the creation of present generation of economists. 10

Or

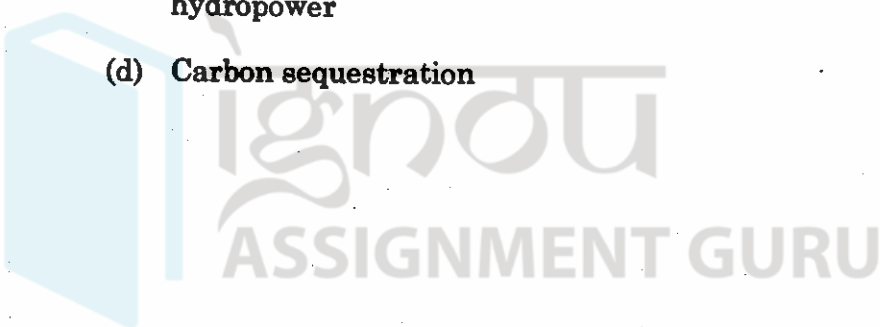
Discuss the impacts of energy in relation to sustainability in terms of economic growth.

[3]

5. Write short notes on any *two* of the following :

5 each

- (a) Solar thermal power generation
- (b) Biomass technologies
- (c) Advantages and limitations of small hydropower
- (d) Carbon sequestration



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No. of Printed Pages : 3 **MED-003/MED-009**

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Term-End Examination

December, 2020

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Time : 2 Hours

Maximum Marks : 50

Note : *Question No. 1 is compulsory. Attempt any
three questions from question nos. 2 to 5.*

*Support your answer with suitable examples
wherever necessary.*

1. Attempt all parts :

- (a) Discuss the concept of harnessing the sun's
light as clean energy. 5

- (b) Discuss deforestation in relation to
hydrological cycle. 5

[2]

MED-003/MED-009

- (c) Explain the harmful impacts of wind energy technologies that are in use today. 5
- (d) Discuss how energy sector is affecting the environment and global climate at large. 5
2. (a) Discuss the energy policies adopted in the SAARC region. 5
- (b) Describe briefly the aims and benefits of energy planning. 5
3. (a) Explain in brief the energy in relation to sustainability. 5
- (b) Discuss the energy policy vis-a-vis environment and development. 5
4. Discuss the economics of demand and supply of energy. 10

Or

Explain the problem of energy in eliminating the obscene levels of poverty without further polluting the planet.

[3]

5. Write short notes on any *two* of the following : $2 \times 5 = 10$

- (a) Devices of solar thermal applications
- (b) Biological processing to derive energy from biomass
- (c) Wind energy
- (d) Waste as an energy resource



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