

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: 1SRE203**Date: 19-05-2025**

**Subject Name: FUNDAMENTAL OF ELECTRICAL
ENGINEERING-II**

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) A voltage waveform is given by $V(t)=170\sin(314t+30^\circ)V$. The peak value of this waveform is		1	N	1
(i) 314 V	(ii) 30 V			
(iii) 230 V	(iv) 170 V			
(b) What is the significance of real power in an AC system?		1	U	2
(i) Power dissipated in reactance	(ii) Imaginary component of power			
(iii) Actual usable power	(iv) Losses in the circuit			
(c) In a series RC circuit, the total impedance increases when:		1	U	3
(i) Frequency decreases	(ii) Frequency increases			
(iii) Resistance decreases	(iv) Capacitance increases			
(d) This device oppose instantaneous change in current		1	U	2
(i) Resistor	(ii) Inductor			
(iii) Capacitor	(iv) All of the above			

(e) In a phasor representation, what does the length of the phasor indicate?	1	R	4
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(i)Time period of AC wave	(ii)Magnitude of the AC quantity
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(iii)Angle of the AC waveform	(iv)Direction of rotation
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Q.2 Attempt Any Three	[15]		
(a) Define real power, reactive power, and apparent power with their units and power triangle	5	R	1
(b) Define the following terms related to Alternating Waveform: (1) Cycle, (2) Frequency, (3) Time Period, (4) Form Factor, (5) Peak Factor	5	R	1
(c) Define RMS value. Derive the equation of RMS value.	5	R	1
(d) A 10 mH inductor has a current $I = 5 \cos (2000t)$. Obtain the voltage V_L across it.	5	N	2

Q.3 Attempt Any Three	[15]		
(a) Prove analytically that the power factor of purely resistive circuit is unity.	5	R	2
(b) Justify “average power consumption in pure inductor is zero when a.c. voltage is applied”	5	U	3
(c) Derive equations of current and power in series R-L circuit supplied with sinusoidal alternating voltage. Draw necessary vector diagram.	5	U	3
(d) Explain resonance of R-L-C series circuit.	5	A	3

Q.4 Attempt Any Three	[15]		
(a) Prove that the sum of three-phase voltage is zero in a balanced three-phase System.	5	U	4
(b) Derive relationship between line voltage and phase voltage in case of balanced Star-connected system.	5	R	4
(c) Explain the addition of two vectors by a parallelogram method.	5	U	4
(d) Convert polar to rectangular form (i) $15 \angle 60$ (ii) $10 \angle 30$ (iii) $10 \angle 60$ (iv) $8 \angle -45$ (v) $20 \angle 40$	5	N	4
