

PGDM 2013-2015

Energy Management (DM-441/IB-413)

Trimester – IV End-Term Examination: September 2014

Time allowed: 2.5 Hours

Max Marks: 50

Roll No: _____

Section A:

Max. Marks: 15

Short answers: Answer any 3 out of 5 questions below. Each question carries 5 marks.

A-1: Write a short note on BEE and EC Act 2001

A-2: Write a short note on Energy conservation and its impact on global warming.

A-3: What is meant by “Energy efficient lighting systems”? Give at least four ways to make the lighting systems efficient.

A-4: What are cooling towers and where are they used? How do they improve the efficiency of air conditioning system?

A-5: How is the power generated in a thermal power station? Give a schematic explanation.

Section B

Max. Marks: 20

Long answers: Answer any 2 out of 3 questions below. Each question carries 10 marks.

B-1: What is a VFD. Give at least five examples where the VFDs have been used.

B-2: What is Screw Compressor. Write three advantages of screw compressors over the reciprocating compressors.

B-3: In a typical academic institution, there are various functional divisions such as;

- a) Main teaching complex, b) Student hostels in main campus, c) students’ mess, d) a cafeteria,
- e) Residential block to accommodate about twenty staff members, f) an outdoor student hostel,
- g) Outdoor students’ play fields, h) a gymnasium and i) centralized laundry service.

The main components of the energy sources used by the institute are i- the Grid supplied electricity, ii- an in house captive DG set for back up power and iii- Piped gas for cooking in students’ mess.

The management is concerned about the ever increasing energy bills. You have been hired to advise and help the management bring down the energy consumption without compromising on any of the basic requirements.

What advise would you give? Also, suggest an organization chart for energy management in the institute.

Section C:

Case Study

Max. Marks: 15

The situation:

India's energy intensity per unit of GDP is higher by 3.7 times that of Japan, 1.4 times that of Asia and 1.5 times that of USA, indicating very high energy wastage, and thus potential of substantial energy saving. The increasing liberalization of global trade through WTO and growing competition have made productivity improvement and energy cost reduction as the most important benchmarks for economic success. This calls for concerted efforts by industry to reduce energy intensity for their products. The projected economic growth necessitates commensurate growth of commercial energy resources, most of which is expected to be from fossil fuels and electricity. To bridge peak power shortages (13 to 15%) and average shortages (8 to 10%), India needed fresh capacity addition of nearly 1,00,000 MW, more than 75% of which was likely to be coal based. This would require an investment of the order of Rs.8,00,000 crores. This poses a great challenge to a developing country like India. India needs a paradigm shift in approach to overall energy policy issues - a shift from supply domination to an operational efficiency improvement of existing power generating stations, T&D losses reduction, and most importantly the end use efficiency improvements.

In view of the above, integrated resource planning and demand side management (DSM) including active promotion of efficiency in end uses of energy should evidently constitute our long-term energy strategy. The policy goals and concepts will have to be shifted from energy conservation to energy efficiency and from energy inputs to the effectiveness of energy use and energy services for all sectors of economy. The industry sector, a major consumer of energy, has significant potential to improve its end-use energy efficiency resulting in reduced energy consumption and cost minimisation. This is more so crucial for the energy intensive sectors like, cement, fertilizer, and iron & steel, etc.

As can be seen, Energy is a vital component for the economic development of our country. Energy Efficiency and its conservation is a cost effective solution to reduce the dependence of our country on expensive fossil fuels, and to enhance productivity, in the backdrop of rising energy prices. Energy efficiency and its conservation assumes tremendous significance with the view of ensuring energy security and sustainable economic growth.

A large number of industries in India participate in the annual National Energy Conservation Awards contest. Each one of them submit a report of their efforts in this area, which had lead

them to the global fore front of energy efficiency, enabling them to achieve and maintain specific energy consumption levels that are at par with international best practices. In their endeavour to reduce their energy costs while enhancing the performance, these industries have implemented viable energy efficient technological interventions continuously over the past several years. As a result, today these industries have become role models for their peers.

Questions: Each question carries 5 marks:

C-1: Write the names of at least ten companies who participated in the award contest for the year 2013.

C-2: Write at least five different ways the industries have been able to improve their energy efficiencies and resulted in to energy conservation.

C-3: Write three areas where the potential for energy savings is comparatively easy, high and possible.