

Hall Ticket Number:

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Code No. : 14567 AS N/O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

Accredited by NAAC with A++ Grade

B.E. (Mech. Engg.) IV-Semester Advanced Suppl. Examinations, Aug./Sept.-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.	Write the limitations of ohm's law.	2	1	1	1,2,12
2.	Define the phase and frequency for sinusoidal wave form.	2	1	1	1,2,12
3.	Why transformer rating is in KVA and not in KW.	2	3	2	1,2,12
4.	Mention few applications of single phase induction motor	2	2	3	1,2,12
5.	Draw the half wave uncontrolled rectified output waveform	2	2	4	1,2,12
6.	Compare Bipolar Junction Transistor (BJT) and Silicon Controlled Rectifier (SCR) characteristics	2	3	4	1,2,12
7.	List the applications of operational amplifier.	2	1	4	1,2,12
8.	List the characteristics of an ideal operational amplifier (OP-AMP).	2	1	4	1,2,12
9.	Convert $(86)_{10}$ to binary value.	2	3	5	1,2,12
10.	Differentiate between JK and T flip flop.	2	3	5	1,2,12
Part-B (5 × 8 = 40 Marks)					
11. a)	A series RL series circuit having a resistance of 4Ω and inductive reactance of 3Ω is fed by 100 V, 1- \emptyset supply. Find current, power drawn by the circuit and power factor.	4	3	1	1,2,12
b)	Derive the relationship between phase current and line current in 3-phase delta connected balanced load circuit	4	3	1	1,2,12
12. a)	Derive the back E.M.F equation of the D.C motor.	4	3	2	1,2,12
b)	Explain the principle of operation of 1- \emptyset capacitor start & run induction motor.	4	1	3	1,2,12
13. a)	Explain the operation and V-I characteristics of SCR (silicon controlled rectifier).	4	2	4	1,2,12
b)	Calculate the R.M.S and Average values for full wave uncontrolled rectifier output waveform.	4	3	4	1,2,12

14. a)	Explain the operation of inverting amplifier.	4	2	4	1,2,12
b)	Derive the expression for output voltage of an integrator amplifier.	4	3	4	1,2,12
15. a)	Explain the operation of parallel adder.	4	2	5	1,2,12
b)	Explain D flip flop and write its truth table.	4	2	5	1,2,12
16. a)	Explain the KCL and KVL with example	4	1	1	1,2,12
b)	Explain speed control of DC shunt motor using flux control method.	4	1	2	1,2,12
17.	Answer any <i>two</i> of the following:				
a)	Write the use of filters and explain the operation of L – filter.	4	2	4	1,2,12
b)	Explain how to realize zero-crossing detector using OP-AMP.	4	2	4	1,2,12
c)	Realize the XOR gate using NAND gates	4	3	5	1,2,12

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

i)	Blooms Taxonomy Level – 1	25%
ii)	Blooms Taxonomy Level – 2	35%
iii)	Blooms Taxonomy Level – 3 & 4	40%
