Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2024

Course: Energy & Utilities. **Semester: III**
Program: MBA Oil & Gas **Time: 03 hrs.**
Course Code: OGOG8011 **Max. Marks: 100**

Instructions:

SECTION A
10Qx2M=20Marks (Answer All Question)

S. No.		Marks	CO
Q 1	Name any 3 utilities of power generation sector of India	**2**	**CO1**
Q 2	Give four example of Resource-Energy- Application combination	**2**	**CO1**
Q 3	What is capacity Utilization Factor of a Power Plant	**2**	**CO1**
Q 4	Which power plant usually have lower CUF A. Hydro B. Steam C. Solar	**2**	**CO1**
Q 5	A solar plant has CUF of 20% and a wind plant has 24%. The capital cost of both plants is same Rs 4 Cr/MW and also the Power sale price is same at Rs 3/kWh. Which would be the financially viable option for the investor to invest in? A. Solar B. Wind	**2**	**CO1**
Q 6	What is open access in energy sector (electricity)	**2**	**CO1**
Q 7	A company (Fabric Manufacturer) has Solar Purchase obligations to fulfill their certain energy demand. Since the core business of company is manufacturing, obviously they do not have expertise of power sector. Though, there is huge space available in their premise to install solar project based on their need also management is keen to explore such chances. In this case, what would be the better business model for this Company and why? Capex Model A. Opex Model B. Capex Model	**2**	**CO1**
Q 8	Write down the three sector where hydrogen is being used in India	**2**	**CO1**

Q 9	Define IRR of an investment and its significance	**2**	**CO1**
Q 10	What should be the capacity of solar power plant to be considered as Utility Scale in India?	**2**	**CO1**
SECTION B **4Qx5M= 20 Marks**			
Q 1	What are the challenges power distribution utilities facing in India	**5**	**CO2**
Q 2	Define each measure which could be well used for assessing the financial attractiveness of an investment in the energy projects.	**5**	**CO2**
Q 3	What is Grey, Blue and Gren Hydrogen	**5**	**CO2**
Q 4	Calculate Weighted Average Cost of Capital (WACC) for an investment in the energy sector's project having Debt Share – 60% Equity Share – 40% Return on Equity – 13% Annual Interest on debt – 11%	**5**	**CO2**
SECTION-C **3Qx10M=30 Marks**			
Q 1	A solar 10 MW solar plant has capital cost of Rs 4 crore per MW. Annual O&M cost is 3% of Capital cost and CUF is 20%. Estimate the unit cost of electricity generation (Rs/kWh) for the first year of operation. Consider discount rate (d) 10% Life of the project 25 years	**10**	**CO3**
Q 2	Describe National Green Hydrogen Mission (India) Targets, Policy Measures, Incentives etc.	**10**	**CO3**
Q 3	What are the applications of renewable energy in Oil & Gas sector	**10**	**CO3**
SECTION-D **2Qx15M= 30 Marks**			
	Short-term interventions addressing the current energy crisis must be accompanied by a steadfast focus on mid- and long-term goals of the energy transition. High fossil fuel prices, energy security concerns and the urgency of climate change underscore the pressing need to move faster to a clean energy system, says *World Energy Transitions Outlook 2022*. Launched by the International Renewable Energy Agency (IRENA) at the Berlin Energy Transition Dialogue today, the Agency's Outlook sets out priority areas and actions based on available technologies that must be realized by 2030 to achieve net zero emissions by mid-century. It also takes stock of progress across all energy uses to date, clearly showing the inadequate pace and scale of the renewables-based transition.		**CO4**

	"The energy transition is far from being on track and anything short of radical action in the coming years will diminish, even eliminate chances to meet our climate goals", said Francesco La Camera, Director-General of IRENA. "Today, governments are facing multiple challenges of energy security, economic recovery and the affordability of energy bills for households and businesses. Many answers lie in the accelerated transition. But it's a political choice to put policies in place that comply with Paris Agreement and the Sustainable Development Agenda. Investing in new fossil fuel infrastructure will only lock-in uneconomic practices, perpetuate existing risks and increase the threats of climate change." "It is high time to act", La Camera added. "Recent developments have clearly demonstrated that high fossil fuel prices can result in energy poverty and loss of industrial competitiveness. 80% of the global population lives in countries that are net-importers of fossil fuels. By contrast, renewables are available in all countries, offering a way out of import dependency and allowing countries to decouple economies from the costs of fossil fuels while driving economic growth and new jobs." The Outlook sees investment needs of USD 5.7 trillion per year until 2030 including the imperative to redirect USD 0.7 trillion annually away from fossil fuels to avoid stranded assets. But investing in the transition would bring concrete socioeconomic and welfare benefits, adding 85 million jobs worldwide in renewables and other transition-related technologies between today and 2030. These job gains would largely surpass losses of 12 million jobs in fossil fuel industries. Overall, more countries would experience greater benefits on the energy transition path than under business as usual, according to the Outlook. Renewables would have to scale-up massively across all sectors from 14% of total energy today to around 40% in 2030. Global annual additions of renewable power would triple by 2030 as recommended by the Intergovernmental Panel on Climate Change (IPCC). At the same time, coal power would have to resolutely be replaced, fossil fuel assets phased out and infrastructure upgraded. The Outlook sees electrification and efficiency as key drivers of the energy transition, enabled by renewables, hydrogen, and sustainable biomass. End-use decarbonization will take center-stage with many solutions available through electrification, green hydrogen, and the direct use of renewables. Notably electromobility is seen as driver of energy transition		

	progress, growing the sales of electric vehicles (EV) to a global EV fleet twenty times bigger than today. However, a comprehensive set of cross-cutting, structural policies covering all technological avenues and just transition objectives is needed to achieve the necessary deployment levels by 2030. Increasing ambition in the National Determined Contributions (NDCs) and national energy plans under the Glasgow Climate Pact must provide certainty and guide investment strategies in line with 1.5°C. Particularly the world's largest energy consumers and carbon emitters from the G20 and G7 must show leadership and implement ambitious plans and investments domestically and abroad. They would need to support the global supply of 65% renewables in power generation by 2030. Climate finance, knowledge transfer and assistance would have to increase for an inclusive and equal world. Finally, enabling a rapid transition that complies with climate and development goals requires political commitment to support the highest level of international cooperation. Achieving Sustainable Development Goals and universal access to modern energy by 2030 must remain a vital pillar of a just and inclusive energy transition. A holistic global policy framework can bring countries together to enable international flow of finance, capacity and technologies. Short-term interventions addressing the current energy crisis must be accompanied by a steadfast focus on mid- and long-term goals of the energy transition. High fossil fuel prices, energy security concerns and the urgency of climate change underscore the pressing need to move faster to a clean energy system, says *World Energy Transitions Outlook 2022*. Launched by the International Renewable Energy Agency (IRENA) at the Berlin Energy Transition Dialogue today, the Agency's Outlook sets out priority areas and actions based on available technologies that must be realised by 2030 to achieve net zero emissions by mid-century. It also takes stock of progress across all energy uses to date, clearly showing the inadequate pace and scale of the renewables-based transition. "The energy transition is far from being on track and anything short of radical action in the coming years will diminish, even eliminate chances to meet our climate goals", said Francesco La Camera, Director-General of		

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Q1	Analyze the challenges in getting investment for any projects of Energy transition projects.	**15**	**CO4**
Q 2	Elaborate the steps any Government can take in promoting Energy Transition	**15**	**CO4**