

CBCS SCHEME

USN

17EE832

Eighth Semester B.E. Degree Examination, July/August 2021 Operation and Maintenance of Solar Electric System

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

- 1 a. Explain the effect of the earth's atmosphere on solar radiation. (06 Marks)
b. Define solar altitude, azimuth angle magnetic declination. (06 Marks)
c. With the neat graph, explain I-V and P-V characteristics. Mark I_{SC} , V_{OC} , V_{MP} , I_{MP} , M_{PP} . (08 Marks)
- 2 a. Compare Mono crystalline silicon, multi crystalline silicon and Thin film solar cells. (06 Marks)
b. List and explain the factors affect the performance of photo voltaic array. (08 Marks)
c. In an array 4 solar Panel are connected :
Panel 1 - $V_{mp} = 12V$, $I_{mp} = 6A$, $P_{max} = 100w$
Panel 2 - $V_{mp} = 12V$, $I_{mp} = 6A$, $P_{max} = 100w$
Panel 3 - $V_{mp} = 24V$, $I_{mp} = 6A$, $P_{max} = 200w$
Panel 4 - $V_{mp} = 36V$, $I_{mp} = 10A$, $P_{max} = 360w$
Find total V_{mp} , I_{mp} and P_{max} if it is connected in series and also it is connected in parallel. (06 Marks)
- 3 a. Compare different categories of grid interactive inverters. (08 Marks)
b. Explain different techniques to mount PV arrays on roof. (08 Marks)
c. What is wind loading? (04 Marks)
- 4 a. Compare net metering and gross metering. (08 Marks)
b. Briefly explain types of ground mounting system. (06 Marks)
c. Compare basic functions of grid interactive inverters with battery inverters. (06 Marks)
- 5 a. Explain information to be collected during site assessment for PV system installation. (06 Marks)
b. Explain use of solar path finder and Horicatcher. (08 Marks)
c. Write a note on Portrait and landscape installation. (06 Marks)
- 6 a. Explain the potential sources of shading. (06 Marks)
b. List and explain important factors to be considered when choosing system components. (08 Marks)
c. What is Fault- current protection? (06 Marks)

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- 7 a. What are the issues to be taken care during installation of Grid connected PV system. (10 Marks)
b. Explain the system documents to be supplied to the owner after completion of PV installation. (10 Marks)
- 8 a. What are the risk associated with installing PV systems. How risks are classified. (10 Marks)
b. Explain the Testing of PV system. (10 Marks)
- 9 a. What are the various costs involved in PV system? Explain in detail. (10 Marks)
b. List and explain the strong barriers to PV technology. (10 Marks)
- 10 a. What is feed-in tariff? What are the two different ways of feed in Tariff? Give important features. (10 Marks)
b. What are the positive attributes of PV systems need to be considered while marketing. (10 Marks)

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