Unit Test-I

Program Name: Computer Engineering Group

Program Code: CM

Semester: Second

Course Title: Basic Electrical and Electronics

Course Code: 312302

UNIT – I Basic Electrical Fundamentals (C01)

(2 Marks)

1. Define Faraday's law of electromagnetic induction.
2. Explain Lenz law with two applications.
3. state Fleming's right hand rule.
4. Differentiate between A.C. and D.C. quantities. And write advantages of A.C. over D.C.
5. State relationship between
   - i. angular velocity and frequency
   - ii. Time period and frequency
6. Define
   - i) R.M.S. value
   - ii) Average value of alternating current
7. Define and state the values of
   - i) form factor
   - ii)peak factor
8. Explain the concept of lagging and leading with the help of waveforms.
9. Calculate Maximum voltage, RMS value, frequency, time period, phase angle, angular frequency.
10. A capacitor of 10μf connected across 200v,25Hz single phase supply. Calculate Reactance,rms value,maximum current,maximum power.

4 Marks

11. Define

i. Magnetic flux
ii. flux density
iii. Field strength
iv. permeability
v. Reluctance

12. Explain with a neat diagram series and parallel magnetic circuit.

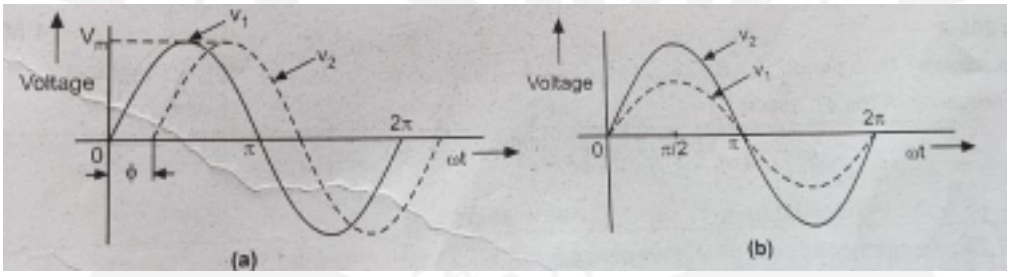
13. A coil of 500 turns wound uniformly on an iron ring of mean circumference 50cm and cross sectional area of $4/\pi$ cm^2, carries a current of 1A. find

i. M.M. F
ii. Field Strength
iii. Reluctance
iv. flux. Take μr =1000.

14. An iron ring of mean circumference of 0f 90 cm is uniformly wound with a number of turns of wire. Calculate the value of flux density that a current of 1.5Would produce in the ring. Assume a relative permeability of 1400.

15. Explain Dynamically, statically and mutually induced e.m.f with a neat diagram.

16. Write voltage equation and phase relationship for waveforms shown in fig.



17. An alternating volage is represented by v= 50.5 sin $(314+90^0)$ Calculate: frequency, amplitude, r.m.s value and phase difference

18. An alternating current is given by the equation i= 142.14 sin 628t. Find

i)Maximum value ii) Time period iii)R.M.S value iv) Average value v) form factor

vi) peak factor

19. A sinusoidal voltage with equation v=200 sin(314t+ π/3) volts is applied to a load.Calculate Maximum voltage,RMS value,frequency,time period,phase angle,angular frequency.

20. Write formulae for inductive and Capacitive reactances.

21. The volage and current equation in AC circuit is given by

$$v = 120 \sin wt \text{ and } i = 2.5 \sin(wt+\pi/2)$$

find r.m.s. value of current and voltages. And state the type of circuit.

22. A.C volage of v=110 sin (314t) is applied across a 39 mH inductor. Write equation for the current. Draw the phasor diagram.

23. State the advantages of a three phase circuit over a single phase circuit.

24. Define phase sequence of three phase supply systems with waveforms. State the importance of standard colour used to represent the phase sequence.

25. a) Draw star connected load. State relationship between

i)Line voltage and phase voltage
ii) Line current and phase current

b)Draw delta connected load. State relationship between

i)Line voltage and phase voltage
ii) Line current and phase current

26. Three 100 µf capacitors are connected in mesh to a 500v, three phase,50Hz supply. Find the line current. What will be the value of each capacitor such that when connected in star across the same supply, the line current will be the same?

27. A balanced 3 phase star connected load consist of three resistances each of 4 Ω connected to 400 V,3 phase 50 Hz supply find

i)phase voltage ii)phase current iii)line current iv)power consumed

UNIT – II Electrical Machines (C02)

2 Marks

1. Write any two applications of each of the following:

i) D.C.Shunt motors. **ii)** D.C.series motors.

2. Classify transformers on the basis of transformation ratio.

3. Draw schematic representation of :

i)D.C.Shunt motors **ii)** D.C.series motors.

4. List any two types of stepper motors. State one application of each.

5. Define the transformation ratio of a transformer.

4 Marks

1. State and explain the working principle of a transformer.

2. Derive emf equation for a transformer.

3. Enumerate various losses in a transformer and state the steps taken to minimize these losses.

4. What is KVA rating of a transformer? Why a transformer israted in KVA and not in KW? Explain.

5. A 20KVA,3300/240 V ,50 Hz single phase transformer has 80 turns on the secondary winding. Calculate the number of primary winding turns, full load primary and secondary currents and maximum value of flux in the core.

6. A single phase transformer of 50 Hz has maximum flux in the core of 0.021 Wb, the number of turns of primary being 460 and that on secondary 52. Calculate the emf induced in the primary and secondary windings of the transformer.

7. Explain the principle of operation for a D.C.motor.

8. Draw and label constructional diagram of a D.C. motor.

9. State the function of poles and brushes in D.C. motors. State material for each.

10. Explain the principle of operation of the universal motor with a neat diagram.

11. Explain how the direction of rotation of the universal motor is reversed.

12. Explain the working principle of a stepper motor and explain one type with a neat sketch.

UNIT – IV Special Purpose Diodes And Their Applications (C04)

2 Marks

1. Sketch V-I characteristics of Zener diode.

2. State LED operating principle.

3. Write classification of DC supply regulators.

4 Marks

4. Draw the construction of LED .List any two applications.

5. Draw and explain the working of CLC filter.

6. Sketch block diagram of DC regulated power supply. Also sketch waveform after each block.

7. With suitable diagram, explain the working of capacitor Filter, LC filter and π-type filters.