

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination, April-May, 2018

M. Tech. in Thermal Engineering, Semester II

Roll No.....

TEMTECH 202: Energy Management

Time: 3 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.
4. Students are allowed to carry scientific calculator.

Q.1A	Objective type multiple choice questions (10 questions @ 1 mark)	10
i.	The outer tube of the pitot tube is used to measure ____ a) Static pressure b) velocity pressure c) Total pressure d) Dynamic pressure	
ii.	Axial fans are best suitable for ----- application. a) Large flow, low head b) Low flow, high head c) High head, large flow d) Low flow, low head	
iii.	All of the following can be handled by an EMS (energy management system) except: a) lighting demands and security systems. b) monitoring carbon dioxide in garages. c) controlling sensitivity adjustment. d) preheating or precooling.	
iv.	Which is false concerning utility bills? a) each utility bill should be checked in detail, starting with the meter readings b) most utility companies will furnish customers with their scheduled meter-reading dates a year in advance c) building staff should take utility meter readings four times or fewer per year d) one of the most effective practices to reduce energy costs is to scrutinize utility bills monthly	
v.	The ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) guideline for the commissioning of HVAC (heating, ventilating, and airconditioning) systems is provided to: a) make certain that new HVAC systems do not leak refrigerant. b) verify that HVAC systems operate in conformity with design intent. c) give guidelines for cleaning construction dust and contaminants out of a system.	

	d) establish routine and preventive maintenance procedures.	
vi.	The EPA's (Environmental Protection Agency's) FVC (Financial Value Calculator) does all of the following except : a) allows you to track your energy performance improvements over time through continued use. b) allows you to measure your company's energy performance. c) shows you how to purchase utilities at the lowest cost. d) shows you how your building measures up in the industry based on industry averages.	
vii.	All of the following are basic types of heat recovery systems except : a) hydronic recovery systems. b) hygroscopic recovery systems. c) heat-pump recovery systems. d) air-to-air recovery systems.	
viii.	A building engineer must have CFC (chlorofluorocarbon) technician certification training for all of the following situations except : a) when only responsible for inspection or routine maintenance. b) when the technician has adequate training. c) when working on small refrigeration systems. d) when all refrigeration work is subcontracted.	
ix.	The supply of air for most air-conditioning systems is: a) all fresh air from outside the building. b) a mixture of outdoor air and recirculated air. c) all recirculated air from the area near the HVAC system. d) all recirculated air from throughout the building.	
x.	For a building complex with a central plant and several remote mechanical equipment rooms, the best EMCS (energy management control system) to use is a: a) fully distributed system. b) localized single-function system. c) centralized station. d) localized multi-function system.	

Q.2	Short answer type questions (4 questions @ 2.5 marks)	10
i.	Name different options available to control the speed of a fan?	
ii.	Which type of housing is more efficient for better fan performance?	
iii.	List at least five energy saving opportunities for a fan application.	
iv.	Write the potential sectors of Co-generation.	
Q.3A	Differentiate between 'centrifugal' and 'axial flow' fans?	05
Q.3B	Explain with diagram the topping and Bottoming systems of Cogeneration.	05
Q.4A	Distinguish "speed control" vs "guide vane control" in a fan?	05
Q.4B	Write the advantages of Cogeneration in the present power sector scenario.	05

Q.5A	What are the potential benefits of Energy management?	05
Q.5B	Explain Combined Cycle plant with Sankey diagram.	05
Q.6	How do you assess the performance of fans? Explain.	10
Q.7	Write the components of establishing an energy management action plan.	10
	OR	
Q.7	In addition to NFRC ratings, what are the different factors for choosing energy efficient windows, explain?	10
Q.8	With a neat diagram, explain the heat transfer phenomena of Heat Pipes and its effectiveness.	10
Q.9	Outline a general procedure for energy auditing of most of the buildings.	10
Q.10	Write in detail about "flash steam recovery" from steam condensate.	10
	OR	
Q.10	What are the important guidelines for proper drainage and layout of steam lines?	10