



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad -500 043

MECHANICAL ENGINEERING

TUTORIAL QUESTION BANK

Course Name	:	ENERGY CONSERVATION AND MANAGEMENT
Course Code	:	AME805
Class	:	VII Semester
Branch	:	MECHANICAL ENGINEERING
Year	:	2019–2020
Course Coordinator	:	Mr. G.Sarat raju, Assistant professor.
Course Faculty	:	Mr. G.Sarat raju, Assistant professor.

OBJECTIVES:

I	Understand the fuels and combustion in relation to energy conservation.
II	Understand the properties and sources of steam.
III	Learn about the energy saving methods.\
IV	Understand the waste heat recovery.

S No	QUESTION	Blooms Taxonomy Level	Course Learning Outcomes
UNIT – I			
FUELS AND COMBUSTION, BOILERS			
Part - A (Short Answer Questions)			
1	What is the function of a reheater?	Understand	AME805.01
2	Write the methods of coal storage?	Understand	AME805.02
3	List out the methods of coal handling	Understand	AME805.03
4	What is the function of a coal crusher?	Remember	AME805.02
5	What is the necessity of a stoker	Understand	AME805.01
6	Differentiate between wet type and electrical dust collectors	Understand	AME805.01
7	Explain the function of a generator.	Understand	AME805.02
8	What is underfeed fuel bed?	Understand	AME805.03
9	What is over feed fuel bed?	Remember	AME805.04
10	Define the term fuels.	Understand	AME805.02
11	What are fossil fuels? ? Give examples.	Understand	AME805.02
12	Define primary fuels	Understand	AME805.03
13	What are secondary fuels?	Understand	AME805.04
14	. Write a short note on liquid fuels	Understand	AME805.02
15	What do you mean by product of combustion?	Remember	AME805.04
Part - B (Long Answer Questions)			
1	Explain the following (i) Compressed naturalgas (CNG) (ii) Liquid petroleum gas. (LPG)	Understand	AME805.02

2	What do you mean by hydrogenation of coal How Synthetic petrol is manufactured by Bergius Process?	Understand	AME805.01
3	Explain proximate analysis. Give its significance.	Understand	AME805.02
4	Explain with neat sketches, the construction and working of the La Mont boiler and Benson boiler	Understand	AME805.01
5	Explain the following boiler terms : Shell, setting, grate, furnace, water space and steam space	Understand	AME805.02
6	State the differences between the following boilers? Externally fired and internally fired boilers	Understand	AME805.01
7	How can you convert weight analysis in volumetric analysis?	Understand	AME805.02
8	Derive Boiler Efficiency by Indirect Method.		
9	What are the Factors Affecting Boiler Performance? Discuss.	Remember	AME805.02
10	Why boiler efficiency by indirect method is more useful than direct method?	Understand	AME805.01
11	What are the Measurements Required for Performance Assessment Testing in boilers?	Understand	AME805.01
12	What is the significance of pre-heating furnace oil before burning?	Understand	AME805.02
13	What are the uses of proximate and ultimate analysis?		
14	What are the major constituent of LPG and Natural gas?	Remember	AME805.02
15	Which parameter influences the Viscosity of liquid fuel?	Understand	AME805.01

UNIT-II
STEAM SYSTEM`

Part - A (Short Answer Questions)

1	Explain 'degree of reaction' in a steam turbine	Understand	AME805.04
2	Discuss the importance of compounding of steam turbine.	Understand	AME805.05
3	List the functions of governors in steam turbine.	Understand	AME805.05
4	What are boiler mountings?	Remember	AME805.06
5	What are boiler tube leak identifications?	Understand	AME805.07
6	What is a steam trap?	Understand	AME805.06
7	Discuss Specific enthalpy of wet steam.	Understand	AME805.05
8	Write the Advantages of superheated steam.	Understand	AME805.06
9	Why Dryness fraction is important ?	Remember	AME805.07
10	What is throttling process?	Understand	AME805.08
11	Name two reasons why steam is used as a heat transfer medium?	Understand	AME805.05
12	What are the some Major Uses Of Flash Steam?	Remember	AME805.06
13	What is Operating principle of acoustic steam leak detection system?	Understand	AME805.07
14	What is the Principles of Acoustic Emission?	Understand	AME805.06
15	How Bubble immersion test can be performed?	Understand	AME805.05

Part - B (Long Answer Questions)

1	What is the reason boiler water tubes leak?	Understand	AME805.06
2	Explain different Types of Steam Traps.	Understand	AME805.05
3	Write the Advantages disadvantages of the inverted bucket steam trap.	Understand	AME805.06
4	What are the Performance Assessment Methods for Steam Traps?	Remember	AME805.07
5	What are the precautions to be taken while steam pressure is reduced for a process?	Understand	AME805.08
6	List a few barriers to heat transfer in heat exchangers using steam?	Understand	AME805.05
7	Name a few methods for testing of steam traps? Explain them.	Understand	AME805.06
8	Explain why low-pressure steam is more efficient?	Understand	AME805.04

9	Write about Leak detection methods without leak detector.	Remember	AME805.05
10	How can you determine dryness fraction by Throttling Calorimeter?	Understand	AME805.06
11	What are the precautions to be taken while steam pressure is reduced for a process?		
12	Discuss the advantages of direct injection versus indirect injection using steam?		
13	List a few barriers to heat transfer in heat exchangers using steam?		
14	Name two cases when steam trap can fail?		
15	Explain why low-pressure steam is more efficient?		

UNIT-III
INSULATION and COGENERATION

Part - A (Short Answer Questions)

1	Which feature is best suited for insulating materials?	Understand	AME805.09
2	What are the different types of insulation?	Understand	AME805.10
3	What is the density of insulation?	Understand	AME805.08
4	Which is better fiberglass or cellulose insulation?	Remember	AME805.10
5	What is the best material for attic insulation?	Understand	AME805.09
6	How well does fiberglass insulate heat?	Understand	AME805.10
7	Which is better cellulose or foam insulation?	Understand	AME805.09
8	Why is Cogeneration more efficient?	Understand	AME805.10
9	What is cogeneration and what are its advantages?	Remember	AME805.08
10	What is an example of cogeneration?	Understand	AME805.10
11	How does cogeneration save energy resources?	Remember	AME805.08
12	What are the disadvantages of cogeneration?	Understand	AME805.10
13	What do you mean by "Economic thickness of insulation"? Explain in details		
14	What are the factors involved in selecting a lagging material?		
15	List out the general requirements of refractory?		

Part - B (Long Answer Questions)

1	Explain the different types of insulation?	Understand	AME805.09
2	What are the disadvantages of cogeneration?	Understand	AME805.10
3	What is the process of cogeneration?	Remember	AME805.10
4	Write short notes on cogeneration system.	Understand	AME805.09
5	Write short notes on cogeneration cycle.	Understand	AME805.10
6	How does a cogeneration system work?	Understand	AME805.09
7	What is cogeneration and how does it work?	Understand	AME805.10
8	How does a trigeneration plant work?	Remember	AME805.08
9	What are some benefits of using a smart grid?	Understand	AME805.10
10	What are the Types Of Cogeneration Systems	Understand	AME805.10
11	Write short notes on Power Plant Performance Analysis	Understand	AME805.10
12	Explain one case study of Reciprocating engine system in industry	Understand	AME805.10
13	Explain briefly Cogeneration system-Sugar Mill	Understand	AME805.10

14	Explain one case study of Reciprocating engine system in industry	Understand	AME805.10
15	How do you classify the Cogeneration system? Explain any one System.	Understand	AME805.10
UNIT-IV			
WASTE HEAT RECOVERY			
Part - A (Short Answer Questions)			
1	What are the direct and indirect benefits of waste heat recovery?	Understand	AME805.13
2	What are the sources of waste heat recovery?	Understand	AME805.14
3	How does a heat recovery ventilator work?	Understand	AME805.15
4	What is recovery unit?	Remember	AME805.09
5	What is HRSG in power plant?	Understand	AME805.10
6	What is waste heat recovery boiler?	Understand	AME805.08
7	Why is there always some waste heat in a heat engine?	Understand	AME805.10
8	Why do cars produce unwanted heat?	Remember	AME805.09
9	What are the direct and indirect benefits of waste heat recovery?	Understand	AME805.10
10	What is the difference between an ERV and HRV?	Understand	AME805.09
11	What is the function of Recuperator?	Remember	AME805.09
12	What is the function of Air preheater?	Understand	AME805.10
13	What are the advantages of Recuperator?	Understand	AME805.09
14	What is the function of regenerator?	Remember	AME805.09
15	What is the difference between recuperator and regenerator?	Remember	AME805.09
Part - A (Short Answer Questions)			
1	List some of the direct and indirect benefits of waste heat recovery systems	Understand	AME805.11
2	What are the major points to be considered for developments of WHRS?	Remember	AME805.11
3	Mention any three commercial waste heat recovery devices.	Understand	AME805.11
4	What is the principle of 'recuperators'?	Understand	AME805.11
5	What is the advantage of 'ceramic recuperators' over 'metallic recuperators'?	Understand	AME805.11
6	Describe briefly about 'heat wheels'?	Understand	AME805.11
7	List some of the major applications of a 'heat wheel'?	Remember	AME805.11
8	Explain with a neat sketch the function of an economizer?	Understand	AME805.11
9	What are waste heat recovery boilers? Explain the need and benefits?	Understand	AME805.11
10	Explain the principle of operation of heat pipe. Discuss three examples of its industrial application	Understand	AME805.11
11	What is the principle of 'regenerators'?	Understand	AME805.11
12	Explain briefly about heat recovery unit.	Understand	AME805.11
13	What are the major advantages of waste heat recovery in industry?	Understand	AME805.11
14	Write short notes on Economizer	Understand	AME805.11
15	Write short notes on thermo compressor.	Understand	AME805.11
UNIT-V			
COOLING TOWER			
Part - A (Short Answer Questions)			
1	How do you calculate the effectiveness of a cooling tower?	Understand	AME805.11
2	What are the parameters affect to performance of cooling tower?	Understand	AME805.11
3	What is the approach of a cooling tower?	Understand	AME805.11
4	What is the meaning of TR in cooling tower?	Remember	AME805.11
5	How do you calculate TR on a cooling tower?	Understand	AME805.11
6	What is the Blow-down Loss, if the Cycles of Concentration (COC) is 3.0?	Understand	AME805.11

7	What is the function of fill media in a cooling tower?	Understand	AME805.11
8	List the factors affecting cooling tower performance.	Understand	AME805.11
9	How many types of cooling towers are there?	Remember	AME805.11
10	What is L/G ratio?	Understand	AME805.11
11	What is the function of mechanical draft towers?	Understand	AME805.11
12	What are the components of cooling tower?	Remember	AME805.11
13	What are the materials of cooling tower?	Understand	AME805.11
14	What are the important parameters of cooling towers?	Understand	AME805.11
15	Write some factors affecting cooling tower performance.	Remember	AME805.11
Part - B (Long Answer Questions)			
1	What do you understand by the following terms in respect of cooling towers? a) Approach, b) Cooling Duty	Understand	AME805.11
2	Explain with a sketch the different types of cooling towers.	Understand	AME805.12
3	What do you mean by the term of Cycles of Concentration and how it is related to cooling tower blow down?	Understand	AME805.12
4	CT Observations at an industrial site were * CW Flow : 5000 m ³ /hr * CW in Temperature : 42°C * CW Out Temperature : 36°C * Wet Bulb Temperature : 29°C What is the Effectiveness of the cooling tower?	Remember	AME805.11
5	What is the function of fill media in a cooling tower?	Understand	AME805.11
6	Explain the difference between evaporation loss and drift loss?	Understand	AME805.13
7	Explain the term L/G ratio briefly.	Understand	AME805.13
8	List the energy conservation opportunities in a cooling tower system.	Understand	AME805.14
9	What do you understand by the following terms in respect of cooling towers? a) Range b) Cooling Tower Effectiveness	Remember	AME805.11
10	What is the effect of change in heat load on cooling tower performance ?Explain	Understand	AME805.12
11	Explain briefly about Mechanical draft towers	Understand	AME805.13
12	Explain the Components of Cooling Tower with neat sketch	Understand	AME805.13
13	Write short notes on Tower Materials	Understand	AME805.14
14	What are the important parameters, from the point of determining the performance of cooling towers?	Understand	AME805.14
15	What are the factors Affecting Cooling Tower Performance?	Understand	AME805.14

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