

Q.P. Code: 95958

Semester Examination- FH2022 (Academic Year 2021-2022)

M. Pharm Sem II (Choice based R2019)

Subject: Computer Aided Drug Development

Total Marks – 80 M

Q. 1 Attempt all multiple-choice questions (MCQ)

20M

| Sr No | Questions | Options |
|-------|--|---|
| 1. | The degree to which the statistical model represents the data collected is known as the | a Homogeneity b Fit c Reliability d Validity |
| 2. | In Gastroplus® parameter sensitivity analysis | a We change parameter values to test the effect on the dynamics of the system b We change the values of time and/or space c We estimate parameter values that better fit the experimental data d We predict and analyze equilibrium states |
| 3. | The design of the experiment is used to determine the variables which | a most affect the state of the process b least affect the state of the process c have no effect on the state of the process d have unpredictable effects on the state of the process |
| 4. | Choose the correct sequence of steps involved in computational fluid dynamic i. Create suitable mesh ii. Solution of discrete equations iii. Setup boundary conditions iv. Identify and build computational domain | a iv-i-iii-ii b ii-i-iii-iv c iii-iv-i-ii d i-ii-iii-iv |
| 5. | _____ plays a crucial role in assessing the robustness of the findings or conclusions based on primary analyses of data. | a Statistical modeling b Mechanistic modeling c Confidence interval d Sensitivity analysis |
| 6. | Which is NOT TRUE about P-gp transporter | a Improves intestinal absorption of drugs b ATP-dependent transporter c Efflux transporter d Limits intestinal absorption of drugs |
| 7. | | a Quick onset of action b Increase the drug dose |

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| | Which sentence is false in the merits of SMEDDS | c | Ease of manufacturing and scale up |
| | | d | Improvement in oral bioavailability. |
| 8. | A Virtual trial refers to _____ on a number of virtual subjects, wherein the values of the selected variables are randomly sampled from predetermined distribution. | a | Stochastic simulations |
| | | b | Predetermined simulations |
| | | c | Non-random simulations |
| | | d | Partially predetermined, partially non-random simulations |
| 9. | ICH Q8 guidelines are related to _____ | a | Pharmaceutical development |
| | | b | Pharmaceutical risk management |
| | | c | Pharmaceutical Quality systems |
| | | d | Pharmaceutical packaging |
| 10. | A drug can be said to be a P-gp substrate if its efflux ratio is | a | less than 0.5 |
| | | b | equal to 1 |
| | | c | between 1 and 2 |
| | | d | more than 2 |
| 11. | _____ are the components of Pseudo ternary phase diagram constructed during SMEDDS formulations. | a | Oil:Surfactant:Water |
| | | b | Oil:Smix:Water |
| | | c | Oil:Drug:Water |
| | | d | Oil:Drug:Surfactant |
| 12. | Level 2 of computer simulations in pharmacokinetics and pharmacodynamics involve | a | Tissue and Organ |
| | | b | Whole Body |
| | | c | Cell |
| | | d | Protein and Genome |
| 13. | Predictive models for BCRP, hPEPT1 and ASBT are developed to simulate | a | active transport of specific drugs |
| | | b | passive diffusion of specific drugs |
| | | c | bulk flow of specific drugs |
| | | d | paracellular transport of specific drugs |
| 14. | In the year _____, the term Artificial Intelligence was coined for first time | a | 1956 |
| | | b | 1965 |
| | | c | 1950 |
| | | d | 1970 |
| 15. | DISCO is an automated module for | a | pharmacophore modeling of drug disposition |
| | | b | QSAR modeling of drug disposition |
| | | c | docking studies related to drug disposition |
| | | d | similarity based design modeling of drug disposition |
| 16. | Which of the following tools of artificial intelligence is more relevant to the Medical/ Pharmaceutical field? | a | Erica Robot |
| | | b | MEDi Robot |
| | | c | TUG Robot |
| | | d | Berg |
| 17. | | a | Molecular pharmacophores |

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| | The following is a qualitative approach used for computational modelling of drug disposition processes. | b | Simple multiple linear regression |
| | | c | Multivariate partial least squares |
| | | d | Support vector machine |
| 18. | GastroPlus is a software package that simulates biopharmaceutics and pharmacokinetics of drugs administered by | a | intravenous and oral routes in humans and animal species |
| | | b | oral routes in humans only |
| | | c | intravenous and oral routes in humans only |
| | | d | intravenous route in humans only |
| 19. | Gastroplus® ACAT model of human GI tract consists of | a | 9 compartments linked in series |
| | | b | 2 compartments linked in series |
| | | c | 5 compartments linked in series |
| | | d | 7 compartments linked in series |
| 20. | Investigators visually examine disease status remotely via videoconferencing, without requiring participants to leave their homes. This is an example of _____ | a | Virtual clinical trial |
| | | b | Artificial intelligence |
| | | c | Robotics |
| | | d | Computational fluid dynamics |

Q.2 Answer any one of the following two questions.

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| | | | 12M |
| i | a. Write a comparative short note on Descriptive versus Mechanistic modeling in pharmaceutical research. | 6M | |
| | b. Give a detailed account of biowaivers. Elaborate on the requirements for a BCS-based biowaiver study. | 6M | |
| ii | a. Write a note on screening designs | 6M | |
| | b. Give an overview of Artificial intelligence significance in healthcare sector | 6M | |

Q.3 Answer any four of the following five questions.

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| | | | 48M |
| i | a. Discuss the essential elements of quality by design | 6M | |
| | b. Briefly discuss important input parameters for ACAT modeling of oral bioavailability. | 6M | |
| ii | a. Write a note on Parameter sensitivity analysis (PSA) with suitable example and give its uses. | 6M | |
| | b. Discuss merits and demerits of Robotics in drug development | 6M | |

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| iii | a. Describe qualitative and quantitative techniques used for computational modeling of drug disposition. | 6M |
| | b. Briefly explain the significance of in vitro-in vivo correlation studies with relevant examples. | 6M |
| iv | a. Discuss formulation development of Pharmaceutical emulsion using any one optimization technique tool | 6M |
| | b. Describe with examples importance of computational fluid dynamics | 6M |
| v | a. Give QbD protocol for developing and optimizing injectable nano-emulsion. Explain CPP in detail | 6M |
| | b. Write a note on prediction of food effects on drug absorption giving suitable example. | 6M |