

**UNIVERSITY OF PETROLEUM & ENERGY STUDIES
DEHRADUN**

End Semester Examination – May 2019

Name of the Program: - MBA Power Mgt. Semester – Second
Subject Name: Operation Management Course code – LSCM 7001 (for PM2)
Max. Marks : 100 Duration: 3 Hrs

SECTION – A

- 30 Marks

Attempt all questions. Each question carries three marks.

1. Differentiate Operation Management with Production Management. (CO1)
2. Define RfQ, EXW and FOB. (CO5)
3. Differentiate between MMT and Intermodal Transportation. (CO3)
4. Explain and critically evaluate 3PL. (CO1 & CO3)
5. What is Porter Value-chain? Explain. (CO2)
6. What do you mean by feasibility? Explain. (CO1)
7. Explain production system. (CO2)
8. What is ABC analysis? Explain. (CO5)
9. Explain and evaluate JIT implementation in India. (CO5)
10. What is job-design? Explain. (CO3 & CO4)

SECTION – B

- 40 Marks

Attempt any four questions. 40 marks = 4X10 marks)

1. Explain and critically evaluate various selection process of site for a TPP based on coal adopted in India with 2-3 examples of diverse nature. Suggest betterment. (CO4 & CO2)
2. Explain SCM, how it is different from logistic management. Explain key features of SCM. (CO2 & CO3)
3. Explain characteristics of good layout of a plant. Apply this for any power related generation-unit. (CO2 & CO3)
4. What are key features of inventory management. Explain and evaluate its impact on any one segment of Indian power sector. (CO5)
5. “Business Process Mapping for Transmission of electricity” – Design and explain from generation end to start of distribution sector. (CO5)
6. An oil manufacturer purchases lubricants at the rate of Rs. 42/- per piece. The requirements are 1800 p.a. What should be the ordering quantity, if the cost per order is Rs. 16/- and inventory carrying charges per rupee per year is 20 paisa? (CO3)

7. Explain process design. What are different types of it with their relative advantages and disadvantages. (CO3)

SECTION – C

30 Marks

CASE STUDY

In the village of Aharkandhi in northeastern Bangladesh, life has changed since homeowners began installing solar panels on their roofs. At night, families gather at the local grocery store to watch TV, which boosts business. Children study longer than before.

This is due in part to a World Bank-financed electrification project to promote off-grid electricity in rural communities. This year, the project became the first renewable energy program in Bangladesh to be issued carbon credits for lowering greenhouse gas emissions and the world's first Programme of Activities for solar home systems under the UNFCCC's Clean Development Mechanism (CDM) to generate carbon credits.

With access to electricity, people are finding new ways to increase their income, and the word is spreading quickly across villages. Mujib, a shopkeeper, saw his income increase by 1,000 Tk per month (about US\$13), and his evening business grew after his solar home system was installed.

After Hajra installed solar panels, she was able to power five lights so her children could study, a TV, and a mobile phone charger that allows her to keep in touch with her husband, a laborer. Previously, she used kerosene, and she remembers the fumes that filled her house.

This is one of the fastest growing renewable energy programs in the world – to date, more than 3.5 million solar home systems have been installed in rural Bangladesh, creating 70,000 direct jobs.

Bolstering financing through carbon credits

Solar power is helping to green Bangladesh's energy mix. Renewable energy accounts for less than 1 percent of the country's energy generated, but the government aims to have 10 percent of its national grid powered by renewable energy by 2020. Adding solar panels to rural homes is an important part of the country's sustainable development strategy.

In addition to providing energy, the solar home systems are reducing greenhouse gas emissions and earning carbon credits by reducing the use of kerosene lamps for lighting and diesel generators that had been used to charge batteries. The program is projected to deliver 1.1 million Certified Emission Reductions, or carbon credits, by 2016, issued under the CDM. The carbon credits are sold to the World Bank's Community Development Carbon Fund, generating a revenue stream that is shared by the companies involved in financing, installing and servicing the solar panels to expand the program.

It is also the first solar home system Programme of Activities under the UN's Clean Development Mechanism to generate carbon credits. As an approved Programme of Activities, it is able to combine 13 similar projects under one countrywide umbrella program, lowering transaction costs and creating the possibility to add similar projects in the future in a simplified process.

The sun provides light in rural Bangladesh

Benefits of solar panels abound. Communities are reporting a significant increase in the quality of life thanks to better, safer, and cheaper lighting and the ability to power electrical appliances, cell phones, TVs, and radios. Remote and poor families can now hear weather forecasts on the radio and watch the news on small TVs, which becomes more than just a luxury in a country that frequently faces severe weather.

Night lights are improving safety in the dark, especially for women and children. Replacing conventional kerosene lamps and their toxic fumes help reduce indoor air pollution, fire hazards, and health risks such as respiratory diseases. And the solar panel industry is booming, including employing Bangladeshi women.

Solar panel subsidies help the poor

The solar panels are subsidized by the Infrastructure Development Company, Ltd. (IDCOL), a state-owned financial institution that provides families with grants and credits to pay for part of the cost and provide electricity in a country where only 60 percent of the population and about 42 percent of rural household have access to electricity. Around 13 million rural households still live without power. Even those connected to the grid experience blackouts during peak hours because the electricity supply can't keep up with demand.

Installing solar panels has become a reliable and increasingly financially viable solution for more Bangladeshis. A 20 watt-peak system costs about US\$150, which is paid by the users over three years and provides enough electricity to power two lights and one mobile charger. Bangladeshis even in the most rural areas rely on cell phones.

Overcoming the affordability barrier has been crucial in allowing for a widespread adoption of solar home systems. The cost of solar panels has come down over time, and today there is a growing trend for very small, 10 watt-peak panels, allowing poorer households gain access to electricity.

The Bangladesh program is one of the most successful solar home system programs in the world. It's a model that is bringing cheaper and more reliable electricity to remote areas of the country and has potential to go beyond Bangladesh to be scaled up in other developing countries.

1. How Subsidy affects electricity distribution for rural areas? (10) **(CO4 & CO5)**
2. Will this above model applicable to Indian rural areas? Critically explain. (10) **(CO3)**
3. Give some idea on micro grid concepts. (10) **(CO3, CO4 & CO5)**

UNIVERSITY OF PETROLEUM & ENERGY STUDIES, DEHRADUN
End Semester Examination – May 2019
Name of the Program: MBA Power Mgt. Semester – 2nd Semester
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Max. Marks : 100 Duration : 3 Hrs

SECTION – A

- 30 Marks

Attempt all questions.

Question 1: (Each question carries 3 marks)

1. Explain Operation Management. (CO1)
2. Explain different types of wastages. (CO4)
3. Explain reduce, reuse and recycle concept. (CO4)
4. Explain BPR. How it is useful? (CO3)
5. How OM is different from Production Management? (CO1)
6. Concept of break even. (CO3)
7. Explain EOQ in inventory management. (CO5)
8. Explain VED concept in inventory. (CO5)
9. Porter's Value chain. (CO2)
10. Feasibility of Project. (CO2&CO3)

SECTION – B Total - 40 Marks

Attempt any four questions. Each question carries ten marks.

2. A manufacturing company purchases 9000 spare parts as an annual requirement, every month @ Rs. 20/- per piece. The ordering cost is Rs. 15/- and inventory carrying charges are 15% of the average inventory p.a. Suggest an economic policy for the company. Also advice how much would it save on the part of Co. p.a.? **9CO5)**
3. Differentiate among PPP, Privatization & Public & Distribution franchisee in Power Distribution business in India? (CO3 &CO4)
4. Explain Job-design in industries. What are job-enrichment, job-enlargement and job rotation with their advantages? (CO3 & CO4)
5. Explain after naming the ten INCOTERMS as defined by ICC in 2010. (CO5)

6. What are key features of store management? Explain and evaluate its impact on any one segment of Indian power sector. (CO5)
7. Determine the standard time for a job. The employee under the time study has produced 20 units of product in an 8 hour day. During observations the employee was found nervous, thus assessed to be working 10 percent faster than the normal pace. Allowances for the job remained as 25 percent of the normal time. What are the normal and standard times for this job? (CO4 & CO5)

SECTION – C 30 marks

Recent and Anticipated Development in Hydro Power in India

One of the important sources of power in India is Hydropower which contributes around 45,480MW of installed capacity which is 13 percent of the country's total installed capacity of 347 GW. Hydro is the third largest source of power after coal and renewables in India. But the total hydropower potential of the country is about 145 GW. Only 30 percent of the power has been exploited from the total potential. It has been stated that only 5.4 GW pf capacity has been added during the 12th five-year plan (2012-2017). Although the segment was opened for private participation since from 1991, so far only 7 percent of the total hydro capacity has been commissioned by the private companies. There are various challenges associated with environmental, technical, financial, infrastructural and administrative issues that significantly affecting the investment and project development of hydropower in India. Challenges including water-sharing issues among states, rehabilitation and resettlements (R&R) issues, geological surprises and limited availability of long-term financing, procuring clearances delays etc. The entire sector is looking forward for the new hydropower policy framed by Ministry of Power which will take care of all the issues. The recent and anticipating development of hydropower in the country has been stated below

1. Classification of hydro as Renewable power:

On 7th March 2019, the cabinet approves the Renewable status for large hydro power projects. Earlier, only the small hydropower projects up to 25 MW capacity were considered as renewable. By considering the hydro, irrespective of size as a renewable source of energy, the hydro power projects will secure long-tenor loans to male debt more suitable to its characteristics such as long construction period, greater risk at

development period and significantly lower risk during the operational stage. This also includes recommendation of soft loans for a longer period (20-25 years). Other important benefits include “must-run” status and interstate transmission charges exemptions.

2. Longer-tenor loans:

One important challenge related to finance is the non-availability of long-term loans at low interest rates which made the hydropower so costly. This issue includes the problem of high capital costs and long gestation periods. Recently, bankers expressed their willingness to give standardised loans up to 20years.

3. Using of latest technologies:

Basically, the segment has a barrier of availability of good construction equipment's and survey techniques so there was a track record of projects not getting completed within quoted time and cost. It is one of reason why hydropower projects have received a very bad reputation. But, today, due to the availability of updated and latest best technologies, the projects are getting completed within framed time and cost. One best example is NHPC's Krishanganga project that used latest construction technologies like tunnel boring machines for the construction of long tunnel of 24 km long in snowbound areas of Jammu and Kashmir.

4. Signing of PPAs:

Signing the Power Purchase Agreements with hydropower is being a very big challenge of the segment, where no efforts have made by the Power Ministry. A series of regulatory changes has been suggested to overcome the challenge. For some costly hydropower projects like Kishanganga, the central government is providing a large chunk o subordinate loans and supporting for signing PPAs with state governments.

5. Increased Depreciation Period:

In the upcoming new hydropower policy, it has been suggested to have increased project's depreciation period from 35 years to 40 years which will brought down the per unit power tariffs.

6. Peaking power policy:

Introducing peaking power policy will facilitate hydropower offtake and will also help the DISCOMs to manage the peak demand in a better way by mandating higher peak tariffs combined with time-of-day metering. By the introduction of time-of-day tariffs, the signing of PPAs will also not going to be a constraint.

7. Separate Hydropower Purchase Obligation:

Another important key proposal for the development of hydropower is mandating a separate hydropower purchase obligation (HPO). HPO under the currently mandated non-solar renewable purchase obligation would promote the offtake of hydropower. This separate hydropower purchase obligation will significantly provide a safety net for hydropower developers which would guarantee the electricity purchase and making the projects more viable and bankable.

8. Hydro Power Development Fund:

Under the bailout plan which has been in the work since 2017, the central government has created a HPDF of Rs. 160 billion packages to revive nearly 11,000 MW capacity projects that also includes 4 percent interest subvention. This HPDF sources from coal cess, the National Clean Energy Fund. However, it is a known fact that all the cess is now subsumed under the new goods and service tax regime, the finance ministry had asked the Ministry of Power to rework on the scheme to reduce the dependence on budgetary support.

9. Updated Basin-wise Review of hydro potential:

The CEA in association with WAPCOS limited carried out the reassessment study to review the hydro potential by considering the actual site constrains in terms of geology, submergence, etc. and also includes the environmental and forest impacts of the projects which will be very useful for the development of RMU work of the hydel power projects in future.

10. Financial Rehabilitation Plan:

NITI Aayog in the draft of National Electricity Policy which was released in 2017 mentioned about the financial rehabilitation plan where the state and central government will cooperate in reorienting the current hydro power strategy for course

correction. This will be helpful in rehabilitation of ongoing/stranded and large hydropower projects so that the already invested fund can be put to good use.

11. Increased project life:

The usual project life of a hydro power project is 35 years. There are hydel projects which has more than 40 years of life but still running effectively. It has been suggested by NITI Aayog in the draft of the National Electricity Policy to have longer project life of about 60 years instead of 35 years, which will enable in accessing long-term loans.

12. Other needed developments in Hydropower projects:

The following are some of the developments needed in the segment.

1. The government should control the unnecessary interference of NGOs and should ensure single-window clearances. Moreover, the additional burden of catchment Area Treatment Plan, Wildlife Conservation Plan, etc. should not be loaded onto the hydropower projects which further reduces the participation of private players in the segment.
2. Regulators need to explore the need to extend the ancillary services markets which is currently limited to frequency support only. Spinning reserves, voltage regulation, black start, etc. can also be included in the ancillary services.
3. The land acquisition procedures should be made simple as possible and R&R requires stakeholder consultation.
4. The development of trained and skilled manpower for the hydropower sector is very important.
5. A provision of benefits to the downstream affected people should also be taken in to consideration

Que 1. – What are latest initiatives and major decision taken by GOI for growth and development of Hydro-power in India as per text? (15Marks) (CO1 to CO5)

Que 2. Critically evaluate these decisions for Indian Power sector with suggestion if any for betterment. (15Marks) (CO1 to CO5)