2024 WASSCE SUPER MOCK APPLIED ELECTRICITY 3

APPLIED ELECTRICITY 3 hours

ESSAY

[100 marks]

1. Aim: determine the lead angle in an a.c RC circuit.

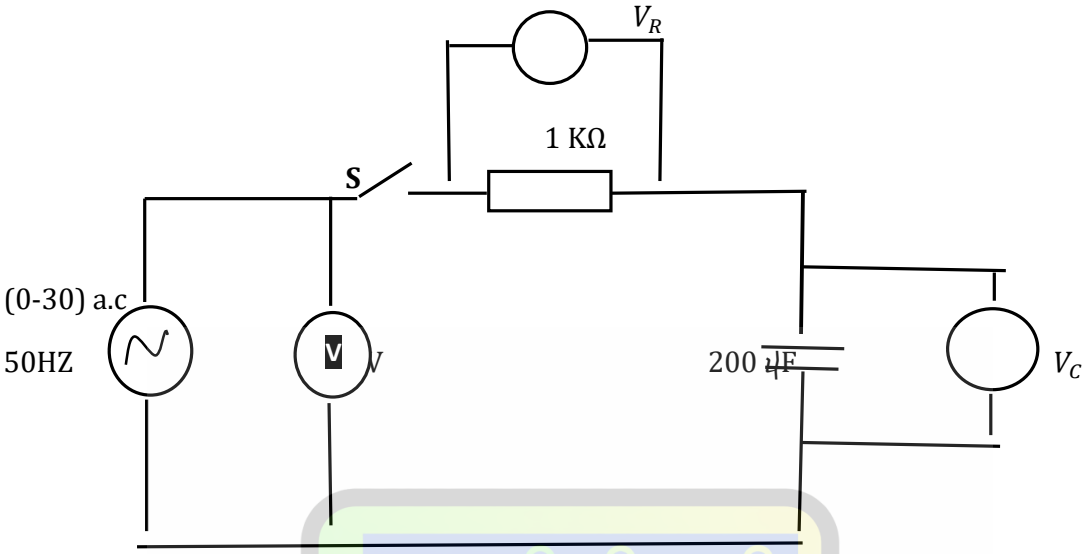

Figure 1

(a) Connect the circuit as shown in figure 1.

(b) Ask the supervisor to check the circuit connection.

(c) Copy the table 1 into your answer booklet.

Table 1

V_S	V_R (V)	V_C (V)
0		
5		
10		
15		
20		
25		

(d) Set the variable a.c. power supply to 0V and close the switch (S).

(e) Read and record in the Table 1, the voltmeter reading of V_R (V) and V_C (V)

(f) Open the switch, S

(g) Adjust the variable a.c. power supply to 5V and close the switch, S.

(h) Read and record in the Table 1, the voltmeter reading of V_R (V) and V_C (V)

(i) Repeat steps (f) to (h) for the other values of V_S in the Table 1.

(j) Plot a graph of V_C (V) on the vertical axis against V_R (V) on the horizontal axis.

(k) Determine

(i) Slope of the graph

(ii) Lead angle using the slope of the graph

2. Aim: To determine the effect of resistance on the current in an a.c. circuit.

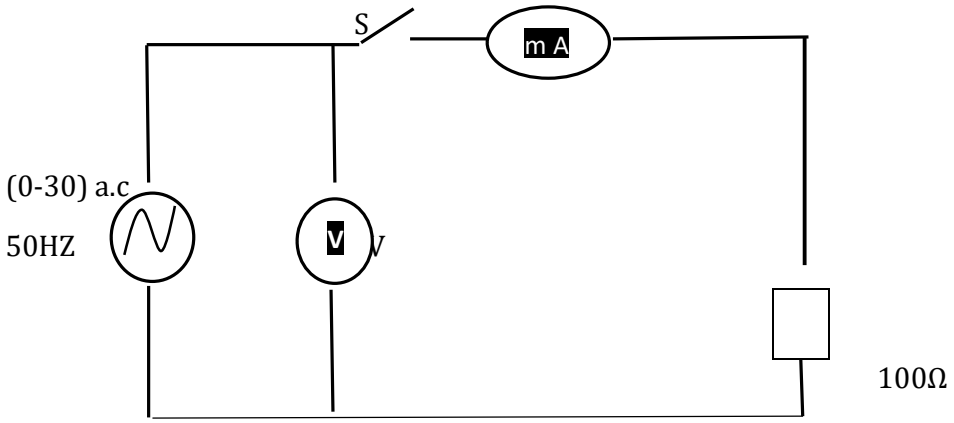

Figure 2

(a) Connect the circuit as shown in Figure 2.
(b) Ask the supervisor to check the connection.
(c) Copy Table 2 into your answer booklet

Resistance (Ω)	Current (m A)
100	
200	
300	
400	
500	

(d) Set the variable a.c power supply to 25V.
(e) Close the switch, S.
(f) Read and record in Table 2, the ammeter readings.
(g) Open the switch, S.
(h) Replace the 100Ω resistor with the 200Ω resistor and close the switch, S
(i) Read and record in Table 2 the corresponding ammeter reading.
(j) Repeat steps (g) to (i) for the other values of resistors in Table 2.
(k) Plot a graph of current (m A) on the vertical axis against resistance (Ω) on the horizontal axis
(l) Comment on the graph

END OF PAPER