

Hall Ticket Number:

Code No. : 14567 N/O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade

B.E. (Mech. Engg.) IV-Semester Main & Backlog Examinations, July-2023

Basic Electrical and Electronics Engineering

Time: 3 hours

Max. Marks: 60

Note: Answer all questions from Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	State Kirchhoff's laws.	2	1	1	1,2,12
2.	Differentiate active and reactive power.	2	3	1	1,2,12
3.	Classify DC machines based on excitation.	2	2	2	1,2,12
4.	List the main parts of transformer and indicate its use.	2	1	2	1,2,12
5.	Compare diode and SCR (Silicon Controlled Rectifier).	2	2	4	1,2,12
6.	List the applications of Electronic devices.	2	1	4	1,2,12
7.	List different types of operational amplifier (OP-AMP) and draw their circuit.	2	1	4	1,2,12
8.	Compare non – inverting and inverting operational amplifier (OP-AMP).	2	2	4	1,2,12
9.	Convert $(69)_8$ to binary value.	2	2	5	1,2,12
10.	Differentiate SR and T flip flop.	2	3	5	1,2,12
Part-B (5 × 8 = 40 Marks)					
11. a)	Compute the current through the 10Ω resistor for the circuit shown below. <div style="text-align: center;"> </div>	4	3	1	1,2,12
b)	Derive the relation between line and phase quantities in three phase balanced star connected system.	4	2	1	1,2,12
12. a)	Explain the operation of DC motor and derive equation for torque developed by DC motor.	4	2	2	1,2,12
b)	A 6 pole, 440 V, 50 Hz, three phase Induction motor rotates at 975 rpm. Determine i) synchronous speed ii) slip speed iii) percentage slip iv) frequency of rotor current	4	3	3	1,2,12

Contd... 2

13. a)	Explain the operation of MOSFET and draw its V – I characteristics.	4	2	4	1,2,12
b)	Define filter, list different types of filters and explain any one type of filter.	4	1	4	1,2,12
14. a)	Explain the operation of non – inverting OP-AMP and calculate its open loop voltage gain.	4	2	4	1,2,12
b)	Design an integrator using OP-AMP and explain its operation.	4	4	4	1,2,12
15. a)	Realize NAND gate using NOR gate.	4	4	5	1,2,12
b)	Implement JK flip flop using NAND gate and write its truth table.	4	4	5	1,2,12
16. a)	A single phase, 230 V, 50 Hz AC supply is given to a series R – L circuit of resistance 4Ω and 10mH respectively. Compute i) impedance ii) current iii) voltage across resistor iv) voltage across inductor. Also, draw phasor diagram indicating voltages and current.	5	3	1	1,2,12
b)	Explain the operation of ideal transformer on no load and draw corresponding phasor diagram.	3	1	2	1,2,12
17.	Answer any <i>two</i> of the following:				
a)	Explain the operation of full wave rectifier and draw the waveforms of input voltage and output voltage.	4	1	4	1,2,12
b)	Realize zero cross detector using operational amplifier (OP-AMP).	4	4	4	1,2,12
c)	Using a neat diagram, explain the operation of parallel adder.	4	1	5	1,2,12

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	28.75%
ii)	Blooms Taxonomy Level – 2	30%
iii)	Blooms Taxonomy Level – 3 & 4	41.25%
