

QUESTIONNAIRE REPORT SHEET

iPQ4CMVP.V2.1



B E Y O N D

S M A R T C I T I E S

AEE'S CERTIFIED MEASUREMENT & VERIFICATION PROFESSIONAL
CMVP EXAM QUESTION BANK

iPQ.No	Correct Answer	Points	Explanation
4CMVP001	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The physical properties of the EEM allow the impacted energy flows to be separately measured. • Any interactive effects of the EEM on the energy consumption and demand of other facilities • Equipment can be reasonably estimated or assumed to be insignificant.
4CMVP002	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The EEMs exhibit a significant degree of interactive effects, specifically pertaining to the energy interactions among them. • The measurement of energy flows affected by the EEM(s) cannot be conducted in isolation. • The anticipated level of savings is deemed sufficiently substantial to warrant the utilization of Option C, wherein the reporting of the facility's overall performance is prioritized over the performance of Energy Efficiency Measures (EEMs).
4CMVP003	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> • There exist numerous distinct Energy Efficient Measures (EEMs) with energy flow patterns that pose challenges in their individual measurement. • The availability of baseline period energy data is lacking (Option D).
4CMVP004	1	18	<p>Answer = 1 The use of Option A is favored.</p> <p>Explanation:</p> <p>The use of Option A is favored. A short reporting period may be considered, for example, in the case of a constant-speed exhaust-fan motor that operates under a constant load according to a well-defined schedule.</p>
4CMVP005	4	18	<p>Answer = 4 Consider using Options B, C, or D.</p> <p>Explanation:</p> <p>Consider using Options B, C, or D. However, savings are likely to show in the utility records, so Option C techniques may be used with careful monitoring of static factors to detect the need for non-routine adjustments</p>

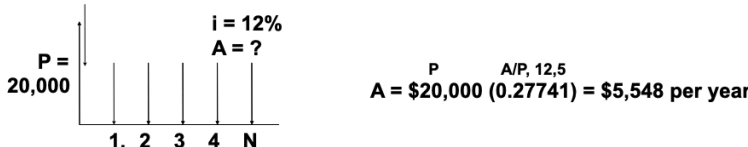
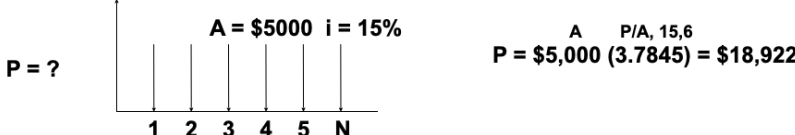
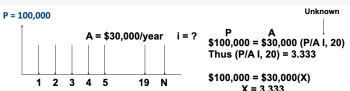
iPQ.No	Correct Answer	Points	Explanation
4CMVP006	1	8	<p>Answer = 1 True</p> <p>Explanation: In order to enhance the accuracy of determining savings, it is imperative to employ methodologies that enable the quantification, evaluation, and mitigation of various sources of errors and uncertainties. These methods should be incorporated into the development of the Measurement and Verification (M&V) Plan.</p>
4CMVP007	1	8	<p>Answer = 1 Option A or B</p> <p>Explanation: Option A or B</p>
4CMVP008	2	8	<p>Answer = 2 Option B</p> <p>Explanation: Option B</p>
4CMVP009	1	18	<p>Answer = 1 \$0.06000 per kWh.</p> <p>Explanation: A utility rate is an example of an exact number. If a local power company charges \$0.06 per kWh and Company X uses 725,691.0 kWh in one month, the utility bill would be \$43,541.46, not \$40,000, according to the rounding rule. This is due to the fact that the utility rate is precise; it can be represented as \$0.06000 per kWh.</p>
4CMVP010	4	8	<p>Answer = 4 All of the above</p> <p>Explanation: The individuals responsible for formulating and authorizing the M&V plan must consider the desired level of precision in conjunction with the following factors.</p> <ul style="list-style-type: none"> • Risk sharing and responsibility • Existence of data on similar projects • The use of Guaranteed Savings
4CMVP011	4	8	<p>Answer = 4 It evaluates all energy-using systems to provide a complete M&V plan for a building.</p> <p>Explanation: The process involves the comprehensive assessment of all energy-consuming systems in order to develop a comprehensive energy project plan for a given structure.</p>
4CMVP012	1	8	<p>Answer = 1 True</p> <p>Explanation: The determination of the appropriate level of rigor in a savings-reporting process is frequently contingent upon the preferences of project stakeholders, as it directly influences their desired level of confidence in the reported savings.</p>

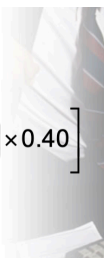
iPQ.No	Correct Answer	Points	Explanation
4CMVP013	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> In order to obtain agreement and funding, it is necessary to comprehend the projected costs associated with Measurement and Verification (M&V). In order to enable a comprehensive cost-benefit analysis aimed at determining the appropriate extent of Measurement and Verification (M&V) activities, if deemed necessary.
4CMVP014	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> In order to systematically assess the project under consideration and establish an appropriate reference point for claiming savings, it is necessary to employ a methodical approach. In order to facilitate the consideration and evaluation of different Measurement and Verification (M&V) approaches, with the aim of selecting the most favorable approach for adoption.
4CMVP015	4	8	<p>Answer = 4 How much can be allocated for Ongoing Commissioning expenditures?</p> <p>Explanation: How much can be allocated for M&V expenditures? Not Ongoing cxa</p>
4CMVP016	2	8	<p>Answer = 2 False</p> <p>Explanation: In general, it is recommended that the Monitoring and Verification (M&V) budget for a project should not exceed 10% of the initial year's savings. This allocation typically falls within the range of 3-5%.</p>
4CMVP017	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> In the present scenario, it is worth noting that while the implementation of higher-efficiency lighting has led to a decrease in heat load, it is important to acknowledge that the area under consideration lacks air-conditioning, thereby negating any potential interactive effects. If the cumulative savings reach a substantial amount, it may be feasible to initiate a secondary Measurement and Verification (M&V) project specifically for the air conditioning system. Alternatively, expanding the scope of the original measurement area to encompass both systems could be considered. The reduction in thermal energy will result in a corresponding alteration in the energy requirements of the air conditioning system. The cooling process is expected to consume a reduced amount of energy, whereas the heating process may necessitate a higher energy input.

iPQ.No	Correct Answer	Points	Explanation
4CMVP018	4	8	<p>Answer = 4</p> <p>Routine adjustments can be easily identified, estimated, and incorporated.</p> <p>Explanation:</p> <p>The following situations are ideal for using a boundary of the facility type:</p> <ul style="list-style-type: none"> • A suitable correlation between energy consumption and independent variables can be established. • Non-routine adjustments can be easily identified, estimated, and incorporated. • M&V of individual ECMs is not required.
4CMVP019	4	8	<p>Answer = 4</p> <p>Grid planners can target and deliver energy-saving effects to specific places and times with the help of building energy modeling.</p> <p>Explanation:</p> <p>Advantages</p> <ul style="list-style-type: none"> • ESCOs benefit from earlier and time-based feedback on savings performance for individual installations. This may help them to identify and correct problems and achieve higher performance payments, where applicable. • Early usage data helps third-party evaluators provide early savings indicators and faster evaluation results. • M&V allows grid planners to target and deliver locational and temporal energy efficiency impacts. Grid planners must predict short-term demand as energy efficiency becomes a grid resource.
4CMVP020	4	8	<p>Answer = 4</p> <p>These methods aim to be faster, more accurate, more economical, and more valuable than automated ones.</p> <p>Explanation:</p> <ul style="list-style-type: none"> • These approaches are intended to be conducted more quickly, more accurately, at lower cost, and with greater value than non automated methods. • Together with higher resolution data and multiparameter models, these methods can capture the impact of efficiency on building load shape more accurately. • These tools are advancing M&V by enabling ongoing monitoring and estimating of energy savings in near-real time, both for individual premises and for portfolios of homes or businesses.

iPQ.No	Correct Answer	Points	Explanation
4CMVP021	4	8	<p>Answer = 4 All of the a above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • There is a significant global disparity in the ability to measure and verify energy efficiency savings. • The primary factor contributing to the M&V Gap is the dearth of proficient professionals possessing the requisite expertise to formulate or assess M&V plans and energy savings computations. • We are seeking professionals with expertise and proficiency in the field of Measurement and Verification (M&V) who possess the necessary experience and capabilities to accurately assess and quantify the energy efficiency project savings.
4CMVP022	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> • There exists a significant level of interaction among the chosen ECMs. • The implementation of Energy Conservation Measures (ECMs) results in significant energy savings, constituting a substantial proportion of the overall energy expenditures of the building.
4CMVP023	1	8	<p>Answer = 1 True</p> <p>Explanation: The M&V Plan ought to encompass the identification of the software or data analysis package employed for the computation of savings, including its name and version number.</p>
4CMVP024	3	8	<p>Answer = 3 Prior to the start of any work on the ECM.</p> <p>Explanation: Before commencing any work on the extracellular matrix (ECM).</p>
4CMVP025	1	8	<p>Answer = 1 Both (i) and (ii) are correct.</p> <p>Explanation: Both (i) and (ii) are correct.</p>
4CMVP026	1	8	<p>Answer = 1 True</p> <p>Explanation: Option D has the potential to be implemented in either an entire facility or in a particular system or retrofit scenario. Both the calibration of the simulation and the retrofit system necessitate the use of metering data, which can be obtained either for the entire facility or through submetering.</p>
4CMVP027	3	8	<p>Answer = 3 By adjusting both the baseline and reporting period to a reference data set</p> <p>Explanation: By modifying both the baseline and reporting period to align with a reference data set</p>

iPQ.No	Correct Answer	Points	Explanation
4CMVP028	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> As the need of individuals arises. On an annual basis, or at least once a year.
4CMVP029	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <p>The baseline period should be established to represent all operating modes of the facility. This period should span a full operating cycle, from maximum energy use to minimum.</p> <ul style="list-style-type: none"> Weather conditions can have a big impact on a building's energy use. Typically, a whole year of baseline data is needed to define a full operating cycle. Only the weekly cycle of changes in plant production levels may determine how much energy a compressed air system uses. So one week's data may be all that is needed to define baseline performance.
4CMVP030	3	8	<p>Answer = 3 Production</p> <p>Explanation: Production</p>
4CMVP031	3	8	<p>Answer = 3 Energy consumed per unit of production</p> <p>Explanation: Energy consumed per unit of production</p>
4CMVP032	3	8	<p>Answer = 3 Both</p> <p>Explanation: Production and Energy</p>
4CMVP033	2	8	<p>Answer = 2 SEC Vs Energy</p> <p>Explanation: SEC Vs Energy</p>
4CMVP034	1	8	<p>Answer = 1 1 kg HSD = 10500 kcal</p> <p>Explanation:</p> <p>1 kg HSD = 10500 kcal HSD: High speed diesel</p>

iPQ.No	Correct Answer	Points	Explanation
4CMVP035	1	18	<p>Answer = 1</p> <p>Solution in \$/kWh Select 1 KWh as the common unit of steam output.</p> <p>Explanation:</p> $\text{POU}_{\text{LPG}} \frac{\$}{\text{kWh}} = \frac{\$1.25}{\text{kg}} \times \frac{1 \text{ kg}}{45,650 \text{ kJ}} \times \frac{3,600 \text{ kJ}}{\text{kWh}} \times \frac{1}{0.75}$ $= \$0.1314 / \text{kWh}$ $\text{POU}_{\text{oil}} \frac{\$}{\text{kWh}} = \frac{\$1.00}{\text{L}} \times \frac{1 \text{ L}}{39,000 \text{ kJ}} \times \frac{3,600 \text{ kJ}}{\text{kWh}} \times \frac{1}{0.78}$ $= \$0.1183 / \text{kWh}$ <p>Use oil if possible</p>
4CMVP036	1	18	<p>Answer = 1</p> <p>Explanation:</p> 
4CMVP037	2	18	<p>Answer = 2</p> <p>Explanation:</p> 
4CMVP038	1	18	<p>Answer = 1</p> <p>Explanation:</p>  <p>Now, search the different interest tables until you find the i where $(P/A, i, N) = 3.333$: $i = \text{IRR} = 30\%$ (almost)</p> <p>Hint: For IRR a good start is try $i = A/P$.</p> <p>In our example, $i = \\$30,000/\\$100,000 = 30\%$ which is an upper limit for IRR.</p> <p>For long periods of time ($n = 20$ or more) and high i this will be <u>very close</u>. For shorter n and smaller i, it is only a start and IRR will be less than $i = A/P$.</p>

iPQ.No	Correct Answer	Points	Explanation
4CMVP039	1	18	<p>Answer = 1 Explanation:</p> <p>Solution:</p> $ATS = S - [(S - D) \times TR] = ATCF$ $ATCF = S - [(S - D) \times TR]$ $= \$20,000 / \text{yr} - \left[\left(\frac{\$20,000}{\text{yr}} - \frac{\$100,000}{10 \text{ yrs}} \right) \times 0.40 \right]$ $= \$20,000 / \text{yr} - \$4,000 / \text{yr}$ $= \$16,000 / \text{yr}$ 
4CMVP040	1	18	<p>Answer = 1 Explanation:</p> <p>Solution :</p> <p>LCC Rhino = \$30,000 + \$15,000 [P/A, 10%, 10]</p> <p>LCC Elephant = \$40,000 + \$12,000 [P/A, 10%, 10]</p> <p>LCC Rhino = \$30,000 + \$15,000 [P/A, 10%, 10]</p> $= \$30,000 + \$15,000 (6.1446)$ $= \$122,169$ <p>LCC Elephant = \$40,000 + \$12,000 [P/A, 10%, 10]</p> $= \$40,000 + \$12,000 (6.1446)$ $= \$113,735$ <p>Elephant DG system has the lowest life cycle cost</p>
4CMVP041	4	8	<p>Answer = 4 All of the above Explanation:</p> <ul style="list-style-type: none"> • The purpose of the contract is to establish an agreement between a building owner and an Energy Service Company (ESCO) contractor with the objective of reducing the building owner's energy costs (s). • The contractor agrees to engage in the exploration, advancement, establishment, and upkeep of energy-conserving capital enhancements. • The proprietor agrees to provide compensation to the contractor for any cost savings achieved throughout the contractual period.
4CMVP042	4	8	<p>Answer = 4 The objective of the IPMVP is to erect more obstacles for the energy and water efficiency industries.</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Approach to measuring and verifying efficiency investments to facilitate a scaled-up global engagement into energy efficiency. • The purpose of the IPMVP is to reduce barriers to the energy and water efficiency industries. • The IPMVP is owned and maintained by Efficiency Valuation Organization (EVO) is a non-profit organization whose products and services help people engineer and invest in energy efficiency projects.

iPQ.No	Correct Answer	Points	Explanation
4CMVP043	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> • International Performance Measurement and Verification Protocol (IPMVP) • American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Guideline 14,
4CMVP044	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Contract Terms • Project Complexity • Client Creditworthiness
4CMVP045	4	8	<p>Answer = 4 Non-Assurance savings.</p> <p>Explanation:</p> <p>Typical performance contracting options</p> <ul style="list-style-type: none"> • Outsourcing (agreement as to services provided and price, chauffage) • Shared savings • Guaranteed savings.
4CMVP046	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Company gets use of new equipment without spending capital. • Company is using a share of future savings to pay for equipment today. • Company usually does not maintain equipment (ESCO does). Company can concentrate on building widgets (its core objectives).
4CMVP047	4	8	<p>Answer = 4 Typically, businesses perform equipment maintenance, but ESCOs DO NOT.</p> <p>Explanation:</p> <ul style="list-style-type: none"> • If a company desires to "get back in," a capital lease may be required. • Typically, businesses do not perform equipment maintenance, but ESCOs do. • Company can concentrate on producing widgets (one of its primary goals).

iPQ.No	Correct Answer	Points	Explanation
4CMVP048	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The enhancement of environmental quality entails the mitigation of global warming and the reduction of acid rain. • The objective of enhancing economic competitiveness is to effectively manage costs and stimulate job creation. • The topic of energy security revolves around the objective of diminishing reliance on imported oil and achieving equilibrium in the balance of payments.
4CMVP049	4	8	<p>Answer = 4 TQM is an integrated approach to Design project management.</p> <p>Explanation:</p> <p>Correct statements</p> <ul style="list-style-type: none"> • TQM is an integrated approach to facility management. • TQM is founded on the principle that front-line employees should have the authority to make changes and other decisions at the lowest operational levels of an organization. • Energy management is a natural component of TQM; employees should receive training in energy management in order to make the best energy decisions possible.
4CMVP050	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Most savings in energy costs will come from improvements in energy efficiency. • Some savings will come from changing the patterns of energy use, and possibly shifting to other sources of energy.
4CMVP051	1	18	<p>Answer = 1 Explanation:</p> <p>The stuck open steam trap is like a 2.5 mm leak in a 690 kPa steam system. From the chart, the annual heat loss for 8760 hours of operation per year is about 400 GJ/yr.</p> $\frac{\$}{\text{yr}} = \frac{400 \text{ GJ}}{\text{yr}} \frac{\$1.25}{\text{kg}} \frac{1 \text{ kg}}{45,605 \text{ kJ}} \frac{1}{0.78}$ $= \$14,070 / \text{yr}$

iPQ.No	Correct Answer	Points	Explanation
4CMVP052	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> The ASHRAE guideline specifies three engineering approaches to M&V. Compliance with each approach requires that the overall uncertainty of the savings estimates be below prescribed thresholds. The three approaches presented are closely related to and support the options provided in IPMVP, except that Guideline 14 has no parallel approach to IPMVP/FEMP Option A.
4CMVP053	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> Allocate risks between the contractor and the customer Accurately assess energy savings and persistence of savings for a project Reduce uncertainties to reasonable levels
4CMVP054	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> Assistance in the monitoring of equipment performance Identifying supplementary avenues for savings Enhance the efficiency and effectiveness of operations and maintenance (O&M) activities.
4CMVP055	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> Overview of proposed energy and cost savings Schedule for all M&V activities Witnessing requirements and customer approval and sign-off requirements
4CMVP056	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> Witnessing requirements and customer approval and sign-off requirements Utility rates and the method used to calculate cost savings O&M reporting responsibilities
4CMVP057	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> Logic and cost-effectiveness drive the allocation of responsibilities. The responsible party predicts its likely tasks and associated costs to fulfill its responsibilities and makes sure these are covered in the ESPC or the customer's budget.

iPQ.No	Correct Answer	Points	Explanation
4CMVP058	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> The party responsible for the project undertakes the task of estimating the associated tasks and costs, which are subsequently incorporated into the Energy Savings Performance Contract (ESPC) or the budget of the customer. The responsibility for covering unforeseen expenses lies with either the party responsible for their occurrence or the owner of the area where the risk is present. The Monitoring and Verification (M&V) strategy has the potential to enhance role clarity, particularly in the context of goods that are not under the control of any specific entity.
4CMVP059	1	18	<p>Answer = 1 Rs. 75,000</p> <p>Explanation:</p> <p>Assuming simple interest:</p> <p>Total repayment = 30,00,000 + (10/100 x 30,00,000 x 5) = 45,00,000 Monthly repayment = 45,00,000/(5 x 12) = Rs. 75,000</p>
4CMVP060	1	18	<p>Answer = 1 6.8 lakh kCal/hr</p> <p>Explanation:</p> <p>Waste heat potential = 1000 x 8 x 0.25 x (520 – 180) = 6.8 lakh kCal/hr</p>
4CMVP061	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> Greenhouse gases stop some of the energy from leaving the earth's atmosphere and keep heat there. This causes the temperature of the earth's atmosphere to rise.
4CMVP062	1	8	<p>Answer = 1 Climate models say that by the year 2100, the average global temperature will rise by about 6 °C and the mean sea level will rise by 9–88 cm.</p> <p>Explanation: According to climate models, it is projected that by the year 2100, there will be an estimated increase of approximately 6 °C in the average global temperature, accompanied by a rise in mean sea level ranging from 9 to 88 cm.</p>

iPQ.No	Correct Answer	Points	Explanation
4CMVP063	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> In order to overcome obstacles related to efficiency, the U.S. Department of Energy initiated collaboration with the industry in the early stages of 1994 with the objective of formulating a mutually agreed upon approach for monitoring and certifying enhancements in efficiency. The IPMVP paper garnered favorable reception and subsequently established itself as the prevailing industry benchmark for measurement and verification (M&V) practices. The establishment of IPMVP Inc. was initiated by the Protocol Committee of the IPMVP.
4CMVP064	1	8	<p>Answer = 1 2001</p> <p>Explanation:</p> <p>In 2001, AEE launches the Certified Measurement and Verification Professional (CMVP®) credential.</p>
4CMVP065	4	8	<p>Answer = 4 Lack of awareness</p> <p>Explanation: Lack of awareness</p>
4CMVP066	2	8	<p>Answer = 2 Corporate energy philosophy</p> <p>Explanation: Corporate energy philosophy</p>
4CMVP067	1	8	<p>Answer = 1 True</p> <p>Explanation:</p> <p>It is imperative for each activity center within an organization to possess an individual energy budget, akin to budgets allocated for labor, raw materials, and other resources. Please indicate whether the statement is true or false.</p>
4CMVP068	4	8	<p>Answer = 4 Achieve company's best interests</p> <p>Explanation: Achieve company's best interests</p>

iPQ.No	Correct Answer	Points	Explanation
4CMVP069	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The factory or office exhibits signs and posters. • Progress charts that visually display predetermined targets and corresponding achievements. • The implementation of energy conservation stickers on light switches and thermostats has been proposed as a means to promote energy efficiency and reduce energy consumption.
4CMVP070	1	18	<p>Answer = 1 True</p> <p>Explanation:</p> <p>Monitoring and targeting constitutes a component of the comprehensive information systems employed in energy action planning.</p>
4CMVP071	1	8	<p>Answer = 1 Energy action planning</p> <p>Explanation: Energy action planning</p>
4CMVP072	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Cost-centre accountability • Each activity and manager would be responsible for energy utilisation. This requires detailed energy sub-metering for each Energy representative. • Each department would delegate an engineer to the plant energy management committee. • Training Energy conservation engineers and representatives should have enough training. • Metering • Metering helps conserve energy. Metering has a psychological effect on individuals—just having metres put and monitored reduces energy consumption. • Publicity focused at employees is one of the finest strategies to promote an energy conservation initiative.
4CMVP073	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Metering is one of the management tools for energy conservation. • At the individual's level, there is a psychological impact involved with metering - Just having meters installed and monitored is in itself an inducement to reduce unnecessary energy consumption.

iPQ.No	Correct Answer	Points	Explanation
4CMVP074	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The factory or office exhibits signs and posters. • The progress charts visually represent the set targets and corresponding achievements. • The implementation of energy conservation stickers on light switches and thermostats has been proposed as a means to promote energy-saving behaviors among individuals.
4CMVP075	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Information on bulletin boards • Articles in in-house magazines • Signs and posters that are hung up in the manufacturing facility or office
4CMVP076	1	8	<p>Answer = 1 Combustion analyser</p> <p>Explanation:</p> <p>Combustion analyser</p>
4CMVP077	1	8	<p>Answer = 1 Energy management</p> <p>Explanation:</p> <p>The judicious and effective use of energy to maximize profits (minimize the costs) and enhance competitive positions.</p>
4CMVP078	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The substitution of electric heaters with steam heaters • The substitution of steam-powered hot water systems with solar-based alternatives.
4CMVP079	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The utilization of natural gas has been steadily growing in popularity as a preferred fuel and raw material in various industries such as fertilizer production, petrochemical manufacturing, power generation, and sponge iron production. • The substitution of coal with alternative biomass sources such as coconut shells and rice husk. • The substitution of low-dropout (LDO) regulators with low standby current (LSHS) regulators.

iPQ.No	Correct Answer	Points	Explanation
4CMVP080	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> Financial accounting systems can provide valuable plant-level information, specifically in relation to the utilities cost centre. Information regarding the Plant Department can be obtained by analyzing comparative energy consumption data for a cohort of comparable facilities, as well as by examining service entrance meter readings, among other sources. Performance data at the system level, such as that of a boiler plant, can be ascertained by utilizing sub-metering data.
4CMVP081	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> The data pertaining to nameplates, run-time, schedule, and sub-metered measurements of energy-consuming equipment offers detailed information at the equipment level. The utilization of sub-metering data has the potential to offer valuable insights into the performance statistics of boiler plants.
4CMVP082	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> Reduction in energy usage, by eliminating energy wastages Changes in usage patterns by controlling maximum demand and consuming energy at different times of the day (when the cost is lower) Improved monitoring of energy expenditure, which ensures that you pay the correct amount based on how much energy the site uses.
4CMVP083	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> Indicators of the efficiency of a plant's operations can be derived from benchmarking process parameters. Indications of the efficiency of plant energy utilization.
4CMVP084	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> Organizations invest in their core or profit-making activities over energy efficiency. Even when they save energy, they want a faster return than other investments.
4CMVP085	4	8	<p>Answer = 4 Internal rate of return and non-Return on investment</p> <p>Explanation:</p> <ul style="list-style-type: none"> Simple payback period Return on investment and internal rate of return Net present value and cash flow

iPQ.No	Correct Answer	Points	Explanation
4CMVP086	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The analysis fails to consider the concept of the time value of money. • The model fails to consider the fluctuating nature of yearly net cash inflows.
4CMVP087	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The implementation of energy conservation practices necessitates the dissemination of knowledge and active engagement from individuals. • The presence of competition serves as a driving force for individuals to engage in energy conservation practices. • It is imperative to treat energy budgets for each activity center as separate entities, similar to labor or raw material budgets, and to account for them in a comparable manner.
4CMVP088	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The performance of managers may encompass the management of energy as a component of organizational policy. • In energy-intensive sectors, corporations may designate an engineer for each manufacturing facility with the purpose of overseeing and implementing energy management and conservation measures. • It is recommended that senior management allocate both human resources and financial resources to support the energy programme, following the implementation of a divisional accountability system for energy consumption.
4CMVP089	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • This analysis provides insight into the degree of realism exhibited by the assumptions made in the project. • The provision of a documented log of experience is of great value for informing future decision-making processes. • It is recommended that appropriate measures be implemented in response to the observed level of performance.
4CMVP090	1	18	<p>Answer = 1 3.7 kWh or Units</p> <p>Explanation:</p> <p>Electricity consumption (kWh) = $V \times I \times \cos \times \text{No of Hours}$ $= 0.230 \times 2 \times 0.8 \times 10 = 3.7 \text{ kWh or Units}$</p>

iPQ.No	Correct Answer	Points	Explanation
4CMVP091	1	18	<p>Answer = 1 3.78 kWh. Explanation:</p> <p>(a) Electricity consumption (kWh) at rated voltage = 5 kW x 1 hour = 5 kWh. (b) Consumption of electricity at 200 V (kWh) = $(200 / 230) 2 \times 5 \text{ kW} \times 1 \text{ hour}$ = 3.78 kWh.</p>
4CMVP092	2	8	<p>Answer = 2 Cumulative Sum Explanation: Cumulative Sum</p>
4CMVP093	1	8	<p>Answer = 1 Monthly specific energy consumption and turnover Explanation: Monthly specific energy consumption and turnover</p>
4CMVP094	1	8	<p>Answer = 1 Specific Energy Consumption; Explanation: Specific Energy Consumption;</p>
4CMVP095	1	8	<p>Answer = 1 Combustion analyzer: Explanation:</p> <p>This instrument has in-built chemical cells which measure various gases such as O₂, CO, NO_x and SO_x.</p>
4CMVP096	3	8	<p>Answer =3 Both Explanation:</p> <p>This measures oxygen and temperature of the flue gas. Calorific values of common fuels are fed into the microprocessor which calculates the combustion efficiency.</p>
4CMVP097	4	8	<p>Answer = 4 The flue gas sample is drawn into the solution outside the fyrite by a hand-operated pump.</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The flue gas sample is drawn into the solution within the fyrite by means of a hand-operated bellows pump. • The liquid volume undergoes alteration as a result of a chemical reaction, thereby providing insight into the quantity of gas present. • The utilization of distinct fyrite devices enables the measurement of both O₂ and CO₂.

iPQ.No	Correct Answer	Points	Explanation
4CMVP098	4	8	<p>Answer = 4</p> <p>All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Simple Lighting retrofits • Motor replacement • Steam trap replacement
4CMVP099	1	8	<p>Answer = 1</p> <p>Whole facility/building retrofits (involving lighting, HVAC and other EEMs)</p> <p>Explanation:</p> <p>Whole facility/building retrofits (involving lighting, HVAC and other EEMs)</p>
4CMVP100	3	18	<p>Answer = 3</p> <p>5.0 years</p> <p>Explanation:</p> <p>$PB = 22,20,000 / (4,86,000 - 42,000) = 5.0 \text{ years}$</p>