TEST 1

SUBJECT: ELECTRICAL PRINCIPLES AND PRACTICE LEVEL: 3

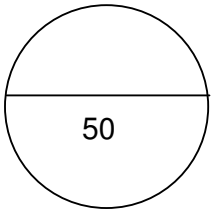
DATE: MARCH 2017

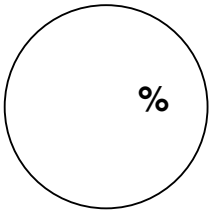
EXAMINER: B.ALLCHIN

NAME OF MODERATOR: R.DEYSEL

Student Surname		Name	
ID. Number		Group	

Topic and outcomes covered	**1-2 SO 1.1 , SO 2.1- 2.2**
Duration	1 Hour
Evidence Required	Written test
Instrument	**Memorandum**





Rating Scale	Remark	Rating
5	Outstanding	80 - 100
4	Highly competent	70 - 79
3	Competent	50 - 69
2	Not yet Competent	40 - 49
1	Not achieved	0 - 39

SIGNATURES:

Student declaration: I declare that the evidence provided is my own work.

STUDENT: _____ DATE: _____

FEEDBACK: _____

Indicate which questions you found difficult (tick √)

1	2	3	4	5	6	7	8	TOTAL
								50

LECTURER: _____ Date: _____

COMMENT: _____

Post moderation _____

College moderation: _____ Date _____

External moderation _____ Date _____

TIME: 1 HOURS
MARKS: 50

_____

INSTRUCTIONS AND INFORMATION

1.	Answer ALL the questions.		
2.	Read ALL the questions carefully.		
3.	Number the answers according to the numbering system used in this assignment.		
4.	Write neatly and legibly.		
5.	You must work on your own.		

ELECTRICAL PRINCIPLES AND PRACTICE LEVEL 3

TEST 1

Question 1

1.1. Give a brief description of the following terms:

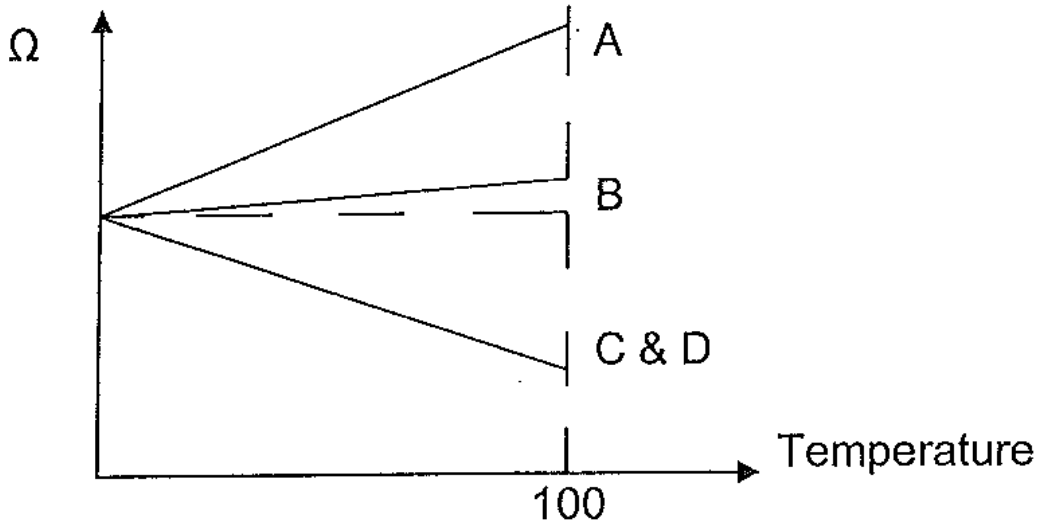
1.1.1. Electromotive force (2)

1.1.2. Potential difference (2)

1.1.3. Ampere (2)

1.1.4. Electric Resistance (2)

1.2. The figure below shows a graph of resistance/temperature of FOUR materials. Identify the materials labelled A – D. Write only the answer in your answer book. (4)



1.3. Calculate the resistance of 1km of copper conductor if its diameter is 10mm.

The resistivity of copper is 0.017μΩm (5)

1.4. A piece of nickel wire has a resistance of 15Ω at 20®C. Calculate its resistance at 120®C.

Take the temperature coefficient of nickel as 0,0062/®C. (3)

[20]

Question 2

2.1. List five properties of magnetic field lines (lines of force). (5)

2.2. 2 A 80mm long conductor carries a current of 20A which creates a magnetic field having a flux density of 2 Tesla. Calculate the force on the conductor. (4)

2.3. Explain the left hand grip rule. (4)

2.4. List four factors which will affect the force on a current carrying conductor. (4)

2.5. Two conductors carrying each 400000mA are 50mm apart. Conductor length is 60m.

(a). Calculate the magnitude of the force on the conductors. (3)

(b). Is the force repulsive or attractive? (2)

2.6. State one of the Faraday's law of electromagnetic induction. (3)

2.7. A 300mm long conductor moves at 10m/s in a uniform magnetic field of 2 Tesla at an Angle of 90®. Calculate:

(a). The emf induced in the conductor. (2)

(b). The induced emf if the conductor is now at 30® angle with the lines of force. (3)

[30]

Total [50]

FORMULAE SHEET

1) Cosø = $\frac{R}{Z}$

2) P = V.I Cos ø

3) Q = V.I Sin ø

4) S = V.I

5) $V_1 = (\frac{R1}{RT}) V_T$

21) $R_t = R_0 (1 + \alpha t)$

22) $\frac{R1}{R2} = \frac{1+ \alpha t 1}{1+ \alpha t 2}$

23) P = V.I

24) $P = I^2 R$

25) $\eta = \frac{Pout}{Pin}$ x 100 %

6) $I_1 = \left(\frac{R2}{R1+R2}\right) I_T$

7) $R_T = R_1 + R_2 + R_3$

8) $\frac{1}{RT} = \frac{1}{R1} + \frac{1}{R2} + \frac{1}{R3}$

9) $\frac{V1}{V2} = \frac{N1}{N2} = \frac{I2}{I1}$

10) $V_L = \sqrt{3}\ V_{Ph}$

11) $E = V - I_a R_a$

12) $f = \frac{Np}{60}$

13) $S = \frac{Ns - Nr}{Ns}$

14) $R_{sh} = \frac{Im \cdot Rm}{Ish}$

15) $R_{se} = \frac{Vt}{It} - R_m$

16) $F = B\ I\ L$

17) $\tan \acute{o} = \sqrt{3}\ \left(\frac{W1-W2}{W1+W2}\right)$

18) $E = V + Ir$

19) $V = I.R$

20) $R = \frac{pl}{a}$

26) $X_L = 2\ \pi f\ L$

27) $X_C = \frac{1}{2\pi fc}$

28) $Z = \sqrt{R^2 + (X_L - X_C)^2}$

29) $Mmf = N\ I$

30) $H = \frac{Mmf}{l}$

31) $\beta = \frac{\emptyset}{A}$

32) $E = \beta\ l\ v$

33) $E = -L\frac{\Delta I}{t}$

34) $A = \frac{\pi d^2}{4}$

35) $E = \frac{1}{2}\ C\ V^2$

36) $Q = C\ V$

37) $F = 2 \times 10^2 . \frac{I_1 . I_2}{d}$

38) $I = \frac{E}{R+r}$

39) $L = N\frac{\Delta \emptyset}{\Delta I}$

40) $E = V \pm I_a R_a$