SAMPLE PHARMACEUTICS PAPER 2

DATE

VENUE

TIME

Examiners...

TIME ALLOWED : THREE HOURS

SECTION A

Write an essay on one of the following:

1. The formulation and potential uses of liposome preparations.
2. Has a Pharmacopoeia any relevance?
3. Have in-vitro dissolution tests any practical uses?

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SECTION B

Answer all questions. Mark **one box only** to indicate the answer you consider correct for each question.

Answers to all questions are to be recorded on the multiple-choice forms, which accompany this examination paper in the format True/False or A-E.

Select only one answer to each question. A negative marking system is in operation for incorrect answers or where more than one answer is selected and if you are doubtful as to the correct answer to a question you may leave the box blank.

Rough calculations may be shown in an examination booklet.

*Candidates must ensure that their name and student number is included on both multiple choice forms and any booklets*, all of which must be presented to the supervisor at the completion of the examination.
Multiple Choice Questions : A – E and True / False

1. The serum level \((C_p \, \mu m \, ml^{-1})\) versus time \((t, \, hr)\) curve following bolus intravenous injection of 25 mg of a new drug was described by the following equation:

\[ C_p = 0.5e^{-0.35t} \]

The half life of the drug is:

a) 0.505 hr\(^{-1}\)
b) 0.7 hr
c) 1.98 hr\(^{-1}\)
d) 1.4 hr\(^{-1}\)
e) 71.4 hr\(^{-1}\)

2. The volume of distribution (Vd) of the drug is:

a) 500 L\(^{-1}\)
b) 50 L
c) 50 ml
d) 0.02 ml\(^{-1}\)
e) none of the above

3. The total body clearance is:

a) 17.5 ml hr\(^{-1}\)
b) 99 ml hr\(^{-1}\)
c) 99 L hr\(^{-1}\)
d) 17.5 L hr\(^{-1}\)
e) none of the above

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4. The amount of drug recovered (cumulative) unchanged in the urine following a 10 mg dose (see Question 1) was 3 mg, while 2 mg of drug as the sulphate conjugate was also recovered in the urine.

   a) Estimate the urinary elimination rate constant of the drug.
   b) Estimate the renal clearance of the drug.

5. The drug (as per Question 1) was administered by intravenous infusion at a rate of 10 mg per hour.

   a) What steady state serum level will result from this infusion rate?

6. The components below, enhance percutaneous absorption.

   a) DMSO
      True □ False □

   b) Lactose
      True □ False □

   c) Water
      True □ False □

   d) HPMC
      True □ False □
7. Give two (2) major factors affecting the dissolution rate of drugs.
   i) 
   ii) 

8. List any two (2) potential advantages of the use of ion-exchange resins in the design of drug delivery systems.
   i) 
   ii) 

9. PLA polymers tend to be more biodegradable than PGLA polymers?
   True ☐ False ☐
   Comment on your answer: 

10. An increase in drug concentration will bring about an increase in clearance values for passively absorbed drugs.
    True ☐ False ☐ Unknown ☐
11. The lag time in the absorption of a particular drug will be the same when estimated by either an in-vitro or an in situ technique.

   True  □     False  □     Unknown  □

12. An increase in resistance time in the gut will result in a subsequent increase in reserve length.

   True  □     False  □     Unknown  □

13. The aqueous diffusion layer thickness is an important rate-limiting step in the absorption of highly lipophilic drugs.

   True  □     False  □     Unknown  □

14. Transfollicular absorption is negligible in topical therapy.

   True  □     False  □     Unknown  □

15. Radioactively labelled medicaments are ideal for studying percutaneous absorption.

   True  □     False  □     Unknown  □

16. Esterification of steroidal compounds always enhances percutaneous absorption.

   True  □     False  □     Unknown  □
17. Vehicle composition has no effect on percutaneous absorption.

True    False    Unknown

18. Increased concentration of drug substance in the formulation produces a proportionate increase in the amount absorbed percutaneously.

True    False    Unknown

19. Drugs which are highly bound to tissues tend to have very large extrapolate volumes of distribution (V dist.).

True    False    Unknown

20. The human milk/plasma concentration ratio for a basic drug (e.g. erythromycin) should be higher than that for an acidic drug (e.g. penicillin).

True    False    Unknown

21. Drug metabolism only occurs in the liver.

True    False    Unknown

22. The release into aqueous sink from a single surface of a slab of siastic impregnated with fine particles of progesterone is proportional to time.

Square route of time    Time squared    Independent of time

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23. Coacervation phase separation procedures for microencapsulation work only with hydrophilic colloids.

True □ False □ Unknown □

24. Decrease in microcapsule size at constant core:coat ratio causes decrease in the rate of drug release.

True □ False □ Unknown □

25. Addition of cholesterol to liposome formulations makes the product more permeable at the phase transition temperature of the system.

True □ False □ Unknown □

26. The dosage in rads from a radioactive pharmaceutical depends on the relative biological efficiency of the radiation.

True □ False □ Unknown □