

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

B.Voc. SEMESTER-II, SEMESTER END EXAMINATION – SUMMER 2025

Subject Code: 1SRE204**Date: 15-05-2025****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 - Bloom's Taxonomy Levels (R-Remember, U-Understanding, A-Application, N-Analyze, E-Evaluate, C-Create), CO - Course Outcomes.

	Marks	BL	CO
Q.1 Multiple-Choice Questions	[05]		
(a) What is the basic working principle of a solar cell?	1	R	1
(i) Chemical Reaction			
(ii) Magnetic Induction			
(iii) Photovoltaic Effect			
(iv) Thermal Expansion			
(b) In an unbiased P-N junction, the direction of the electric field is from	1	R	1
(i) N to P			
(ii) P to N			
(iii) Both Directions			
(iv) No Electric Field			
(c) The performance of solar cells is affected by	1		
(i) Shading			
(ii) Series Resistance		R	2
(iii) Temperature			
(iv) All of the above			
(d) Which connection increases the voltage output of solar panel	1		
(i) Series			
(ii) Parallel		R	3
(iii) Both			
(iv) None			

(e) The tilt of the Earth's axis is approximately	1	R	4
(i) 10°	(ii) 23.5°		
(iii) 45°	(iv) 90°		

Q.2 Attempt Any Three	[15]		
(a) What is a solar cell, and how does it convert solar energy into electrical energy? Give Advantages and Disadvantages of Solar Cells.	5	R	1
(b) Draw and explain the I-V characteristics of solar cell.	5	R	2
(c) How are Individual solar cells connected to the solar PV Module?	5	U	3
(d) Explain the sun – earth movement for the solar radiation.	5	A	4
Q.3 Attempt Any Three	[15]		
(a) Which are the types of Solar PV Modules? Explain any one in Details.	5	R	1
(b) How does the energy band diagram change when a P-N junction is forward or reverse biased?	5	R	2
(c) Which are the different types of PV Module?	5	R	3
(d) Explain the sun tracking for the solar collectors in details.	5	U	4
Q.4 Attempt Any Three	[15]		
(a) Explain the Solar Cell Connections in Series and Parallel Connections.	5	E	1
(b) Explain effect of series and shunt resistance in solar cell.	5	U	2
(c) How does a mismatch in series – connected solar cells affect the module's performances?	5	U	3
(d) Explain any method for measurement of solar radiation energy	5	E	4
