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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2010/2011**

**COURSE NAME : ELECTRICAL TECHNOLOGY
PRACTICE**

COURSE CODE : DET 2233

PROGRAMME : 2 DET

EXAMINATION DATE : APRIL / MAY 2011

DURATION : 3 HOURS

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

THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

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- Q1** (a) State the function of Megohmmeter.
(2 marks)
- (b) Draw and label completely the basic circuit of Dynamometer type of Wattmeter.
(5 marks)
- (c) From the circuit drawn in Q1 (b), briefly explain the operation of the circuit.
(10 marks)
- (d) Give three (3) comparisons between AC Ammeter in Digital Multimeter and Clamp-On Ammeter to measure AC currents.
(6 marks)
- (e) 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 9 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) types of incandescent lamps.

(2 marks)

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

- (i) choke
- (ii) starter
- (iii) PF capacitor
- (iv) radio interference suppression capacitor (RISC)

(8 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.

(10 marks)

- Q4** (a) Briefly describe the basic construction of:
- (i) electric water heater
 - (ii) heating elements
- (10 marks)
- (b) Draw and label completely the circuit of a refrigerator motor-starting relay.
- (5 marks)
- (c) Briefly explain the operation of the circuit drawn in Q4 (b).
- (10 marks)
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- Q5** (a) Draw the basic circuit of permanent-split capacitor motors (PSC).
- (4 marks)
- (b) Briefly describe the characteristics of permanent-split capacitor motors (PSC).
- (9 marks)
- (c) A 3 kW, 240 V, 50 Hz induction motor has a running power factor 0.9 lagging and an efficiency of 90 %. Calculate:-
- (i) the current drawn by the motor
 - (ii) the motor losses
- (12 marks)
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- Q6** (a) (i) Give three (3) examples of transformer applications in electronic circuits.
- (ii) Give two (2) examples of transformer applications in electrical circuits.
- (5 marks)

- (b) State the main differences between signal transformers and power transformers. (3 marks)
- (c) Briefly explain on how to know that the power transformer is in good condition by using AC Voltmeter while it is in the circuit. (5 marks)
- (d) A 100 kVA power transformer feeds a load operating at a power factor of 0.8. Find the efficiency of the transformer if the combined iron and copper loss at this load is 1 kW. (6 marks)
- (e) A 10 KVA single-phase transformer feeds a load operating at a power factor of 0.8 with an efficiency of 98 %. Calculate the total losses of the transformer. (6 marks)