PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

MAKEUP EXAMINATION – JAN 2023

Course Code: EEE1001

Course Name: Fundamentals of Electrical & Electronics Engineering

Program   : B.Tech

Date: 27-JAN-2023

Time: 1:00pm to 4:00pm

Max Marks: 100

Weightage:50%

Instructions:
(i)   Read the all questions carefully and answer accordingly.
(ii) Draw the sketches neatly.
(iii) Scientific / Nonprogrammable Calculators are permitted.

Part A [Memory Recall Questions]

Answer all the Questions. Each question carries TWO marks.   (10Qx 2M= 20M)

1. Most of the practical loads consists of both active and passive elements in it…………is a classic example of passive element out of the following options.
   a) Voltage source   b) Current source c) Resistor   d) Generator   (C.O.No.1) [Knowledge level]

2. If there are two bulbs connected in series and one blows out, then the other bulb
   a) Continues to glow with the same brightnes   b) Stops glowing
   c) Glows with increased brightnes   d)Also burns out   (C.O.No.1) [Knowledge level]

3. Magnetic field in the electrical machines can be produced by both permanent and electromagents depending on the application and feasibility. But the Magnetic field in a large practical D.C. generator is produced by
   a) Electromagnets   b) Permanent magnets   c) Both (a) and (b)
   d) None of the above   (C.O.No.2) [Knowledge level]

4. The armature winding of DC machine can be either connected in lap or wave fashion and the armature current gets divided accordingly. The armature conductors of a 6-pole, lap wound DC generator are divided into ……… parallel paths
   a) 6   b) 2   c) 4   d) 8   (C.O.No.2) [Knowledge level]

5. The Back emf developed in DC motor during starting
   a) Equal to supply voltage   b) Around 100V   c) zero
   d) Greater than supply voltage   (C.O.No.2) [Knowledge level]

6. Transformer losses are produced by the electrical current flowing in the coils and the magnetic field alternating in the core. The loss that varies with the load in the transformer is
   a) Core loss   b) Copper loss   c) Both core loss and copper loss   d) None of the above
                                                          (C.O.No.2) [Knowledge level]

7. The rotating magnetic field produced in the stator of three phase Induction motor rotates at
   a) Synchronous speed   b) Rotor speed c) Slip speed   d) Infinite speed
                                                          (C.O.No.2) [Knowledge level]

8. The meter which is used for measuring the energy utilizes by the electric load is known as the energy meter. In energy meter the main function of the registration or counting mechanism is to …………
the number of rotations of the aluminum disc.

a) Record   b) Conceal   c) Neglect   d) None of the above   (C.O.No.3) [Knowledge level]

9. Fuse, Miniature Circuit Breaker(MCB) and Earthing System are the important protection systems used in House wiring. The process of transferring the immediate discharge of the electrical energy directly to the earth by the help of the low resistance wire is known as……

a) Domestic wiring   b) Electrical earthing   c) Industrial Wiring   d) None of the above

(C.O.No.4) [Knowledge level]

10. Electrical equipments and appliances can be controlled from two, three or even more different locations by adding more intermediate switches. The controlling of one lamp at two different places is called ….

a) Staircase wiring   b) One way control of lamp   c)Three way control of lamp

d) All of the above   (C.O.No.4) [Knowledge level]

Part B [Thought Provoking Questions]

Answer all the Questions. Each question carries TEN marks.   (4Qx10M=40M)

11. It is required to find the currents and power consumed in a certain branch of an electrical network with multiple voltage sources. Identify a suitable technique to solve the above problem and state the laws on which it is based.   (C.O.No.1) [Comprehension]

12. In a DC Motor, the presence of back emf make the machine self regulating. Explain the concept of back EMF and its significance. Also give the expression for armature current.

(C.O.No.2) [Comprehension]

13. It is required to measure electrical energy utilized in kWH for a manufacturing industry. Identify the meter which records the number of units of electricity consumed. With a neat diagram, show the constructional features and working of meter that can be used.

(C.O.No.3) [Comprehension]

14. Develop the lay out and wiring Diagram for a part of the House with the following data:

a) Room No 1: 1 lamp Point, 1 fan Point, 1- 3 pin socket point

b) Room No 2: 2 Lamp Point, 1 fan Point, 1- 3 pin socket point.

(C.O.No.4) [Comprehension]

Part C [Problem Solving Questions]

Answer all the Questions. Each question carries TEN marks.   (4Qx10M=40M)

15. For the figure shown below, compute the voltage drop across the resistor R3 (1Ω).
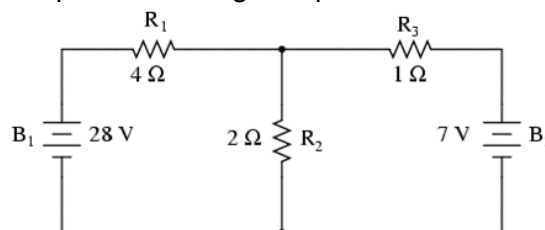
(C.O.No.1) [Application]

16. In a series RL circuit excited by an AC source of 10 V, 50 Hz and the current flowing through the circuit is 2A. Resistance(R) of the circuit is 2 Ω. Identify the unknowns that can be calculated from the given data and compute the same. (C.O.No.1) [Application]

17. A DC motor used in an electric locomotive has 6 pole and develops back emf of 480 V. The armature current is 100 A and the flux per pole is 30 milli weber in the machine. The armature is wave connected and has 800 conductors. Obtain speed and the gross torque developed by the armature. (C.O.No.2) [Application]

18. The general purpose of using transformers is to maintain a balance between the electricity that was generated at very high voltages and consumption which was done at very low voltages. A 400KVA, 11000/415V, 50Hz single phase, step down transformer used in the distribution system has 80 turns on the secondary. Calculate:
    a. Rated primary and secondary currents
    b. Number of primary turns
    c. Maximum value of flux in the core
    d. Voltage induced per turn on the secondary.

    (C.O.No.2) [Application]