UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2010/2011

COURSE NAME	:	BASIC ELECTRIC AND ELECTRONICS
COURSE CODE	:	DKE 3273
PROGRAMME	:	3 DDT
EXAMINATION DATE	:	NOVEMBER/DECEMBER 2010
DURATION	:	3 HOURS
INSTRUCTIONS	:	ANSWER **FIVE (5)** QUESTIONS ONLY

THIS QUESTION PAPER CONSISTS OF TEN (10) PAGES

Q1 Refer to Figure Q1, show all the calculation to find the value for;

a) Total resistance R_T

(4 marks)

b) The voltage drop across resistance R_2 (V_{R2}), resistance R_3 (V_{R3}), resistance R_4 (V_{R4}) and resistance R_6 (V_{R6})

(8 marks)

c) The current flow through resistance R_2 (I_{R2}), resistance R_3 (I_{R3}), resistance R_4 (I_{R4}) and resistance R_6 (I_{R6})

(8 marks)

Q2 a) An electromagnet produces a magnetic flux of 900μWb. Determine the magnetic field lines.

(10 marks)

b) Calculate the flux density, in gauss units for a flux, Ø, of 200μWb in a cross sectional area of 5×10^{-4} m^2.

(10marks)

Q3 a) Determine the amount of charge, Q, stored by a capacitor if

i) C = 10μF and V = 5V
ii) C = 680 pF and V = 200V
iii) C = 0.22 μF and V = 50 V

(6 marks)

b) Determine the voltage, V, across a capacitor if

i) Q = 2.5 μC and C = 0.01 μF
ii) Q = 10 mC and C = 1000 μF
iii) Q = 188 nC and C = 0.0047 μF

(6 marks)

c) Calculate the capacitance, C, of a capacitor for each set of physical characteristics listed below;

i) A = 0.1 cm^2, d = 0.005 cm, Kε = 1
ii) A = 1 cm^2, d = 5×10^{-6} cm, Kε = 6

(8 marks)

Q4 Refer to Figure Q4, assume a charging current of 2.4 mA flows for 1 ms, determine;

a) Total equivalent capacitance, C_{EQ} (4 marks)

b) The charge stored each capacitor C_1, (Q_{C1}), C_2 (Q_{C2}) and C_3 (Q_{C3}) (6 marks)

c) The voltage across each capacitor C_1 (V_{C1}), C_2 (V_{C2}) and C_3 (V_{C3}) (6 marks)

d) The total charge, Q_T stored by the equivalent capacitor, C_{EQ} (4 marks)

Q5 Refer to Figure Q5, calculate;

a) The secondary voltage , V_S (4 marks)

b) The secondary current, I_S (4 marks)

c) The secondary power, P_S (4 marks)

d) The primary power, P_P (4 marks)

e) The primary current, I_P (4 marks)

Q6 Refer to Figure Q6, determine;

a) The total equivalent resistance, R_{EQ} (4 marks)

b) The branch currents, I_1 and I_2 (4 marks)

c) The total current, I_T (4 marks)

d) The power dissipated at each resistors, P_1 and P_2 (4 marks)

e) The total power supplied by the source, P_T (4 marks)

Q7 (a) Figure Q7(a) shows a transistor biasing circuit;

i) calculate collector saturation current ($I_{C(sat)}$) (1 mark)

ii) calculate collector–emitter off voltage ($V_{CE\,(off)}$) (1 mark)

iii) calculate current at the Q-point (I_{CQ}) (3 marks)

iv) calculate voltage at the Q-point (V_{CEQ}) (1 mark)

v) draw the DC load line for the transistor circuit (4 marks)

(b) Figure Q7(b) shows a n-channel JFET circuit. What is the value of R_S that will provide drain current (I_D) of approximately one-half I_{DSS}? (2 marks)

(c) Referring to Figure Q7(b), for the values of R_S calculated in question Q7(b), determine:

i) gate voltage (V_G) (2 marks)

ii) source voltage (V_S) (2 marks)

iii) gate-source voltage (V_{GS}) (2 marks)

iv) drain voltage (V_D) (2 marks)

FINAL EXAMINATION

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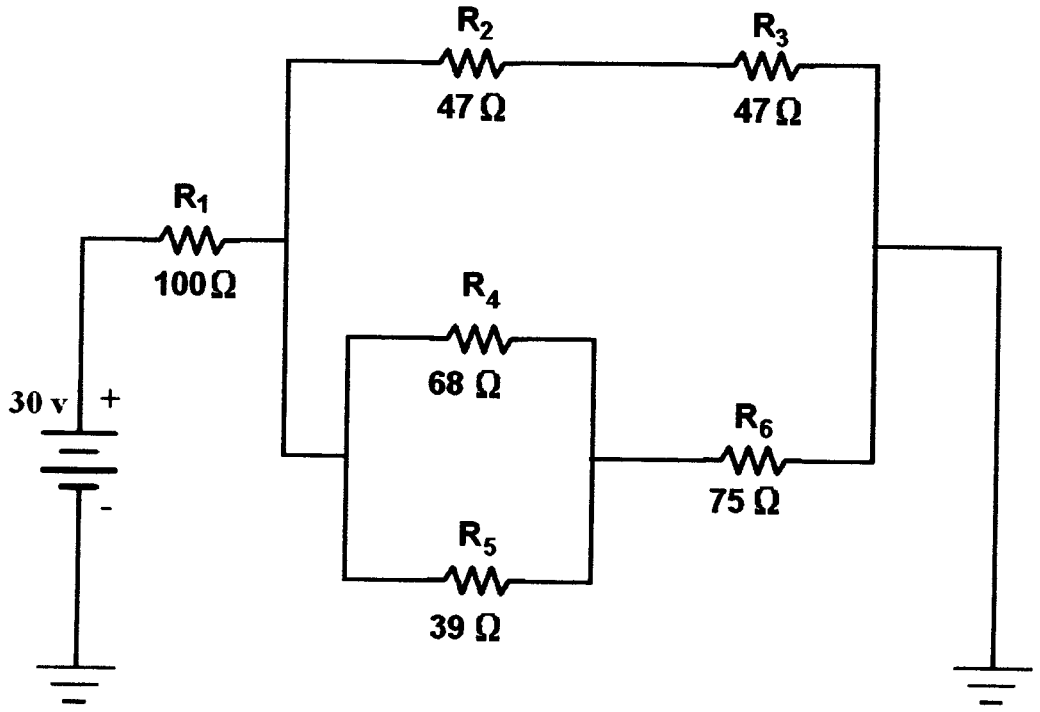

Figure Q1

FINAL EXAMINATION

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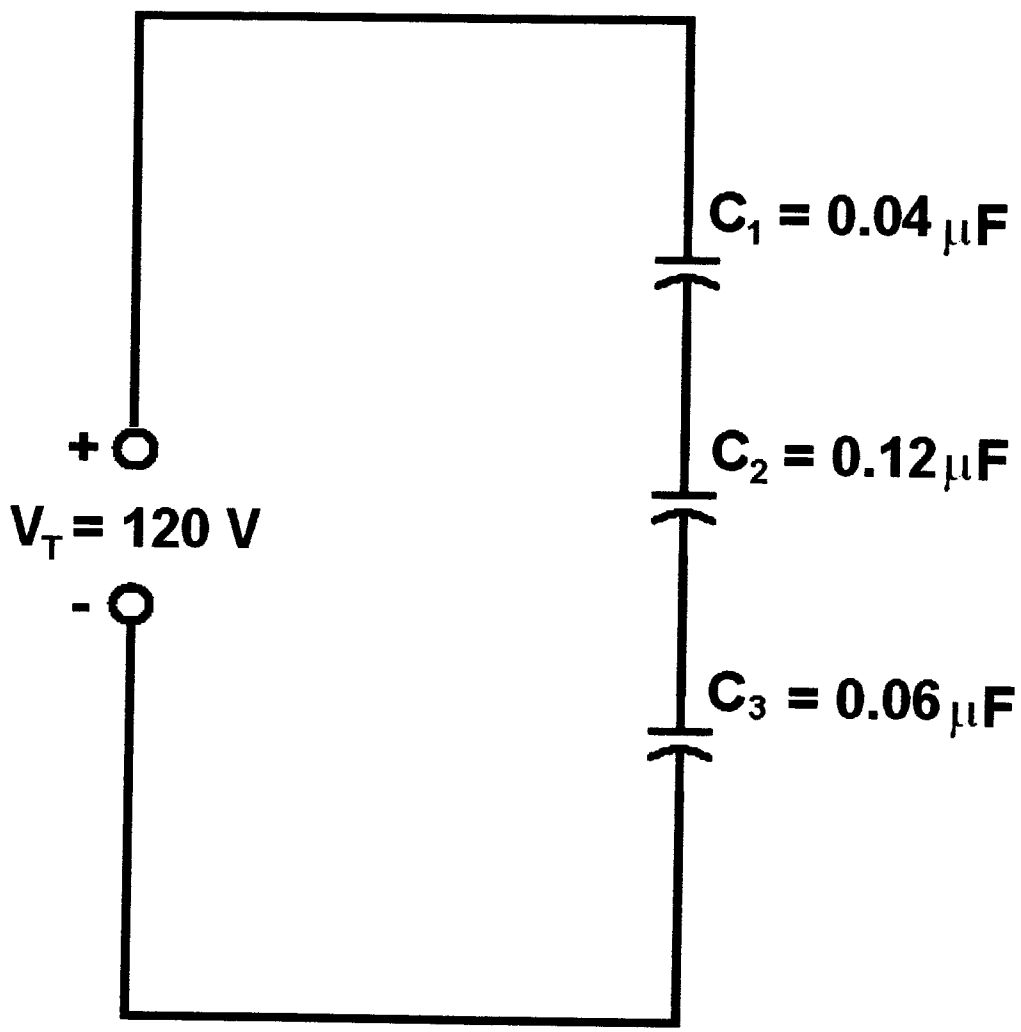

Figure Q4

FINAL EXAMINATION

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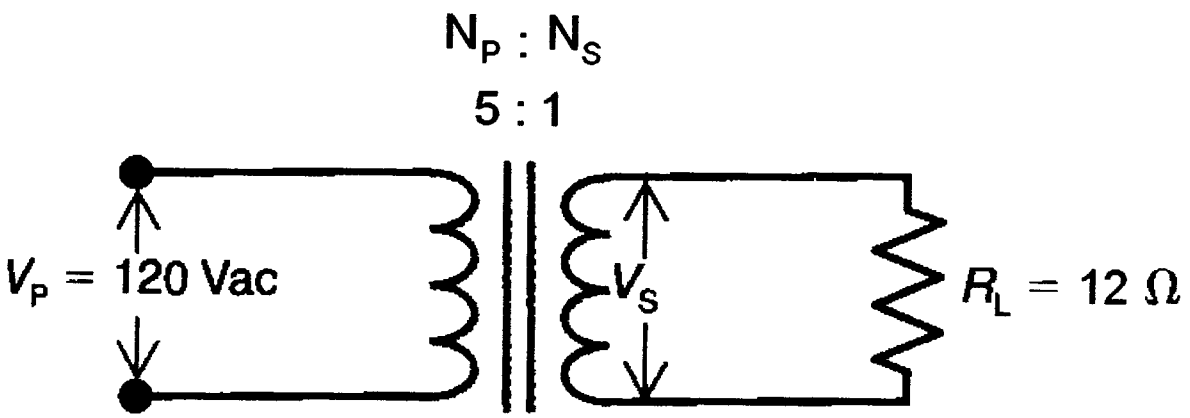

Figure Q5

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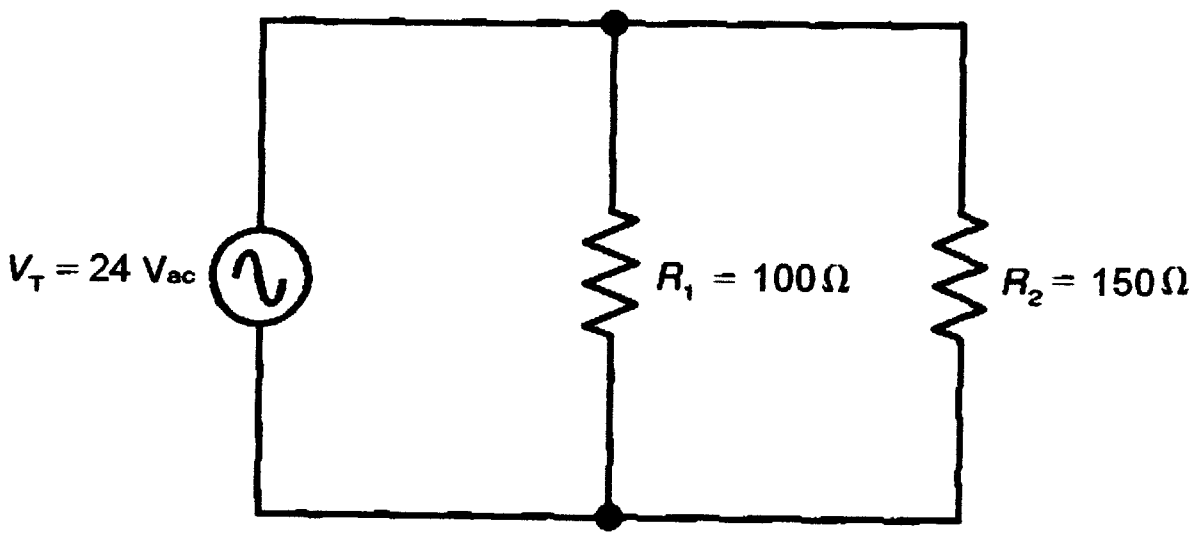

Figure Q6

FINAL EXAMINATION

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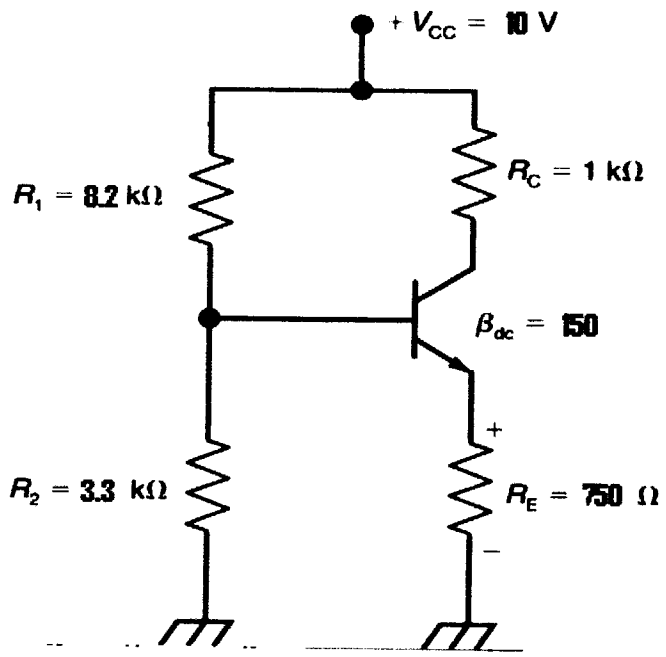

Figure Q7 (a)

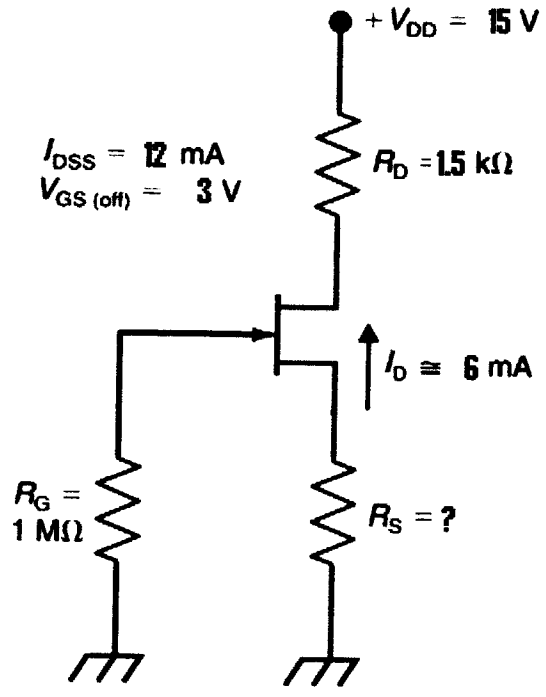

Figure Q7 (b)

References :

Band Color	Digit	Multiplier	Tolerance
Black	0	1	---
Brown	1	10	±1%
Red	2	100	±2%
Orange	3	1,000	±3%
Yellow	4	10,000	±4%
Green	5	100,000	---
Blue	6	1,000,000	---
Violet	7	10,000,000	---
Gray	8	100,000,000	---
White	9	---	---
Gold	---	0.1	±5%
Silver	---	0.01	±10%
None	---	---	±20%