Code No. : 11602 S

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade
B.E. I-Semester Supplementary Examinations, September-2022
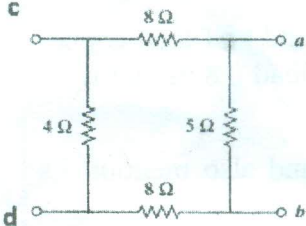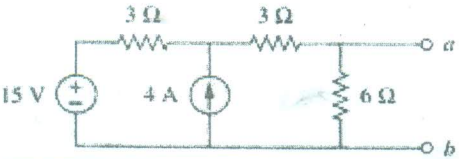## Basic Electrical Engineering
(I.T.)

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.	Determine R_{eq} between Terminals a-b and c-d for the circuit shown in Fig.1. Fig 1	2	3	1	1.2
2.	Explain in brief about open circuit and short circuit.	2	2	1	1
3.	In an AC circuit if v=250sin 500t volts and i=25sin (500t-30°). Determine circuit elements and their values.	2	3	2	1,2
4.	Derive the relationship between line and phase voltages in a 3 phase star connected system.	2	2	2	1
5.	Name the method of speed control you prefer for getting speeds above rated rpm. Justify your answer.	2	3	3	1
6.	List the types of DC generators based on type of excitation.	2	1	3	1
7.	Draw the phasor diagram of an ideal transformer under no load.	2	2	4	1
8.	Write the need for Earthing.	2	1	4	1
9.	A three phase, 4 pole, 50 Hz Induction motor is running at 1440rpm. Determine the slip and rotor frequency under running condition .	2	3	5	1,2
10.	Determine the step angle of a stepper motor having 3 stator phases and 24 rotor teeth.	2	3	5	1,2

Part-B (5 × 8 = 40 Marks)

11. a)	Find the Norton's equivalent circuit in Fig.2 between terminals a and b. Fig.2	4	3	1	1,2

			M	L	CO	PO
	b)	Explain the concept of source Transformation using a suitable example.	4	2	1	1
12.	a)	Derive the RMS and Average values of a sinusoidal quantity.	4	2	2	1
	b)	A series R-L-C circuit with R=100 ohms, L= 100mH and C=100 micro Farads is supplied with 250 sin500t. Determine i) current ii) Active power iii) Reactive power. Draw the phasor diagram also.	4	3	2	1,2
13.	a)	Explain in brief the construction and working of DC motor	4	1	3	1
	b)	A 4 pole DC shunt motor is connected to a 500 V DC supply and takes an armature current of 80 A. The resistance of the armature of the armature circuit is 0.4 ohms. The armature is wave connected with 522 conductors flux per pole is 0.025 wb. Determine the speed of the motor.	4	3	3	1,2
14.	a)	Derive the equation for EMF induced in the windings of a transformer.	4	1	4	1
	b)	A 100 KVA transformer has iron loss of 0.6 KW and half load copper loss of 0.8 KW. Calculate its effficiency at i) Full load 0.8 pf and ii) ¾ th full load 0.6 pf.	4	4	4	1,2
15.	a)	Explain how does a brushless DC motor works and also mention its advantages over brushed DC motor.	4	1	5	1
	b)	A 3 phase, 6 pole, 50 Hz induction motor develops 3.68 KW at 950 rpm. If the stator losses are 300 W, Find the Stator input.	4	3	5	1,2
16.	a)	Explain the Mesh analysis using a suitable example.	4	1	1	1
	b)	A 3 phase star connected balanced load of 10+j 20 ohms /phase is connected to 440 V 3 phase balanced supply. Find the line current and power consumed in the circuit. Assume RYB phase sequence.	4	2	3	1.2
17.		Answer any *two* of the following:				
	a)	Explain the method of speed control for DC shunt motor for getting speeds below rated rpm.	4	2	3	1
	b)	A 100 KVA, 4000V/200 V, 50 Hz, single phase transformer has 100 turns in the secondary. Determine i) the rated primary and secondary currents ii) the number of primary turns iii)The maximum value of flux.	4	3	4	1,2
	c)	Draw and explain the Torque-Slip characteristics of a 3 phase Induction motor.	4	2	5	1

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

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	32.5%
iii)	Blooms Taxonomy Level – 3 & 4	47.5%

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