



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad - 500 043

ELECTRICAL AND ELECTRONICS ENGINEERING

DEFINITIONS AND TERMINOLOGY QUESTION BANK

Course Name	:	ENERGY AUDIT AND MANAGEMENT
Course Code	:	AEE503
Program	:	B.Tech
Semester	:	VI
Branch	:	Electrical and Electronics Engineering
Section	:	A & B
Course Faculty	:	Dr. Mule Laxmidevi Ramanaiah, Associate Professor, EEE

COURSE OBJECTIVES:

The course should enable the students to:	
I	To help students to consider in depth the terminology and nomenclature used in the syllabus.
II	To focus on the meaning of new words / terminology / nomenclature

DEFINITIONS AND TERMINOLOGY QUESTION BANK

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
UNIT -I						
1	Define energy audit.	An energy audit is an inspection survey analysis of energy flows to reduce the amount of energy input to the system.	Understand	CO1	CLO1	AEE503.01
2	What is energy?	It is the capacity of a physical system to perform work.	Remember	CO1	CLO2	AEE503.02
3	What is Preliminary Energy Audit?	The Preliminary Energy Audit focuses on the major energy suppliers and demands usually accounting for approximately 70% of total energy.	Remember	CO1	CLO1	AEE503.01
4	What is the aim of energy audit?	The purpose of an energy audit is to analyze the energy flows in a building, and understand its energy dynamics.	Remember	CO1	CLO1	AEE503.01
5	Why energy audit is required?	An energy audit is an analysis of a facility, indicating how and where that facility can reduce energy consumption and save energycosts.	Understand	CO1	CLO1	AEE503.01
6	What is energy bench marking?	Energy Benchmarking is a method used to determine whether a building is using more or less energy than its peer facilities	Remember	CO1	CLO1	AEE503.01

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		with similar occupancies, climates, and sizes.				
7	What is detailed energy audit?	Detailed energy audit is defined as the verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption	Remember	CO1	CLO1	AEE503.01
8	What is need of energy management?	Energy management is the means to controlling and reducing your organizations energy consumption.	Remember	CO1	CLO1	AEE503.01
9	What are energy costs?	Monetary and non-monetary costs (such as the environmental impact) associated with the production, transmission, and consumption of energy.	Understand	CO1	CLO2	AEE503.02
10	What is fuel and energy substitution?	With the traditional sources of fuel depleting, efforts to search for other forms of energy, which are sustainable have been expedited globally. Bio-fuels such as methane or compressed natural gas (CNG), propane or liquid petroleum gas (LPG), alcohols, bio-fuels and hydrogen are important fuel substitution.	Understand	CO1	CLO1	AEE503.01
11	What fuel can be used instead of petrol and diesel?	Vehicles tend to employ M85, a mixture of 85 per cent methanol and 15 per cent unleaded petrol. Even used as a substitute for diesel, Methanol is available as M100. Interestingly, most vehicles opting for Methanol are fuel-flexible which means they can use 100 per cent petrol instead of methanol if needed.	Understand	CO1	CLO1	AEE503.01
12	Can we use alcohol instead of petrol?	We know e85 fuel is made of 85% ethanol and 15% gasoline/petrol, ethanol is an alcohol.	Remember	CO1	CLO2	AEE503.02
13	Which is the best fuel?	Best fuels we have are hydrocarbons, gasoline, diesel and ethanol.	Understand	CO1	CLO2	AEE503.02
14	What is the cleanest burning fuel?	Gas is far and away the cleanest-burning fossil fuel, generating at least 50 percent less carbon per kilowatt hour than coal, and almost zero sulfur oxides, mercury and particulate ash.	Remember	CO1	CLO2	AEE503.02
15	Which is the most ecofriendly fuel of energy?	LPG is a fossil fuel and can be refined from oil and natural gas CNG is a Eco-Friendly Fuel and Wallet Friendly Fuel. The main Component of CNG fuel is Methane (CH ₄), the finest fuel that comes out from the Gasoline Tanks even before	Remember	CO1	CLO3	AEE503.03

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		LPG (Liquid Petroleum Gas- C_2H_6).				
UNIT – II						
1	What are energy sources?	Natural resources, something such as oil, coal, or the sun, which can be used to provide power for light, heat, machines etc.	Remember	CO2	CLO4	AEE503.04
2	How is energy used in everyday life?	They include watching television, washing clothes, heating and lighting the home, taking a shower, working from home on your laptop or computer, running appliances and cooking. Residential uses of energy account for almost forty percent of total energy use globally.	Understand	CO2	CLO5	AEE503.05
3	Why do we use energy?	We use energy for lights and appliances. Energy makes our vehicles go, planes fly, boats sail, and machines run.	Understand	CO2	CLO5	AEE503.05
4	What are some facts about Thermal Energy?	Unlike other forms of energy, thermal energy is difficult to convert to other forms of energy. If thermal energy is transferred from or to an object, it is called heat.	Remember	CO2	CLO5	AEE503.05
5	Questionnaire will be defined as what and what are the types?	Questionnaires are commonly used to gather first-hand information from a large audience, in the form of a survey. There are different types of questionnaires in practice and the type of questionnaire to be used usually depends on the purpose of the survey and the type of data that has to be collected.	Understand	CO2	CLO5	AEE503.05
6	Questionnaire method of data collection is?	A questionnaire is a research instrument consisting of a series of questions for the purpose of gathering information from respondents.	Understand	CO2	CLO5	AEE503.05
7	What is a good questionnaire?	A good questionnaire is one which helps directly achieve the research objectives, provides complete and accurate information; is easy for both interviewers and respondents to complete, is so designed as to make sound analysis and interpretation possible and is brief.	Understand	CO2	CLO5	AEE503.05
8	Incremental cost example is?	Incremental cost, also referred to as marginal cost , is the total change a company experiences within its balance sheet or income statement due to the production and sale of one additional unit of product. It is	Understand	CO2	CLO6	AEE503.06

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		calculated by analyzing the additional charges incurred based on the change in a certain activity.				
9	How do you find incremental cost	It is the total change of in cost of producing more goods and dividing that by the change in the quantity of good produced.	Remember	CO2	CLO5	AEE503.05
10	Why is mass balance important?	The development of a plant mass balance has a number of benefits. The mass balance is also very useful to identify and quantify the impact recycle loads.	Understand	CO2	CLO5	AEE503.05
11	What is the purpose of material and energy balance?	Material and Energy balance: Facility as an energy system, Methods for preparing process flow, Material and energy balance diagrams. Material quantities, as they pass through processing operations, can be described by material balances. Such balances are statements on the conservation of mass.	Understand	CO2	CLO5	AEE503.05
12	What are the 4 types of heat transfer?	Various heat transfer mechanisms are convection, conduction, radiation and evaporate cooling.	Remember	CO2	CLO4	AEE503.04
13	What are the 3 types of heat transfer?	Various heat transfer mechanisms are convection, conduction and radiation.	Remember	CO2	CLO4	AEE503.04
14	What are the three types of electrical load?	Three basic types of loads exist in circuits: capacitive loads, inductive loads and resistive loads.	Remember	CO2	CLO4	AEE503.04
15	What does load mean in electricity?	An electrical load is an electrical component or portion of a circuit that consumes (active) electric power	Understand	CO2	CLO4	AEE503.04
UNIT – III						
1	What is the purpose of a force field analysis?	Purpose: Force Field Analysis is a general tool for systematically analyzing the factors found in complex problems.	Understand	CO3	CLO8	AEE503.08
2	What is an example of a force field?	Examples of force fields include magnetic fields, gravitational fields, and electrical fields.	Remember	CO3	CLO8	AEE503.08

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3	What is a national energy policy?	National Energy Policy. National policies to improve energy efficiency are critical to job creation and economic development, reducing oil imports, improving the reliability of the electric grid, lowering energy prices, and addressing climate change and air pollution.	Remember	CO3	CLO8	AEE503.08
4	What is the Energy Policy Act of 2005	Energy Policy Act of 2005. This act was signed into law on August 8, 2005. ... It also requires the federal government to increase the efficiency of its buildings and vehicles and provides tax credits for certain energy efficient purchases or improvements.	Remember	CO3	CLO8	AEE503.08
5	Which one is the key element for successful energy management?	The Seven Elements of Effective Energy Management. Comprehensive energy management is the best way to achieve sustained energy-cost savings. Successful energy-management programs reduce waste and increase productivity. Key steps include assessing energy performance, setting goals, and measuring progress.	Remember	CO3	CLO8	AEE503.08
6	What is the role of energy manager?	Energy Managers Responsibilities. Prepare an annual activity plan and present to management concerning financially attractive investments to reduce energy costs. Initiate activities to improve monitoring and process control to reduce energy costs. Analyze equipment performance with respect to energy efficiency.	Understand	CO3	CLO8	AEE503.08
7	What are the 4 basic management functions?	There are four functions of management that span across all industries. They include: planning, organizing, leading, and controlling. You should think about the four functions as a process, where each step builds on the others.	Remember	CO3	CLO8	AEE503.08
8	What are managerial tasks?	Essential Managerial Tasks. ... In order to use these resources and achieve the company goals, the management of the	Remember	CO3	CLO8	AEE503.08

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		organizations can help by performing four essential managerial tasks: Planning, Organizing, Leading and Controlling				
9	What is employee motivation in HRM?	Employee motivation is a factor, or factors, that induce(s) an employee to pursue work -related tasks or goals. Two theories of motivation include extrinsic motivation and intrinsic motivation. Extrinsic motivation involves the use of external factors to influence employee behavior, such as rewards and punishments	Remember	CO3	CLO8	AEE503.08
10	Why do you motivate employees?	Importance of Employee Motivation. There are several reasons why employee motivation is important. Mainly because it allows management to meet the company's goals. Motivated employees can lead to increased productivity and allow an organization to achieve higher levels of output.	Understand	CO3	CLO8	AEE503.08
11	What is a marketing communication plan?	Developing a Marketing Communication Plan. A marketing communication plan (or marcom plan) is a plan to communicate your marketing messages to your target customer audience. It is one component of your overall marketing plan (which also includes strategy, competitive analysis, etc).	Remember	CO3	CLO9	AEE503.09
12	What are marketing communication strategies?	Marketing communications strategy is the strategy used by a company or individual to reach their target market through various types of communication. Usually, PR strategy means building top of mind awareness amongst your ideal customers about the product or offer.	Remember	CO3	CLO9	AEE503.09
13	What marketing communication means?	Marketing communication (MarCom) is a fundamental and complex part of a	Remember	CO3	CLO9	AEE503.09

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		company's marketing efforts. Loosely defined, MarCom can be described as all the messages and media you deploy to communicate with the market.				
14	What is the role of communication in marketing?	Communication helps in turning such encounters into commendable experiences so that they help in developing correct consumers' attitude toward the product or service. Communication has a major role everywhere and not just marketing. The role of communication is to deliver the message to your customers.	Understand	CO3	CLO9	AEE503.09
15	What are marketing communication tools?	Marketing communications. A marketing communication tool can be anything from: advertising, personal selling, direct, marketing, sponsorship, communication, promotion and public relations.	Remember	CO3	CLO9	AEE503.09

UNIT – IV

1	What is First Law efficiency?	The first law states that energy cannot be created or destroyed, but can be converted from one form, to another.	Remember	CO4	CLO12	AEE503.12
2	How is thermal efficiency measured?	For a boiler that produces 210 kW (or 700, 000 BTU/h) output for each 300 kW (or 1,000,000 BTU/h) heat-equivalent input, its thermal efficiency is $210/300 = 0.70$, or 70%. This means that 30% of the energy is lost to the environment. An electric resistance heater has a thermal efficiency close to 100%.	Understand	CO4	CLO12	AEE503.12
3	What is meant by second law efficiency?	Energy efficiency (also known as the second - law efficiency or rational efficiency) computes the efficiency of a process taking the second law of thermodynamics into account.	Understand	CO4	CLO11	AEE503.11
4	How do you calculate boiler efficiency?	In order to calculate boiler efficiency by this method, we divide the total energy output of a boiler by total energy input given to the	Understand	CO4	CLO11	AEE503.11

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		boiler, multiplied by hundred. The indirect efficiency of a boiler is calculated by finding out the individual losses taking place in a boiler and then subtracting the sum from 100%.				
5	What is the formula for efficiency?	In many processes, work or energy is lost, for example as waste heat or vibration. The efficiency is the energy output, divided by the energy input, and expressed as a percentage. A perfect process would have an efficiency of 100%. η = efficiency(Greek letter "eta")	Remember	CO4	CLO11	AEE503.11
6	What is integrated energy system?	The Integrated Energy System is a custom -designed configuration of different renewable technologies with concentrated solar power (CSP) acting as focal point of the system.	Understand	CO4	CLO12	AEE503.12
7	What is included in a process flow diagram?	A Process Flow Diagram (PFD) is a type of flowchart that illustrates the relationships between major components at an industrial plant. It's most often used in chemical engineering and process engineering, though its concepts are sometimes applied to other processes as well.	Remember	CO4	CLO11	AEE503.11
8	What is a process flow document?	Flowcharts use special shapes to represent different types of actions or steps in a process. Lines and arrows show the sequence of the steps, and the relationships among them. These are known as flowchart symbols. The type of diagram dictates the flowchart symbols that are used.	Understand	CO4	CLO11	AEE503.11
9	What is identification of losses in energy audit?	Identifying energy losses and quantifying them; segregating the losses into technical and commercial losses; estimating the energy conservation potential of a system; and Energy audit helps to evaluate the economics, and technical practicability of implementing the measures for energy loss and usage reductions	Understand	CO4	CLO11	AEE503.11

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10	What is opportunity for improvement?	Continuous improvement is an organized approach to identifying opportunities for improvement that can help an organization meet its goals for increasing profits, reducing costs, and accelerating innovation.	Remember	CO4	CLO12	AEE503.12
11	What is MIS and how it works?	Management Information Systems (MIS) is the study of people, technology, and organizations. Everyone who works in business, from someone who pays the bills to the person who hires and fires, uses information systems. For example, a supermarket could use a computer database to keep track of which products sell best.	Remember	CO4	CLO12	AEE503.12
12	What are the roles of MIS?	The MIS helps the middle management in short term planning, target setting and controlling the business functions. The MIS plays the role of information generation, communication, problem identification and helps in the process of decision-making.	Remember	CO4	CLO12	AEE503.12
13	What is energy modeling?	Energymodeling or energy system modeling is the process of building computer models of energy systems in order to analyze them. Such models often employ scenario analysis to investigate different assumptions about the technical and economic conditions at play.	Understand	CO4	CLO12	AEE503.12
14	What is on a balance sheet example?	Most accounting balance sheets classify a company's assets and liabilities into distinctive groupings such as Current Assets; Property, Plant, and Equipment; Current Liabilities; etc. The following balance sheet example is a classified balance sheet.	Remember	CO4	CLO12	AEE503.12
15	What is a good balance sheet?	A strong balance sheet goes beyond simply having more assets than liabilities. Entities with strong balance sheets are those which are structured to support the entity's business goals and maximize financial performance.	Understand	CO4	CLO12	AEE503.12

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UNIT – V						
1	What is Combustion analyzer?	This instrument has in-built chemical cells which measure various gases such as O ₂ , CO, NO _x and SO _x	Remember	CO5	CLO13	AEE503.13
2	What are the different types of measuring instruments?	The measuring instrument categorized into three types; Electrical Instrument. Electronic Instrument. Mechanical Instrument.	Remember	CO5	CLO13	AEE503.13
3	What is electrical instrument?	Electric instrument. It is also known as an amplified musical instrument due to the common utilization of an electronic instrument amplifier to project the intended sound as determined by electric signals from the instrument. Two common types of instrument amplifiers are the guitar amplifier and the bass amplifier.	Understand	CO5	CLO13	AEE503.13
4	What are the desirable qualities of measuring instrument?	Some of the desirable characteristics are well outlined in the psychometric literature. A measure ought to span a sufficient range of ability. It should have a sufficient number of strata of capabilities, capacities, and abilities, whether that is reading, writing, arithmetic, work, or something else.	Remember	CO5	CLO13	AEE503.13
5	What is used to measure electricity?	Electricity is measured in Watts and kilowatts. Electricity is measured in units of power called Watts, named to honor James Watt, the inventor of the steam engine. A Watt is the unit of electrical power equal to one ampere under the pressure of one volt.	Understand	CO5	CLO13	AEE503.13
6	What is Fuel Efficiency Monitor?	This measures oxygen and temperature of the flue gas. Calorific values of common fuels are fed into the microprocessor which calculates the combustion efficiency.	Understand	CO5	CLO13	AEE503.13
7	What is Fyrite?	A hand bellows pump draws the flue gas sample into the solution inside the fyrite. A chemical reaction changes the liquid volume revealing	Understand	CO5	CLO13	AEE503.13

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		the amount of gas. A separate pyrite can be used for O ₂ and CO ₂ measurement.				
8	What is Contact thermometer?	These are thermocouples which measures for example flue gas, hot air, hot water temperatures by insertion of probe into the stream.	Remember	CO5	CLO13	AEE503.13
9	What is Infrared? Thermometer	This is a non-contact type measurement which when directed at a heat source directly gives the temperature read out. This instrument is useful for measuring hot spots in furnaces, surface temperatures etc.	Remember	CO5	CLO13	AEE503.13
10	What are WPitot Tube and manometer?	Air velocity in ducts can be measured using a pitot tube and inclined manometer for further calculation of flows.	Remember	CO5	CLO13	AEE503.13
11	Water flow meter?	This non-contact flow measuring device using Doppler effect / Ultra sonic principle. There is a transmitter and receiver which are positioned on opposite sides of the pipe. The meter directly gives the flow. Water and other fluid flows can be easily measured with this meter.	Understand	CO5	CLO13	AEE503.13
12	What is Tachometer?	A simple tachometer is a contact type instrument which can be used where direct access is possible.	Understand	CO5	CLO13	AEE503.13
13	What is Stroboscope?	More sophisticated and safer ones are noncontact instruments such as stroboscopes.	Understand	CO5	CLO13	AEE503.13
14	What are Leak Detectors?	Ultrasonic instruments are available which can be used to detect leaks of compressed air and other gases which are normally not possible to detect with human abilities.	Remember	CO5	CLO13	AEE503.13
15	What are Lux meters?	Illumination levels are measured with a luxmeter. It consists of a photo cell which senses the light output, converts to electrical impulses which are calibrated as lux	Understand	CO5	CLO13	AEE503.13

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