

## BE3252 BASICS ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING

### IMPORTANT QUESTIONS AND QUESTION BANK

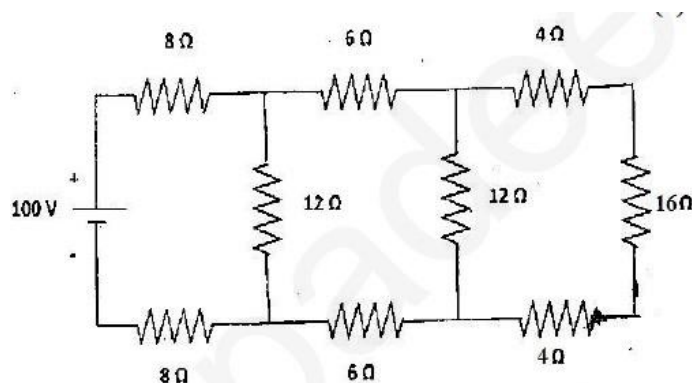
#### UNIT-I ELECTRICAL CIRCUIT

##### 2-Marks

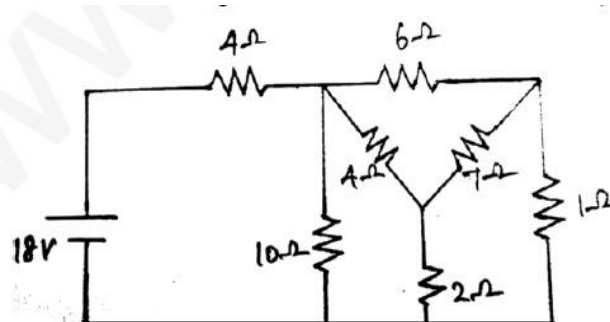
1. State ohm's law?
2. Define Kirchoff's current law?
3. Define Kirchoff's voltage law?
4. Distinguish between nodal-analysis and mesh-analysis.
5. What are the components of DC circuits?
6. Define AC circuits?
7. What are the steady state analysis of RLC circuits?
8. Draw the Three phase supply in DC circuit?
9. Define real power and reactive power?
10. What is RMS value?

##### 13-Marks

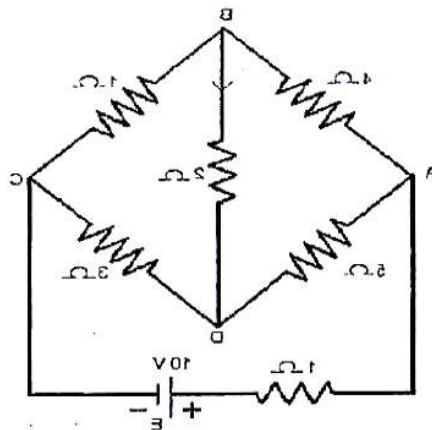
1. (i) Equivalent resistance across the terminal supply  
(ii) Total current display by the source?  
(ii) Power delivered to 6 ohm resistor circuit shown below



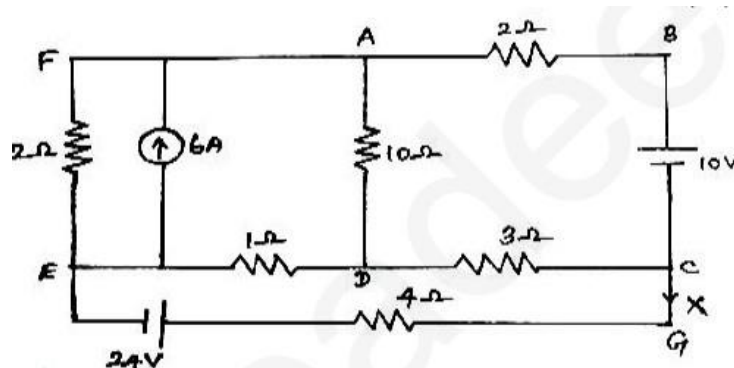
2. Describe the Kirchoff's laws, And explain details about it?
3. For the circuit shown in figure determine the current through 6ohm resistor



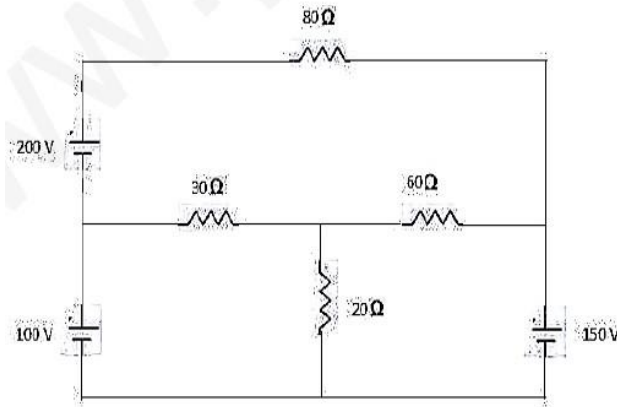
4. In the circuit shown calculate the current through 2ohm resistor and the total current delivered by the battery. Use Kirchoff's laws



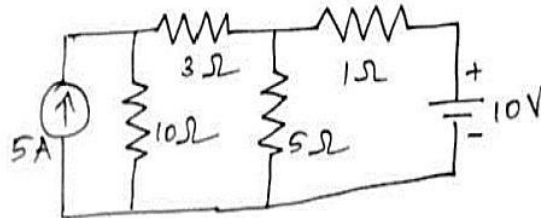
5. Determine the current X power in the 4ohm resistance of the circuit shown in below



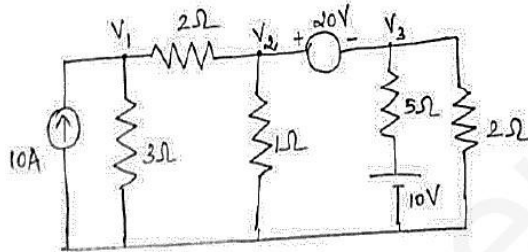
6. Using mesh analysis estimate the current through the various branches in the circuit of the following figure



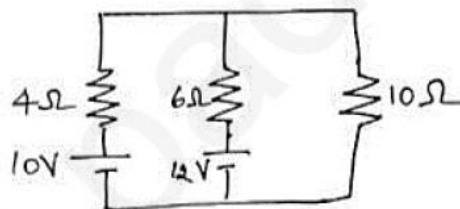
7. Write a node voltage equation and determine the current in each branch for the network shown



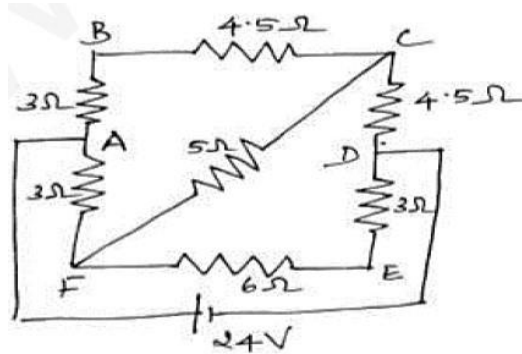
8. Determine the analysis the current in the 5ohm for the resistor in given shown



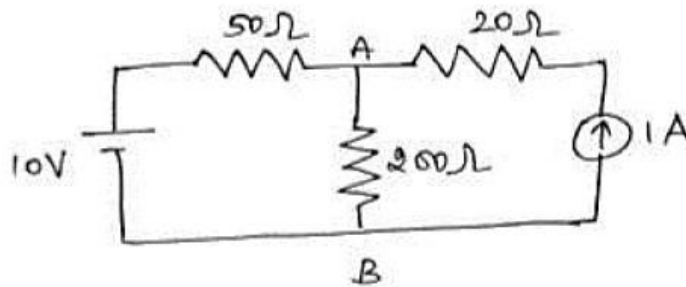
9. Determine the current in 10ohm resistor for the given diagram



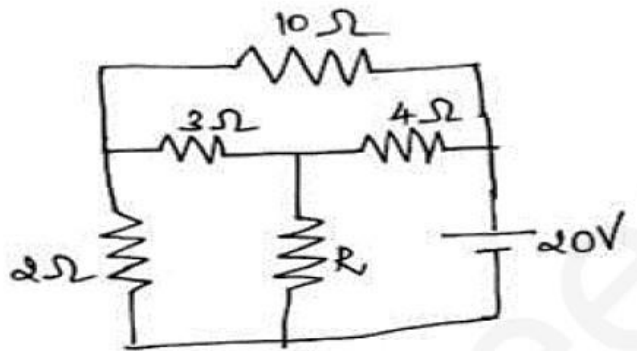
10. Find the current through the branch FC. Shown in figure



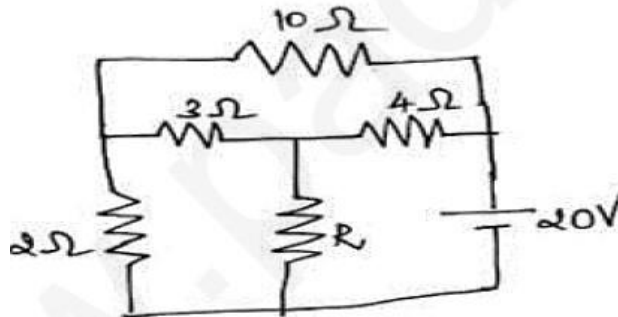
11. Determine the voltage across 200ohm resistor in the circuit



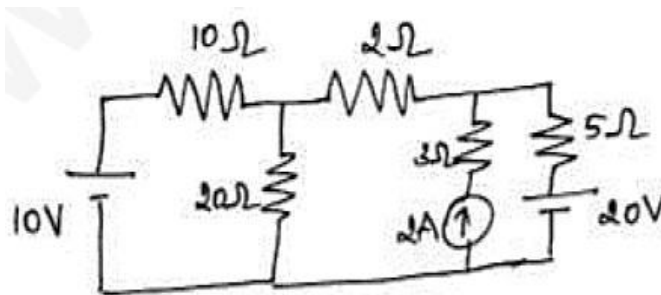
12. Obtain the equivalent circuit at terminals A&B



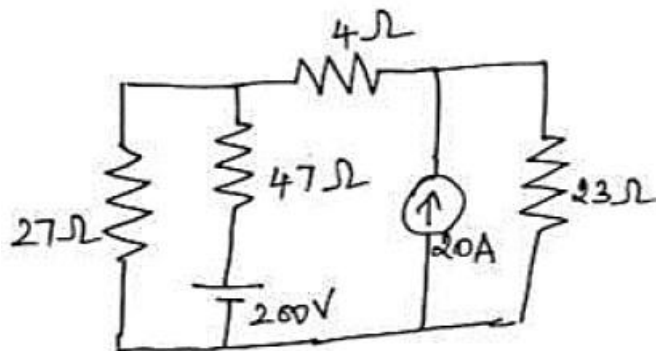
13. Find the maximum value of R in the power transfer



14. Find the current 30hm resistor in giver circuit



15. Compute the current through 23ohm resistor of the figure below



## UNIT-II MAGNETIC CIRCUIT AND ELECTRICAL INSTALLATION

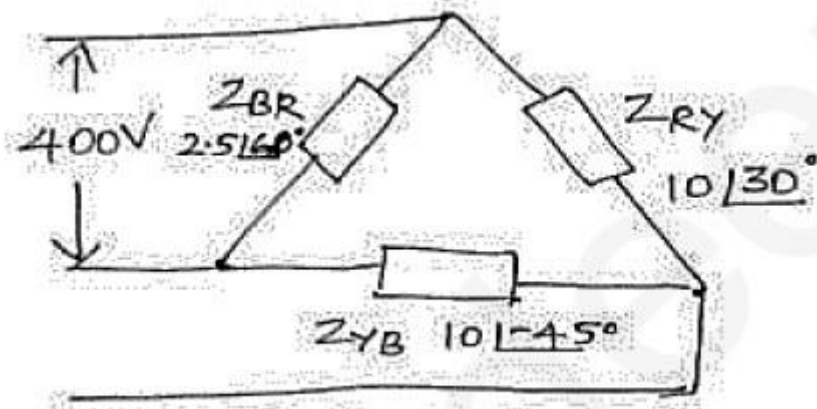
2-Marks

1. Define magnetic circuit?
2. What is flux density?
3. What are the types of wires and cables?
4. Define MMF?
5. What is the magnetic field intensity?
6. What is domestic wiring?
7. Give the application of domestic wiring?
8. What are protective devices?
9. Define safety precaution ana first aid?
10. What is the electrical installation?

13-Marks

1. Discuss the safety measures used in domestic wiring?
2. Discuss the materials used for wiring?
3. Present a simple domestic layout and explain how wiring is carried out on it?
4. Explain the working principle of magnetic circuit?
5. What are the types of wire and cables? Explain the details of each type?
6. Explain the details of circuit breaker and their limitations?

7. Write a short note on (i) MMF (ii) flux density (iii) wire and cables
8. (i) Explain the earth leakage circuit breaker  
(ii) Write a note on magnetic filed in industry
9. Explain the details form magnetic circuit and the also explain the working principle of circuit diagrams?
10. A symmetrical three phase three wire 400V is supply is to connect to a delta and connect to load in shown figure. Find the connected load?



11. Explain the details about the safety precautions?
12. Write the all definitions of magnetic circuit diagrams?
13. Explain the working principle of domestic wiring?
14. The voltage across the coil in the magnetic circuit? And the explain of their limitations?

### UNIT-III 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 features of synchronous machines?
9. Formulate the relationship between torque and slip of induction motor?
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 components?
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-IV FUELS AND COMBUSTION

#### 2-marks

1. Define resistor 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?
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 JFET and SCR explain in details?
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-5 SENSORS AND TRANSDUCERS**

### 2-Marks

1. Define transducers?
2. Point out the desirable features of a transducers?
3. Classify the types of transducers?
4. List different types of resistive transducers?
5. How a capacitive in transducers is used as a pressure sensor?
6. Differentiate active and passive transducers? Give is an example?
7. Give any one method to increase the sensitive of capacitive transducers?
8. List out any four materials by which piezo electric transducers and made of?
9. What is the principle of photo electric transducers?
10. What is the principle of thermoelectric transducers?

### 13-Marks

1. Discuss the classification of transducers based on different characteristics?
2. List the merits and demerits and typical application for inductive transducers?



3. Describe the principle of operation capacitive transducers and how pressure is measured using capacitive transducers?
4. Develop the transfer function LVDT with equivalent circuit with its characteristics?
5. Analysis the effect used in capacitance transducers explain with them application example for each?
6. Define piezo electric effect draw the equivalent circuit of a piezoelectric crystal and obtain the transfer function of piezoelectric transducers?
7. Discuss the principle of operation and characteristics and the application of hall effect transducers?
8. What is mechatronics and what are the types of values and its applications?
9. Explain about the details of sensors and give its their effects?
10. Describe the operation and the working the photo sensors and give the example in it?
11. List the different types of ration present in instrument transformers and write how it is calculated?
12. Explain the electro-pneumatic system? And the principle and operation to explain in it?
13. Discuss the details about the differential pressure transducers?
14. Write a short- notes on (i) Smart sensors and (ii) thermal imagers.
15. Discuss the details about the smart sensors and give it's the types and the example?