



# GOVERNMENT COLLEGE OF ENGINEERING, JALGAON

(An Autonomous Institute of Government of Maharashtra)

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Name of Examination : **Winter 2020** - (Preview)

Course Code & Course Name : **EE403B - Elective -I-Energy Audit and Conservation**

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Maximum Marks : **60**

Duration : **3 Hrs**

[Edit](#) [Print](#) [View Answer Key](#) [Close](#) **Answer Key Submission Type:** Marking scheme with model answers and solutions of numerical

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data; if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks.

## 1) Solve all sub-questions.

- a) What are the major pollutants in burning fossil fuels? Explain how its effect on environment. [06]
- b) Discuss about the various reforms in the energy sector in India. [06]

## 2) Solve all sub-questions.

- a) What is the need for energy audit? Also list out the types of energy audit. [06]
- b) 'Measurements are an essential part of energy audit' why? [06]

## 3) Solve any two sub-questions.

- a) How we can conduct energy audit of buildings? Which factors are consider while doing energy audit of building? [06]
- b) Discuss the step involved in DSM planning and implementation. [06]
- c) Explain how demand side management help to improve the environment. [06]

## 4) Solve any two sub-questions.

- a) Which industries generally go in for captive power plant and why? [06]
- b) Find the generation cost of captive power plant installed in sugar mill from the following data: Size of plant 30 MW, total capital cost Rs. 800 million, interest rate 10%, life of plant 20 years. The plant will use bagasse as fuel which is free of cost. Annual operation and maintenance cost 5 % of capital cost, load factor 60%, subsidy 30%. [06]
- c) List and discuss the factors that affect energy efficiency in air compressor. [06]

## 5) Solve any two sub-questions.

- a) An industrial installation has a load of 1 MW at power factor 0.78 lagging. The tariff is Rs. 200 per kVA of maximum demand per year plus Rs. 3.50 per kWh. The cost of installation of capacitors is Rs. 500 per kVAR. The interest and depreciation is 15 %. Find (i) most economical power factor (ii) capacitor kVAR to improve the power factor to this value.(iii) annual electricity bill before installation of capacitor (iv) annual electricity bill after installation of capacitor. Assume that load factor of installation is 0.8. [06]
- b) Briefly discuss the energy audit of steam generation, distribution and utilization system. [06]
- c) Describe the procedure for efficient illumination design of a workshop. [06]

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