SCHEME OF VALUATION				
(Scoring Indicators)				
Revision: 2021				
Course Name: ENERGY CONSERVATION & MANAGEMENT				
Course Code: 6032 B		**QID:SET -1**		
Qst. No	**Scoring Indicator**	**Split up Score**	**Sub Total**	**Total**
I	**PART A**			9
1)	General term for the electromagnetic radiation emitted by the sun.		1	
2)	o Fixed dome type o Floating drum type		1	
3)	Energy management refers to the process of planning, controlling, and optimizing the use of energy resources to achieve greater efficiency, reduce costs, and minimize environmental impact, usually through the use of energy management software		1	
4)	Energy efficiency means using less energy to get the same job done – and in the process, cutting energy bills and reducing pollution.		1	
5)	Bureau of Energy Efficiency (BEE)		1	
6)	Energy conservation involves using less energy by adjusting your behaviors and habits.		1	
7)	HVAC refers to heating, ventilation, and air conditioning		1	
8)	Preliminary Audit and Detailed Audit		1	
9)	3		1	
II	**PART B**			24
1)	Renewable resources cannot be depleted over time. Non-renewable resources deplete over time. Sources. Renewable resources include sunlight, water, wind and also geothermal sources such as hot springs and fumaroles. Non-renewable resources includes fossil fuels such as coal and petroleum.		3	

2)	• The rotating blades of the turbine are veritably dangerous. It can accidentally kill swimming ocean life. • As high-speed water increases the threat of marine lives being pushed near or through the blades. •Making a shower may change the oceanfront within the bay or creek, affecting a large ecosystem that depends on tidal apartments. Inhibiting the inflow of water in and out of the bay may beget fresh turbidity and lower saltwater. It can end in the death of fish that act as a vital food source to catcalls and mammals. •Blade strike on fish trying to enter the lagoon, the aural affair from turbines, and changes in sedimentation processes.	Any 3	3	
3)	• The principal pollutants are as follows: o Sulphur dioxide o Nitrogen oxides o Carbon monoxide (CO) o Ground-level ozone (O3) o Hydrocarbons o Benzene		3	
4)	• Energy Audits • Setting Objectives • Implementing Energy Efficiency Measures • Monitoring and Analysis • Employee Engagement • Continuous Improvement		3	
5)	• Energy conservation involves using less energy by adjusting your behaviors and habits. • Energy efficiency, involves using technology that requires less energy to perform the same function.		3	
6)	ECBC, ECBC Plus, Super ECBC.		3	
7)	• HVAC refers to heating, ventilation, and air conditioning. • AC simply refers to air conditioning. • AC is generally used when referring to systems that are designed to cool the air in your home.		3	

8)	o Verification of data of energy use. o Scope of energy audit . o Monitoring and analysis of use of energy data for energy audit. o Reparation of recommendations on energy saving measures, their cost benefit analysis		3	
9)	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.		3	
10)	o Phase I - Pre Audit Phase o Phase II - Audit Phase o Phase III - Post Audit Phase		3	
	PART C			42
III	PRIMARY AND SECONDARY ENERGY • Primary energy sources are those that are either found or stored in nature. • Common primary energy sources are coal, oil, natural gas, and biomass (such as wood). • All energy that has been subjected to human-made transformation is secondary energy. CONVENTIONAL AND NON-CONVENTIONAL ENERGY RESOURCES: • Conventional energy resources which are being traditionally used for many decades and were in common use around oil crisis of 1973 are called conventional energy resources, e.g., fossil fuel, nuclear and hydro resources. • Non-conventional energy resources which are considered for large – scale use after oil crisis of 1973, are called non-conventional energy sources, e.g., solar, wind, biomass, etc. RENEWABLE AND NON-RENEWABLE ENERGY • Renewable energy is energy obtained from sources that are essentially inexhaustible.Non-renewable energy is the conventional fossil fuels such as coal, oil and gas, which		7	

IV	• Wind Energy is an inexhaustible source of energy and is virtually a limitless resource. • Energy is generated without polluting environment. • This source of energy has tremendous potential to generate energy on large scale. • Like solar energy and hydropower, wind power taps a natural physical resource. • Windmill generators don't emit any emissions that can lead to acid rain or greenhouse effect. • Wind Energy can be used directly as mechanical energy. • In remote areas, wind turbines can be used as great resource to generate energy. • In combination with Solar Energy they can be used to provide reliable as well as steady supply of electricity. • Land around wind turbines can be used for other uses, e.g. Farming.		7	
V	.• As of Dec 2023, Renewable energy sources, including large hydropower, have a combined installed capacity of 180.79 GW. • The following is the installed capacity for Renewables: o Wind power: 44.73 GW o Solar Power: 73.31 GW o Biomass/Co-generation: 10.2 GW o Small Hydro Power: 4.98 GW o Waste To Energy: 0.58 GW o Large Hydro: 46.88 GW • India has set a target to reduce the carbon intensity of the nation's economy by less than 45% by the end of the decade, achieve 50 percent cumulative electric power installed by 2030 from renewables, and achieve net-zero carbon emissions by 2070. • India aims for 500 GW of renewable energy installed capacity by 2030.			

<table>
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<td>VI</td>
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<tr><th>Sr. No</th><th>Mandatory Appliances</th></tr>
<tr><td>1.</td><td>Room Air Conditioners</td></tr>
<tr><td>2.</td><td>Frost Free Refrigerators</td></tr>
<tr><td>3.</td><td>Tubular Florescent Lamp</td></tr>
<tr><td>4.</td><td>Distribution Transformer</td></tr>
<tr><td>5.</td><td>Room Air Conditioner (Cassettes, Floor Standing)</td></tr>
<tr><td>6.</td><td>Direct Cool Refrigerator</td></tr>
<tr><td>7.</td><td>Colour TV</td></tr>
<tr><td>8.</td><td>Electric Geysers</td></tr>
<tr><td>9.</td><td>Variable Capacity Inverter Air conditioners</td></tr>
<tr><td>10.</td><td>LED Lamps</td></tr>
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<td>VII</td>
<td>• Turn your refrigerator down: To increase energy savings, set your fridge to 37 degrees Fahrenheit and your freezer to 3 degrees Fahrenheit.
• Use energy-efficient light bulbs.
• Clean or replace air filters as recommended: appliances have to work even harder with dirty air filters.
• Do full loads: Make sure your dishwasher and washing machine are full before running them to get the most energy-saving use from each run cycle.
• Use smart power strips: Energy-saving smart power strips, which shut down appliances that have gone into standby mode, help you cut down on phantom-load costs, potentially resulting in money and energy savings.
• Air-dry dishes and clothes.
• Cook using the right-sized burner.</td>
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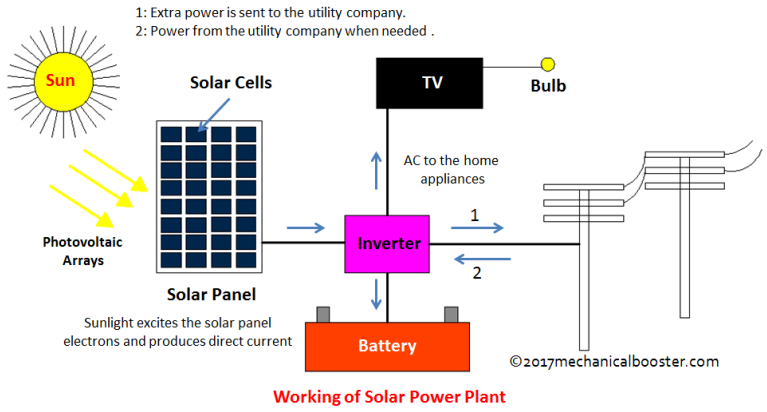
VIII	• Air Conditioner - An air conditioner cools your home by removing heat and humidity from inside and transferring it outside. • Heat Pump - Contrary to their name, a heat pump can both heat and cool your home. They use refrigerant to absorb, transport, and release heat, and they can reverse the flow of that refrigerant depending on if you need heating or cooling. Heat pumps are powered by electricity, not fossil fuels. • Furnace - Furnaces create heat by burning a fuel source like natural gas or propane. The heat they create is then distributed throughout your home, in order to increase the indoor temperature. • Air Handler - Air handlers circulate both warm and cool air formed by other HVAC units throughout your entire home, in order to reach your desired temperature in every room. • Ductwork - Ductwork is a system of pipes, also known as ducts, that carry and distribute air from units like your furnace, air conditioner, and heat pump. • Thermostat - The thermostat, located inside your home, allows you to control your indoor temperature.		7	
IX	Preliminary energy audit is a relatively quick exercise to: • Establish energy consumption in the organization • Estimate the scope for saving • Identify the most likely (and the easiest areas for attention • Identify immediate (especially no-/low-cost) improvements/ savings • Set a 'reference point' • Identify areas for more detailed study/measurement • Preliminary energy audit uses existing, or easily obtained data.		7	

X	Sankey diagrams feature directed arrows that have a width proportional to the flow quantity visualized: if a flow is twice as wide it represents double the quantity. Flow diagrams can show e.g. energy, materials, water or costs. Within a Sankey chart the directed flow is always drawn between at least two nodes (processes). Thus it shows not only values but also information about the structure and distribution of the defined system. So they are a great alternative to common flow or bar & pie charts.		7	
XI	Solar power works by converting energy from the sun into power. There are two forms of energy generated from the sun for our use – electricity and heat. Both are generated through the use of solar panels, which range in size from residential rooftops to 'solar farms' stretching over acres of rural land.  Working of Solar Power Plant		7	

XII	• Effective energy management can lead to various benefits, including: o Cost savings: By reducing energy consumption and improving efficiency, businesses and individuals can reduce energy costs. o Environmental sustainability: Lower energy consumption means reduced greenhouse gas emissions and a smaller ecological footprint. o Enhanced operational efficiency: Efficient use of energy can lead to improved performance and productivity in industrial processes and operations. o Compliance with regulations: Many countries have energy efficiency regulations that organizations must comply with, and effective energy management helps meet these requirements		7	
XIII	• HVAC maintenance: • Proper insulation • Teach employees to turn off electronics. • Utilize smart building technology: • Replace old windows that are not very energy efficient. Though new windows are a big investment, new windows can produce tremendous energy savings. Old roof can also waste energy by leaking air conditioned and heated air. • LED lights can result in simple savings • Get energy efficient appliances • Get the right size HVAC system. • Do an energy audit		7	

XIV	A comprehensive audit provides a detailed energy project implementation plan for a facility, since it evaluates all major energy using systems. □ This type of audit offers the most accurate estimate of energy savings and cost. It considers the interactive effects of all projects, accounts for the energy use of all major equipment, and includes detailed energy cost saving calculations and project cost. □ In a comprehensive audit, one of the key elements is the energy balance. This is based on an inventory of energy using systems, assumptions of current operating conditions and calculations of energy use. This estimated use is then compared to utility bill charges. □ Detailed energy auditing is carried out in three phases: Phase I, II and III. o Phase I - Pre Audit Phase o Phase II - Audit Phase o Phase III - Post Audit Phase		7	