SRI SIDDHARTHA INSTITUTE OF TECHNOLOGY, TUMKUR.

(A Constituent College of Sri Siddhartha Academy of Higher Education, Agalakote, Tumkur.)

B.E., SEMESTER END EXAMINATION (SUMMER) – SEPT/OCT 2021

ES-EEI102 / ES-EE101 : BASIC ELECTRICAL ENGINEERING

TIME: 3.00 Hrs **SEMESTER : I** **MAX MARKS: 100**

NOTE: Answer any five full questions by choosing at least one full question from Unit-1 to Unit-4 and 5th question can be from Unit-1 to Unit-5.

		M	CO	BL
	UNIT-1			
1.a)	Sketch the sinusoidal alternating current wave form and define the following terms. i. Instantaneous value ii. Amplitude iii. Cycle iv. Time period v. Frequency	06	1	1,2
b)	Examine whether the current in a pure capacitor leads the applied voltage by 90°.	06	1	2,3
c)	Given V=200sin377t volts and I = 8sin(377t + 30°) for an A.C circuit. Evaluate i. Power factor ii. Real power iii. Apparent power iv. Reactive power.	08	3	3,4, 7
	OR			
2.a)	Examine whether the current in a pure inductor lags the applied voltage by 90°.	08	1	3
b)	Define i. Apparent power ii. True power iii. Reactive power iv. Form factor v. Peak factor	05	1	1,2
c)	A voltage of 200Volts is applied to a series circuit consisting of resistor, inductor and capacitor. The respective voltages across the components are 170V, 150 & 100V and the current is 4A. Evaluate i. power factor ii. resistance iii. impedance.	07	1	1,2
	UNIT-2			
3.a)	Develop the relation between line and phase voltages in a three phase balanced star connected system.	06	2	2,3
b)	A balanced star connected load of (8+J6)Ω per phase are connected to a three phase 400V supply. Evaluate the line current, power factor, power, reactive voltampere and total voltampere.	06	2	2,3
c)	With the help of circuit diagram, explain two way and three way control of lamp.	08	2	1,2
	OR			
4.a)	Examine whether in a three phase balanced circuit, two wattmeters are sufficient to measure three phase power.	07	2	1,2
b)	Two Watt meters are connected to measure power in a 3-phase unit reads 5KW and 2KW, the later reading being obtained after reversing current coil connection. Calculate power factor of load and the total power consumed.	06	2	1,2
c)	With the help of neat sketch, explain plate earthing.	07	2	1,2

UNIT-3

5.a)	Define and develop an expression for co-efficient of coupling.	08	3	2,3
b)	Explain Fleming's left hand and right hand rule.	08	3	1,2
c)	Explain the principle of operation of transformer.	04	3	1,2

OR

6.a)	Describe the construction of a single phase transformer.	07	3	1,2
b)	Develop the emf equation of a single phase transformer.	07	3	1,2
c)	A 250KVA, 11000/415 V, 50Hz single phase transformer has 80 turns on the secondary. Evaluate i. rated primary and secondary currents ii. number of primary turns iii. maximum value of flux.	06	3	2,3

UNIT-4

7.a)	With a neat sketch, explain the construction of a D.C machine.	07	4	1,2
b)	With usual notation develop the e.m.f equation of a D C generator.	07	4	1,2
c)	An 8 pole lqp connected armature has 40 slots with 12 conductors per slot, generates a voltage of 500V. Predict the speed at which it is running if the flux per pole is 50m web.	06	4	2,3

OR

8.a)	Explain the working principle of D C motor.	07	4	1,2
b)	Develop an expression for armature torque of a D C motor.	07	4	2,3
c)	A 200 volts series motor is taking a current of 40 amperes. Resistance of armature is 0.5Ω and resistance of series field is 0.25Ω. Evaluate back emf.	06	4	2,3

UNIT-5

9.a)	With a neat sketch, discuss the construction and working of a 3-phase induction motor.	08	5	1,2
b)	With neat sketches, explain the concept of rotating magnetic field.	06	5	1,2
c)	A 6 pole induction motor is supplied by 10 pole alternator , which is driven at 600rpm, If the motor is running at 970 rpm, Evaluate, i. The percentage slip ii. Frequency of rotor current at full load.	06	5	2,3

OR

10.a)	Describe the construction of an alternator.	07	5	1,2
b)	Develop the e.m.f equation of an alternator by introducing all the factors.	07	5	1,2
c)	A 4 pole, 1500 rpm star connected alternator has 9 slots per pole and 8 conductor/slot. Evaluate the flux/pole to give a terminal voltage of 3300V. Take winding factor and pitch factor as unity.	06	5	2,3

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