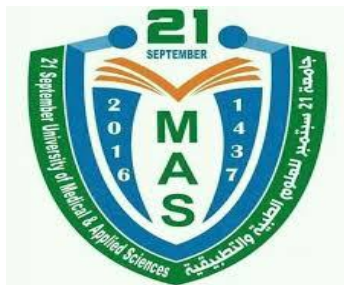


نموذج 1



الجمهورية اليمنية
وزارة التعليم العالي والبحث العلمي
جامعة 21 سبتمبر للعلوم الطبية والتطبيقية
كلية الصيدلة السريرية

Level	4 TH	Semester	2 ND	Year	2020-2021	Time allowed	2 hour
Final-term Exam	of	“Pharmacokinetics		حركية دواء			

Note : The exam is composed of (3) Pages

Helping Equations

$[AUC]_{\infty} = \frac{A}{\alpha} + \frac{B}{b} + \frac{C}{\delta}$	$D^{\circ} = C_p V_D$
$t_{1/2} = 0.5 C_p^0 / k$	$k_{21} = \frac{Ab + B\alpha}{A + B}$
$k_{12} = \frac{AB(b - \alpha)^2}{(A + B)(Ab + B\alpha)}$	DR = Du ∞ - Du
$k = \frac{\alpha b(A + B)}{Ab + B\alpha}$	$t_{1/2} = \frac{0.693}{k}$
$C_p = C_{p0} - (k.t)$	$k = -2.303 (\log C_{p3} - \log C_{p1}) / (t_3 - t_1)$
$Cl_T = \frac{D_0}{[AUC]_0}$	$Cl_T = k.V_D$
$\log C_p = \log C_{p0} - (k.t / 2.303)$	$k = - (C_{p2} - C_{p1}) / (t_2 - t_1)$

CHOOSE THE CORRECT ANSWER

1. After a single I.V. injection of 100-mg dose of a drug, the following equation was obtained

$$C_p = 222e^{-0.256t} + 25e^{-0.034t} + 6.7e^{-0.102t}$$

- (i) What is the type of pharmacokinetic model of that drug ?
- Three compartment
 - Two compartment
 - One compartment
 - None

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(ii) Calculate the plasma level of the drug 5 hours after the IV dose.

- a. **1010.4**
- b. 3.6
- c. 66.7
- d. 12.1

(iii) Calculate AUC_{∞} of the drug

- a. **1668.2**
 - b. 2800.4
 - c. 3123.5
 - d. 1.6
- =====

2. After administering a single intravenous dose (10 mg/kg) of a drug in nine normal volunteers (average body weight is 78 kg) , the following equation was obtained

$$C_p = 1.56 e^{-0.213t} + 71.3 e^{-0.098t}$$

(i) Calculate the rate constant of distribution of the drug from body tissues to blood.

- a. 0.782
- b. **0.211**
- c. 0.045
- d. 5.21

(ii) Determine the elimination half-life of the drug

- a. 12.3
 - b. **6.99**
 - c. 2.45
 - d. 1.005
- =====

3. A patient was given a single IV dose of a drug at a dose of 750 mg. Blood samples were taken at various time intervals. (C_p) was determined from the plasma sample and (D_t) from urine samples as follows:

t (hr)	C_p mg/L	D_t (mg)
0.25	33.5	30
1	21.2	102
2	13.4	45
4	11.9	61
12	9.5	17
100	2.3	28

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- (i) Determine the Order of elimination (from blood data)
- a. Zero
 - b. Second
 - c. **First**
 - d. None

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- (ii) Calculate elimination rate constant (from blood data)
- a. 1.43
 - b. 2.005
 - c. **0.017**
 - d. 0.0005

$$k = -2.303 \times \log (2.3) - \log (11.9) / (100 -4) = 0.017$$

- (iii) If the volume of distribution of the drug is 20 L, calculate the total clearance
- a. 77.1
 - b. 12.5
 - c. **0.34**
 - d. 107.3

$$CIT = 20 \text{ L} \times 0.017 = 0.34$$

- (iv) Calculate Du^∞ (from urine data)
- a. 19
 - b. 750
 - c. **283**
 - d. 100

$$Du^\infty = \text{sum} = 283$$

- (v) Determine amount of drug remains to be excreted at 4 hours after drug administration (from urine data)
- a. 230
 - b. 600
 - c. **45**
 - d. 2.1

END OF EXAM # BEST WISHES # DR. ANES THABIT