UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2019

Course: Energy Sector Project Financing　　　　　　　　　　**Semester: III**

Program: MA-Economics (With Specialization in Energy Economics)　　**FINC 8007**

Time: 03 hrs.　　　　　　　　　　　　　　　　　　**Max. Marks: 100**

Instructions: This question paper is divided into four sections A, B, C and D. Section A; Section B has 20 marks each, and Section C and Section D are of 30 marks each.

SECTION A

S. No.		Marks	CO1
Q 1	**Explain the following concepts related with Energy Project financing in India:**		
a.	Non-recourse financing	**02**	
b	Time value of money signifies that the value of a unit of money remains unchanged during different time periods. (True or False with reason)	**02**	
c.	Return of portfolio is simply weighted average of returns on individual securities in the portfolio multiplied by their corresponding proportions (weights) in the portfolio.	**02**	
d.	Working capital from business operations can be determined from profit and loss account.	**02**	
e.	Issue of 12% preference shares will ------------------- debt equity ratio of a corporate enterprise. (Decrease/Increase).	**02**	
f.	Two Price Setting Approaches	**02**	
g.	Public Utilities consist of two characteristics	**02**	
h.	Two mutually exclusive projects (A and B) have been evaluated. Project A has an NPV of Rs 8 lakh and an IRR of 16 per cent; Project B has NPV of Rs 7 lakh but has IRR or 18 per cent. Since Project B has higher IRR, it should be selected.	**02**	
i.	Risk Identification techniques	**02**	
j.	Concept of Risk Response for Risk Analysis	**02**	

SECTION B

Q.2	**Short Answer Questions. Attempt Any Four Questions**	Marks	CO2
a.	Determine the average rate of return from the following data of two machines A and B: <table><tr><td></td><td>Machine A</td><td>Machine B</td></tr><tr><td>Cost</td><td>Rs 56125</td><td>Rs 56125</td></tr><tr><td>Annual Estimated Income after depreciation and income tax: Year　1 　　　2 　　　3 　　　4 　　　5</td><td> 3375 5375 7375 9375 11375</td><td> 11375 9375 7375 5375 3375</td></tr><tr><td>Estimated Life (Years)</td><td>5</td><td>5</td></tr><tr><td>Estimated Salvage Value</td><td>3,000</td><td>3,000</td></tr></table> Depreciation has been charged on straight line basis.	**05**	

b.	Profitability Index (PI) or Benefit Cost Ratio (B/C Ratio)	**05**	
c.	Discuss the different phases of Life Cycle Cost Model.	**05**	
d.	Difference between corporate finance and project finance.	**05**	
e.	A company issues 11 per cent debentures of Rs 100 for an amount aggregating Rs. 1,00,000 at 10 percent premium, redeemable at par after five years. The company's tax rate is 35 per cent. Determine the cost of debt.	**05**	
f.	Discuss similarities between NPV and IRR.	**05**	

<div align="center">SECTION-C</div>

Q.3	Long Answer questions. Attempt Any Two Questions.	**Marks**	**CO3**
A.	A company has the following estimates of the present values of the future cash flows after taxes associated with the investment proposal, concerned with expanding the plant capacity. It intends to use a decision-tree approach to get a clear picture of the possible outcomes of this investment. The plant expansion is expected to cost Rs, 3, 00,000. The respective PVs of future CFAT and probabilities are as follows: **PV of future CFAT** 	**With Expansion**	**Without Expansion**	**Probabilities**	 Rs 3,00,000 / Rs. 2,00,000 / 0.2 5,00,000 / 2,00,000 / 0.4 9,00,000 / 3,50,000 / 0.4 Advise the company regarding the financial feasibility of the project.		
B.	Discuss the credit rating methodology for renewable energy project.	**15**	
C.	Compare and analyze various tariff regulations and discuss the impact on financial viability of the selected energy systems. You can take any energy system of your choice for the purpose.	**15**	
D.	Aries limited wishes to raise additional finance of Rs 10 lakh for meeting its investment plans. It has Rs 2, 10,000 in the form of retained earnings available for investment purposes. The following are the further details : 1. Debt-Equity Ratio 30:70 2. Cost of debt: Upto Rs 1,80,000, 10 percent (before tax); Beyond Rs 1,80,000, 12 percent (before tax) 3. Earnings per share Rs 4 4. Dividend payout, 50 per cent of earnings 5. Expected growth rate in dividend, 10 percent 6. Current market price per share, Rs 44 7. Tax Rate, 35 per cent You are required: (a) To determine the pattern for raising the additional finance, assuming the firm intends to maintain existing debt/equity mix. (b) To determine the post-tax average cost of additional debt. (c) Compute the overall weighted average after tax cost of additional finance.	**15**	

<div align="center">SECTION-D</div>

Q	**Read the case carefully and Answer the questions that follow:**	**Marks**	**CO4**
	Case A: Efficient Stoves to Protect Pandas by WWF, China (Reward-based)		

The nested CFAT table (for row A):

PV of future CFAT		
With Expansion	**Without Expansion**	**Probabilities**
Rs 3,00,000	Rs. 2,00,000	0.2
5,00,000	2,00,000	0.4
9,00,000	3,50,000	0.4

The WWF-China Giant Panda Program (GPP) Team targeted to raise USD 50,000 via a crowdfunding platform to build 100 highly energy efficient cook stoves for local households in a village nearby Giant Panda habitat in Sichuan Province of China. The project aimed to reduce the non-renewable biomass consumption by local households, by improving the efficiency of the cook stoves, saving surrounding forest areas and reducing CO2 emissions. A conventional cook stove used approximately 30 tons of firewood every year per household. The deforestation and forest degradation caused by massive firewood harvesting have destroyed panda habitats, leading to the ecological biodiversity loss of the Giant Panda nature conservation areas. Being replaced with efficient stoves, wood consumption could be halved and air quality in homes was improved. This project also got Golden Standard credit in a Voluntary Emission Reduction scheme to offset carbon from the stoves. By the end of the campaign, the GPP team had raised USD 2,439 from 91 funders who were offered rewards such as Panda e-cards, Panda drawing, or Panda album etc. Since this was a scalable project, the building stoves were proportional to the fund that was raised from crowdfunding.

Case B: "A Flame Called Hope"by WWF Nepal (Donation-based)

The Gold Standard Biogas Voluntary Emission Reduction (VER) Scheme dubbed as 'A Flame Called Hope' by WWF Nepal was aimed at raising USD 100,000 to provide access to clean and alternate biogas energy for 150 households in a village in Nepal's Terai. Deforestation in the Terai Arc Landscape has become worse due to the rising demand for timber for daily use as fuel. The affordable and highly effective technology turned animal and human waste into biogas (a clean cooking gas) as a better alternative to wood. One biogas unit saves approximately 4 tons of CO2 equivalent emissions. The Gold Standard Biogas VER Project was also a carbon-financing project that contributes to emissions reductions, bringing financial benefits to local communities. The carbon credit sale further sustained the implementation of the biogas project. By the end of the campaign, the WWF Nepal had raised USD 2,626 from 66 funders who received social recognition and thank-you cards as rewards.

Case C: Pay-As-You-Go Solar Energy, Tanzania (Lending-based)

Via a crowdfunding platform with 91 investors USD$15,000 loan has been raised to enable the production and sale of 1,000 Solar Home Systems to small-scale businesses and their families in Mwanza, Tanzania. More than 1/3 of the production costs were covered by raised loan. The target customers were small stall or shop owners who cannot afford connection to the electric grid. The "Pay-As-You-Go" photovoltaic technology enables users to pay cash-in hand for the use of clean energy in an affordable manner. The investors received quarterly payment in fixed annual interest rate of 3.5% over a 12-month term. It is expected to improve the living of 4,000 people benefiting from solar energy annually. The household energy savings is estimated at USD$5,000 for the first year and USD$75,000 the second to the fifth year. The project would displace kerosene as the main lighting fuel and is slated to achieve an emission reduction of 100,000 kg of CO2 annually.

a.	Discuss various crowdfunding models for RE projects financing and compare the given cases.		
b.	Highlight possible limitations of crowdfunding		
c.	Explain governance and ownership considerations		