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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2011/2012**

COURSE NAME : ELECTRICAL TECHNOLOGY
PRACTICE

COURSE CODE : DAE 23103

PROGRAMME : 2 DAL

EXAMINATION DATE : MARCH 2012

DURATION : 2½ HOURS

INSTRUCTION : ANSWER **FOUR (4)** QUESTIONS
ONLY

THIS QUESTION PAPER CONSISTS OF SIX (6) PAGES

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- Q1**
- (a) Give three (3) examples of applications of Megohmmeter for electrical installation purposes.
(3 marks)
 - (b) Give three (3) reasons why Megohmmeter is the most suitable meter used for insulation test.
(4 marks)
 - (c) Give three (3) reasons why atmospheric conditions affect the resistance of insulation for the certain period of time.
(3 marks)
 - (d) State five (5) advantages of Clamp-On Ammeter.
(5 marks)
 - (e) State the difference of basic concept between AC Clamp-On Ammeter and DC – AC Clamp-On Ammeter.
(3 marks)
 - (f) Briefly explain the method how to measure low current (less than 1 A) by using Clamp-On Ammeter.
(5 marks)
 - (g) State two (2) reasons why Clamp-On Ammeter is suitable to measure higher values of AC currents.
(2 marks)
- Q2**
- (a) State five (5) general maintenance of a battery.
(5 marks)

(b) If a cell with an emf of 12 V and an internal resistance of 0.5Ω is connected across a 2.5Ω load resistor.

- (i) Draw the above circuit.
- (ii) Calculate the current that will flow through the load.

(5 marks)

(c) A battery-operated circuit requires 6 V and a capacity of 6 Ah. Cells rated at 1.5 V and 2 Ah are available to do the job. Based on the above description,

- (i) determine the number of cells in series,
- (ii) determine the number of parallel rows,
- (iii) draw the required arrangement.

(9 marks)

(d) Give three (3) comparisons between series and parallel cell connections.

(6 marks)

Q3 (a) State four (4) examples of filament lamps.

(2 marks)

(b) State the functions of the following components in the circuit of fluorescent lamp.

- (i) choke
- (iii) PF capacitor

(4 marks)

(c) Draw and label completely the basic circuit of fluorescent lamp using the glow starter.

(5 marks)

- (d) From the circuit drawn in Q3 (c), briefly explain the practical operation of the glow starter.

(6 marks)

- (e) Give two (2) comparisons between standard (regular) tungsten filament lamp and full-size fluorescent lamp (fluorescent induction).

(4 marks)

- (f) Give two (2) main reasons why fluorescent lamp is better than tungsten filament lamp.

(4 marks)

- Q4** (a) Briefly describe the basic construction of:

- (i) electric water heater
- (ii) heating elements

(10 marks)

- (b) Explain the principle of operation of the refrigerators.

(9 marks)

- (c) Draw and label completely the circuit of a refrigerator motor-starting relay.

(6 marks)

- Q5** (a) Draw the basic circuit of permanent-split capacitor motors (PSC).

(4 marks)

- (b) State two (2) main factors determine the speed of the motor.

(2 marks)

- (c) Give two (2) comparisons of characteristics between PSC and Universal or Series motor.

(4 marks)

- (d) (i) State the maximum speed of an electric motor.
(ii) Give a reason for your answer in Q5(d)(i).

(4 marks)

- (e) An induction motor runs at 2,880 rpm when connected to the 240 V, 50 Hz main supply. Determine the:-

- (i) synchronous speed, N_s
(ii) number of poles, p
(iii) percentage of slip, %S

(9 marks)

- (f) State a difference between synchronous speed and rotor speed.

(2 marks)

- Q6** (a) State the condition to achieve the maximum transfer of power from the input source to the output load of an audio frequency transformer.

(2 marks)

- (b) Give three (3) reasons why the transformer unable to obtain 100% efficiency.

(3 marks)

- (c) (i) Give three (3) examples of transformer applications in electronic circuits.

- (ii) Give two (2) examples of transformer applications in electrical circuits.

(5 marks)

- (d) State the main differences between signal transformers and power transformers. (3 marks)
- (e) Give three (3) comparisons between audio frequency and radio frequency transformers. (6 marks)
- (f) With the aid of suitable diagram, briefly explain how to determine the power transformer is in good condition or not by using AC Voltmeter while it is in the circuit. (6 marks)