POLYTECHNIC PORT DICKSON
Km 14, Jalan Pantai Sirusa, 71050 PD. NSDK
DEPARTMENT OF MECHANICAL ENGINEERING

Electrical Technology 2 *E2063*

Test 1

Instruction:

1. Answer 4 Question only.
2. 1 hour 30 minute

Question 1

a) Describe what is the 1st and 2nd faraday law clearly (5 Mark)

b) A ring shaped mild steel core having an average circumference of 40 cm, cross section of 2 cm^2, is wound with a 1000-turns conductor with a 4 A current flowing through it. If the relative permeability of the core is 200, calculate:

i) The schematic diagram
ii) The magnetomotive force
iii) The magnetic field strength
iv) The flux density
v) The flux within the magnetic circuit
vi) The reluctance (20 Mark)

Question 2

a) Briefly what are the **Ohm law** and **Kirchoff Law.** (5 Mark)

b) A **short shunt** DC generator is supply with 30 Kw of power. The value of resistances is given for R_a, R_{se}, R_{sh} and R_L are 0.004Ω, 0.02Ω, 1.25 KΩ and 1 KΩ respectively. If the **total** loss of the carbon brush is 2 V. Determine:

i) Sketch clearly circuit and all states
ii) Load current.
iii) Input voltage.
iv) Serial current and voltage.
v) Voltage terminal and shunt current.
vi) Generated voltage.
vii) What is the possible value of flux if the generator running at 2500rpm, number of conductor 30 (Z), poles (P) is 4. (20 Mark)

Question 3

a) Describe 3 factor influence E.M.F inside the generator and describe relationship between the factors with the E.M.F value. (5 Mark)

b) A shunt DC motor supply with 250 V/ 25 kW, have the armature and shunt resistance 0.25Ω and 250Ω respectively. Determine.

i) Sketch clearly circuit and all states
ii) Armature currents. I_a
iii) $E_{reaction}$
iv) Power generated by armature
v) Power loss by Cooper. (P_{cu}) (20 Mark)

Question 4

a) State the differences between DC generator and AC generator (6 Mark)

b) List down 4 type of starter and 4 main function of starter (8 Mark)

c) A diesel system generator generated AC voltage at output. These system have 4 pair core and system frequency is 50Hz. Calculate

i) Synchronous speed (Ns)
ii) Rotor speed (Nr) if slip (s) 3%
iii) Slip (s)
iv) Rotor frequency (fr) (11 Mark)

Question 5

a) Sketch the schematic diagram of the transformers and describe clearly control principle of these circuit. (8 Mark)

b) A single phase transformers have 12000/240V, 20KVA has 5000 of turns at the input. If the flux loss is 1 KW and the power factor 0.9, calculate the efficiency of the transformers when:

i) Full load
ii) Half load (17 Mark)