NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA
FACULTY OF SCIENCES

DEPARTMENT OF PURE AND APPLIED SCIENCE

2021_2 EXAMINATIONS5678

COURSE CODE: **PHY308**

COURSE TITLE: **ELECTRONICSI**
CREDIT UNIT: **2**
TIME ALLOWED: **(2 HRS)**

INSTRUCTION: ***Answer question 1 and any other three questions***

QUESTION 1

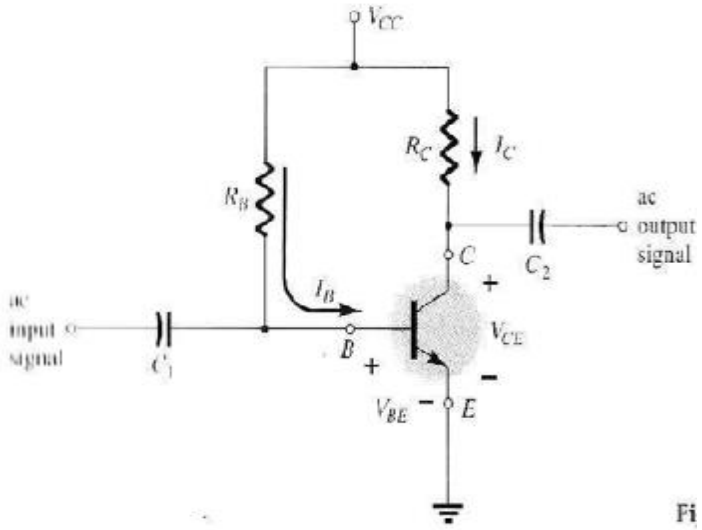
(a). List some of the factors that the h-parameters depend on. (3 marks)
(b).Enumerate four (4) uses of multivibrators. (4 marks)
(c). Briefly describe the characteristics of the BJT operation in the cut-off, saturation, and linear regions. (4.5 marks)
(d). The frequency of time-period of the oscillatory current depends on two factors. Explain them. (3 marks)
(e). Highlight three (3) advantages of Negative Feedback. (3 marks)
(f). Write three (3) applications of Resonance Effect. (3 marks)
(g). What is the use of a Nyquist plot? (2 marks)
(h). What is a Choke Input or L-C Filter? (2.5 marks)

QUESTION 2

(a). What are oscillators? (3 marks)

(b). Briefly explain what you understand as the Common Base Configuration of a transistor. (4 marks)

(c).



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In the circuit above, determine the following for the fixed-bias configuration:

(i) I_{BQ} and I_{CQ} (ii) V_{CEQ} (iii) V_B and V_C and (iv) V_{BC}.

Given that V_{cc} = +12 V, V_{BE} = 0.5 V,

R_B = 200 kΩ, R_C = 4 kΩ, $C_1 = C_2$ = 8 μF and β = 30.

What is the implication of the answer in (iv)? (8 marks)

QUESTION 3

(a). How does a feedback amplifier function? (4 marks)

(b). Show the diagrammatic representation of the:

(i) construction (ii) two-diode analogy and

(iii) symbols of a PNP and NPN transistors. (4 marks)

(c). Briefly discuss the common collector amplifier circuit. (7 marks)

QUESTION 4

(a). Mention the usage of an oscillator? (4 marks)

(b). Explain an Uninterruptible Power Supply (UPS)? (5 marks)

(c). Explain the Piezoelectric Effect. (6 marks)

QUESTION 5

(a). Give the two reasons for the loss of energy during the oscillations of the capacitor in an oscillatory circuit. (4 marks)

(b). What is an Operational Amplifier? (6 marks)

(c). What do you understand by Windmill? (5 marks)