KONGUNADU COLLEGE OF ENGINEERING AND TECHNOLOGY

NAMAKKAL-TRICHY MAIN ROAD, THOTTIAM, TRICHY -621 215

DEPARTMENT OF CIVIL ENGINEERING

REGULATION – 2017

YEAR/SEM:I/II SUBJECT CODE & NAME: BE8251- BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

QUESTION BANK
UNIT - I

ELECTRICAL CIRCUITS & MEASUREMENTS

PART – A

1. State Ohm's law.
2. Mention the limitations of Ohm's Law.
3. State Kirchhoff's voltage law.
4. State Kirchhoff's Current law.
5. Explain how voltage source with a source resistance can be converted into an equivalent current source.
6. Define R.M.S value.
7. State the advantages of sinusoidal alternating quantity.
8. What is a phasor?
9. Write the relation between the power factor and wattmeter readings in two-wattmeter method of power measurement.
10. In three phase circuit, what do you mean by balanced load?
11. When a three phase supply system is called balanced supply system?
12. List any two advantages of 3-phase system over 1-phase system.
13. Mention the two types of MI instruments.
14. How can ammeter and voltmeter are connected in a circuit? Why?
15. Mention any two types of Wattmeters.
16. List the major components of a single phase induction type energy meter?
17. List the measuring instruments you known.
18. Compare moving coil and moving iron instruments based on any two salient features.

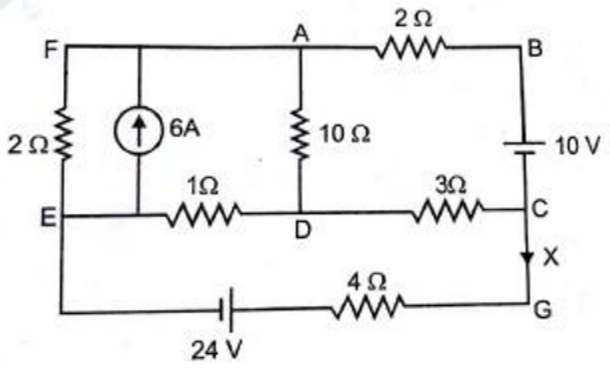
19. Mention any two importance of MC and MI instruments.
20. What are the advantages of Induction type energy meter?

PART – B

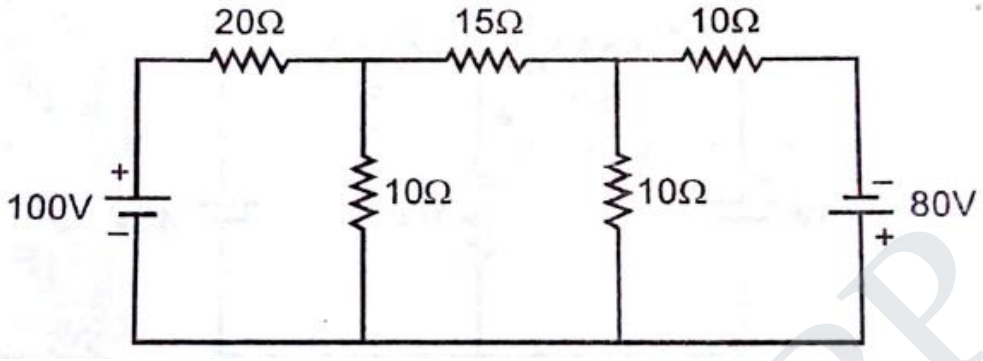
1. Extend the working principle of attraction type, repulsion type M.I. instruments and derive its deflecting torque.
2. Explain with neat diagram, the constructional features of PMMC instrument. Also derive its torque equation and list its errors.
3. Explain the working of a Dynamometer wattmeter with a neat sketch.
4. Explain the construction and principle of operation of single phase energy meter.
5. State and explain Kirchoff's law.
6. A series circuit has R=10 , L=50mH, and C=100μF and is supplied with 200V,50Hz. Find (i) Impedance (ii) current (iii) power (iv) power factor (v) voltage drop across the each element.
7. A series R- C circuit with R = 20 Ω and C = 127 μF has 160 V, 50 Hz supply connected to it. Find (i) the impedance (ii) current (iii) power factor (iv) power. Draw the phasor diagram.

PART – C

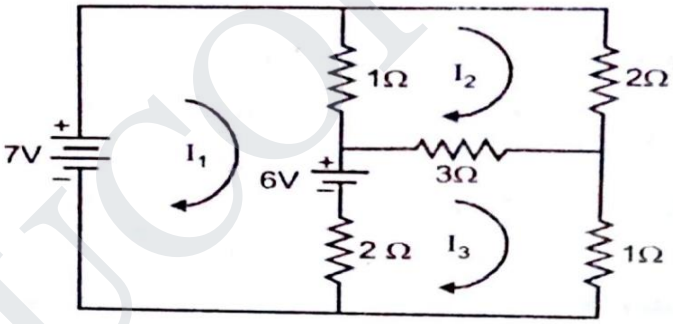
1. Determine the current, power X in the 4 Ω resistance of the circuit shown below.



2. Calculate the current through the 15Ω resistor in the network shown in figure below using nodal analysis.



3. A balanced star – connected load of (8+j6)Ω per phase is connected to a 3- phase 230 V supply. Find the line current, power factor, power, reactive volt-ampere and total volt-ampere.
4. Use mesh analysis to determine the three mesh currents in the circuit of figure shown in below.



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UNIT – II

ELECTRICAL MACHINES

PART – A

1. State the three basic types of rotating electrical machines.
2. State two types of induction motors.
3. Mention the difference between core and shell type transformers.
4. What is the purpose of laminating the core in a transformer?
5. Give the emf equation of a transformer and define each term.
6. Does transformer draw any current when secondary is open? Why?
7. Define voltage regulation of a transformer.
8. What are the applications of step-up & step-down transformer?
9. How transformers are classified according to their construction?
10. Write down the emf equation for d.c.generator.
11. Why commutator is employed in d.c.machines?
12. How does d.c. motor differ from d.c. generator in construction?
13. What is back emf in d.c. motor?
14. Why starter is necessary for a dc motor?
15. What are the losses occurring in a dc machine?
16. What is the function of capacitor in a single phase induction motor?
17. In which direction does a shaded pole induction motor run?
18. Why singe phase induction motor has low power factor?
19. What happens when the centrifugal switch fails to close?
20. What are the classifications of single phase induction motor based on the method of starting?

PART – B

1. Explain the construction, principle of operation of a D.C. Generator with neat sketch.
2. Derive the equation for induced EMF of a DC machine.
3. Explain the construction details of single phase transformer.
4. Explain the working principle of single phase transformer.
5. Derive the EMF equation of single phase transformer.
6. With neat sketches, explain the working principle of DC motor.
7. Derive the torque equation of DC motor.

PART – C

1. With neat sketch, explain the construction and principle of operation of Single-Phase Induction Motor. Also list its various types.
2. A 25 KW, 250V, dc shunt generator has armature and field resistances of 0.06ohm and 100ohm respectively. Determine the total armature power developed when working (1) as a generator delivering 25 kw output and (2) as a motor taking 25kw.

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UNIT – III

SEMICONDUCTOR DEVICES AND APPLICATIONS

PART – A

1. What are Semiconductors? Give examples?
2. What are the types of Extrinsic Semiconductor?
3. What is P-type Semiconductor?
4. What is N-type Semiconductor?
5. What is doping?
6. What is depletion region in PN junction?
7. What is barrier potential?
8. What is meant by biasing a PN junction?
9. What are the types of biasing a PN junction?
10. What is forward bias and reverse bias in a PN junction?
11. What is meant by reverse recovery time?
12. What is break down? What are its types?
13. What is Zener breakdown?
14. What is avalanche break down?
15. Why transistor called a current controlled device?
16. When does a transistor act as a switch?
17. What is biasing?
18. What is an amplifier?
19. How are amplifiers classified according to the input?
20. How are amplifiers classified according to the transistor configuration?

PART – B

1. Illustrate the construction and operation of a PNP transistor.
2. Illustrate the construction and operation of a NPN transistor.
3. Construct the circuit diagram for full wave rectifier and outline it's working.
4. Explain the operation of half wave rectifier with necessary diagrams.
5. Explain V-I characteristics of Zener diode and applications with necessary diagrams.
6. Discuss the elementary treatment of small signal amplifier.
7. Describe the Working of a PN junction diode with neat diagrams. Also explain its V-I characteristics.

PART – C

1. Explain how you will obtain the static characteristics of common emitter configuration.
2. Illustrate the working of the CB configuration of a BJT and construct its input, output characteristics.
3. Summarize the operation of NPN and PNP transistors.

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UNIT – IV

DIGITAL ELECTRONICS

PART – A

1. What are the basic digital logic gates?
2. What is a Logic gate?
3. Which gates are called as the universal gates? What are its advantages?
4. Define combinational logic
5. Explain the design procedure for combinational circuits
6. Define half adder and full adder
7. What are the classifications of sequential circuits?
8. Define Flip flop.
9. What are the different types of flip-flop?
10. What is the operation of D flip-flop?
11. What is the operation of JK flip-flop?
12. What is the operation of T flip-flop?
13. Define race around condition.
14. Define registers.
15. Define sequential circuit?
16. Give the comparison between combinational circuits and sequential circuits.
17. Define synchronous sequential circuit
18. Give the comparison between synchronous & Asynchronous counters.
19. Mention the types of Analog to Digital converter.
20. Mention the types of Digital to Analog converter.

PART – B

1. Draw and explain the operation of AND, OR, NOT, NAND and NOR gates with suitable truth table.
2. What are universal gates? Explain their principle of working with necessary truth table.

3. Design a half adder and implement it using logic gates.
4. Design a full adder and implement it using logic gates.
5. Briefly explain the working of JK flip flop.
6. Explain the operation of various types of shift register.
7. Explain the operation of various types of counters.
8. Explain the operation of RS flip-flop with logic diagram and truth table.

PART - C

1. Explain in details about Analog to Digital conversion.
2. Explain in details about Digital to Analog conversion.
3. Describe the operation of a 4-bit binary, ripple counter.
4. Write short notes on:
    a. RS – Flip flop
    b. D – Flip flop
    c. JK – Flip flop
    d. T – Flip flop

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UNIT – V

FUNDAMENTALS OF COMMUNICATION ENGINEERING

PART – A

1. Define Communication.
2. What is an antenna?
3. Define analog signal.
4. Define digital signal.
5. What is meant by modulation?
6. What is meant by demodulation?
7. What are the types of modulation?
8. Define amplitude modulation.
9. Define frequency modulation.
10. Why are AM systems preferred in broadcasting than FM systems?
11. What are the various standards used in TV transmission systems?
12. What are the advantages of optical fiber communication?
13. What is packet loss?
14. What is the radio transmitter?
15. List the advantages of super heterodyne receiver.
16. List the various types of Microwave antennas.
17. Compare amplitude modulation and frequency modulation.
18. What are the basic modes of Radio wave propagation?
19. What is meant by ISDN?
20. What are the advantages of fiber optic communication?

PART – B

1. Write short notes on modulation and demodulation.
2. Outline the block diagram of optical fibre communication system and explain it.
3. Construct the block diagram and explain the operation of microwave communication.

4. Discuss the configuration of Satellite communication with neat diagram. Give its merits and demerits.
5. Draw the block diagram of radio broadcasting and reception system and explain the function of each block.
6. With a neat block diagram, explain the principle of operation of FAX.

PART – C

1. Justify the principle of modulation and its needs. Write the short note on amplitude and frequency modulation.
2. Discuss the functional block diagram of monochrome TV transmitter and receiver with neat sketch.