Total No. of Questions : 6] **SEAT No. :**

P5888 **[Total No. of Pages : 2**

BE/Insem./Oct.-522

B.E. (Mechanical Engineering)

ENERGY AUDIT & MANAGEMENT

(2015 Pattern) (Semester - I) (Elective - II)

Time : 1 Hour] ***[Max. Marks : 30***

Instructions to the candidates:

1) ***Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.***
2) ***Draw neat diagrams wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of scientific calculator is allowed.***
5) ***Assume suitable data wherever necessary.***

Q1) a) Explain the Need of Energy Management in India. **[5]**

b) Describe the relation between Environment and Energy. **[5]**

OR

Q2) a) Explain the need of energy security and reliability. **[5]**

b) Explain the principles of energy management. **[5]**

Q3) a) Explain preliminary energy audit and its importance. **[5]**

b) List out instruments used in energy audit and explain any three. **[5]**

OR

Q4) a) Explain detailed energy audit with 10 step methodology. **[6]**

b) Explain the method of analysis of energy audit. **[4]**

Q5) a) Explain in short with advantages **[5]**

i) Risk and Sensitivity analysis

ii) Time value of money

P.T.O.

b) Find simple payback period and return on investment when Rs. 600,000/- is required as an investment for replacing old machine by new machine which gives annual saving of Rs. 140,000. The yearly maintenance cost is Rs. 25,000. **[5]**

OR

Q6) a) Annual saving after replacement of a boiler for 1st year is Rs. 6.5 lakhs, for 2nd year is Rs. 6.0 lakhs and for 3rd year is 5.25 lakhs respectively. Total Project cost is Rs. 12 lakhs considering cost of capital as 12%, if boiler requires Rs. 1.2 lakhs for maintenance per year, what is the NPV of proposal. Is proposal attractive? **[5]**

b) Calculate the internal rate of return for an economizer that will cost Rs. 500,000 will last 10 years and will result in fuel saving of Rs. 150,000 each year. **[5]**