EAST POINT COLLEGE OF PHARMACY
East Point Campus, Jnana Prabha, Virgo Nagar Post,
Bengaluru – 560049, Karnataka

QUESTION BANK

B Pharmacy

Semester-VIII

EAST POINT COLLEGE OF PHARMACY
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Biostatistics and Research Methodology

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LONG ESSAY 10 MARKS

1. Explain the measures of central tendency

Calculate the mean and standard deviation for the following data on systolic BP of volunteers

Systolic BP(mmHg)	91-100	101-110	111-120	121-130	131-140	141-150
Frequency	08	14	20	26	24	18

2. Explain different types of hypothesis. Explain type I and type II errors, level of significance, P v a lue. Explain the different phases of clinical trials.
3. Discuss the protocol for an experimental study design.
4. Explain 't' test. Find if there is statistical significance in the serum digoxin level in the given data: -Critical value= 2.31($p< 0.05$)

Serum digoxin level(mcg/ml)	1	2	3	4	5	6	7	8	9
After 4 hrs	1.0	0.9	1.0	1.3	1.0	1.3	0.9	1.1	1.0
After 8 hrs	1.0	0.7	1.0	1.2	0.9	0.3	0.8	1.0	1.0

5. What are measures of dispersion? Explain their significance with suitable examples.
6. Explain the various phases of clinical trials.
7. Explain regression analysis and its applications in stability testing of pharmaceuticals.
8. Explain the measures of dispersion. Calculate mean, variance and standard deviation for s the given data:-

Height(cm)	135-140	141-145	146-150	151-155	156-160	161-165	166-170
Frequency	08	12	18	22	20	14	10.

9. Describe the different measures of central tendency. Calculate mean and standard deviation for the given data on mid arm circumference(cm) of 16 children – 14, 12, 13, 10, 11, 13, 14, 12, 12, 11, 10, 13, 12, 11, 10, 14
10. Explain types of observational study designs.
11. Explain with suitable examples regression analysis and standard error of regression.

12. Explain null and alternate hypothesis, type I and type II errors, confidence interval.
13. Explain chi square test. From the following data, test whether prevalence of scabies is significant intwo different genders (critical value=10.83, p, 0.001) :-

Gender	Number with scabies	Number without scabies	Total
Male	1173	10410	11583
Female	547	7640	8187
Total	1720	18050	19770

14. What is hypothesis? What are different types of hypothesis? Explain how you will. formulate ahypothesis with a suitable example
15. What is QbD, Why are DOE essential in a QbD development process?
16. What are the measures variability? What is their statistical significance
17. Discuss different types of observational clinical studies in detail.
18. Discuss various steps involved in testing the significance of single mean and difference between twomeans (independent samples) in small samples using Student's t- test.
19. Classify different types of data, explain any three measures of dispersion with example.
20. Describe briefly the different interventional study designs
21. Explain the hypothesis testing of non-parametric data
22. Describe the various types of measures of dispersion and their significance.
23. Discuss briefly about determination of sample size for simple comparative experiments and forconfidence interval of specific width.
24. Explain the hypothesis testing of non-parametric data
25. How is QbD based product development better. Explain the steps in involved in it.
26. How will you design a clinical study methodologically? Explain briefly.
27. What is hypothesis? What are different types of hypothesis? Explain how you formulate the hypothesiswith a suitable illustration.
28. Discuss about the hypothesis testing of parametric data.

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SHORT ESSAY 05 MARKS

1. Explain types of correlation and correlation coefficient. Give suitable examples.
2. Define probability and explain its significance in statistical inference with examples.
3. What are measures of dispersion? Explain.
4. Explain ANOVA and its applications.
5. Discuss different methods of sampling.
6. Explain the graphical methods of representing quantitative data.
7. Discuss the applications of EXCEL and SPSS programmes in statistical analysis.
8. What are non-parametric tests? Explain chi square test-Goodness of fit test.
9. Explain the types and advantages of factorial design in formulation Development.
10. Explain correlation, types of correlation and its applications.
11. Explain null hypothesis, type I and type II errors.
12. Discuss with examples measures of central tendency.
13. Discuss the sampling methods in research study.
14. Explain probability and its significance in statistical analysis.
15. Explain regression analysis to assess the influence of independent variable on continuous variable.
16. Explain the hypothesis testing using one way of ANOVA.
17. Describe the various of graphical methods of representing quantitative data.
18. Explain a typical experimental study design.
19. Define and explain correlation with examples.
20. Explain student‘t’ test and its applications.
21. Explain types of observational study designs.
22. Explain ANOVA and its significance.
23. Discuss null hypothesis, type I and type II errors.
24. Explain the application of factorial design in pharmaceutical product development.
25. Explain with examples- Histogram, Pie chart.

26. Describe the sampling techniques in research study.
27. Discuss Wilcoxon Rank Sum test and Mann Whitney U test.
28. Explain type I and type II errors.
29. Discuss the methods of sample size calculation in comparative studies.
30. Explain Karl Pearson's coefficient of correlation with examples.
31. Explain chi square test for Goodness of fit.
32. Discuss the applications of SPSS and SAS in research study.
33. Explain one way ANOVA and the assumptions in one way ANOVA.
34. Briefly describe the different distribution patterns of data.
35. Discuss- Histogram, Bar diagram.
36. Explain phases of clinical trial.
37. Define 't' test. Explain the different situations where paired and unpaired 't' tests applied
38. Explain the different measures of dispersion of data.
39. Explain ANOVA and its applications
40. Explain the pharmacokinetic applications of regression analysis.
41. Define and explain probability and its significance in statistics.
42. Define and explain experimental study designs.
43. Discuss the methods of sampling in research study.
44. Explain correlation coefficient and types of correlation.
45. Discuss the applications of SPSS and MINITAB in data analysis.
46. Discuss observational studies.
47. Describe variance and standard error of mean with suitable example.
48. List the elements that need to be incorporated in a clinical study protocol?
49. Explain the concept of DOE
50. Describe how Mean is the most appropriate measure of centrality with suitable example?
51. Explain linear regression? How is it applied for pharmaceutical sciences.
52. Explain the statistics of stability testing of pharmaceutical products
53. Explain the concept of design space in QbD
54. Discuss the general rules for constructing and labeling a graph? b) Describe the construction of a semi- logarithmic graph with an example?

55. How is central tendency measured?
56. What are general rules for constructing and labeling a graph? Write a note on semi-logarithmic plot with an example.
57. Write notes on randomization and objectives of clinical studies.
58. What characteristics of data can be represented by a) Histogram b) Pie chart c) Semi-logarithmic plots
59. How will test hypothesis for ordinal data.
60. Explain chi square test
61. Explain the concept of Fractional factorial Design
62. Compare and contrast Nonparametric and Parametric data
63. Explain the concept of Central Composite Design
64. Explain report writing in research methodology.
65. Explain the hypothesis testing of non-parametric data
66. Describe variance and standard error of mean with suitable example.
67. What are the underlying assumptions of one way ANOVA? Explain under what circumstances ANOVA is the most preferred type of statistical data analysis?
68. Discuss the general rules for constructing and labeling a graph? b) Describe the construction of a semi- logarithmic graph with an example?
69. Compare and contrast Nonparametric and Parametric data
70. What are the underlying assumptions of one way ANOVA? Explain under what circumstances ANOVA is the most preferred type of statistical data analysis?
71. Explain Fractional Factorial Design
72. Role of QbD in Pharmaceutical Development
73. Classify different types of data. Explain any three measures of dispersion with examples.
74. Classify and list the tests used for hypothesis testing of parametric data
75. Classify and explain different types of t- tests.
76. Explain Pearson’s correlation & Spearmann’s correlation.
77. Explain Wilcoxan signed rank test and Mann Whitney U test.
78. Explain in detail about cross-over and parallel clinical study design.

79. Classify types of data. Give an outline of testing hypotheses for different types of data
80. What are Mixture Designs? List their applications
81. Explain linear regression? How is it applied for pharmaceutical sciences?
82. Explain about standard deviation and variance.
83. Explain Pearson's correlation &Spearmann's correlation.
84. List the pharmaceutical applications of Student's t test.
85. List the pharmaceutical applications of Student's t test.
86. Distinguish between parametric and non-parametric tests. For what type of data is Chi Square test performed?
87. What is underlying assumptions of one way ANOVA? If these assumptions are not fulfilled which alternative non-parametric test do you suggest?
88. What is QbD. List the experimental designs used in QbD
89. Explain how computers can be used for patient record database management in hospital pharmacy.

SHORT ANSWER 02 MARKS:

1. Multiple regression.
2. One tailed and Two tailed tests.
3. Pharmaceutical examples for optimization techniques.
4. Degrees of freedom.
5. Standard error of mean and its significance.
6. Two methods of sample size calculation in research study.
7. Examples of application of regression models in stability testing.
8. Wilcoxon Rank Sum test.
9. Normal distribution of data.
10. Types of Observational study designs.
11. Sample size calculation for confidence interval.
12. Power of a study.
13. Pharmaceutical examples for data analysis using SPSS.
14. Factorial design.
15. Degrees of freedom.

16. Report writing in research study.
17. Assumptions in chi square test.
18. Confidence interval.
19. Characteristics of Normal distribution data.
20. Applications of nonparametric tests.
21. chi square test.
22. Power of a study.
23. Confidence interval
24. Probability.
25. Applications of SAS
26. Standard error of mean
27. Features of normal distribution pattern.
28. Optimization technique.
29. Report writing in research study.
30. When is median more important than mean as a measure of central tendency
31. Degrees of freedom.
32. 2^2 and 2^3 designs.
33. Power of a study.
34. Probability.
35. Applications of student‘t’ test.
36. Standard error of mean.
37. One tailed and Two tailed tests.
38. Applications of non-parametric tests.
39. Confidence interval.
40. Pharmaceutical examples of optimization techniques.
41. Characteristics of normal distribution.
42. Standard error of mean.
43. Histograms.
44. Report writing in research study.
45. Wilcoxon Rank Sum test.
46. Differentiate between sample and population parameter.

47. Power of study.
48. Descriptive and interferential statistics.
49. Classification of clinical study designs.
50. Factorial design.
51. Power of study
52. Confidence interval
53. Define blinding in clinical study.
54. Differentiate SD and SEM.
55. Difference between nominal and ordinal type of data.
56. Define scatter plots.
57. p-value
58. Mann Whitney U tests.
59. Advantages of Design space
60. Explain one way analysis of variance.
61. Confidence interval
62. Classification of clinical study designs
63. Power of study.
64. Define coefficient of variation.
65. Comparison of means between three or more distinct/independent groups which parametric and non-parametric test can be used in inferential statistics?
66. Sign test.
67. Pearson's Correlation.
68. Standard Error of Mean.
69. Advantages of Data visualization methods.
70. Central composite design.
71. Define bias in clinical study.
72. Role of sample size in calculation of confidence interval.
73. Characteristics of normal distribution.
74. Advantages and disadvantages Pie charts.
75. Explain: Range, Interquartile range and Variance
76. Standard Error of Mean.

77. One tailed and two tailed tests.
78. Control Space.
79. Inclusion & exclusion criteria
80. Define histogram
81. Define discrete and continuous variables.
82. Pie charts.
83. Types of correlation.
84. What is Control Space
85. Difference between ANOVA and student t test.
86. What factors qualifies mode to be the best measure of central tendency?
87. Define α and β error.
88. Degree of freedom.
89. Classify observational and experimental studies.
90. What is interventional study?
91. List the characteristics of observational studies.
92. Define coefficient of variation.
93. Characteristics of normal distribution.
94. Define semi logarithmic plots.
95. Application of Post Hoc tests
96. Type I and Type II errors in hypothesis testing.
97. Design Space
98. Degrees of freedom.
99. Define surrogate & direct end point.
100. Relationship between sample size and power of the study.

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SOCIAL AND PREVENTIVE PHARMACY

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LONG ESSAYS 10 MARKS

1. Explain different vitamin deficiency disorders and their prevention.
2. Explain Integrated disease surveillance programme (IDSP).
3. Write a note on national health programme and national AIDS control programme.
4. Explain the evaluation of public health.
5. What are national health programs, write in detail about national AIDS control program.
6. Write general principles of prevention and control of respiratory infections.
7. Explain different vitamin deficiency disorders and their prevention.
8. Write general principles, prevention and control of cholera.
9. Explain about national Tuberculosis health programme.
10. Define malnutrition and write about types & diseases associated with it.
11. Write general principles of prevention and control of diabetes mellitus.
12. Write a note on HIV and AIDS control program.
13. Explain the Evaluation of public health.
14. Describe the general principles for prevention and control of malaria.
15. Explain national leprosy control programme.
16. Write a note on concept of health and disease.
17. Write general principles of prevention and control of acute respiratory infection.
18. Write a note on objectives, functioning and scope of national leprosy control program
19. Write a note on General principles and control of cancer.
20. Write a note on HIV and AIDS control programme.
21. Define malnutrition write the causes, symptoms and its prevention.
22. Explain prevention and control of hypertension.
23. What is SARS write its symptoms, prevention and control.
24. Define malnutrition and & diseases associated with it.
25. Write general principles, prevention and control of cholera.
26. Integrated disease surveillance program (IDSP).
27. Explain in detail vitamin deficiency disorders and their prevention.
28. Explain malnutrition in detail and its prevention.
29. Describe the general principles, prevention and control of Dengue.
30. Explain objectives and functions of universal immunization programme.

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SHORT ESSAYS 05 MARKS

1. Write a note on food with relation to nutrition and health.
2. Write general principles of prevention and control of cholera.
3. Write the evaluation of public health.
4. What is SARS write its symptoms and prevention?
5. What are the objectives of national family welfare programme?
6. Objectives and functions of national leprosy programme.
7. What are the functions of Primary Health Centres.
8. Objectives and implementation of national tobacco control programme.
9. What are the community services in urban areas?
10. Write functions of PHC in health care system.
11. Role of WHO in Indian national health program.
12. Explain the concept of diseases.
13. Explain about malnutrition and its preventive measures.
14. Explain prevention and control of Dengue.
15. Explain about Integrated disease surveillance program (IDSP).
16. Explain national health intervention program for mother and child.
17. Write the objectives in improving rural sanitation.
18. Explain the universal immunization program.
19. Write the concept of diseases.
20. Explain prevention and control of diabetes mellitus.
21. Explain the effects of Ebola virus, mode of transmission and prevention.
22. Write about national leprosy control programme.
23. Write a note on food with relation to nutrition and health.
24. What are the objectives of national family welfare programme?
25. Write the community health services in urban area.
26. Write the evaluation of public health.
27. Objectives and implementations of national tobacco control programme
28. Write the concept of prevention of diseases.
29. Prevention and control of dengue.
30. Write about national intervention programme for mother and child.

31. Explain about malnutrition and its prevention.
32. National Malaria prevention programme
33. How rural sanitation helps in improving health care system.
34. What is influenza? write its prevention and control.
35. Role of WHO in Indian national health programme.
36. What is national urban health mission?
37. Explain Concept of nutritional deficiency disease.
38. Socio cultural factors related to health and diseases.
39. General principles of prevention and control of acute respiratory infections.
40. General principles of prevention and control of lymphatic filariasis.
41. Explain the objectives and functions of HIV control programme.
42. Explain National Malaria preventive programme.
43. Role of WHO in Indian national programme.
44. Explain functions of Primary Health Centers.
45. Measures to improve rural sanitation.
46. Explain malnutrition and its prevention.
47. Write a note on Balanced diet.
48. General principles, prevention and control of hypertension.
49. Explain Vitamin deficiencies.
50. Explain role of WHO in Indian national program.
51. Explain National family welfare programme.
52. Explain Community services in urban health.
53. Explain Improvement in rural sanitation.
54. Prevention and control of cholera.
55. Write briefly about nutritional deficiency.
56. Write a note on food with relation to diseases.
57. Prevention and control of diabetes mellitus.
58. Explain drug addiction and drug substance abuse.
59. Functions of TB control programme.
60. Objectives of pulse polio programme.
61. Role of WHO in intervention programme for mother.
62. Community services in rural health.

63. Write the objectives of national urban health mission.
64. Write a note on prevention of vitamin deficiency diseases.
65. Define health, write a note on evolution of public health.
66. Prevention and control of malaria.
67. Write a note on control of deafness.
68. Role of WHO in Indian national programme.
69. National family welfare programme.
70. Enumerate the functions of Primary Health Centers.
71. Write the objectives of national urban health mission.
72. Prevention and control of SARS.
73. Write the staff pattern of PHC and their responsibilities.
74. Objectives and implementation of national tobacco control programme.
75. What are objectives of the community services in rural areas.
76. Role of WHO in Indian national health programme.
77. National AIDS control programme.
78. Prevention and control of diabetes mellitus.
79. Write the mode of transmission and prevention of Ebola virus.
80. Write the health problems associated with under nutrition.
81. Write the concept of control of diseases.
82. Write the evaluation of public health.
83. Write the causative factors, signs and symptoms of influenza.
84. Write a note on prevention of dengue.
85. Write about national leprosy control programme
86. Role of WHO in Indian national health programme.
87. What are the functions of PHC.
88. Causes of Rickets and its prevention.
89. How healthcare system is improved by improving rural sanitation.
90. Objectives of national family welfare programme.
91. Objectives of national family welfare programme.
92. Write functions of PHC in health care system.
93. Role of WHO in Indian national health program.
94. Explain the concept of diseases.

95. Explain about malnutrition and its preventive measures.
96. Explain prevention and control of Dengue.
97. Explain about Integrated disease surveillance program (IDSP).
98. Explain national health intervention program for mother and child.
99. Write the objectives in improving rural sanitation.
100. Explain the universal immunization program.

SHORT ANSWERS 02 MARKS

1. What is Beriberi?
2. Causes of malaria.
3. Objectives of National Tuberculosis programme.
4. Toxic effects of tobacco.
5. What is national urban health mission?
6. Importance of personal hygiene.
7. Lymphatic filariasis.
8. Objectives of national mental health programme.
9. Health care programme for elderly.
10. Health promotion in schools.
11. What is Night blindness?
12. Social Causes of diseases.
13. Define cholera and its symptoms.
14. Write about drug addiction.
15. What is health care for elderly?
16. Prevention and control of deafness.
17. Health education in schools.
18. Urban health mission.
19. Define health.
20. Harmful effects of Tobacco.
21. What is Marasmus?
22. Socio cultural factors to health and diseases.
23. Screening of diabetes mellitus.
24. What is SARS?

25. What is universal immunization program?
26. Objectives of national mental health program.
27. Intervention programme for children.
28. Adverse health effects of open defecation.
29. How to improve health education in schools?
30. Health issues of old age.
31. What is Rickets?
32. Symptoms of Pneumonia.
33. Immunization of infants.
34. Sources of tobacco.
35. Rural sanitation.
36. Importance of personal hygiene.
37. Difference between drug abuse and drug addiction.
38. Define mental health.
39. Mention psychological problems of elders.
40. Dental health education in schools.
41. Explain malnutrition in detail and its prevention.
42. Describe the general principles, prevention and control of Dengue.
43. Explain objectives and functions of universal immunization programme.
44. Define Hygiene and health.
45. Factors of poverty on health.
46. Prevention of cancer.
47. Control of SARS.
48. Write the outcome of Universal immunization programme.
49. Define mental health.
50. Mention Interventions for child development programme.
51. Write a note on Social health.
52. National urban health mission.
53. Enlist community services for health promotion.
54. Prevention of chicken guinea.
55. Mention social problems of sick.
56. Define pneumonia and its symptoms.

57. Prevention of drug abuse.
58. Objectives of TB programme.
59. Control of deafness.
60. Harmful effects of tobacco.
61. Health care for the elderly.
62. Community services in national urban health mission.
63. Factors of health promotion.
64. Vitamin deficiency.
65. Mention social causes of disease.
66. Prevention measure of chicken guinea.
67. Lymphatic filariasis.
68. Write about Integrated Disease Surveillance Programme.
69. Scopes of national mental health programme.
70. Prevention and control of malaria.
71. Define social health programme.
72. Functions of Primary Health Centers.
73. Scope of health promotion in schools.
74. Define balanced diet.
75. Mention any four factors which have impact on urban health.
76. Control of dengue.
77. Define drug addiction and drug substance abuse.
78. Define universal immunization programme.
79. Importance of pulse polio programme.
80. Objectives of national tobacco programme.
81. Scope of social health care programme.
82. Write the steps involved in improving of rural sanitization.
83. Importance of health promotion in schools.
84. What is Goitre?
85. Write symptoms of pneumonia.
86. Objectives of leprosy control programme.
87. What is neonatal mortality rate?
88. Functions of PHC.

89. Health promotion in schools.
90. Outcomes of social health programme.
91. Functions of pulse polio programme.
92. Lymphatic filariasis.
93. Social problems of sick.
94. What is nutritional deficiency Anaemia?
95. Enumerate symptoms of pneumonia.
96. Objectives of dengue control programme.
97. What is infant mortality rate?
98. Programme for the health care of elderly.
99. Community services in urban areas.
100. Social problems of sick.
101. Mode of transmission of Ebola virus.
102. Preventive measures of deafness.
103. Health awareness program in schools.

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PHARMACEUTICAL REGULATORY SCIENCES

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LONG ESSAYS 10 MARKS

1. Explain in detail on DMF system in India
2. Explain the approval process and timeline for investigational new drug.
3. Define common technical document (CTD) and electronic common technical document (eCTD). Explain different modules in CTD and eCTD.
4. Explain the stages in development of new drug
5. What is CTD and eCTD. Explain the different modules of CTD in detail
6. Discuss the application and approval process for ANDA
7. Explain the stages in drug development process
8. Explain the regulatory approval process for New Drug Application.
9. Discuss briefly open part and closed part of DMF.
10. What is innovator and generic products?
11. Explain stage in development of generic formulations
12. Define CTD and discuss the process involved in its submission
13. Explain the organization and functions of regulatory bodies of EU and Australia
14. Explain the regulatory approval process for ANDA
15. Explain different stages of drug discovery
16. Explain the application and approval process of IND
17. Explain different stages involved in development of new drugs
18. Explain the organization and functions of Australia and US drug regulatory bodies
19. Explain the application and regulatory approval process for IND
20. Discuss the process of DMF system
21. Explain the different modules of CTD in detail
22. Explain the different modules of ACTD
23. Discuss the various stages involved in generic product development
24. Discuss approval process of NDA
25. Explain the organization and functions of regulatory bodies of EU and Japan
26. Discuss different stages of pre-clinical studies
27. Discuss the application and approval process of ANDA
28. Discuss the procedure for the export of the pharmaceutical products

29. Explain stages in drug development process
30. Explain different modules of ACTD.
31. Explain the organization and functions of regulatory bodies of EU and Japan

SHORT ESSAYS 05 MARKS

1. Explain code for federal regulation with respect to Part 21
2. What is CTD and eCTD? Differentiate them.
3. Explain inclusion and exclusion in clinical trials
4. Explain changes made to approved NDA
5. Explain salient features of orange book
6. Discuss the criteria for selection of human volunteers in clinical trials
7. Explain the development of clinical trial protocols.
8. Explain different stages in non-clinical studies.
9. Explain the application and approval process for IND
10. Explain the organization structure and functions of Japan drug regulatory body
11. Explain the stages of drug discovery process
12. Discuss the importance of orange book in development of generic product
13. Explain the application and approval of ANDA
14. Write briefly on clinical trial protocol
15. Explain the salient features of pharmacovigilance
16. Explain the differences between brand and generic products
17. Explain organization structure and functions of Europe drug regulatory authority
18. Write an overview on ACTD
19. Explain the non -eCTD electronic submission form (NeeS).
20. Explain the organization and functions of CDSCO
21. Explain the salient features of purple book.
22. Define clinical trial and explain Phase II
23. Explain the constitution and functions of Institutional Review Board
24. Regulatory approval process for IND
25. Explain the salient features of Pharmacovigilance

26. Write a note on ANDA and its approval process
27. Differentiate between innovator and generic products
28. Explain independent ethics committee
29. Write a note on different modules of DMF
30. Discuss salient features of orange book
31. Discuss Phase I clinical trials
32. Discuss briefly stages of drug discovery process
33. Differentiate innovator and generic products
34. Explain monitoring of clinical trials
35. Write briefly on changes made to approved ANDA
36. Write an overview on ACTD
37. Explain the eCTD.
38. Explain code of federal regulation.
39. Write a note on ANDA and its approval process.
40. Explain regulatory change over from NDA to ANDA
41. Define and explain ethical principles of informed consent process
42. Explain salient features of purple book
43. Explain independent ethics committee
44. Discuss organization structure and functions of regulatory authority for EU
45. Explain regulatory approval process of IND
46. What is clinical trial protocol? Write a note on informed consent process.
47. Write briefly on organization structure and functions of USFDA.
48. Explain the salient features of orange book.
49. Define clinical trial and explain Phase III
50. Explain the constitution and functions of Institutional Review Board
51. Write a note on 21 CFR
52. Write different modules of ACTD
53. Explain the importance of pharmacovigilance
54. Explain organization structure and functions of drug regulatory authority of Australia
55. Explain the salient features of pharmacovigilance

56. Explain the organization structure and functions of CDSCO
57. Explain the working procedure for preparation of clinical trial protocol
58. Explain the application and approval of IND
59. Explain the constitution and functions of clinical review board
60. What is CTD and explain different sections of CTD
61. Discuss the importance of orange book
62. Explain organization structure and functions of USFDA
63. Explain different changes made to an approved NDA
64. Explain CTD and eCTD
65. Explain inclusion and exclusion in clinical trials
66. Explain code for federal regulation with respect to Part 21
67. Explain changes made to approved NDA
68. Explain salient features of purple book
69. Explain the organization and functions of CDSCO
70. Explain briefly generic product development process
71. Explain the formation and functions of institutional review board
72. Briefly write a note on submission of DMF
73. Define and differentiate CTD and eCTD
74. Explain the Phase II clinical trials
75. With example differentiate between brand and generic products
76. Explain the process involved in shifting from NDA to ANDA
77. Explain the importance of 21 CFR
78. Explain the procedure for the export of generic formulations
79. Explain the inclusion and exclusion criteria in clinical trials
80. Discuss the importance of pharmaceutical regulatory affairs in industry
81. Explain the safety monitoring in clinical trials
82. Explain the organization structure and functions of Australian drug regulatory body
83. Explain code of federal regulation
84. Write briefly on the development of clinical trial protocol
85. Explain the salient features of orange book

86. Explain the formation and functions of independent ethics committee
87. What is DMF? Explain the contents of DMF
88. Explain organization structure and functions of drug regulatory authority of Japan
89. Explain the ethical principles of informed consent form for clinical trial process
90. Concept of generic drug product development

SHORT ANSWERS 02 MARKS

1. Purple book
2. Enlist different applications used for approval in EU
3. Pre-clinical studies
4. Organogram of CDSCO
5. Difference between brand and generic products
6. Difference between NDA and ANDA
7. Enlist the stages of drug development process
8. Name the regulatory authorities of India, US, EU and Australia
9. Write a note on Phase II
10. List out the items of module III in ANDA
11. Exclusion criteria in clinical trials
12. Constitution of Australian authority
13. Export of generic products
14. Process of informed consent
15. Phase II clinical trials
16. Significance of pharmacovigilance
17. Role of regulatory affairs in pharmaceutical industry
18. eCTD
19. CFR
20. Functions of US regulatory authority
21. Functions of Japan drug regulatory authority
22. Importance of DMF
23. Modules of CTD

24. Non-clinical studies
25. Functions of CDSCO
26. Non – eCTD submission form
27. Informed consent form
28. Purple book
29. Constitution of IRB
30. Module III in eCTD
31. Functions of Japan drug regulatory body
32. Salient features of DMF
33. Phase II clinical trials
34. Export of generic products
35. Institutional Review Board
36. Safety monitoring in clinical trials
37. Open parts of DMF
38. Objectives of regulatory affairs
39. Differentiate innovator and generic products
40. Functions of US FDA
41. Orange book
42. Safety monitoring in clinical trials
43. Phase I
44. Importance of DMF
45. Modules of ACTD
46. Non-clinical studies
47. Mention the general list of 21 CFR
48. Difference between CTD and eCTD
49. Give examples for brand and the respective generic products
50. Constitution of CDSCO
51. Objectives of regulatory affairs department in pharma industry
52. Enlist the types of DMF
53. Non-clinical studies

54. Pharmacovigilance
55. Differentiate innovator and generic products
56. Modules in ACTD
57. Functions of US FDA
58. What is clinical trial protocol?
59. Write a note on IND
60. Enlist the functions of CDSCO
61. What is DMF? Enlist the types
62. NDA vs ANDA
63. Enlist the different applications used for approval in USFDA
64. Role of regulatory affairs personnel in pharmaceutical industry
65. Briefly write on Phase I studies
66. Importance of purple book
67. Informed consent form
68. Mention the general list of 21 CFR
69. Non-clinical trials
70. Inclusion criteria for clinical trials
71. Phase III studies
72. Write a note on generic products
73. 21 CFR
74. Enlist the functions of TGA
75. Open parts of DMF
76. Define the term TGA and EMEA
77. List out the parts in module III
78. Non-clinical studies
79. Define regulatory affairs
80. Difference between NDA and ANDA
81. List out the items in module III in ANDA
82. Write a brief note on 21 CFR
83. Define regulatory affairs

84. Enlist the functions of Australian drug regulatory authority
85. What is clinical trial protocol?
86. Differentiate between generic and innovator products
87. Enlist parts of DMF
88. Modules of ASEAN common technical document
89. Exclusion criteria in clinical trials
90. Generic vs Innovator
91. Phase II clinical trials
92. Modules of ASEAN common technical document
93. Safety monitoring in clinical trials
94. Monitoring clinical trials
95. Define the term USFDA and EMDA
96. Pre-clinical studies
97. Salient features of purple book
98. Define the term IND and NDA

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Pharmacovigilance

LONG ESSAY 10 MARKS

1. Enumerate methods to evaluate antidepressant activity of an agent. Discuss two in vivo methods.
2. Enlist methods to evaluate anti-diabetic activity of an agent. Discuss two in vivo method.
3. Enumerate methods to evaluate nootropics activity of an agent. Discuss one in vivo method.
4. Explain any two in-vivo screening methods for sympatholytic agents.
5. Enumerate methods to evaluate analgesic activity of an agent. Discuss two in vivo method
6. Describe two in-vivo methods to screen central analgesic activity
7. Describe any two methods to screen antiarrhythmic drugs.
8. Enumerate methods to evaluate anti-inflammatory activity of an agent. Discuss one in vivo method
9. List the various methods used in preclinical evaluation of sympathomimetic agents. Discuss two in-vivo methods.
10. Enumerate various methods to evaluate a compound for anti-diabetic activity. Explain two in-vitro methods and the chemically induced diabetes in rat.
11. List the various methods used in preclinical evaluation of anti-cancer agents. Discuss two in-vivo methods.
12. Enlist the methods to evaluate skeletal muscle relaxant activity. Discuss two in vivo method
13. List out the various screening methods for Antihypertensive drugs. Discuss one In-vitro & One In-vivo method.
14. Enlist methods to evaluate Parasympatholytics activity of an agent. Discuss two screening methods.
15. Explain any three in-vivo screening methods for anti-hypertensive agents.
16. Explain two in-vivo Preclinical Screening methods for Anti-pyretic drugs
17. Enlist various Preclinical Screening methods for Anti-inflammatory drugs. Explain two in-vivo methods.

18. Describe two various screening methods for Parasympathomimetic drugs.
19. Explain the any three Pre clinical Screening methods for Anti-cancer drugs
20. Describe three in-vivo screening methods for Sympathomimetic drugs.
21. Enlist methods to evaluate antihypertensive activity of an agent. Discuss two in vivo methods
22. Enumerate and explain various Preclinical Screening methods for Antipsychotic drugs.
23. Describe various screening methods for Sympathomimetic drugs. Explain on model in detail.
24. Enlist methods to evaluate anti-arrhythmic activity of an agent. Discuss two in vivo methods.
25. Explain any two in-vivo screening methods for skeletal muscle relaxants agents.
26. Enlist various methods to evaluate a compound for anti-cancer activity. Explain two in vivo methods
27. Describe any three screening models for Parasympatholytics drugs.
28. List the methods to screen antipsychotic activity. Discuss two in-vivo methods.
29. List the commonly used methods to screen an agent for skeletal muscle relaxants agents. Discuss two in-vivo methods.
30. List out various methods to evaluate a compound for anti-inflammatory activity. Explain two in-vivo methods.

SHORT ESSAY 10 MARKS

1. Explain different methods for collection of blood in laboratory animals.
2. Describe the use to transgenic animals in preclinical screening.
3. Explain on method for screening local anesthetics.
4. Describe the two different screening methods for Antidiabetic activity.
5. In brief describe research hypothesis. Explain any two screening methods for coagulants
6. Explain any two screening methods for analgesics.
7. Explain significance of statistical analysis of one way ANOVA.
8. Explain constitution of IAEC and mention their role.
9. Discuss any two preclinical screening methods for nootropics models

10. Describe various blood collection methods of laboratory animals.
11. Explain any two preclinical screening methods for Parasympatholytics activity.
12. Explain any two preclinical screening methods for Antiulcer activity.
13. Enlist the various screening methods for Anti-arrhythmic drugs. Explain any one model.
14. Enlist the various screening methods for Anti-diabetic drugs. Explain any one model.
15. Explain the Significance of Statistical analysis of Student t test.
16. Mention the objectives of CPCSEA. Write the composition and responsibilities of IAEC.
17. Enlist different screening methods for coagulants. Explain any one in vivo method.
18. Explain one screening method for anti-arrhythmic agents.
19. Explain one screening method for anti-inflammatory activity.
20. Explain one screening method for anti-depressant
21. Describe one screening model for anticoagulants.
22. Explain the use of mutant animals in preclinical screening.
23. Describe the techniques of anaesthesia in laboratory animals.
24. Explain one screening method for sympathomimetic.
25. Explain one method to screen anti-ulcer activity.
26. What is the difference between student t test and one way ANOVA?
27. What are the commonly used methods to screen an agent for skeletal muscle relaxation?
28. Describe the significance of laboratory animals in pharmacological screening methods.
29. Describe any two screening methods for anti-ulcer activity.
30. Describe one in-vivo screening model for anti-epileptic drug.
31. Describe one in-vivo screening model for local anaesthetics.
32. Explain the high fat diet model for screening of anti-atherosclerotic agents.
33. Describe one way ANOVA.
34. Briefly explain breeding methods of laboratory animals.
35. Describe one screening method for anti-aggregatory activity.
36. Describe techniques of anaesthesia in laboratory animals.
37. Explain research hypothesis.
38. Discuss one screening method for anticoagulants
39. Explain one in vivo screening method for anti-hyperlipedmics.
40. In brief explain maintenance of laboratory animals as per CPCSEA guidelines?
41. What are the techniques used for anaesthesia in laboratory animals?

42. Explain any one screening method for anti-arrhythmic agents.
43. Explain one method to screen antipyretic activity.
44. Explain the applications of transgenic animals in pharmacology research.
45. Describe one in-vivo screening model for anti-asthmatics.
46. List various in-vivo methods to screen analgesic agents and discuss any one method
47. Explain the significance of statistical analysis of student T test.
48. What is Euthanasia? Describe different methods of Euthanasia.
49. Explain any one screening method for anti-cancer agents.
50. Explain significance of statistical analysis of student‘t’ test
51. Explain any two preclinical screening methods for Antidepressant activity.
52. Describe any one preclinical screening method for diuretic activity.
53. Describe different routes of drug administration in lab animals.
54. Describe different routes of drug administration in laboratory animals
55. What are the functions of institutions animal ethics committee?
56. Explain one screening methods for anti-asthmatic activity.
57. Describe one in-vivo screening method for sympathomimetic activity.
58. Discuss one in-vivo method for Screening antiulcer activity. In brief explain ANOVA.
59. Explain techniques for collection of blood in laboratory animals.
60. What are screening methods for parasympathomimetics?
61. Explain significance of sham negative and positive control group.
62. Explain different screening methods for anti-coagulants. Explain any one in vivo method.
63. Write a brief note on Maintenance of Laboratory Animals.
64. Describe any two preclinical screening methods for anti-aggregatory drugs.
65. Describe the use of Transgenic animals in Preclinical screening methods
66. Explain any two preclinical screening methods for Anti-Parkinsonism activity.
67. Application of mice as laboratory animal.
68. Explain any one screening method for anti-dyslipidemic activity.
69. Explain one screening method for anti-asthmatic activity
70. Enlist and explain any two preclinical screening methods for antiepileptic activity.
71. Enumerate any two preclinical screening methods for local anaesthetics.
72. Explain any two preclinical screening methods for anti-hyperlipidemia activity.
73. Describe two screening methods for anti-asthmatic activity.

74. Explain any two preclinical screening methods for coagulant activity.
75. Describe student-t-test and its significance.
76. Write a brief note on Maintenance of Laboratory Animals.
77. Explain two preclinical screening methods for Alzheimer's disease.
78. Explain any one preclinical screening methods for Skeletal muscle relaxants.
79. Describe any two preclinical screening methods for analgesic activity.
80. Discuss one screening method on nootropics
81. Describe one in vivo preclinical method on local anaesthetics.
82. Explain one screening method for antipyretic activity.
83. Explain the different methods involved in breeding of laboratory animals
84. Discuss one screening method for anti-diabetic activity.
85. Explain rationale in selection of animal species and sex in experimental study.
86. Explain any one screening method anti-epileptic agents.
87. Explain one screening method for coagulants.

SHORT ANSWERS 10 MARKS

1. What is the significance of sham negative group?
2. What are the methods used for preparations of drugs suspension.
3. Enlist the methods for screening anti-ulcer activity.
4. Application of mutant animals.
5. What are the methods for screening of analgesic activity?
6. Mention the screening methods for anti-asthmatics.
7. List the screening methods for drugs acting on eye.
8. Application of transgenic animals.
9. What is one way ANOVA?
10. Mention screening methods for sedative agents.
11. What are the techniques for collection of blood samples in laboratory animals.
12. What are different techniques for euthanasia?
13. Different methods for screening analgesics
14. What are the rationales for selection of animal species?
15. Briefly explain the on the study designs involved in pre-clinical experiments.
16. Define research hypothesis.

17. Define hypothesis with example.
18. What are pharmacological uses of rat as laboratory animals?
19. List out different routes of drug administration in laboratory animals?
20. Mention the different species and strains of animals used in laboratory?
21. What method used for preparations of drugs suspension with examples.
22. Application of transgenic animals.
23. List out different methods for screening of anti-inflammatory activity.
24. Define Sedative and hypnotics.
25. Explain the preparation of drug solution regarding to various solvents used.
26. Enlist preclinical screening methods for anti-inflammatory activity.
27. Enlist preclinical screening methods for skeletal muscle relaxants.
28. Mention the screening methods for diuretics.
29. Mention the list of screening methods for anti-ulcer activity.
30. What different method used for screening anti-epileptic activity.
31. Write a short note on ANOVA.
32. Explain Graphical representation of data
33. Mention the screening methods for hypnotic activity.
34. Short note on review of literature.
35. List out different techniques for euthanasia?
36. List the screening methods for drugs acting on eye.
37. Enlist various techniques for collection of Blood Sample.
38. What is OECD? Briefly describe breeding techniques.
39. List out the screening models for analgesic activity.
40. Explain the preparation of drug solution in regard with various solvents used.
41. Explain the mechanism of chemical induced convulsions for screening of Anti-epileptic drugs.
42. Mention the screening methods for anti-ulcer drugs.
43. Mention the list of screening methods for sedatives and hypnotic activity.
44. Enlist methods to screen anti-hypertensive activity
45. Enlist the various screening methods for Anti-inflammatory drugs.
46. Enlist the various screening methods for Ant-iasthmatic activity.

47. Explain the Possible ways of Graphical representation of a data.
48. Enumerate the different screening methods for Parasympatholytics.
49. What are Parametric and nonparametric tests?
50. Mention the screening methods for drugs acting on eye.
51. Enlist different methods for screening of type-2 Anti-diabetic activity.
52. What is research hypotheses?
53. Enumerate different techniques for anaesthesia in laboratory animals.
54. Enlist models used to screen for hypnotic activity.
55. What are different routes of drug administration in laboratory animals?
56. Application of transgenic animals.
57. Mention different methods for screening anti- Alzheimer's activity?
58. What are the rationales for selection of animal species?
59. What is review of literatures?
60. Examples for mydriatics and miotics.
61. What is student t test?
62. What are the methods for review of literatures?
63. What are different techniques for euthanasia in laboratory animals?
64. Give full form of CPCSEA and OECD?
65. Enlist different methods for screening nootropics?
66. What are the rationales for selection of animal species?
67. Write the full form of IAEC and OECD.
68. What are pharmacological uses of guinea pig as laboratory animal?
69. What are the rationales for selection of animal species?
70. Mention the composition of IAEC.
71. Mention the different species and strains of animals used in laboratory?
72. What are different routes of drug administration in laboratory animals?
73. Mention the screening methods for hypnotics.
74. Rationale for selection of animal species in preclinical studies.
75. Uses of rabbit in experimental pharmacology.
76. What is the significance of sham negative grou
77. How do you screen the analgesic agents?
78. Mention screening methods for sedative agent

79. What are the objectives of OECD guidelines?
80. Enlist preclinical screening methods for diuretics
81. Explain the possible ways of Graphical representation of data
82. What are parametric and non-parametric tests?
83. Enlist preclinical screening methods for diuretics
84. Explain the possible ways of Graphical representation of data.
85. What are parametric and non-parametric tests?
86. Mention the screening methods for anti-diabetic drugs.
87. Mention the list of screening methods for hypnotic activity.
88. What different models used for screening glaucoma activity?
89. Significance of Student –t-test.
90. Explain study design.
91. What are pharmacological uses of mice as laboratory animal?
92. What are experimental uses of rabbit?
93. Name the different methods used for screening of Parasympatholytics?
94. What are different techniques for euthanasia in laboratory animals?
95. What are the techniques for collection of blood samples?
96. Mention the screening methods for anti-asthmatics.
97. List out the methods to screen anti-epileptic agents?
98. Mention different species and strains of animals used in laboratory.

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Computer Aided Drug Design

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LONG ESSAY 10 MARKS

1. Explain various stages involved in drug discovery.
2. Explain the electronic and stearic parameters in QSAR with their applications.
3. Explain the different types of Molecular docking studies.
4. Explain various physicochemical parameters of QSAR with examples.
5. Elaborate Analog based drug designing giving emphasis on objectives and categories of analog designing.
6. What is a lead molecule? Discuss the various stages involved in identification of a lead molecule.
7. What is QSAR? Explain the Hansch analysis and Free Wilson analysis.
8. Define and classify Molecular docking and discuss various steps involved in the flexible docking.
9. Discuss classical and non-classical bioisosteric replacement strategies in analog based design of drugs with examples.
10. What is QSAR? Explain the electronic and steric parameters to be considered in QSAR analysis.
11. Define pharmacophore and discuss concept of pharmacophore mapping and pharmacophore based Screening.
12. What is lead compound? How lead compounds are generated and optimized in drug discovery?
13. Define and classify Molecular docking and discuss various steps involved in the flexible docking.
14. Discuss Hammett's Substituent constant and Taft's steric constant and give their importance.
15. Discuss the various Stages of drug discovery and development.
16. Explain the Hansch analysis and Free Wilson analysis and relationship between them.
17. Define and classify Molecular docking and discuss various steps involved in the flexible docking.

18. Explain Hansch analysis and Free Wilson analysis along with its advantages and disadvantages.
19. Explain various rational approaches to lead discovery.
20. Describe the virtual screening techniques.
21. What is docking? Explain the different types of docking and their applications.
22. Explain in detail the lead discovery based on drug metabolism and clinical observation with examples and structures.
23. Explain the concept of Quantitative structure activity relationship (QSAR). Enlist the different QSAR parameters.
24. Classify bio-isosterism approach with examples. Discuss of bio-isosterism replacement strategy with one case study.
25. Describe the theoretical determination of partition coefficient and electronic parameters in QSAR.
26. Define the term pharmacophore. Explain about the pharmacophore mapping suitable example
27. Define lead? Explain the different stages of drug discovery.
28. Explain the different types ofvirtual screening techniques with examples.

SHORT ESSAY 05 MARKS

1. Explain few methods of determination of Partition coefficient.
2. Explain Bioisosterism. Classify with examples
3. Define Bioinformatics. Mention applications of bioinformatics.
4. Explain various approaches for De Novo design.
5. Explain Pharmacophore mapping and its applications.
6. Write a note on chemoinformatics in the drug discovery process.
7. Discuss the role of molecular and quantum mechanics in drug discovery.
8. Write a note on various parameters of molecular mechanics.
9. Explain different methods in determination of energy minimization.
10. What properties a lead compound should possess to develop as an orally active compound.

11. Discuss Hammett's substituent constant and Taft's steric constant and its role in predicting biological activity.
12. Explain the role of Pharmacophore.
13. Discuss various databases used in drug design and discovery.
14. What is automated De Novo design? Explain various stages involved in De Novo drug design.
15. Write a short note on energy minimization.
16. Discuss global minima.
17. Write a note on the role of bioinformatics in the drug discovery process.
18. Explain various parameters of molecular mechanics.
19. What is analog Based Drug Design? Explain with suitable examples.
20. Discuss about similarity based methods used in virtual screening.
21. Discuss Comparative Molecular Field Analysis (CoMFA)
22. Discuss the important aspect of pharmacophore mapping.
23. Discuss the importance of prediction and analysis of ADME properties in drug design
24. Briefly explain the importance of various databases in drug design?
25. Write a note on various energy minimization techniques used in molecular modeling study.
26. Briefly explain quantum mechanical approach in drug design
27. Explain in brief about the molecular mechanics in drug design
28. Define Lead molecule? Discuss Lead discovery in drug design.
29. Discuss about similarity based methods used in virtual screening.
30. Explain Hansch analysis and give its application.
31. Distinguish between Rigid docking, Flexible docking.
32. Discuss the importance bioinformatics in drug design
33. Enlist the various databases applications in drug design?
34. Explain the concept of molecular mechanics in drug design.
35. Discuss the role of quantum mechanical approach in drug design
36. Explain global energy minimization.
37. What is analog Based Drug Design? Explain with suitable examples.

38. Discuss the role of quantum mechanical approach in drug design.
39. Write a note on pharmacophore mapping.
40. Give an account of brief history and development of QSAR.
41. Discuss the importance Chemoinformatics in drug design
42. Enlist the various databases applications in drug design?
43. Explain various energy minimization techniques used in molecular modeling.
44. Discuss the various steps involved in pharmacophore based virtual screening.
45. Explain the various parameters of molecular mechanics in drug design.
46. Discuss the various stages involved in identification of a lead molecule.
47. Explain the role of quantum mechanical approach in drug design.
48. Discuss about similarity based methods used in virtual screening.
49. Describe the concept of molecular mechanics in drug design.
50. Explain various energy minimization techniques used in molecular modeling.
51. Discuss the importance of prediction and analysis of ADME properties in drug design
52. Discuss the importance Chemoinformatics in drug design
53. Discuss the important aspect of pharmacophore modeling.
54. Write experimental method of determination of logP.
55. Explain Hammett's and Taft's constants of QSAR.
56. Explain de novo drug design.
57. Discuss concept of pharmacophore mapping.
58. Write note on ADME databases.
59. Discuss importance of quantum mechanics in drug design.
60. Define bio-isosterism? Classify bio-isosterism with examples.
61. Write a note on Conformational analysis.
62. Explain different methods in determination of energy minimization.
63. Define bioinformatics? Explain its application in drug discovery.
64. Write a note on Chemoinformatics.
65. Explain serendipitous drug discovery with examples.
66. Explain about the molecular mechanics principles.
67. Explain the approaches for de novo drug design.

68. Explain different methods in determination of energy minimization.
69. Explain Hansch analysis and give its applications.
70. Explain the pharmacophore based screening.
71. Write a note ADME databases.
72. Discuss in brief various parameters of quantum mechanics
73. Write a note on a) Random and non-random screening.
74. Differentiate molecular mechanics and Quantum mechanics.
75. Define the term virtual screening. Explain the concept.
76. Define Chemoinformatics? Explain steps involved in chemical data curation.
77. Write a note on different stages of drug discovery.
78. Discuss the Hansch and Free Wilson analysis.
79. Discuss various methods for determination of energy minimization.
80. Define molecular docking. Explain rigid docking
81. Write note on ADME databases.
82. Write a note on analog based drug design.
83. Enlist the differences between SAR and QSAR?
84. Explain the different approaches of de novo drug design.
85. What is bioinformatics? Explain the applications of bioinformatics.
86. Give a brief account of flexible docking.
87. Describe in detail about chemoinformatics.
88. Explain energy minimization methods.
89. Explain in detail molecular mechanics.
90. Explain the process of global conformational minima determination.

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SHORT ANSWER 02 MARKS

1. Define Free Wilson Analysis with examples.
2. Write the applications of QSAR.
3. Enlist two ADME databases.
4. Mention two Biochemical databases.
5. Explain Lipinski rule of 5.
6. Define Random screening for lead optimization.
7. Define COMFA and COMSIA.
8. Write applications of pharmaceutical databases.
9. Define Global minima.
10. Define bioisosterism with examples.
11. Explain Hansch analysis.
12. Compare SAR and QSAR.
13. Define COMSIA with its two applications.
14. Explain Lipinski rule of 5.
15. Define cheminformatics and mention its two applications.
16. Enlist any two pharmaceutical databases.
17. How are ADME databases are obtained.
18. Define Local minima.
19. Enlist various stages of drug design..
20. Define Random screening and Non-random screening.
21. Define partition coefficient and log P.
22. Enlist electronic and steric descriptors of QSAR
23. Compare SAR versus QSAR.
24. Define pharmacophore and De novo drug design.
25. Define the terms Bioinformatics and chemoinformatics..
26. List out the various chemical databases.
27. Write a note on importance of biochemical databases.
28. What is Conformational Analysis and give its applications
29. What is serendipitous drug discovery?

30. List out the various chemical databases.
31. Expand and give importance of COMFA and COMSIA.
32. Enlist various stages of drug design.
33. Define chemoinformatics and give its applications.
34. Define and classify molecular docking.
35. Compare SAR versus QSAR
36. What is Conformational Analysis and give its applications
37. Give the importance of pharmaceutical databases.
38. What is Lipinski's Rule of five?
39. Define and Classify Bioisosterism.
40. Enlist 1D and 2D descriptors of QSAR.
41. Define partition coefficient and log P.
42. What is lead optimization?
43. Give the application of 3D QSAR.
44. What is drug likeliness? Explain.
45. List out biochemical database's.
46. What is Conformational Analysis and give its applications.
47. Give the importance of pharmaceutical databases.
48. Give the importance of various ADME properties in drug design.
49. Define Random screening and Non-random screening.
50. What is Hammett substituent constant?
51. Explain Lipinski's rule of 5.
52. Describe extra precision docking.
53. Define bioinformatics and give its applications.
54. What is Conformational Analysis and give its applications.
55. Define lead optimization.
56. Enlist 1D and 2D descriptors of QSAR.
57. Give the importance of pharmaceutical databases.
58. Enlist the various databases used in drug design?
59. Mention the electronic parameters used in QSAR studies.

60. Mention the steric parameters used in QSAR.
61. Expand COMFA and COMSIA.
62. Random and non-random screening.
63. Define global and local minima.
64. Lipinski's rule of five.
65. Define lead optimization.
66. Define Chemoinformatics.
67. Enlist biochemical database's.
68. Application of chemical database's.
69. Write the application of molecular modelling.
70. Expand COMFA and COMSIA.
71. Define Lipinski's rule of 5.
72. Enlist the various database's used in drug design.
73. What is CADD? Enlist the applications.
74. Define global and local minima.
75. Importance of partition coefficient in the drug action.
76. Applications of Free Wilson analysis.
77. Give the importance of biochemical database.
78. What is lead optimization?
79. Define lead molecule.
80. Give two methods of lead optimization
81. Taft's steric constant.
82. Expand COMFA and COMSIA.
83. Define global minima.
84. Enumerate the applications of QSAR
85. List out the various chemical database.
86. Lipinski's rule of five.
87. What is bio-informatics?
88. Enlist any two biochemical databases.
89. Define lead optimization?
90. What is drug design?

91. What is CoMFA and CoMSIA
92. Define QSAR.
93. In partition coefficient studies, why n-octanol is used?
94. Applications of chemical databases.
95. Name any two biochemical databases
96. Applications of ADME databases
97. Define molecular modeling?
98. What is Lipinski's rule of five.

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Cosmetic Science

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LONG ESSAY 10 MARKS

1. List out various cosmetic excipients. Discuss emollients and preservatives.
2. Write the source, active constituents and cosmetic applications of turmeric and clove.
3. Describe the principle building blocks used in the formulation of oral care products.
4. Describe the structure and functions of the skin with neat labeled diagram.
5. Discuss in detail the formulation of vanishing cream and cold cream.
6. Discuss the role of Neem and Clove in oral care formulations.
7. Discuss the role of humectants and emollients in cosmetics along with their applications.
8. Describe the principle building blocks in the formulation of hair care products.
9. Discuss the role of Henna and Amla in hair care formulations.
10. Define and classify surfactant used in cosmetics and cosmeceuticals. Write its applications?
11. Compare and contrast vanishing cream, cold cream and moisturizing creams.
12. Describe BIS general specifications for shampoos.
13. Describe the structure and functions of the hair with neat labeled diagram.
14. Define herb. Discuss the role of herbs as cosmetic and cosmeceutical excipients.
15. Discuss the raw materials used in the formulation of oral care cosmetic products.
16. List out various cosmetic excipients. Discuss emollients and preservatives.
17. Classify rheology modifiers and humectants used in cosmetics. Write its applications.
18. Discuss the raw materials used in the formulation of hair care cosmetic products.
19. Describe specification for tooth paste as per BIS.
20. Define cosmeceuticals. Discuss origin, categorization and international scenario of cosmeceuticals
21. Discuss the raw materials used in the formulation of Skin care cosmetic products
22. List out different skin care cosmetic products. Describe the moisturizing creams.
23. Discuss the various analytical specifications for shampoos as per BIS.
24. Compare and contrast cold creams and moisturizing creams with examples? Write their advantages and disadvantages.
25. Discuss the role of herbs in oral care cosmetic preparations
26. List out various excipients used in cosmetics and cosmeceuticals. Describe briefly rheology modifiers.
27. Describe the chemistry and formulation of para-phylene diamine based hair dye.
28. What is SPF? Explain different methods of its measurement?

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SHORT ESSAY 05 MARKS

1. Define and classify Humectants used in cosmetics.
2. Describe the steps involved in the manufacturing soaps.
3. What are hair dyes? Classify and write its ideal properties.
4. How do you select suitable moisturizer for different types of skin and face? Explain the guidelines for its selection.
5. Write two formulas for cold creams with their method of preparation.
6. Explain the determination of foam height in shampoos as per BIS.
7. Write the formulation and method of preparation of translucent soaps.
8. Explain the cosmetic treatment for dandruff.
9. What are different types of blemishes? Give reasons.
10. Applications of Surfactants in cosmetics and Cosmeceuticals.
11. What is TEWL? How it is measured.
12. Classify shampoos. Write its applications in hair care.
13. What are different types of wrinkles? Give reasons.
14. Write the applications of skin care products in Cosmetics and Cosmeceuticals.
15. Write the cosmetic and Cosmeceutical applications of sunscreens.
16. Describe the noninvasive techniques for the measurement of skin colour.
17. Discuss the mechanism of action of actives used in antiperspirants.
18. What is meant by Millaria? How it is treated.
19. Differentiate Cosmetics and Cosmeceuticals.
20. Write the principle and applications of Corneometer.
21. Explain the formulation of oxidative hair dye system.
22. Describe methods to manage dermatitis.
23. Explain formulation of conditioning shampoos.
24. Define SPF. Write any one method to measure SPF.
25. With neat-labeled diagram, explain Sebumeter.
26. What are different types of hair fall? Give reasons.
27. What are skin blemishes? How it is treated.
28. Discuss cosmetics as quasi drugs.
29. Write the principle and applications of Sebumeter.

30. What are vanishing creams? Write its advantages and disadvantages.
31. What is dry skin? What are the causes for dry skin?
32. Write a note on hair oils.
33. Explain cosmetic and Cosmeceutical applications of Clove.
34. With neat-labeled diagram, explain Corneometer.
35. Discuss the applications of moisturizers.
36. Write a note on Comedogenic.
37. Draw a typical structure of skin.
38. Discuss the important causes for acne.
39. What are conditioning shampoos? Write its applications.
40. Differentiate Sebometer and corneometer.
41. Write a note on evaluation of soap bars.
42. What are the causes of hair loss?
43. Explain the treatment for wrinkles.
44. Define combability. Write its benefits and procedure.
45. Classify the excipients used in cosmetics with examples.
46. Explain the principle involved in the formulation of face wash.
47. Discuss the formulation of antiperspirant roll-on preparations.
48. Classify organic sunscreens with examples.
49. Describe the BIS Specification and analytical methods for Shampoo.
50. Explain the pathogenesis and characterization of acne.
51. What is TEWL? how it is measured?
52. Discuss the actives used in formulation of deodorants.
53. Explain the role of preservatives in cosmetics.
54. What is TEWL? How it is measured by closed chamber method?
55. Explain the principle involved in the formulation of hair conditioners.
56. What are the causes of dandruff? How it is treated?
57. Describes the formulations aspects of Antiperspirants.
58. Explain the cosmetic and Cosmeceutical applications of aloe.
59. Differentiate soaps and Syndents.
60. Describe the formulation considerations of antiperspirants.

61. Explain hair growth cycle.
62. Explain the principle involved in the formulation of Moisturizing creams.
63. What is dermatitis. Discuss the causes for dermatitis.
64. What are deodorants? Explain their mechanism.
65. Describe the BIS Specification for skin creams.
66. What is hair tensile strength? How it is measured?
67. Explain cosmetic treatment for hair loss.
68. Classify the actives used in the formulation of Anti-Perspirants.
69. Explain cosmetics as OTC drugs.
70. Write a note on sebum Stripmeter.
71. What is face wash? Write its ideal properties and functions.
72. Explain different types of prickly heat. Give reasons.
73. List out herbs used in Haircare cosmetic preparations. Explain any one herb.
74. What are the advantages and disadvantages of Corneometer.
75. What are the important causes of body odour.
76. Explain the remedies to prevent and relieve dry skin.
77. Describe the formulation of antiperspirants.
78. What is TEWL and how it is measure?
79. Explain the principle involved in the formulation of face wash.
80. Describe the treatment of acne.
81. Explain the mechanism of antiperspirants.
82. Discuss the general treatment of prickly heat.
83. Explain the mechanism of action of Deoderants.

SHORT ANSWERS 02 MARKS

1. Classify Haircare cosmetic preparations.
2. Differentiate cosmetic and cosmeceutical preparations.
3. Write any one formula of moisturizing cream.
4. Write four cosmetic applications of Amla.
5. What are Suncreens? Give examples.
6. Write applications of Corneometer.
7. Write the principle involved in TEWL measurement.

8. Write the limitations of hair tensile strength measurement.
9. Write any one formula for deodorant powder.
10. Define Antidandruff shampoos. Give one example.
11. Define cosmetics.
12. What are Humectants? Give examples.
13. Write the advantages and disadvantages of cold creams.
14. Classify sunscreen preparations.
15. What is SPF? Give example.
16. Classify skin types.
17. What are wrinkles.
18. What is Millaria.
19. What is TEWL?
20. What are Syndent bars?
21. Define cosmetics as per Indian regulations.
22. Enlist the preservatives used in cosmetics preparation.
23. Write the advantages and disadvantages of vanishing creams.
24. What is SPF sunscreen? Explain.
25. Enlist sun protection cosmetics.
26. Enlist various ingredients used in the preparation of Syndent bars.
27. What are Combars?
28. Give four reasons for dandruff.
29. Give four examples of marketed deodorant preparations.
30. Differentiate cosmetics and Cosmeceuticals.
31. What are emollients? Give examples.
32. Write the advantages and disadvantages of shampoos.
33. Enlist various types of sun protection products.
34. Expand SPF sunscreen? Give example.
35. Define tensile strength of a hair.
36. Enlist various ingredients used in soap bars.
37. What is Combability?
38. Define the term Comedogenic.

39. Write different types of wrinkles?
40. Define cosmetics as per Indian regulations.
41. What are Humectants? Give examples.
42. Write the advantages and disadvantages of cold creams.
43. Classify sunscreen preparations.
44. What is SPF? Give example.
45. List out the different types of Corneometer.
46. What are Evaporimeter?
47. Give one formula for deodorant sticks.
48. What are black heads and white heads?
49. Role of skin as a physical barriers.
50. What is gingivitis?
51. What are abrasives? Give examples.
52. What is SPF? List the methods of measurement.
53. Write are the effects of UV-B rays on skin?
54. Name four preservatives used in soaps.
55. Write any one formula of transparent soaps?
56. What is skin hydration? How it is measured.
57. What is Xerosis?
58. List the types of hair fall.
59. Define Anagen and Catagen.
60. Define dental caries and Toothache phase.
61. What are mouthwashes?
62. Write four cosmetic applications of Neem.
63. What is UV-A and UV-B region in sun electromagnetic spectrum?
64. List out the types of chromophore in skin colour.
65. List out the four distinct stages of pigmentation responses after solar UVR.
66. What is periodontitis?
67. What is acne?
68. Define preservatives. Give two examples used in cosmetics.
69. Define cosmetics as per Indian regulations.

70. What are hair dyes?
71. Give four examples of organic sunscreens.
72. Give one formula for sunscreen lotion.
73. List out the benefits of hair combing.
74. Name four Antimicrobial's used in soap formulations.
75. Give four causes for acne.
76. What are blackhead and whitehead.
77. Write four important functions of skin.
78. What is Halitosis?
79. Give four examples for actives used in Antiperspirants.
80. Give examples of herbs used as vehicles in cosmetic preparations.
81. Give examples of herbs used as humectant in cosmetic preparations.
82. What are Sebumeter?
83. What are Corneometer?
84. What is skin pigmentation?
85. Give four examples of emollients used in cosmetics.
86. Write any one formula for Deospray.
87. Define cosmetics as per EU regulations.
88. What are Cosmeceuticals?
89. List out typical properties of face wash.
90. Write four cosmetic applications of Turmeric.
91. Give four analytical specifications for toothpaste as per BIS.
92. Write four applications of Sebumeter.
93. Write four applications of Corneometer.
94. Define tensile strength of hair.
95. Enumerate the types of wrinkles.
96. Write one formula for deodorant spray.

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Advanced Instrumentation Analysis

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LONG ESSAY 10 MARKS

1. Describe and derive the equation for Beer's – Lambert's law. Add a note on deviations and Describe in brief the principle, instrumentation and applications of gas chromatography.
2. Describe the principle, instrumentation and applications of HPLC.
3. Explain the principle, instrumentation and applications of UV-Visible spectroscopy.
4. Explain the instrumentation of HPLC with neat diagram with more emphasis on pumps and detector used.
5. Explain the principle, instrumentation, sampling techniques and applications of IR
6. Describe Gas Chromatograph with a neat labelled diagram. Explain the type of GC columns, carrier gases and detectors used.
7. Explain the construction and working of flame emission spectrometry with neat labeled diagram and discuss the various types of interferences occurred in atomic spectroscopy
8. Describe in brief instrumentation of gas chromatography with neat labeled block diagram
9. State and derive the equation for Beer – Lambert's law. Give the reasons for deviation from law
10. Write elaborately the principle, instrumentation and applications of Gas chromatography
11. Discuss in detail about the concept of EMR, energies in organic molecule and electronic transitions in UV-Visible spectroscopy
12. Draw a neat labelled diagram of double beam UV-Visible spectrophotometer and explain the working principle of monochromators and any two detectors
13. Describes the principle, working and instrumentation of AAS
14. Draw a neat schematic diagram of HPLC. Explain about pumps and detectors used in HPLC
15. Enlist the Detectors and sample injection techniques used in Gas Chromatography & explain in detail each of two.
16. Explain the working of double beam UV-Visible spectrophotometer with the help of neat labelled diagram.
17. Discuss the different pumps & detectors used in HPLC.
18. Discuss the different sources of radiations & detectors used in IR spectroscopy.
19. Draw a neat labelled instrumentation layout of IR spectrophotometer and explain the sample handling techniques in IR.

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SHORT ESSAY 05 MARKS

1. Define and distinguish between fluorescence and phosphorescence. Write the various factors affecting the phenomenon of fluorescence.
2. Define Wavelength, Wavenumber, Frequency, Transmittance and Absorptivity?
3. Explain the instrumentation and working of atomic absorption spectroscopy.
4. Define and classify chromatography with suitable examples
5. Describe the practical steps involved in paper electrophoresis.
6. Explain the instrumentation of HPLC with block diagram
7. Write the statement and derive the equation for Beer 's – Lambert's law.
8. Explain in brief the effect of solvent on absorption UV-Visible radiation by the molecules.
9. Explain the instrumentation and working of flame emission spectrometry.
10. Briefly explain the operational techniques of column chromatography.
11. Add a note on gel electrophoresis.
12. Explain the concept of plate theory and rate theory for increasing the efficiency of column in chromatography.
13. What are ion exchange resins and explain the operational techniques of ion exchange chromatography.
14. Write the practical steps involved in size exclusion chromatography gel chromatography.
15. Explain the phenomenon of Fluorescence and Phosphorescence. Write the requirement of molecules to exhibit fluorescence.
16. Name the burners used in flame photometry and explain in detail any one
17. Explain the factors affecting efficiency of column in chromatography.
18. Define electrophoresis and explain the various factors affecting electrophoresis.
19. Explain the principle and working of thermal conductivity and flame ionization detectors.
20. Write the principle, techniques and applications of ion exchange chromatography.
21. Discuss the principle, instrumentation and applications of affinity chromatography.
22. What are Nephelometry and turbidometry? Write principle involved for the same.
23. Explain the separation techniques involved in column chromatography.
24. Give an account of gel electrophoresis with representation of neat diagram.
25. Explain about the various detectors used in HPLC.

26. Define and classify ion exchange resins and explain the manufacture of cation exchange resin and anion exchange resin
27. Explain the principle, theory and applications of gel chromatography.
28. What is Quenching? Enumerate the various factors which influence quenching effect
29. Define Wavelength, Bathochromic shift, Hypsochromic shift, Hyperchromic effect and Hypochromic effect.
30. Describe the detectors of an IR spectrometer
31. Explain the packing method of adsorbent in column chromatography with their merits and demerits.
32. What is zone electrophoresis? Explain any one in detail.
33. Describe the pumps, sample injection techniques and applications of HPLC.
34. Principle, classification and mechanism of ion exchange process in ion exchange chromatography
35. Principle, ligands used and applications of affinity chromatography.
36. Enumerate and discuss the different factors that affect the intensity of fluorescence
37. Explain the principle and applications of Flame photometry with neat labelled diagram?
38. Discuss different methods of preparation and elution techniques of column chromatography.
39. Mention the detectors used in HPLC and explain in detail any two.
40. Explain the principle and theory of gel chromatography.
41. Explain affinity chromatography.
42. Write the diagram of flame and explain the different regions.
43. Define electrophoresis. Discuss the factors affecting the electrophoresis.
44. Discuss the development and visualization techniques in paper chromatography
45. Explain the packing, elution and detection techniques involved in column chromatography.
46. Write the construction and working of any two detectors used in HPLC.
47. What is ion exchange chromatography? Give the steps involved in the mechanism of ion exchangers used
48. Discuss the principle involved in separations by gel chromatography

49. Explain the experimental methodology involved in paper electrophoresis and its applications.
50. Discuss the preparation, activation and visualization of TLC.
51. Draw a neat schematic diagram of GC. Explain about columns used in GC.
52. Write a note on affinity chromatography with special emphasis on ligands used.
53. Write a note on cationic and anionic exchangers.
54. Explain the construction & working of photomultiplier tube and barrier layer cell.
55. Discuss the single component & multi component analysis by UV spectroscopy.
56. Discuss the principle and various gels used in gel chromatography.
57. Discuss the principle & applications of Flame photometry.
58. What is adsorption and partition column chromatography. Give its advantages and disadvantages.
59. Discuss the applications of HPLC.
60. Define and classify Ion Exchange resins. Add a note on factors affecting Ion exchange.
61. Discuss the different development techniques used in Paper Chromatography.
62. Explain the principle and techniques involved in Paper Electrophoresis.
63. Discuss the UV method for analysis of single component and multi component formulations.
64. Explain the principle and interferences in Atomic spectroscopy.
65. Define Electrophoresis & discuss the factors affecting Electrophoretic mobility.
66. Write the principle and mechanism of Ion Exchange Chromatography.
67. Write the theory & applications of Affinity Chromatography.
68. Discuss the classification of chromatographic methods based on mechanism of separation.

SHORT ANSWERS 02 MARKS

1. Define chromophore and auxochrome with suitable examples.
2. Name the fuel gases used in flame emission spectroscopy.
3. Write the differences between nephelometry and turbidimetry.
4. What are the elution techniques in column chromatography.
5. Define R_f and Rm value with their significances.

6. What is Guard column? Write its significance.
7. What is the role of ligand in chromatography?
8. Write the applications of affinity chromatography.
9. Define Fluorescence and Phosphorescence.
10. Write the vibrational frequency of alcohol, aldehyde and amide in IR spectrum
11. Write the block diagram of Nephelometry.
12. What are different interferences in flame photometry?
13. Define Rf and Rm value.
14. What is electrophoresis?
15. What is programmed temperature gas chromatography? Write its importance
16. Give the example for anion and cation exchange resins.
17. Write the principle of affinity chromatography.
18. Define and classify filters and monochromators.
19. Mention the various methods of single component analysis.
20. Write the vibrational frequency of amide, amine and ketone in IR spectrum.
21. Write the applications of Atomic Absorption spectroscopy.
22. Name the radiation sources used in IR spectroscopy.
23. What is activation of plates? Write its importance.
24. What is frontal and displacement analysis?
25. What is derivatization in GC and write its significance.
26. Mention the factors affecting ion exchange chromatography.
27. Name the natural and synthetic gels used in gel chromatography.
28. Define Absorptivity and Transmittance.
29. What is Quenching? Give example.
30. What are the events that occur when the compound of a metal to be investigated is aspirated into a flame?
31. Define a) functional group region b) finger print region.
32. Write the formula used to calculate number of fundamental vibration for Linear
33. and nonlinear molecules.
34. Write the difference between normal phase and reverse phase chromatography.

35. Write the difference of silica gel, Silica gel G, silica gel GF.
36. What is derivatization? Mention the various methods of derivatization in gas
37. chromatography.
38. Write the vibrational frequency of C=O, OH, amine and amide.
39. Write the application of nephelometery and turbidometery.
40. Differences between flame emission and atomic absorption spectroscopy.
41. What is two dimensional paper chromatography?
42. Classify adsorbents and detecting reagents with examples.
43. What is programmed temperature gas chromatography.
44. What are the gels used in gel chromatography.
45. Write the difference between gel chromatography and gel electrophoresis.
46. Define chromophore and auxochrome.
47. What is absorption maxima? Write its significance?
48. Write the wavenumber of OH group and NH2 groups in IR spectrum.
49. Write the difference between nephelometery and turdidimetery.
50. How solid samples are handled into IR spectrometers.
51. What is the difference between Silica gel H, Silica Gel G and Silica gel GF?
52. Classify detecting reagents in paper chromatography with suitable examples.
53. What is Guard column? Write its significance.
54. Mention the various factors affecting ion exchange chromatography.
55. Write the applications of gel chromatography.
56. Define the term absorptivity and wave number.
57. Write the difference between fluorescence and phosphorescence.
58. What is the functional group for wavemunber 3400 cm^{-1} and 1715 cm^{-1}
59. Write the difference between nephelometery and turdidimetery.
60. Define the term retention factor (Rf).
61. Differentiate between normal phase & reverse phase chromatography.
62. Write the expansions of Silica gel 60 GF 254.
63. Explain any one derivatisation technique in GC.
64. Why the buffers are used in ion exchange chromatography.
65. What is the principle involved affinity chromatography?

66. Define chromophore and lamda max.
67. Define molar absorptivity.
68. Explain the various frequency regions for amides and ketones.
69. Mention the types of interferences in Atomic spectroscopy
70. Write the applications of nepheloturbidometry.
71. What is the difference between isocratic and gradient elution in chromatography?
72. Define edge effect? Mention the method to prevent.
73. Mention the importance of guard column in GC?
74. Name the stationary phase used in gel chromatography.
75. Enumerate the applications of affinity chromatography.
76. Define chromophore and auxochrome? Give one example for each.
77. Solvent effect on UV absorption spectra.
78. Write the vibrational frequencies of alcohols and amines in IR spectroscopy.
79. Write the principle involved in nepheloturbidometry.
80. What is temperature programming in gas chromatography.
81. Define Rf value? Name the factors that affect Rf value.
82. What is regeneration of ion exchange resins.
83. What is affinity chromatography?
84. Name the molecular vibrations in IR spectroscopy.
85. What is edge effect? How to minimize it.
86. Name the spectral shifts that occur in UV region.
87. What is fingerprint region in IR spectroscopy.
88. Name the electronic transitions that occur in UV region.
89. Give any two applications of Nepheloturbidometry.
90. Write the difference between gel chromatography and affinity
91. Importance of ligand in affinity chromatography.
92. What is molar extinction co-efficient?
93. Enlist the application of fluorimetry in quantitative analysis of drugs.

Vision and Mission of the Institution

Vision

The East Point College of Pharmacy aspires to be a globally acclaimed institution, **recognized** for **excellence in** pharmaceutical education, research and nurturing students for **holistic development.**

Mission

M1 Create pharmacy graduates through **quality education**

M2 Promote innovation, **creativity**, and excellence **in teaching**, learning, and **research**

M3 **Inspire** integrity, teamwork, critical thinking**, personal** development, and ethics in **students** and lay **the** foundation for lifelong learning

M4 **Serve** the **healthcare, technological, scientific**, and **economic** needs of then **society**.