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

DEPARTMENT OF PURE AND APPLIED SCIENCE

2022_2 EXAMINATIONS

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). What is the efficiency of an amplifier? (2.5 marks)
(b). State the operating point of a transistor. (2.5 marks)
(c). What do you understand by the term biasing? (2.5 marks)
(d). Mention the advantages of using bridge rectifier. (3 marks)
(e). List the available types of multivibrators (MV). (3 marks)
(f). Enumerate some of the uses of Linear Integrated Circuit. (4 marks)
(g). Highlight four types of power supply. (5 marks)
(h). Define Gain margin (GM). (2.5 marks)

QUESTION 2

(a). What is a bipolar junction transistor? (2.5 marks)

(b). Write a short note on Amplifier Efficiency. (8 marks)

(c). In a BJT, the emitter current is 12 mA and the emitter current is 1.02 times the collector current. Find the base current. (4.5 marks)

QUESTION 3

(a). What are the types of configuration in transistors? (2 marks)

(b). State two advantages of Class A Amplifiers. (2 marks)

(c). The h-parameter of a transistor used in a common emitter circuit are $h_{ie} = 1\ k\Omega$, $h_{re} = 1 \text{ x } 10^{-4}$, $h_{fe} = 50$ and $h_{oe} = 100\ \mu mhos$. The load resistor for the transistor is 1 kΩ in the collector circuit. The transistor is supplied from a signal source of

the amplifier stage. (11 marks)

QUESTION 4

(a). What are the four possible combinations of bias condition of a BJT with two junctions? (4 marks)

(b). Calculate the cut-off frequency of a first-order low-pass filter for R_1 = 1.8 kΩ and C_1 = 0.082 pF. (2 marks)

(c). A half-wave rectifier using silicon diode has a secondary e.m.f of 15.3 V(rms) with a resistance of 0.4 Ω. The diode has a forward resistance of 0.8 Ω and a threshold voltage of 0.6 V. If load resistance is 12 Ω, determine:

(i) dc load current (ii) dc load voltage and (iii) voltage regulation. (9 marks)

QUESTION 5

(a). What is Power amplifier? (3 marks)

(b). Explain the workings of an Operational Amplifier Shunt Voltage Regulator. (7 marks)

(c). A tuned-collector oscillator has a fixed inductance of 70 μH and has to be tunable over the frequency band of 500 kHz to 1000 kHz. Find the range of variable capacitor to be used. (5 marks)