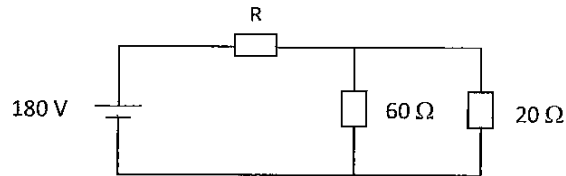


**BE-104**  
**B. E. (First/Second Semester), EXAMINATION, JUNE-2012**  
**( Grading System )**  
**(Common for all Branches )**  
**BASIC ELECTRICALS & ELECTRONICS ENGINEERING**  
*Time : Three Hours*  
*Maximum Marks : 70*  
*Minimum Pass Marks : 22 ( D Grade)*

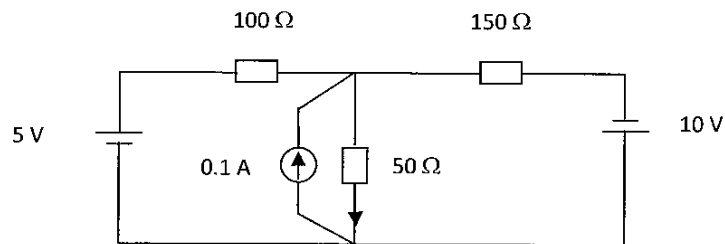
Note : Attempt all the questions. All questions carry equal Marks.

1. Answer any **Two** of the following :

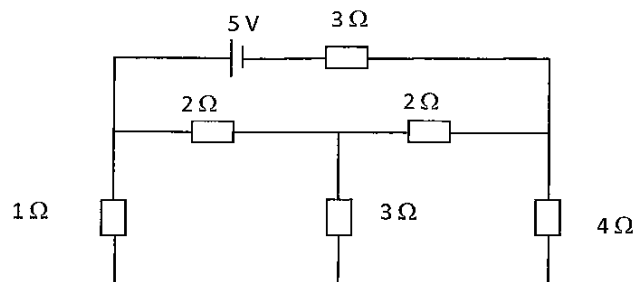
- (a) State the NORTON'S Theorem. In the circuit shown below determine  
 (i) The value of R so that the load of 20 ohm draws maximum power.  
 (ii) The value of maximum power drawn by the load.



- (b) State superposition theorem. Apply the same for finding the current in 50 ohm resistor with the reference direction shown in circuit.



- (c) Determine the current drawn from the 5 volt battery in the network shown.



- (d) Explain the following terms : (i) RMS (ii) Average Value (iii) Active Power (iv) Reactive Power

**P.T.O.**

2. Answer any **two** of the following :

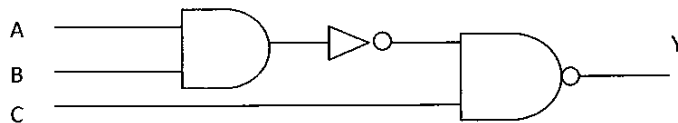
- Explain the following w.r.t. transformer (i) Losses (ii) Voltage regulation
- Draw the phasor diagram of a single phase transformer with an inductive load. Write down the procedure in steps for drawing the phasor diagram.
- A 11 KV/400 V distribution transformer takes a no load primary current of 1 Amp at a power factor of 0.24 lagging. Find (i) The core loss current (ii) The magnetizing current (iii) The iron loss
- Give reasons why :
  - Rating of transformer is specified in KVA and not in KW.
  - Core losses are called iron losses.
  - Cooling is required in transformer
  - Cores of transformer is laminated with laminated sheets

3. Answer any **two** of the following :

- Draw torque-slip characteristics of a 3 phase induction motor. Explain the concept of slip.
- Give reasons why :
  - Starting current is high in dc motor
  - Induced emf in a dc motor is called back emf
- Specify the application of following motors in field ( minimum two )
  - Three phase induction motor
  - Synchronous motor
  - DC motors
  - Single phase induction motor
- A 3 phase, 6 pole induction motor runs at 960 rpm on full load. It is supplied from a 4 pole alternator running at 1500 rpm. Calculate full load slip of the motor.

4. Answer any **two** of the following :

- Obtain the following :
  - Binary equivalent of  $(123.72)_8$
  - Octal equivalent of  $(10010110.1011)_2$
  - Hexadecimal equivalent of  $(2391)_{10}$
  - Decimal equivalent to  $(11011000)_2$
- Draw the truth table of the following logic circuit



- State and prove Demorgan's theorem using two variables.
- Explain the operation of following flip flops.
  - J-K Flip flop
  - R-S Flip flop

5. Answer any **two** of the following :

- Compare the CE, CB and CC configuration of BJT on the basis of -
  - Input resistance
  - Output resistance
  - Voltage gain
  - Current gain
- Specify the following terms :
  - Forbidden energy gap
  - Intrinsic semiconductor
  - Doping
  - Charge carriers
  - Biassing
- Explain the operation of BJT under following mode :
  - Cut off mode
  - Active mode
  - Saturation mode
- Distinguish the following :
  - Semiconductor and Insulator
  - P-Type and N-Type materials.