Draw the load profile curve and calculate the current drain in sunshine period (8 am to 5 pm) and no sunshine period (5 pm to 8 pm).

9. Define state of charge and depth of discharge of a battery. Describe the working of a lead-acid battery. [10]

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Question Paper Code : 6483

B. Voc. (Semester-IV) Examination, 2018

RENEWABLE ENERGY TECHNOLOGY

[Module RET-406]

(Solar Photovoltaic Power Plants)

Time : Three Hours] **[Maximum Marks : 70**

Note : Answer **five** questions in **all**. Question **No. 1** is **compulsory.** In addition, attempt **one** question from each Unit.

1. Answer the following questions in brief : [3x10 = 30]

   (a) Name the terrestrial applications of solar photovoltaic systems.

   (b) Draw the block diagram of a power generating system involving solar photovoltaic array.

   (c) How does the humidity affect the performance of solar cell array ?

   (d) Describe the power output method used in photovoltaic power plant design.

(e) Discuss the solar radiation profile development of a site.

(f) Write the classification of batteries used in SPV systems.

(g) How do the series charge controllers and shunt charge controllers function ?

(h) How does the stand-alone PV system without storage function ?

(i) What is a domestic SPV lighting system ?

(j) Define the life-cycle cost of a SPV system.

UNIT-I

2. Discuss the effects of temperature, precipitation, sand, dust and dirt on solar cell array environment. [10]

3. What is loss of load probability (LOLP) ? Discuss at least two methods of elimination of excess energy. [10]

UNIT-II

4. Classify centralized and decentralized SPV systems. What is grid-interactive SPV system ? [10]

5. What is the use of charge controller in SPV systems ? Describe pulse-width modulation and maximum power point tracking charge controllers. [10]

UNIT-III

6. Give the components of street lighting system. Describe solar powered railway level crossing radio warning system. [10]

7. How can solar energy be used for water pumping for irrigation and drinking water supply ? Explain the functioning of solar photovoltaic pumping system with suitable diagram. [10]

UNIT-IV

8. A solar photovoltaic power system has been designed to power the following loads : [10]

(a) Six lamps at rated current of 0.25 A from 6 pm to 12 midnight.

(b) Six security lamps at rated current of 0.25 A from 6 pm to 6 am.

(c) Four fans at rated current of 0.35 A from 10 am to 5 pm.