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B.E (FULL Time) DEGREE END SEMESTER EXAMINATIONS, MAY 2012

MECHANICAL ENGINEERING BRANCH

VIII SEMESTER EXAMINATION (REGULATIONS : 2008)

ME 9021 : ENERGY CONSERVATION & MANAGEMENT

Time : 3 h *Assume relevant data, if information provided is insufficient* Max Mark :100

Answer ALL Questions

Part A **10x2=20**

1. What does the term CO_2 equivalent mean?
2. Compute the monthly energy share and cost share for a typical household consuming 100 kWh of electricity and 1 LPG cylinder per month
3. Why squirrel cage induction motors are preferred by Industries?
4. Give the equation for determining the optimal loading of transformers
5. What does the term "from & at 100°C" in boiler mean?
6. How flash steam in produced?
7. Mention the significance of NPSH in pumps
8. How air compressors are specified?
9. List the need of CUSUM plot in energy economics
10. What does *"life cycle costing"* mean?

Part B **5x16=80**

11. (i) Compare the objectives and deliverables of Preliminary, Detailed and Specific Energy Audit (8)
    (ii) What are the barriers for an energy audit? (4)
    (iii) Discuss the typical functions of an energy manager (4)

12 (a) (i) List at least 8 options for energy conservation in transformers and illumination systems (12)

(ii) A 50 kW induction motor with 86 % present full load efficiency is being considered for replacement by a 89 % efficiency motor. What will be the savings in energy if the motor works for 6000 hours per year and cost of energy is Rs 4.50 per kWh? (4)

(or)

(or)

(b) (i) Compare the characteristics of Forward Curved, Backward Curved and Radial fans

(ii) Compare PD pumps vis-à-vis rotodynamic pumps with respect to Flow rate versus pressure and Flow rate versus viscosity

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15. (a) Three mutually exclusive projects A,B and C have been proposed. Each projects require investment worth Rs 2 00 000 and have an estimated life of 5 years, 4 years & 3 years respectively. After its life cycle, the salvage value of the projects is observed to be zilch. The company's required rate of return is 10 %. The anticipated cash flows after taxes (CFAT) for the three projects are as follows

Year	CFAT for Projects		
	A	B	C
1	50 000	80 000	1 00 000
2	50 000	80 000	1 00 000
3	50 000	80 000	10 000
4	50 000	30 000	-
5	1 90 000	-	-

Rank each project applying the methods of SPB, ARR, NPV, IRR

(or)

(b) Analyse the merits and demerits of IRR over SPB, NPV and ARR
