

**R.N.G.PATEL INSTITUTE OF TECHNOLOGY-RNGPIT**  
(An Autonomous Institute U/s UGC Act 1956)

**B.Voc. SEMESTER-III, SEMESTER END EXAMINATION – WINTER 2025**

**SUBJECT CODE: 1SRE302**

**DATE: 18-12-2025**

**SUBJECT NAME: DESIGN & INSTALLATION OF SOLAR PV  
SYSTEM**

**TIME: 11:00 AM to 01:00 PM**

**TOTAL MARKS: 50**

**Instructions**

1. It is **compulsory** for students to write **Enrolment No. /Seat No.** on the question paper.
2. Attempt all questions in the question paper.
3. The figures to the right of each question indicate full marks. Make suitable assumptions with proper justification wherever required.
4. Simple, non-programmable scientific calculators are permitted.
5. BL - Cognitive Level (As per Revised Bloom's Taxonomy) (R-Remember, U-Understanding, A –Application, N –Analyze, E – Evaluate, C -Create), CO - Course Outcomes.

		<b>Marks</b>	<b>BL</b>	<b>CO</b>
<b>Q.1</b>	<b>(a)</b> Describe grid-connected, standalone, and hybrid systems.	<b>05</b>	<b>R</b>	<b>1</b>
	<b>(b)</b> Give difference between ON Grid and OFF Grid.	<b>05</b>	<b>R</b>	<b>1</b>
<b>Q.2</b>	<b>(a)</b> What is charge controller & battery? Explain its types.	<b>05</b>	<b>U</b>	<b>2</b>
	<b>(b)</b> What is MPPT? explain in detail with graph	<b>05</b>	<b>U</b>	<b>2</b>
<b>OR</b>				
<b>Q.2</b>	<b>(a)</b> What are the type of power electronic converter and their application?	<b>05</b>	<b>U</b>	<b>2</b>
	<b>(b)</b> Explain Construction and working of MCB.	<b>05</b>	<b>U</b>	<b>2</b>
<b>Q.3</b>	<b>(a)</b> What is ACDB & DCDB. Explain in detail	<b>05</b>	<b>U</b>	<b>3</b>
	<b>(b)</b> Design Off-Grid system for 10 KW and draw the diagram?	<b>05</b>	<b>A</b>	<b>3</b>
<b>OR</b>				
<b>Q.3</b>	<b>(a)</b> Explain series and parallel connection of solar panel to create string design.	<b>05</b>	<b>U</b>	<b>3</b>
	<b>(b)</b> Design on grid system for 25 Kw Solar Power Plant. Data is given below Panel Power-495 W, Vmax:-45 V, Imax:-11 A, String Vmax-1000 V, String Imax-15A, Inverter:- 25 kVA	<b>05</b>	<b>A</b>	<b>3</b>

- Q.4 (a)** Define OC & SC Test of Solar Panel. **05 U 4**
- (b)** What factors affect the power output of a solar PV system? **05 U 4**

**OR**

- Q.4 (a)** What is Fill Factor? Explain efficiency equation for Solar Panel. **05 U 4**
- (b)** What is bidirectional metering, and how does it work in the solar PV system? **05 U 4**

- Q.5 (a)** Compare solar thermal power generation and solar PV system. **05 U 5**
- (b)** Explain construction and working of Solar street lights **05 A 5**

**OR**

- Q.5 (a)** Explain the components and working of a solar thermal power generation plant. **05 U 5**
- (b)** What are the different applications of solar PV systems in daily use? **05 A 5**

**\*\*\*\*\***