

Total No. of Questions: 6

Total No. of Printed Pages:3

Enrollment No.....



Faculty of Engineering  
End Sem (Odd) Examination Dec-2018  
EE3EL04/EX3EL04

Energy Conservation & Management

Programme: B.Tech.

Branch/Specialisation: EE/EX

**Duration: 3 Hrs.**

**Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

- Q.1
- i. Energy can neither be created nor destroyed implies 1
    - (a) Energy is converted from one form to another form
    - (b) Energy is only available in form of heat.
    - (c) Energy is created only by burning fuel
    - (d) Energy cannot be converted from one form to another
  - ii. Which of the following can be the effect of Green House Gases? 1
    - (a) Flood
    - (b) More earth temperature
    - (c) Food shortage
    - (d) All of these
  - iii. Which of the following gives less light for the same wattage? 1
    - (a) Incandescent bulb
    - (b) Conventional tube light
    - (c) CFL
    - (d) LED
  - iv. Which of the following is an example of Renewable Energy source? 1
    - (a) Wind
    - (b) Petrol
    - (c) LPG
    - (d) Coal
  - v. Which rating or labelling is provided by the Bureau of Energy Efficiency, Govt. of India and displayed on electrical home appliances such as refrigerator, TV, air conditioner to indicate their energy efficiency? 1
    - (a) BIS
    - (b) ISI
    - (c) Power
    - (d) Star labelling

P.T.O.

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- vi. "Energy Saved is Energy Generated" implies that **1**  
I. Energy saved by energy conservation is lost and cannot be recovered  
II. Energy requirement is reduced by energy savings  
III. Amount of energy available for use by saving is more than the amount of energy saved  
IV. Energy requirement increases by saving energy  
Which of the above statements are correct?  
(a) I (b) II and III (c) I and III (d) I and IV
- vii. The reduction of utility load primarily during peak demand is known as **1**  
(a) Peak clipping (b) Load shifting  
(c) Valley filling (d) MTP analysis
- viii. If the load current decreases then the power factor **1**  
(a) Will also decrease (b) Will increase  
(c) Will remain unchanged (d) None of these
- ix. While purchasing an air conditioner, we need to consider the followings **1**  
I. Size of room  
II. No of persons using the room  
III. Colour of the room  
IV. Manufacture of the air-conditioner  
Which of the above statements are correct?  
(a) I,III and IV (b) I and II  
(c) I and III (d) III and IV
- x. The device used to measure the wind speed is known as **1**  
(a) Anemometer (b) Earth tester  
(c) Wind turbine (d) Odometer
- Q.2 i. Discuss environmental aspect in energy conservation methods. **2**  
ii. What are the various efforts which countries must undertake for sustainable energy development? **3**

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- iii. With the help of neat sketch discuss the structure of atmosphere along with temperature profile of atmosphere and related phenomenon. **5**
- OR iv. What are the main reasons of global warming and climate change? What could be the steps which can possibly be taken to solve this issue? **5**
- Q.3 i. What is energy management and what are its objectives? **2**  
ii. What is energy audit? How is energy audit classified? **8**
- OR iii. What is energy policy? List out the complete questionnaire for energy audit. **8**
- Q.4 i. What is demand side management? What is its significance? **3**  
ii. Discuss different types of tariffs used for charging the consumers of electric energy. **7**
- OR iii. What do you mean by payback period? Discuss in brief the present value method vs internal rate of return method of evaluation of projects. **7**
- Q.5 i. How energy efficient motors are different than normal motors? **4**  
ii. Explain what do you mean by variable speed drives? What are different energy efficient drives used for energy conservation? **6**
- OR iii. What is the significance of power factor in energy conservation? How is the power factor controlled in a power system? **6**
- Q.6 Attempt any two:  
i. What do you mean by co-generation? Discuss the impact of price of electricity on co-generation. **5**  
ii. Discuss in detail energy conservation measures for industries. **5**  
iii. Explain energy related standards and norms used in India. Also discuss about energy conservation building codes (ECBC). **5**

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## Marking Scheme

### EE3EL04/EX3EL04 Energy Conservation & Management

Q.1	<p>i. Energy can neither be created nor destroyed implies (d) Energy cannot be converted from one form to another <b>1</b></p> <p>ii. Which of the following can be the effect of Green House Gases? (d) All of these <b>1</b></p> <p>iii. Which of the following gives less light for the same wattage? (a) Incandescent bulb <b>1</b></p> <p>iv. Which of the following is an example of Renewable Energy source? (a) Wind <b>1</b></p> <p>v. Which rating or labelling is provided by the Bureau of Energy Efficiency, Govt. of India and displayed on electrical home appliances such as refrigerator, TV, air conditioner to indicate their energy efficiency? (d) Star labelling <b>1</b></p> <p>vi. "Energy Saved is Energy Generated" implies that <b>1</b></p> <p style="margin-left: 20px;">I. Energy saved by energy conservation is lost and cannot be recovered</p> <p style="margin-left: 20px;">II. Energy requirement is reduced by energy savings</p> <p style="margin-left: 20px;">III. Amount of energy available for use by saving is more than the amount of energy saved</p> <p style="margin-left: 20px;">IV. Energy requirement increases by saving energy</p> <p style="margin-left: 20px;">Which of the above statements are correct? (b) II and III</p> <p>vii. The reduction of utility load primarily during peak demand is known as <b>1</b></p> <p style="margin-left: 20px;">(a) Peak clipping</p> <p>viii. If the load current decreases then the power factor <b>1</b></p> <p style="margin-left: 20px;">(b) Will increase</p>		<p>ix. While purchasing an air conditioner, we need to consider the followings <b>1</b></p> <p style="margin-left: 20px;">I. Size of room</p> <p style="margin-left: 20px;">II. No of persons using the room</p> <p style="margin-left: 20px;">III. Colour of the room</p> <p style="margin-left: 20px;">IV. Manufacture of the air-conditioner</p> <p style="margin-left: 20px;">Which of the above statements are correct? (b) I and II</p> <p>x. The device used to measure the wind speed is known as <b>1</b></p> <p style="margin-left: 20px;">(a) Anemometer</p>
	<p>Q.2 i. Environmental aspect in energy conservation methods <b>2</b></p> <p style="margin-left: 20px;">1 mark for each point (1 mark *2).</p> <p>ii. Sketch <b>5</b></p> <p style="margin-left: 20px;">Temperature profile of atmosphere 2 marks</p> <p style="margin-left: 20px;">Related phenomenon. 1 mark</p> <p>OR iii. Reasons of global warming and climate change <b>5</b></p> <p style="margin-left: 20px;">2 marks</p> <p style="margin-left: 20px;">Steps which can possibly be taken to solve this issue</p> <p style="margin-left: 20px;">1 mark for each point (1 mark *3) 3 marks</p>		
	<p>Q.3 i. Energy management <b>2</b></p> <p style="margin-left: 20px;">1 mark</p> <p style="margin-left: 20px;">Its objectives 1 mark</p> <p>ii. Energy audit <b>8</b></p> <p style="margin-left: 20px;">2 marks</p> <p style="margin-left: 20px;">Energy audit classified 6 marks</p> <p>OR iii. Energy policy <b>8</b></p> <p style="margin-left: 20px;">2 marks</p> <p style="margin-left: 20px;">Questionnaire for energy audit. 6 marks</p>		
	<p>Q.4 i. Demand side management <b>3</b></p> <p style="margin-left: 20px;">1 marks</p> <p style="margin-left: 20px;">Its significance 2 marks</p> <p>ii. Tariffs used for charging the consumers of electric energy <b>7</b></p> <p style="margin-left: 20px;">1 mark for each tariff (1 mark *7)</p> <p>OR iii. Payback period <b>7</b></p> <p style="margin-left: 20px;">2 marks</p> <p style="margin-left: 20px;">Present value method vs internal rate of return method of evaluation of projects 5 marks</p>		

Q.5	i.	Energy efficient motors are different than normal motors		<b>4</b>
		1 mark for each point	(1 mark * 4)	
	ii.	Variable speed drives	2 marks	<b>6</b>
		Energy efficient drives used for energy conservation	4 marks	
OR	iii.	Significance of power factor in energy conservation	2 marks	<b>6</b>
		Power factor controlled in a power system	4 marks	
Q.6		Attempt any two:		
	i.	Co-generation	2 marks	<b>5</b>
		Impact of price of electricity on co-generation		
		At least 3 points	3 marks	
	ii.	Energy conservation measures for industries.		<b>5</b>
		1 mark for each point	(1 mark * 5)	
	iii.	Standards and norms used in India	2 marks	<b>5</b>
		Energy conservation building codes	3 marks	

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