



**FIJI NATIONAL UNIVERSITY**

**COLLEGE OF ENGINEERING, SCIENCE AND  
TECHNOLOGY**

**SCHOOL OF ELECTRICAL AND ELECTRONIC  
ENGINEERING**

**CERTIFICATE III IN ELECTRICAL ENGINEERING – STAGE 2**

**EEE221 APPLIED ELECTRICITY- 2**  
**FINAL EXAMINATION PAPER –PENSTER 2- 2012**

**DAY / DATE: TUESDAY- 12/06/2012      TIME:9.00 A.M to 11.10 A.M**

**ROOM: As per time table**

**INSTRUCTIONS TO STUDENTS:**

1. You are allowed 10 minutes extra reading time during which you are not allowed to write.
2. Begin each answer on a fresh page and use both sides of the sheet.
3. Write your candidate number at the top of each answer sheet.
4. Insert all foolscaps, graph paper, drawing paper etc in their correct sequence and secure with string.
5. For all sheets of paper on which rough / draft work has been done, cross it through and you must attach to the answer booklet.
6. Write clearly the number(s) of the question(s) attempted on top of each sheet.
7. **ATTEMPT ALL QUESTIONS**
8. Show all workings where necessary.
9. Programmable calculators are not allowed.

**SECTION A****(35 MARKS)**

1. Draw the three phase wave form from 0-360 degrees. (6 marks)
2. What is the phase sequence of a three phase system? (2 marks)
3. Name two types of three phase connections and draw the connection diagram for both. (5 marks)
4. Compare the two types of three phase connections .Mention at least four (4) points in each case. (4 marks)
5. Draw the circuit connection and also write down the method of reversing the rotation of the following single phase motors:
  - a. Split - Phase motor (6 marks)
  - b. Capacitor – Start motor (6 marks)
  - c. Series motor (6 marks)

**SECTION B****(20 MARKS)**

1. Name the two types of three phase rotor. (2 marks)
2. Draw the bridging connections of a three phase Star and Delta motor. (6 marks)
3. How can the rotation of a three phase motor be changed? (3 marks)
4. List four (4) advantages of using a three phase motor. (4 marks)
5. List two (2) advantages of using a single phase motor. (2 marks)
6. Draw and label the connection diagram of the following DC machine:
  - a. Shunt motor (3 marks)

**SECTION C****(25 MARKS)**

1. State three types of transformer you know. (3 marks)
  
2. Show the internal connections of a three phase transformer connected in Star/Delta (5 marks)
  
3. A transformer has 960 turns on its primary winding ( $N_p$ ) and 48 turns on the secondary ( $N_s$ ). Find the:
  - a. Turns ratio of the transformer (4 marks)
  - b. Secondary voltage when 240V is applied to the primary (4 marks)
  
4. Name and explain two different methods of cooling transformers. (4 marks)
  
5. List down the names of five (5) parts /components of a dc machine. (5 marks)

**SECTION D****(20 MARKS)**

1. Draw the circuit diagram of the following rectifier circuits, giving the input output waveforms:
  - a) Single phase half wave
  - b) Single phase bridge
  - c) Three phase full wave bridge (12 marks)
  
2. In a single phase full wave centre-tap rectification, the AC voltage is 32 volts at 50 hertz and load resistance of 5 ohms, Calculate,
  - a) The load voltage
  - b) The load current
  - c) The ripple voltage
  - d) The ripple frequency
  - e) The PRV. (8 marks)