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BE3251 BASIC ELECTRIAL, ELECTRONICS AND ENGINEERING

## IMPORTANT QUESTIONS AND QUESTION BANK
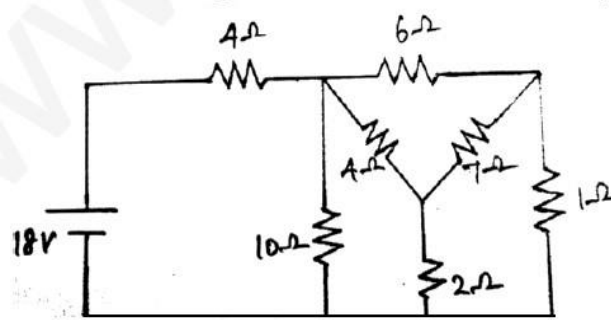
UNIT-I ELECTRIAL CIRCUIT

2-Marks

1. State ohm's law?
2. Define Kirchhoff's law?
3. Define RMS value of an AC voltage signals?
4. Distinguish between nodal-analysis and mesh-analysis.
5. What are the components of DC circuits?
6. Explain current division rule and voltage division rule?
7. Define the term of (i) from factor (ii) peak factor?
8. Define power factor?
9. Explain the term of resonance in a RLC series circuit?
10. Explain the following terms of real power, reactive power and total power?

13-Marks

1. Calculate (i) Equivalent resistance across the terminal supply
(ii)Total current display by the source?
(ii) Power delivered to 6ohm resistor circuit shown below
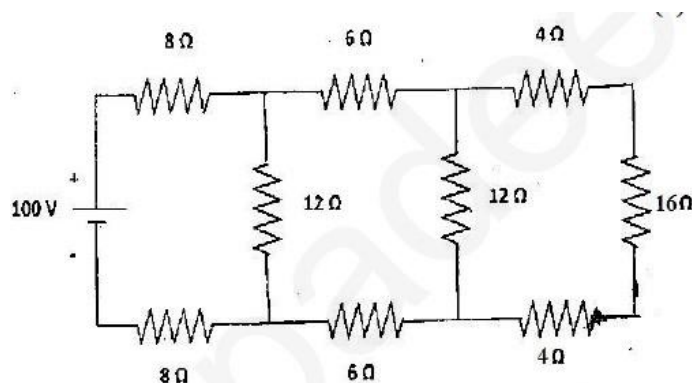
2. Describe the Kirchhoff's laws, And the circuit shown in figure determine the current through 6ohm resister

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3. In the circuit shown calculate the current through 2ohm resister and the total current delivered by the battery. Use Kirchhoff's laws
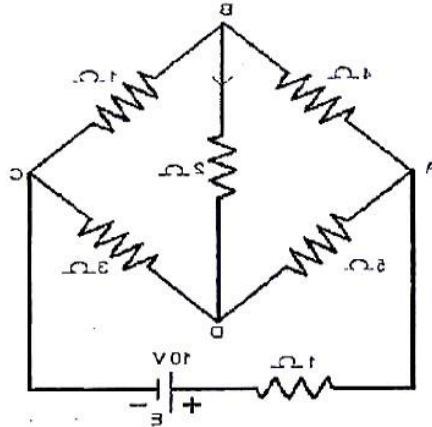

4. Determine the current X power in the 4ohm resistance of the circuit shown in below
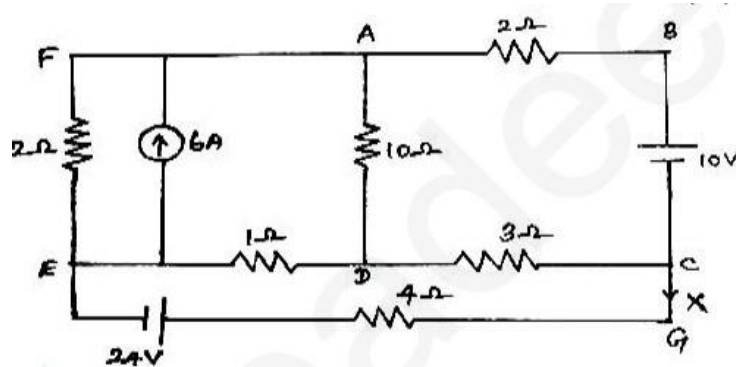

5. Using mesh analysis estimate the current through the various branches in the circuit of the following figure.
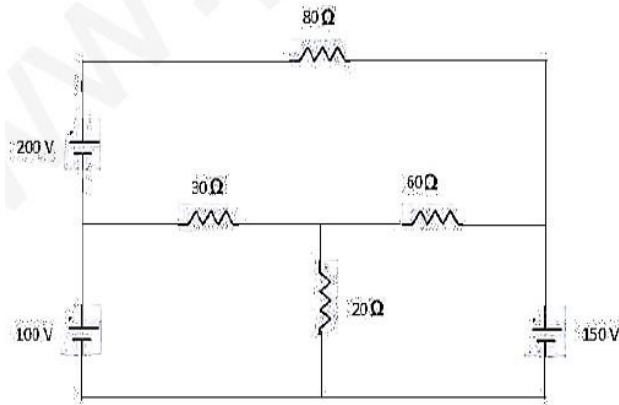
6. Describe the working of singles phase energy meter with neat diagrams? And examine and formulate (a) from factor (b) the peak factor for full wave and rectified sine wave?

7. Write a neat diagram describe a construction and principle of operation of a moving iron (i) Attraction type instrument (ii) Repulsion type instrument

8. With a neat sketch describe the construction and principle of operation (i) permanent magnet moving coil (PMMC) type of instrument. Obtain the expression for its deflecting torque. List the merits and de-merits of PMMC instruments?

9. For the given circuit calculate the magnitude and direction of current in each battery and total current taken from 220V supply mains?
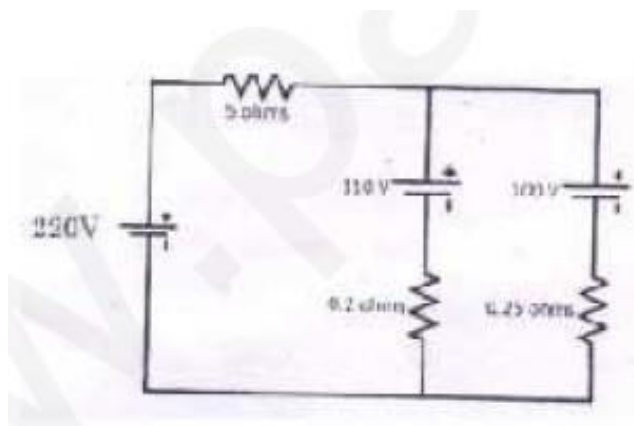
10. A coil take the current of 6A when connected to a 24V DC supply. To obtain the same current with a 50Hz AC supply the voltage required is 30V. calculated (i) the inductance of the coil (ii) the power factor of the coil

11. The inductive coil each with a resistance of 15ohm and an inductance of 0.03H are connected in star to a three phase 400C, 50Hz supply express the value of phase current line current and power absorbed.

12. For the circuit shown calculate the current through each of three resistor
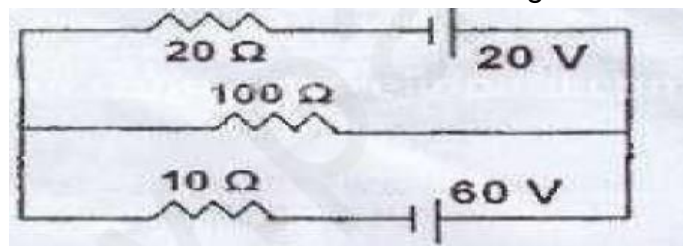
13. Explain the details of Kirchhoff's current and voltage law (i) A sinusoidal current wave is given by i=50 $(\sin\pi t)$ solve and calculate the root mean square value?

14. Calculate the current in the 8ohm resistor in the following circuit using Kirchhoff's law?
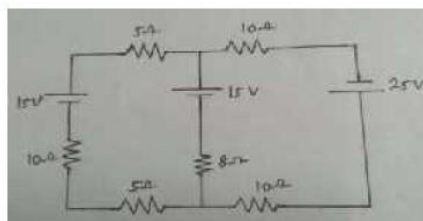
15. With a neat sketch and explain the construction and working principle of dynamometer type watt meter. Mention its merits and demerits

UNIT-II ELECTRICAL MACHINES

2-Marks

1. How DC generators are classified and list out it?
2. What is meant by compound motors?
3. Justify the importance of testing a DC machine and give some list of Test?
4. What are the losses in DC machine?
5. How transformers are classified? And give its classifications?
6. Express the condition for maximum efficiency for a transformer?
7. Examine the meaning of transformer regulation?
8. Identify the constructional feathers of synchronous machines?
9. Formulate the relationship between torque and slip of induction motor?

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10. What are the types of starters used with three phase induction motors?

13-Marks

1. Explain the working principle of DC generators derive the expression for generated for emf?
2. (i) Classify DC motor based on type of field connection
   (ii) Explain back emf in DC motors.
3. (i) State the various part of transformer and their function in details?
   (ii) Explain the construction of a magnetic core of a transformer
4. Explain the working principle of a Single -phase transformer.
5. Define the transformer efficiency and derive the condition under which is it will have maximum efficiency?
6. Explain the sketches of constructional features of a synchronous machine.
7. Explain the equation and torque and its applications?
8. Define and derive the expression for the distribution factor. How is the expression for generated emf changed due to distribution factors?
9. Explain the three- phase alternator and describe the function of each component?
10. Derive the expression for the torque developed by a three -phase induction motor. Show the torque list characteristics?
11. Explain the details about the working principle and the application of transformer?
12. Explain the working principle of self- excited generators?
13. Explain the principle of operation in three-phase induction motor and distinguish between the slip and rotor frequency?
14. Explain the various part of the three- phase induction motor and describe the function in each component?
15. Discuss the expression of EMF equations and it their applications?

UNIT-III ANALOG ELECTRONICS

2-marks

1. Define resister in electronic circuit?
2. Define inductor in electronic circuit?
3. Define capacitor?
4. Write a characteristics of Zener diode?
5. Compare the contrast between intrinsic and extrinsic semiconductor?
6. Point out the behaviour of PN junction diode in forward and reverse bias?
7. What is the purpose biasing in transistor?

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8. Why transistor called as Bipolar device?
9. Write the application of Bipolar junction transistor?
10. Give the basis principles of digital to analog converter?

13-Marks

1. Describe the conductivity of conductors, semiconductors, and insulator with the help of energy bands diagram?
2. Describe the details in intrinsic semiconductors and extrinsic semiconductors?
3. Discuss the formation and operation of N type and P type semiconductors?
4. Discuss the operation of PN junction diode in forward and reverse bias?
5. Describe the input and output characteristics of BJT under common emitter configuration with necessary characteristic curves?
6. Discuss the need for biasing of a transistor?
7. With neat diagram discuss about fixed biasing and voltage divider biasing?
8. Draw the schematic of CB, CC, CE configuration of BJT and analysis their performance?
9. Compare PN junction diode and Zener diode list the application of Zener diode?
10. Write a short notes on; (i) PN junction diode (ii) Zener diode
11. Explain in details about Bipolar junction transistor?
12. Types of JEFT and SCR explain in detalis?
13. Explain the application of rectifier and inverters?
14. Analysis the working principle of digital to analog converter and list out its features and application with suitable schematic circuit?

UNIT-IV DIGITAL ELECTRONICS

2-Marks

1. Define correction codes?
2. What are the representation of logic function?
3. What is the error detection?
4. What is decade counter?
5. What are the binary numbers?
6. Demonstrate the given binary number is equivalent decimal number with steps (i) 1.01 (ii) 101.11
7. Solve the following binary difference 1011010-0101110
8. Define SOP and POS
9. What are the binary codes?
10. What is the representation of k-maps?

13-Marks

1. Find the solution of the following number conversation
   (i) $(96.0625)_{10} = (?)_2$
   (ii) $(34.67)_{10} = (?)_8$
   (iii) $(1101110.110)_2 = (?)_{16}$
   (iv) $(257)_{10} = (?)_2$

2. Write a neat diagram and explain the working of 4bit binary ripple counter?

3. Draw the circuit of binary weighted resistor digital to analog convertor and explain its operation?

4. Explain the details of binary code and it their applications?

5. Write a neat explain of correction codes and its diagrams?

6. Explain the representation of logic functions?

7. Compare the performance feature of the different types of SOP and POP?

8. Classify the types of binary codes and also explain the working principle of binary codes?

9. Explain the details about the representation minimization using K-maps?

10. Explain the details about the number systems and also review the number systems?

11. Explain the truth table and of k-maps and the minimizing procedure including the steps?

12. Explain the k-maps in 3 inputs?

13. Explain the details about binary numbers?

14. With a neat diagram to explain the binary number codes counter?

UNIT-V MEASUREMENT AND INSTRUNENATION

2 marks

1. Define functional element of an instrument?
2. What are the types of moving coil?
3. What are the types of moving irons?
4. Define three phase power?
5. What are the measurement of three phase power?
6. Define energy meter?
7. Differentiate CT and PT?
8. Why the secondary of a CT is never left open circuited?
9. What are the steps are taken by the minimizing error in PT?
10. Define DSO?

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13-marks

1. What are the means to reduce error in CT?
2. Derive the torque equation for moving iron instrument and comment on the shape of the scale?
3. Differentiate between a CT and PT and give it their application?
4. Discuss the theory of a PT with phasor diagram?
5. Derive expression for actual transformation ratio phasor angle error of PT?
6. Derive the errors of CT and PT and discuss the preventives?
7. Sketch and explain the moving coil instrument?
8. Discuss the block diagram the principle of operation three phase energy meter?
9. Describe the details about the principle of DSO and draw a neat block diagram and explain it?
10. Explain the method of measurement in three phase power?
11. Explain the details in energy meter and also the limitations are details to explain?
12. Explain the details in functions of elements in instrumentations?
13. Write a short note on (i) energy meter (ii) instrument transformer
14. Explain about the details in instrument transformer and briefly explain the details about it?