FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
SECOND SEMESTER EXAMINATION 2019/2020 SESSION
MCB 525 (PHARMACEUTICAL MICROBIOLOGY) (2 CREDIT UNITS)
Instruction : Attempt any two (2) Questions in each section
TIME: 2hours

SECTION A

1(a). Describe the following terms and give specific example(s) in each case:
- (i) Chemotherapy,
- (ii) Antibiotic,
- (iii) Prophylaxis,
- (iv) Vaccination,
- (v) Antiseptic,
- (vi) Disinfectant,
- (vii) Preservative,
- (viii) Antimicrobials,
- (ix) Selective toxicity, and
- (x) Pharmaceutical Microbiology

1(b). Discuss antibiotics on the basis of their types as well as their actions

1(c). Make large diagrams of **Clavulanic acid** and a **Fluoroquinolone.**

2(a). Explain spoilage, its sources and preservation of pharmaceutical products with examples

2(b). Outline Pharmaceutical ingredients susceptible to microbial attack

2(c). What are the observable effects of microbial attack on pharmaceutical products?

3(a). What are plant secondary metabolites and why are they produced?

3(b). Give the descriptive features of *Garcinia kola*, *Aframomum melegueta*, *Chasmanthera dependens* and *Nauclea latifolia* and their medical importance.

SECTION B

4. Study the Table 1 below and aanswer the following questions :
- (i) Calculate the mean and standard deviation for the triplicate determinations
- (ii) Explain the principle of the susceptibility test used
- (iii) Explain the response of *Pseudomonas aeruginosa* to E_1. What can you attribute to this response?
- (iv) Differentiate between this susceptibility method and agar dilution method.

Table 1: Antibacterial Activity of Plant Extracts against Some Pathogenic Organisms

Isolates	Zones of inhibition (mm) E_1	E_2	Amoxicillin
	0.00	11.00	18.00
Pseudomonas aeruginosa	0.00	12.00	18.00
	0.00	13.00	19.00
Escherichia coli	15.00	15.00	4.00
	14.00	17.00	5.00
	18.00	14.00	4.00
Klebsiella pneumoniae	22.00	13.00	20.00
	20.00	15.00	21.00
	18.00	12.00	22.00
Staphylococcus aureus	25.00	12.00	0.00
	22.00	14.00	0.00
	24.00	16.00	0.00
Streptococcus pyogenes	19.00	17.00	22.00
	17.00	15.00	21.00
	16.00	18.00	20.00

E_1: N-hexane extract, E_2: Ethylacetate extract

Note: Deviation from mean = (x – x), n = number of population; x = mean of population

$$\text{Standard deviation} = \sqrt{\frac{\varepsilon(x-x)^2}{n}}$$

5. Write short notes on the following:
   (a) Plant materials for extraction
   (b) Solvent of extraction
   (c) Discuss the significance of serial exhaustive extraction of plant materials.