

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

B.Voc SEMESTER-I, SEMESTER END EXAMINATION – WINTER 2025

SUBJECT CODE: 1SRE204

DATE: 07-01-2026

SUBJECT NAME: BASICS OF SOLAR PHOTOVOLTAIC

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.

SECTION A

		Marks	BL	CO
Q.1	(a) What is a solar cell, and how does it convert solar energy into electrical energy?	05	R	1
	(b) How do electrons and holes contribute to the conduction mechanism in a P-N junction?	05	U	1
Q.2	(a) Define the term photovoltaic effect and explain its significance in solar cells.	05	R	2
	(b) Draw and explain the I-V characteristics of solar cell.	05	U	2
OR				
Q.2	(a) Define following terms: 1. Efficiency, 2. Open circuit Voltage, 3. Short circuit Voltage, 4. Fill Factor, 5. Temperature Co-efficient	05	R	2
	(b) Give different types of Photovoltaic Cell. Explain any one type in brief.	05	U	2
Q.3	(a) How are individual solar cells connected to form a solar PV module?	05	A	3
	(b) How does connecting solar cells in parallel affect the voltage and current of the module?	05	U	3
OR				
Q.3	(a) How does the power output of a PV module calculated from its voltage and current ratings?	05	A	3
	(b) Explain the Block diagram of Solar PV system.	05	U	3

- Q.4 (a)** What is solar tracking, and why is it used in solar PV and thermal systems? **05 R 4**
- (b)** What are the different types of Earth movements, and how do they impact solar energy generation? **05 R 4**

OR

- Q.4 (a)** What are the different methods used to estimate solar radiation at a given location? **05 R 4**
- (b)** What is the solar constant, and what is its significance in solar energy applications? **05 R 4**

- Q.5 (a)** Give comparison between Photovoltaic Cell and Solar Cell. **05 R 2**
- (b)** What are the advantages of using multiple solar cells in a module instead of a single large cell? **05 U 3**

OR

- Q.5 (a)** Explain the effect of environmental factors on solar cell performance. **05 R 2**
- (b)** What is the impact of a single defective cell in a series-connected solar PV module? **05 U 3**
