



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2019/2020

SUPPLEMENTARY/SPECIAL EXAMINATION FOR THE DEGREE OF BACHELOR OF PHARMACY (B.PHARM)

PPA 410: PHARMACEUTICS IV

DATE: Thursday 16th January 2020

TIME: 2.00p.m -5.00p.m

INSTRUCTIONS:

- The paper consists of three sections; A, B and C
- Answer all questions
- Answer sections A, B and C in separate booklets

SECTION A

1. The following are factors affecting F-value EXCEPT....
 - A. Container size
 - B. Container geometry
 - C. Container heat co-efficient
 - D. Radiation dose
 - E. Product viscosity
2. A chemical used for removal of microorganisms from mucous membrane and skin is referred to:
 - A. Detergent
 - B. Sanitizer
 - C. Pesticide
 - D. Antiseptic
 - E. Disinfectant
3. Choose the appropriate condition for inspissation
 - A. 60-65°C for 1 hour
 - B. 80-85°C for 30 minutes
 - C. 60-65°C for 30 minutes for 3 successive days.
 - D. 80-85°C for 30 minutes for 3 consecutive days
 - E. 121°C for 15 minutes

4. High Efficiency Particle Air (HEPA) filters remove particles that are
 - A. Less than 0.01 μm
 - B. Less than 0.1 μm
 - C. Greater than 0.03 μm and less than 0.1 μm
 - D. Greater than 0.03 μm and less than 0.3 μm
 - E. Greater than 0.3 μm
5. The following is true about iodophores
 - A. are staining
 - B. are toxic
 - C. have prolonged action
 - D. cause iodine allergies
 - E. cause burns and blisters
6. Mechanism of glutaraldehyde and formaldehyde disinfection
 - A. cross linking nucleic acids and proteins
 - B. disrupting microbial membranes
 - C. altering cell membrane permeability
 - D. preventing the uptake of substrates
 - E. oxidizing cell constituents
7. The following statements about Ethylene oxide are true EXCEPT
 - A. It is colourless
 - B. It is odourless
 - C. It is normally combined with CO_2
 - D. It is mutagenic
 - E. It can be used on skin
8. Thermal Death Time (TDT) is the
 - A. Time required to kill all cells at a given temperature
 - B. Time required to kill a certain population of cells at a given temperature
 - C. Time required to reduce population of cells by 90%
 - D. Time required to reduce population of cells by 10%
 - E. Time required to reduce population of cells to 1%

9. Phenol co-efficient indicates
- A. Efficiency of a disinfectant
 - B. Dilution of a disinfectant
 - C. Purity of a disinfectant
 - D. Quality of a disinfectant
 - E. Shelf life of a disinfectant
10. Gamma rays are used for sterilization of the following EXCEPT:
- A. Glassware
 - B. Food
 - C. Human tissue grafts
 - D. Hormones
 - E. Vitamins
11. Define the following terms (3 marks)
- i. Antisepsis
 - ii. Sterility
 - iii. Bioburden
12. A food processing company produces canned meat. Prevention of *Clostridium botulinum* spores is important. The D_{121} for botulinum spores is 0.2 minutes and the Z value is 10 °C. The company wants to sterilize the canned food at 111°C. What should the length of sterilization be if they aim to kill 10^{12} spores per can content? (3 marks)
13. The Z value for a microorganism is 2°C. It takes 54 minutes at 75°C to reduce the population from 10^9 to 10^6 . At what temperature should the microorganism be treated to achieve the same result in 10.8 sec?. (2 marks)
14. List 2 factors that affect the effectiveness of a sterilization process. (2 marks)
15. Explain why saturated steam is an efficient sterilizing agent. (6 marks)
16. Describe the biocidal mechanism of the following (4 marks)
- i) Electron beam radiation
 - ii) Ultra-sonic vibrations
17. Discuss FIVE factors affecting sterilization by heat. (10 marks)

SECTION B

1. Explain the following terms:
 - a. *In vitro* studies
 - b. *In vivo* studies
 - c. *In silico* studies
 - d. *In situ* studies
 - e. Disintegration time (10 marks)
2. Explain five areas of coverage of Biopharmaceutics (10 marks)
3. Explain with illustrations how serial addition of binder to different batches of a typical formulation of a conventional tablet will influence the Biopharmaceutics of the tablet. (10 marks)
4. Explain two drug-related and three body-related factors that may influence the absorption of paracetamol tablets. (10 marks)

SECTION C

1. Describe five characteristics of drugs that require gastro intestinal drug delivery systems. (5 marks)
2. Outline five advantages of rectal route of drug administration (5 marks)
3. Discuss five ways of enhancing nasal absorption of drugs. (5 marks)
4. With the use of an appropriate formula, define aerodynamic diameter (5 marks)
5. Discuss the role of drug particle size and shape on deposition at the respiratory tract. (5 marks)
6. Outline five physiological barriers to ocular drug permeation. (5 marks)
7. Regarding propellants used in metered dose inhalers
 - i. State four examples. (2 marks)
 - ii. Describe the purpose of propellants. (3 marks)
8. Explain five formulation considerations for parenteral routes of drug administration. (5 marks)