

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

B.TECH SEMESTER-I, SEMESTER END EXAMINATION – SUMMER 2025

Subject Code: 1EL104**Date: 11-06-2025****Subject Name: FUNDAMENTAL OF ELECTRICAL & ELECTRONICS ENGINEERING****Time: 11:00 Am to 01:30 PM****Total Marks: 70****Instructions**

1. It is **compulsory** for students to write **Enrolment No. /Seat No.** on the question paper.
2. Write answers of **Section A** and **Section B** in **separate answer books**.
3. Attempt all questions from both **Section A** and **Section B**.
4. Each section carries **35 marks**, with a total of **70 marks** for the examination.
5. The figures to the right of each question indicate full marks, make suitable assumptions with justification.
6. BL - Bloom's Taxonomy Levels (R-Remember, U-Understanding, A –Application, N –Analyze, E – Evaluate, C -Create), CO - Course Outcomes.

SECTION A

	Marks	BL	CO
Q.1 Multiple-Choice Questions	[05]		
(a) Ohm's law is not applicable to	1	U	1
(i) DC circuits			
(ii) high currents			
(iii) Small resistor			
(iv) Semi-Conductors			
(b) How does the voltage across each branch in a parallel circuit compare to the total voltage?	1	E	1
(i) Less than the total voltage			
(ii) Greater than the total voltage			
(iii) Equal to the total voltage			
(iv) Zero			
(c) Power factor in purely resistive circuit?	1	R	2
(i) Zero			
(ii) Unity			
(iii) Both			
(iv) None of these.			
(d) Full form of BJT _____.	1	R	5
(i) Bipolar Junction Transistor			
(ii) Binomial Junction Terminal			
(iii) Binomial Junction Transistor			
(iv) Bipolar Junction Terminal			
(e) Full form of MOSFET _____.	1	R	5

(i) Metal Oxide Silicon Field
Effect Transistor

(ii) Metal Oxide Semiconductor Field
Effect Transistor

(iii) Metal Oxide Substrate Field
Effect Transistor

(iv) Metal Oxide Silicon Substrate
Transistor

Q.2	Attempt Any Two	[10]		
(a)	State and explain Kirchhoff's voltage and current laws.	5	R	1
(b)	Explain Thevenin's theorem with its steps in brief.	5	U	1
(c)	Explain Norton's theorem with its steps in brief.	5	U	1
Q.3	Attempt Any Two	[10]		
(a)	Define following terms in connection with A.C wave forms : (i) Frequency (ii) phase & phase difference (iii) Time Period (iv) Form Factor (v) R. M. S. Value	5	R	2
(b)	Prove that current through pure inductor is always lagging by 90° to its voltage and power consumed is zero.	5	C	2
(c)	Give the comparison of series resonance and parallel resonance.	5	R	2
Q.4	Attempt Any Two	[10]		
(a)	Explain construction of BJT and write down applications of BJT.	5	U	5
(b)	Give the difference between JFET and MOSFET.	5	U	5
(c)	Explain construction, working and application of solar cell.	5	R	5

SECTION B

		Marks	BL	CO
Q.5 Multiple-Choice Questions	[05]			
(a) Which of the following is the correct value of band gap energy for silicon?	1	U	3	
(i) 0.7 eV	(ii) 1.1 eV			
(iii) 3.2 eV	(iv) None of the above			
(b) Valance band contains_____	1	U	3	
(i) holes	(ii) valance electrons			
(iii) free electrons	(iv) both valance and free electrons			
(c) At absolute zero temperature, Pure semiconductor works as_____	1	U	3	
(i) metal	(ii) non-metal			
(iii) conductor	(iv) insulator			
(d) Temperature coefficient of Metal is _____	1	R	3	
(i) positive	(ii) negative			
(iii) zero	(iv) infinite			
(e) P-type semiconductor Contain _____ majority Charge carrier	1	R	4	
(i) protons	(ii) electrons			
(iii) neutrons	(iv) holes			
Q.6 Attempt Any Two	[10]			
(a) Explain extrinsic semiconductor in details.	5	U	3	
(b) Find out the probability of not finding an electron in the energy state lying 0.02 eV above its Fermi level at 300 K.	5	A	3	
(c) Describe the Pulling technique for the crystal growth in detail.	5	A	3	
Q.7 Attempt Any Two	[10]			
(a) Describe in detail Principle, Construction and Working of ZENER Diode.	5	A	4	
(b) Explain in detail construction, Working and IV characteristics of LED.	5	U	4	
(c) Describe principle, construction, Working of Schottky diode and list out application.	5	U	4	

Q.8 Attempt Any Two	[10]		
(a) Describe in detail Avalance effect and Zener effect.	5	A	4
(b) Explain Construction, Working and IV characteristics of PN Junction diode.	5	U	4
(c) Write down the difference between Conductor, Semiconductor and Insulator.	5	U	3
