

QUESTIONNAIRE REPORT SHEET

iPQ2CMVP.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
2CMVP001	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The calibration and maintenance of meter installations • Performing calculations using experimental data • The process of reporting, ensuring quality assurance, and conducting third-party verification of reports.
2CMVP002	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> • M&V is not just a collection of tasks conducted to help a project meet IPMVP requirements. • Properly integrated, each M&V task serves to enhance and improve facility operation and maintenance of savings.
2CMVP003	4	8	<p>Answer = 4</p> <p>Explanation:</p> <p>The process of confirming the ability to achieve cost reductions is commonly known as operational verification. This procedure typically entails activities such as equipment inspection, equipment commissioning, functional performance testing, and data trending.</p>
2CMVP004	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Enhance the efficacy of engineering design and optimize the operations and maintenance of facilities. • Maximize the efficacy of emission-reduction credits and their overall worth. Effectively managing energy budgets is a crucial aspect of resource allocation and optimization in various domains. The prudent allocation of energy resources is essential for achieving sustainable and efficient operations. • Provide an assessment of regional efficiency programs and their efficacy. Enhance the public's comprehension of energy management as a tool for public policy implementation.
2CMVP005	4	8	<p>Answer = 4 Adjust the baseline by performing a non-routine adjustment using the IPMVP tools</p> <p>Explanation:</p> <p>To achieve a more accurate baseline, it is recommended to implement a non-routine adjustment utilizing the International Performance Measurement and Verification Protocol (IPMVP) tools.</p>

iPQ.No	Correct Answer	Points	Explanation
2CMVP006	1	8	<p>Answer = 1 True</p> <p>Explanation: In the initial stages of 1994, the United States Department of Energy initiated collaboration with the industry to establish a unified methodology for assessing and confirming the effectiveness of investments made in enhancing efficiency. This endeavor aimed to address prevailing obstacles hindering the progress of efficiency measures.</p>
2CMVP007	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Accurate, complete, and consistent • Conservative, relevant, and transparent
2CMVP008	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The application of measurement and verification principles is employed to assess the extent of performance improvement resulting from energy management initiatives. • The application of measurement and verification principles is employed in diverse energy-consuming systems, including building systems and industrial processes.
2CMVP009	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • There exist various categories of energy efficiency projects. • There are various energy management professionals available to oversee and address the energy-related aspects of any given project. • The project exhibits variations across different time periods, while also encompassing endeavors related to energy efficiency and the development of novel energy supply initiatives.

iPQ.No	Correct Answer	Points	Explanation
2CMVP010	4	8	<p>Answer = 4</p> <p>The application of quality assurance and quality control principles is employed in the context of energy savings performance contracts and utility/government incentive schemes.</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Certified Measurement & Verification Professionals® (CMVPs) are responsible for overseeing or conducting internationally recognized methodologies for evaluating the energy consumption implications of energy management practices. • The application of performance and savings verification principles is employed in the context of energy savings performance contracts and utility/government incentive schemes. • Effective communication with project partners is crucial for a Certified Measurement and Verification Professional (CMVP®) to successfully and efficiently carry out cost-saving initiatives.
2CMVP011	4	8	<p>Answer = 4</p> <p>All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The reduction in energy efficiency costs alleviates the financial strain on operating budgets. • There is a growing demand from both government and private building owners for the implementation of performance measurement and accountability systems that can effectively track progress towards targets and savings outcomes. • The recognition of the economic, environmental, health, and social ramifications associated with energy waste. • Enhancing governmental adherence to greenhouse gas (GHG) emission regulations.
2CMVP012	1	8	<p>Answer = 1</p> <p>True</p> <p>Explanation:</p> <p>The guiding principles for M&V (ACCCRT) include the principle of being conservative. An M&V analyst should always apply assumptions and make analysis choices that tend to underestimate energy savings. However, in applying this principle, it is important not to make analysis choices or assumptions that result in reported energy savings that are unrealistically pessimistic.</p>

iPQ.No	Correct Answer	Points	Explanation
2CMVP013	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Owners and managers of buildings, facility managers, plant and process engineers, financial controllers, and purchasing agents • Energy Service Companies (ESCO) and other providers of energy services (ESPs) • Participants in the formulation, administration, and/or reporting of energy savings strategies and initiatives for a portfolio of facilities.
2CMVP014	4	8	<p>Answer = 4 IPMVP Option D</p> <p>Explanation:</p> <p>IPMVP Option D is useful in this case, because there is no energy performance data on the new part of the building. Option D allows for a simulation to be done so we can estimate the baseline and “avoided costs” from doing energy improvements.</p>
2CMVP015	4	8	<p>Answer = 4 They are not over- or under-stated.</p> <p>Explanation:</p> <p>Where judgments are made about uncertain quantities, M&V procedures should be designed to reasonably estimate savings such that they are not over- or under-stated. An assessment of a project’s impact should be made to assure its energy-saving benefits are reasonable and conservative with due consideration to the level of statistical confidence in the estimation.</p>
2CMVP016	1	8	<p>Answer = 1 True</p> <p>Explanation:</p> <p>A good M&V Plan improves the transparency and credibility of reports on the results of investments in efficiency. Additionally, it increases the credibility of efficiency investment projections. This credibility can increase investors' and sponsors' confidence in energy efficiency projects, thereby improving their financing prospects.</p>
2CMVP017	4	16.42	<p>Answer = 4 Option D</p> <p>Explanation:</p> <p>Option D, "calibrated simulation," is the only option because there is no baseline (pre-upgrade) facility to measure anything. Adjusted baseline energy consumption must be calculated using actual operating parameters measured during the reporting period and simulating consumption as if the baseline (less efficient) equipment had been installed. At least electric power use, gas flow, and weather data would be measured during the Reporting Period.</p>

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2CMVP018	3	16.42	<p>Answer = 3 Option C Explanation:</p> <p>Option C, whole facility metering Due to a mixture or combination of many measures to be installed effectively all at once, energy savings are expected to be large (> 10%). Other options are technically feasible, but the cost would be prohibitive.</p>
2CMVP019	4	8	<p>Answer = 4 10% Explanation:</p> <p>Typically, the proportion of Measurement and Verification (M&V) expenses in relation to the annual savings generated by an energy management initiative should not surpass 10%.</p>
2CMVP020	3	8	<p>Answer = 3 Both Explanation:</p> <ul style="list-style-type: none"> • Check-metering on the main incomers • Measuring the supply to each business unit
2CMVP021	1	8	<p>Answer = 1 Spot measurement (option A) Explanation:</p> <p>In the context of verifying a lighting retrofit that solely entails fixture replacement, it is pertinent to consider the most cost-effective measurement approach options for spot measurement.</p>
2CMVP022	2	16.42	<p>Answer = 2 \$0.09000 per kWh. Explanation:</p> <p>A utility rate is an example of an exact number. If a local power company charges \$0.09 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 \$0.09000 per kWh.</p>
2CMVP023	1	8	<p>Answer = 1 True Explanation:</p> <p>To mitigate the ambiguity inherent in calculating savings, it is imperative for the M&V Plan to integrate methodologies that enable the quantification, assessment, and mitigation of various factors contributing to errors and uncertainty.</p>

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2CMVP024	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The home of the IPMVP • A non-profit U.S. corporation • Led by volunteers around the world
2CMVP025	3	8	<p>Answer = 3 Energy substitution</p> <p>Explanation: The substitution of steam-based hot water generation with a solar system exemplifies the concept of energy substitution.</p>
2CMVP026	1	8	<p>Answer = 1 True</p> <p>Explanation: Measurement and verification (M&V) refers to the systematic utilization of measurements to accurately ascertain the quantifiable energy savings generated by an energy management program within a particular facility.</p>
2CMVP027	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The quality of the meter. • The sample size may be compromised if measurements of all equipment are not taken into account. • Additional applications for meter data include the dissemination of cost-related information.
2CMVP028	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The total annual cost required to calculate savings should typically be below 10% of the annual savings amount. However, it is important to note that this threshold may be surpassed in certain exceptional circumstances. • A more prevalent expenditure range for ESCO projects is typically between 3% and 5%.
2CMVP029	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The topic of interest pertains to charges based on energy volume. • Demand charges refer to fees that are imposed on consumers based on their peak electricity usage. These charges are typically applied by utility companies and • The charges that are not related to energy consumption and remain constant regardless of energy usage.

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2CMVP030	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The topic of discussion pertains to charges associated with energy commodities. • The subject of inquiry pertains to network charges and metering charges. • The topic of discussion pertains to charges that are subject to regulation and have implications for the environment.
2CMVP031	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Use more precise measurement equipment • Use an alternative M&V option that is less affected by unknown variables • Review the measurement boundary to minimise unknowns
2CMVP032	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The process of calculating the mean temperature and The process of aggregating the degree days within a specified timeframe to synchronize with business cycles. • The process of choosing a base temperature, commonly referred to as a balance point, • To ascertain the heating or cooling demand, one must compute the disparity between the daily mean temperature and the equilibrium point.
2CMVP033	4	8	<p>Answer = 4 Developing a model of site energy use based on dependent variables.</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Use of a facility boundary. • "Developing a model of site energy use based on ambient temperature and other independent variables." • Measuring post-retrofit use over an extended period.
2CMVP034	1	16.42	<p>Answer = 1 263 kWh</p> <p>Explanation:</p> <p>Adjusted baseline energy use (kWh) = $45 \times 90 \times 65 / 1000 = 263$ kWh</p>
2CMVP035	1	16.42	<p>Answer = 1 194 kWh</p> <p>Explanation:</p> <p>Post-retrofit energy use (kWh) = $45 \times 90 \times 48 / 1000 = 194$ kWh</p>

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2CMVP036	4	8	<p>Answer = 4 All of the above Explanation:</p> <ul style="list-style-type: none"> • The inherent characteristics and qualities of the project that is currently being executed. • The fundamental methodology and framework for executing Measurement and Verification (M&V) procedures are outlined. Additionally, the key components of a comprehensive M&V plan, encompassing various tasks, necessary resources, appropriate timing, and associated costs, are discussed.
2CMVP037	4	8	<p>Answer = 4 All required existing building commissioning plan elements Explanation:</p> <ul style="list-style-type: none"> • The use of terminology that aligns with the referenced edition of the International Performance • Measurement and Verification Protocol (IPMVP) and the inclusion of all necessary elements in the Measurement and Verification (M&V) plan. • Consent is acquired from all stakeholders who are interested in complying with the International Performance Measurement and Verification Protocol (IPMVP).
2CMVP038	3	8	<p>Answer = 3 Both Explanation:</p> <ul style="list-style-type: none"> • In order to establish an appropriate physical demarcation for the execution of the project. This demarcation will serve as a reference point for the purpose of ensuring uniformity. • In order to ascertain the variables that impact energy consumption, it is imperative to determine the appropriate data types that can be measured.
2CMVP039	4	8	<p>Answer = 4 All of the above Explanation:</p> <ul style="list-style-type: none"> • It is imperative to incorporate the concept of additionality into the planning of Measurement and Verification (M&V) processes, while also ensuring the identification of potential overlaps among Energy Conservation Measures (ECMs). • This analysis aims to evaluate the impact of each ECM (Environmental, Cultural, and Material) and ascertain the specific locations and degrees to which they mutually influence one another. • The user is presented with three methods, namely 'Adjust to Isolate', 'Black Box', and 'Ordered Summation of Remainders', to address unresolved additionality concerns.

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2CMVP040	4	8	<p>Answer = 4</p> <p>The magnitude of the savings will be significant in comparison to the total energy consumption of the site.</p> <p>Explanation:</p> <p>The magnitude of the savings is relatively minor in relation to the total energy consumption of the site.</p>
2CMVP041	3	8	<p>Answer = 3</p> <p>Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The focus is on the whole facility. • Multiple ECMs across different energy systems are being implemented.
2CMVP042	1	16.42	<p>Answer = 1</p> <p>Explanation:</p> <div> <p>Investment : Rs 400/-</p> <p>Discount rate (k) : 10% (i.e. 0.1)</p> <p>Life of the CFL (t) : 2 years</p> <p>NPV : $\sum_{t=0}^n \frac{CF_t}{(1+k)^t}$</p> $NPV = \frac{CF_0}{(1+k)^0} + \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2}$ $= \frac{-400}{(1+0.1)^0} + \frac{1000}{(1+0.1)^1} + \frac{1000}{(1+0.1)^2}$ $= -400 + 909 + 826$ $= \text{Rs } 1335/-$ </div>
2CMVP043	1	8	<p>Answer = 1</p> <p>Independent variables can be easily monitored.</p> <p>Explanation:</p> <p>Independent variables can be easily monitored.</p>
2CMVP044	1	8	<p>Answer = 1</p> <p>2 years</p> <p>Explanation:</p> <p>2 years</p>
2CMVP045	2	8	<p>Answer = 2</p> <p>NPV $(1+i)^n$</p> <p>Explanation:</p> <p>NPV $(1+i)^n$</p>

iPQ.No	Correct Answer	Points	Explanation
2CMVP046	2	8	<p>Answer = 2 Rs 12,100</p> <p>Explanation: Rs 12,100</p>
2CMVP047	3	8	<p>Answer = 3 25%</p> <p>Explanation:</p> <p>The ratio of annual net cash flow to capital cost is return on investment</p>
2CMVP048	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Lending • Borrowing
2CMVP049	3	8	<p>Answer = 3 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Profits • Losses • Risk
2CMVP050	3	8	<p>Answer = 3 \$1200</p> <p>Explanation:</p> <p>Present Value = $Pxdxt/(i+d)=(8000 \times 0.2 \times 0.3)/(0.1+0.3) = \\1200</p>
2CMVP051	2	8	<p>Answer = 2 Capital costs</p> <p>Explanation: Capital costs</p>

iPQ.No	Correct Answer	Points	Explanation
2CMVP052	1	16.42	<p>Answer = 1 AED 8.05 lakh</p> <p>Explanation:</p> <p>The two ways of calculating interest are simple & compound interest.</p> <p>The total repayment value with simple interest = Rs (5.0+ (10/100*5.0*5)=AED 7.5 lakh The total repayment value with compound interest = AED 5.0 x (1 + 10/100)⁵ = AED 8.05 lakh</p>
2CMVP053	1	16.42	<p>Answer = 1 120%</p> <p>Explanation:</p> <p>The technique used to evaluate the financial viability of projects is the profitability index. THIS IS GIVEN BY RATIO of Sum of discounted net savings and Capital costs = 1.2 / 1.0 * 100 = 120%</p>
2CMVP054	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • This is an evaluation of the potential risks associated with cash flows, such as capital costs, energy cost savings, maintenance costs, and other relevant factors. • When considering the impact of various factors on a given situation, it is important to take into account several variables. These variables may include changes in processes, alterations in government policies such as depreciation and interest rates, as well as advancements in technology, among others. • In order to enhance the viability of the project, it is advisable to conduct sensitivity analysis, as it directly impacts the cash flows.
2CMVP055	1	16.42	<p>Answer = 1 1.5 Years</p> <p>Explanation:</p> <div style="border-left: 1px solid black; padding-left: 10px; margin-left: 20px;"> <p>Simple pay back period:</p> $\frac{\text{Capital or first cost}}{\text{Yearly benefits} - \text{yearly costs}}$ $: \frac{12000}{12000 - 4000} = 1.5 \text{ years}$ </div>

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2CMVP056	3	16.42	<p>Answer = 3 Both</p> <p>Explanation:</p> <p>Though NPV and IRR are basic principles adopted with the financial analysis of a project, they do not allow for the following considerations.</p> <ul style="list-style-type: none"> • The capital value of plant and equipment generally depreciates over time. • General inflation reduces the value of savings as time progresses. The capital depreciation of an item of equipment can be considered in terms of its salvage value. 																																																
2CMVP057	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Easy to calculate • It is interpreted in tangible terms (in years). • It does not require any assumptions about the project in terms of timing, life, or interest rates. 																																																
2CMVP058	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • It takes no account of any savings after the payback period. • It takes no account of the residual value of the capital asset. • It takes no account of the time value of money. 																																																
2CMVP059	1	16.42	<p>Answer = 1 Rs 20,000</p> <p>Explanation:</p> <hr/> <p>The cash flow detail for ten year duration is given below.</p> <table border="1"> <thead> <tr> <th>Year</th><th>Retrofit cost</th><th>Cost of Energy & demand savings-Computed</th><th>Maintenance savings</th></tr> </thead> <tbody> <tr><td>0</td><td>32500</td><td>0</td><td>0</td></tr> <tr><td>1</td><td>0</td><td>21800</td><td>+2000</td></tr> <tr><td>2</td><td>0</td><td>21800</td><td>+2000</td></tr> <tr><td>3</td><td>0</td><td>21800</td><td>+2000</td></tr> <tr><td>4</td><td>0</td><td>21800</td><td>+2000</td></tr> <tr><td>5</td><td>0</td><td>21800</td><td>+2000</td></tr> <tr><td>6</td><td>0</td><td>21800</td><td>+2000</td></tr> <tr><td>7</td><td>0</td><td>21800</td><td>+2000</td></tr> <tr><td>8</td><td>0</td><td>21800</td><td>+2000</td></tr> <tr><td>9</td><td>0</td><td>21800</td><td>+2000</td></tr> <tr><td>10</td><td>0</td><td>21800</td><td>+2000</td></tr> </tbody> </table> <p>The estimated savings in maintenance saving at the end of life of LED signs is Rs 20,000/-</p>	Year	Retrofit cost	Cost of Energy & demand savings-Computed	Maintenance savings	0	32500	0	0	1	0	21800	+2000	2	0	21800	+2000	3	0	21800	+2000	4	0	21800	+2000	5	0	21800	+2000	6	0	21800	+2000	7	0	21800	+2000	8	0	21800	+2000	9	0	21800	+2000	10	0	21800	+2000
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2CMVP061	1	16.42	<p>Answer = 1 Explanation:</p> <p>c) The net-present value against 12% interest rate is given below.</p> <p>NPV is given by : $\frac{A \times [(1+i)^n]}{[i \times (1+i)^n]}$</p> <p>NPV is given by : $\frac{23800 \times [(1+0.12)^{10} - 1]}{[0.12 \times (1+0.12)^{10}]}$ = Rs. 1,34,472/-</p>																																																
2CMVP062	2	8	<p>Answer = 2 Conference of Parties Explanation:</p> <p>A conference of the parties (COP; French: Conférence des Parties, CP) is the supreme governing body of an international convention (treaty, written agreement between actors in international law). It is composed of representatives of the member states of the convention and accredited observers.</p>																																																
2CMVP063	4	8	<p>Answer = 4 All of the above Explanation:</p> <ul style="list-style-type: none"> • Increase in global temperature • Rise in sea level • Human society will face new risks and pressures. 																																																

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2CMVP064	2	8	<p>Answer = 2 Energy intensity</p> <p>Explanation: Energy intensity is defined as the amount of energy used to produce a given level of output or activity. Using less energy to produce a product or provide a service results in reduced energy intensity.</p>
2CMVP065	1	8	<p>Answer = 1 Carbon Monoxide</p> <p>Explanation: Carbon Monoxide</p>
2CMVP066	1	8	<p>Answer = 1 2 degrees</p> <p>Explanation: 2 degrees</p>
2CMVP067	1	8	<p>Answer = 1 SOx and NOx</p> <p>Explanation: SOx and NOx</p>
2CMVP068	1	8	<p>Answer = 1 2.2 tonnes of coal</p> <p>Explanation: 2.2 tonnes of coal</p>
2CMVP069	2	8	<p>Answer = 2 Electricity</p> <p>Explanation: Electricity</p>
2CMVP070	2	8	<p>Answer = 2 Primary Energy Sources</p> <p>Explanation: Primary Energy Sources</p>

iPQ.No	Correct Answer	Points	Explanation
2CMVP071	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Final energy consumption is the actual energy demand at the user end. • This is the difference between primary energy consumption and the losses that take place in transport, transmission, distribution, and refinement.
2CMVP072	1	8	<p>Answer = 1 Energy efficiency and lower energy intensity routes.</p> <p>Explanation:</p> <p>This is due to their ability to focus on two critical issues: energy efficiency and lower energy intensity routes.</p>
2CMVP073	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Energy intensity is energy consumed per unit of GDP • It indicates the development stage of that country.
2CMVP074	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <p>The major sources of pollutants in Air are fuel combustion in transport, industry, forest fires, and solid waste disposal.</p>
2CMVP075	1	8	<p>Answer = 1 Carbon-dioxide, CFC, methane, Ozone, Nitrous oxide etc.</p> <p>Explanation:</p> <p>Carbon-dioxide, CFC, methane, Ozone, Nitrous oxide etc.</p>
2CMVP076	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Combustion of fossil fuels • Changes in land use
2CMVP077	1	8	<p>Answer = 1 The basic aim of energy security for a nation is to reduce its dependency on the imported energy sources for its economic growth.</p> <p>Explanation:</p> <p>The basic aim of energy security for a nation is to reduce its dependency on the imported energy sources for its economic growth.</p>

iPQ.No	Correct Answer	Points	Explanation
2CMVP078	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <p>Energy conservation is achieved when growth of energy consumption is reduced, measured in physical terms. Whereas the energy efficiency is achieved when energy intensity in a specific product, process or area of production is reduced without affecting output, consumption or comfort levels.</p>
2CMVP079	1	8	<p>Answer = 1</p> <p>Through energy efficiency, energy imports will be reduced, which helps in conserving limited resources and lead to improved energy security.</p> <p>Explanation:</p> <p>Through energy efficiency, energy imports will be reduced, which helps in conserving limited resources and lead to improved energy security.</p>
2CMVP080	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Building stockpiles • Diversification of energy supply sources • Increased capacity of fuel switching
2CMVP081	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Demand restraint • Development of renewable energy sources • Energy efficiency and Sustainable development
2CMVP082	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Efficient generation of energy resources • Improving energy infrastructure • Enhancing energy efficiency
2CMVP083	3	8	<p>Answer = 3 Both</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The deregulation and privatization of the energy sector. • The implementation of investment legislation aimed at fostering the attraction of foreign investments.
2CMVP084	4	8	<p>Answer = 4 All of the above</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Improving energy efficiency in accordance with national, socio-economic, and environmental priorities • Promoting energy efficiency and emission standards • Labeling programmes for products and adoption of energy-efficient technologies in large industries

iPQ.No	Correct Answer	Points	Explanation
2CMVP085	3	8	Answer = 3 technical design Explanation: technical design
2CMVP086	1	8	Answer = 1 Financing Explanation: Financing
2CMVP087	2	8	Answer = 2 Shared savings performance contract Explanation: Shared savings performance contract
2CMVP088	4	8	Answer = 4 Traditional contract Explanation: Traditional contract
2CMVP089	1	8	Answer = 1 Performance indicator Explanation: Performance indicator
2CMVP090	3	8	Answer = 3 Both Explanation: The process of monitoring and verification
2CMVP091	2	8	Answer = 2 Higher Explanation: Higher
2CMVP092	1	8	Answer = 1 Energy saving company Explanation: Energy saving company
2CMVP093	4	8	Answer = 4 All of the above Explanation: <ul style="list-style-type: none"> • From a capital budget • From a specific department or section budget • By obtaining a bank loan

iPQ.No	Correct Answer	Points	Explanation
2CMVP094	1	16.42	<p>Answer = 1 Rs. 3750 Explanation:</p> <p>Present Value = $Pxdxt/(i+d) = (10000 \times 0.3 \times 0.5)/(0.1+0.3) =$ Rs. 3750</p>
2CMVP095	4	8	<p>Answer = 4 All of the above Explanation:</p> <ul style="list-style-type: none"> • Further energy efficiency measures • Activities necessary to create the right climate for successful energy management which do not, of themselves, directly generate savings. • Maintaining or upgrading the management information system.
2CMVP096	1	16.42	<p>Answer = 1 Explanation:</p> <p>Life of the modified system Expected annual savings</p> <p>Investment: 15 years 5%: 0.05×2300000</p> <p>Rs. 1,15,000/year: Rs 2,20,000/-</p> $S = \frac{(1+i)^n \times i}{(1+i)^n - 1} \times I$ <p>S = annual energy savings</p> <p>I = Investment</p> <p>N = years</p> <p>I = Internal rate of return</p> $\frac{115000}{220000} = \frac{(1+i)^{15} \times i}{(1+i)^{15} - 1}$ <p>By trial and error method, I = 52%</p>

iPQ.No	Correct Answer	Points	Explanation										
2CMVP097	1	16.42	<p>Answer = 1 Explanation:</p> <p>Cash flow stream of project</p> <table><tr><td>Investment</td><td>Rs 13,50,000</td></tr><tr><td>Annual savings</td><td>Cashflow</td></tr><tr><td>1</td><td>5,00,000</td></tr><tr><td>2</td><td>5,50,000</td></tr><tr><td>3</td><td>6,50,000</td></tr></table> <p>Cost of capital to the plant is 12%. The net present value of the proposal is:</p> $\begin{aligned} NPV &= \frac{500000}{(1.12)^1} + \frac{550000}{(1.12)^2} + \frac{650000}{(1.12)^3} \\ &= 446428 + 438456 + 462657 \\ &= 13,47,541 \\ NPV &= 13,50,000 - 13,47,541 = 2459 \end{aligned}$	Investment	Rs 13,50,000	Annual savings	Cashflow	1	5,00,000	2	5,50,000	3	6,50,000
Investment	Rs 13,50,000												
Annual savings	Cashflow												
1	5,00,000												
2	5,50,000												
3	6,50,000												
2CMVP098	2	16.42	<p>Answer = 2 Explanation:</p> <p>The internal rate of return is the value of “r” which satisfies the following equation:</p> $100,000 = \frac{30,000}{(1 + \kappa)^1} + \frac{30,000}{(1 + \kappa)^2} + \frac{40,000}{(1 + \kappa)^3} + \frac{45,000}{(1 + \kappa)^4}$ <p>The calculation of “κ” involves a process of trial and error. Try with different values of “κ” till the right-hand side of the above equation is equal to 100,000. To begin with, try κ = 15 per cent. This makes the right-hand side equal to:</p> $\frac{30,000}{(1.15)} + \frac{30,000}{(1.15)^2} + \frac{40,000}{(1.15)^3} + \frac{45,000}{(1.15)^4} = 100,802$ <p>This value is slightly higher than our target value, 100,000. So increase the value of κ from 15 per cent to 16 per cent. (In general, a higher κ lowers and a smaller r increases the right-hand side value). The right-hand side becomes:</p> $\frac{30,000}{(1.16)} + \frac{30,000}{(1.16)^2} + \frac{40,000}{(1.16)^3} + \frac{45,000}{(1.16)^4} = 98,641$ <p>Since this value is now less than 100,000, it can be concluded that the value of r lies between 15 per cent and 16 per cent. For most of the purposes this indication suffices.</p>										

iPQ.No	Correct Answer	Points	Explanation
2CMVP099	1	16.42	<p>Answer = 1</p> <p>Explanation:</p> <p>Find the i that will equate the following:</p> $\text{Rs.}500,000 = 150,000 \times \text{PV} (A = 10 \text{ years, } i = ?)$ <p>To do this, calculate the net present value (NPV) for various i values, selected by visual inspection;</p> $\begin{aligned} \text{NPV } 25\% &= \text{Rs.}150,000 \times 3.571 - \text{Rs.}500,000 \\ &= \text{Rs.}35,650 \end{aligned}$ $\begin{aligned} \text{NPV } 30\% &= \text{Rs.}150,000 \times 3.092 - \text{Rs. } 500,000 \\ &= -\text{Rs. } 36,200 \end{aligned}$ <p>For i = 25 per cent, net present value is positive; i = 30 per cent, net present value is negative. Thus, for some discount rate between 25 and 30 per cent, present value benefits are equated to present value costs. To find the rate more exactly, one can interpolate between the two rates as follows:</p> $\begin{aligned} i &= 0.25 + (0.30 - 0.25) \times 35650 / (35650 + 36200) \\ &= 0.275, \text{ or } 27.5 \text{ percent} \end{aligned}$
2CMVP100	1	16.42	<p>Answer = 1</p> <p>Simple payback period = $80 / (18.85)$, or 4 years and 9 months.</p> <p>Explanation:</p> <p>According to the payback criterion, the shorter the payback period, the more desirable the project, The simple payback period is 4 years and 9 months.</p> <p>Simple payback period = $80 / (18.85)$, or 4 years and 9 months.</p>