Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. / B. Tech / B. Arch (Full Time) - END SEMESTER ARREAR EXAMINATIONS, APRIL/MAY 2024

MECHANICAL ENGINEERING
VII Semester
ME7076 ENERGY CONSERVATION IN INDUSTRIES

(Regulation 2015)

Time: 3 hrs

Max. Marks: 100

PART- A (10 x 2 = 20 Marks)
(Answer all Questions)

Q. No	Questions	Marks
1	List any four energy auditing instruments.	2
2	Name any four primary energy sources.	2
3	Give reasons on the term supply and demand.	2
4	What is meant by payback period?	2
5	Define power factor.	2
6	Differentiate between energy efficiency and energy conservation.	2
7	What is meant by coefficient of performance in heat pump and refrigerator?	2
8	Brief upon waste heat recovery.	2
9	Differentiate between fan and blower.	2
10	What is the function of a cooling tower?	2

PART- B (5 x 13 = 65 Marks)

Q. No	Questions	Marks
11 (a) (i)	Enumerate the scope and objective of Preliminary and Detailed -Energy Auditing.	7
(ii)	Write notes on barriers of energy audit.	6
	(OR)	
11 (b) (i)	Elucidate about the global and national energy scenario in various sectors.	7
(ii)	What are the responsibilities of an energy manager?	6
12 (a) (i)	Explain the ESCO concept with respect to any thermal/mechanical system in detail.	13
	(OR)	
12 (b) (i)	Explain the terms fixed cost, variable cost and selling price of a product.	6
(ii)	What is depreciation? Brief upon the methods and need for depreciation.	7
13 (a) (i)	Explain the laws of illumination.	5
(ii)	Explain in detail about the types of lighting systems.	8
	(OR)	
13 (b) (i)	Consider a household using 4 tube lights, 3 ceiling fans, 1 refrigerator, air conditioner and washing machine, 2 television unit and 4 CFL bulbs. Derive the average cost (in Rupees) of electricity bill to be paid per month to TNEB by assuming suitable value of wattage for the electrical items mentioned.	13
14 (a) (i)	Explain the following with regard to a boiler; (i) Steam trap, (ii) Blowdown, (iii) Advantages of steam as a heat transfer medium and (iv) Indirect method of boiler efficiency determination.	13
	(OR)	

14 (b) (i)	Explain the principle of cogeneration cycle with a neat schematic sketch.	**10**
(ii)	Mention the advantages of cogeneration.	**3**
15 (a) (i)	With a simple sketch, explain the working of a domestic air conditioning system.	**13**
	(OR)	
15 (b) (i)	Differentiate between a pump and a compressor.	**5**
(ii)	Explain the working of cooling tower with a neat sketch.	**8**

PART- C (1 x 15 = 15 Marks)

(Q.No. 16 is Compulsory)

Q. No	Questions	Marks
16 (i)	What are the aspects to be considered in life cycle cost analysis? Mention the need for ESCO (Energy Service Company).	**8**
(ii)	Assume a wood fired boiler and with a simple sketch, explain the process of steam generation. Write short notes on 25 W LED tube light cost and compare the same with the cost of a conventional tube light.	**7**