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Total No. of Pages: 2

SHIVAJI UNIVERSITY, KOLHAPUR
DATTAJIRAO KADAM ARTS, SCIENCE AND COMMERCE COLLEGE, ICHALKARANJI
B.Sc. (Part– I) (Semester– II) (New) (CBCS)
Examination March/April, 2023
CHEMISTRY (Paper - IV)
DSC– 4B: Analytical Chemistry
Sub. Code: 72844

Day and Date: Tuesday, 06-06-2023

Total Marks: 50

Time: 10.30 a.m. to 12.30 p.m.

- Instructions:**
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Draw neat labeled diagrams wherever necessary.
 - 4) Use of Scientific calculator is allowed.

Q. 1 A. Select the most correct alternative from the following. [10]

1. RF value is the ratio of.....
 - a) Two concentrations
 - b) two distances
 - c) rate of migration
 - d) either a or b
2. ----- is process of extracting a small portion of the material from its large quantity which truly represent the composition of the whole material
 - a) error
 - b) sampling
 - c) significant figure
 - d) variation
3. Which one of the following is an acid-base indicator?
 - a) phenolphthalein
 - b) methyl orange
 - c) methyl red
 - d) all of the above
4. BOD stands for ?
 - a) Biological oxygen demand
 - b) basic oxygen demand
 - c) bicarbonate oxygen demand
 - d) CHCl_3
5. When an examination is restricted to the identification of one or more constituents of a sample it is known as-----
 - a) analysis
 - b) qualitative analysis
 - b) quantitative analysis
 - d) all of these
6. Chromatography technique is developed by-----.
 - a) Michael's Tswetz
 - b) Newton
 - c) Mary Curie
 - d) none of these
7. Eriochrome black T is also known as-----.
 - a) solochrome black
 - b) monochrome black
 - c) acid base indicator
 - d) monochrome black T
8. The chemical reaction between acid and base to form salt and water is termed as-----.
 - a) Complexation
 - b) precipitation
 - c) neutralization
 - d) redox

- 8 The solution of exactly known concentration is known as-----solution.
- a) Titrand
 - b) molar solution
 - c) normal solution
 - d) precipitant
- 9 Permanent hardness to the water arises due to ----- of Ca and Mg.
- a) Chlorides
 - b) sulphates
 - c) both a) and b)
 - d) bicarbonates
- 10 The macronutrient elements in fertilizer include-----.
- a) phosphorous
 - b) potassium
 - c) nitrogen
 - d) all of these

Q. 2 Attempt any TWO of the following. [20]

- a) What are errors? State and explain types of error.
- b) Explain the Kjeldahl's method for estimation of total nitrogen in fertilizers.
- c) With the help of neutralization curve explain the choice of indicator for titration between strong acid and strong base.

Q. 3 Attempt any FOUR of the following. [20]

- a) Types of EDTA titrations.
 - b) Compare between paper chromatography and TLC.
 - c) Write qualities of good fertilizer.
 - d) There are following seven observations (values) of the analysis. Find the mean and median. 44, 49, 45, 58, 37, 42, 47
 - e) Explain the terms dissolved oxygen (DO) and COD.
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Seat No.	
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Total No. of Pages: 2

SHIVAJI UNIVERSITY, KOLHAPUR

DATTAJIRAO KADAM ARTS, SCIENCE AND COMMERCE COLLEGE, ICHALKARANJI

B.Sc. (Part– I) (Semester– II) (New) (CBCS)

Examination October, 2023

CHEMISTRY (Paper - IV)

DSC– 4B: Analytical Chemistry

Sub. Code: 72844

Day and Date: Tuesday, 07-11-2023

Total Marks: 50

Time: 10.30 a.m. to 12.30 p.m.

- Instructions:**
- 1) All questions are compulsory.**
 - 2) Figures to the right indicate full marks.**
 - 3) Draw neat labeled diagrams wherever necessary.**
 - 4) Use of Scientific calculator is allowed.**

Q. 1 A. Select the most correct alternative from the following. [10]

- In paper chromatography, stationary phase is commonly.....
 - aqueous
 - cellulose fibres
 - organic
 - either a or b
- is nothing but the actual difference between the true result and experimental result.
 - error
 - sampling
 - significant figure
 - chemical test
- Which one of the following is an acid-base indicator?
 - phenolphthalein
 - methyl orange
 - methyl red
 - all of the above
- COD stands for ?
 - Chemical oxygen demand
 - Carbon oxygen demand
 - Carbonate oxygen demand
 - CHCl₃
- When an examination is restricted to the identification of one or more constituents of a sample it is known as-----
 - analysis
 - qualitative analysis
 - quantitative analysis
 - all of these
- Chromatography technique is developed by-----.
 - Michael's Tswetz
 - Newton
 - Mary Curie
 - none of these
- Eriochrome black T is also known as -----.
 - solochrome black
 - monochrome black
 - acid base indicator
 - monochrome black T
- The chemical reaction between acid and base to form salt and water is termed as ----- .
 - complexation
 - precipitation
 - neutralization
 - redox

9. The solution of accurately known strength is known as ----- solution.
- | | |
|-----------|-------------|
| a) molal | b) molar |
| c) normal | d) standard |
10. The macronutrient elements in fertilizer include -----.
- | | |
|----------------|-----------------|
| a) phosphorous | b) potassium |
| c) nitrogen | d) all of these |

Q. 2 Attempt any TWO of the following.

[20]

- Give classification of fertilizers. Write necessity and qualities of good fertilizer.
- With the help of neutralization curve explain the choice of indicator for titration between strong acid and strong base.
- State and explain types of error.

Q. 3 Attempt any FOUR of the following.

[20]

- Give the classification of analytical methods of analysis.
 - Compare between paper chromatography and TLC.
 - Types of EDTA titrations.
 - There are following seven observations (values) of the analysis. Find the mean and median. 46.62, 46.47, 46.64, 46.76, 46.53, 46.60, 46.71
 - Explain the two physical parameters of water i) pH and ii) color.
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Seat No.	
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Total No. of Pages: 2

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DATTAJIRAO KADAM ARTS, SCIENCE AND COMMERCE COLLEGE, ICHALKARANJI

B.Sc. (Part– I) (Semester– II) (New) (CBCS)

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|----------------|-----------------|
| a) phosphorous | b) potassium |
| c) nitrogen | d) all of these |

Q. 2 Attempt any TWO of the following.

[20]

- Give classification of fertilizers. Write necessity and qualities of good fertilizer.
- With the help of neutralization curve explain the choice of indicator for titration between strong acid and strong base.
- State and explain types of error.

Q. 3 Attempt any FOUR of the following.

[20]

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Seat No.	
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Total No. of Pages: 2

SHIVAJI UNIVERSITY, KOLHAPUR

DATTAJIRAO KADAM ARTS, SCIENCE AND COMMERCE COLLEGE, ICHALKARANJI

B.Sc. (Part– I) (Semester– II) (New) (CBCS)

Examination October, 2023

CHEMISTRY (Paper - IV)

DSC– 4B: Analytical Chemistry

Sub. Code: 72844

Day and Date: Tuesday, 07-11-2023

Total Marks: 50

Time: 10.30 a.m. to 12.30 p.m.

- Instructions:**
- 1) All questions are compulsory.**
 - 2) Figures to the right indicate full marks.**
 - 3) Draw neat labeled diagrams wherever necessary.**
 - 4) Use of Scientific calculator is allowed.**

Q. 1 A. Select the most correct alternative from the following. [10]

- In paper chromatography, stationary phase is commonly.....
 - aqueous
 - cellulose fibres
 - organic
 - either a or b
- is nothing but the actual difference between the true result and experimental result.
 - error
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- Which one of the following is an acid-base indicator?
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 - methyl orange
 - methyl red
 - all of the above
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 - Chemical oxygen demand
 - Carbon oxygen demand
 - Carbonate oxygen demand
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- When an examination is restricted to the identification of one or more constituents of a sample it is known as-----
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- Chromatography technique is developed by-----.
 - Michael's Tswetz
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 - Mary Curie
 - none of these
- Eriochrome black T is also known as -----.
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 - neutralization
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9. The solution of accurately known strength is known as ----- solution.
- | | |
|-----------|-------------|
| a) molal | b) molar |
| c) normal | d) standard |
10. The macronutrient elements in fertilizer include -----.
- | | |
|----------------|-----------------|
| a) phosphorous | b) potassium |
| c) nitrogen | d) all of these |

Q. 2 Attempt any TWO of the following.

[20]

- Give classification of fertilizers. Write necessity and qualities of good fertilizer.
- With the help of neutralization curve explain the choice of indicator for titration between strong acid and strong base.
- State and explain types of error.

Q. 3 Attempt any FOUR of the following.

[20]

- Give the classification of analytical methods of analysis.
 - Compare between paper chromatography and TLC.
 - Types of EDTA titrations.
 - There are following seven observations (values) of the analysis. Find the mean and median. 46.62, 46.47, 46.64, 46.76, 46.53, 46.60, 46.71
 - Explain the two physical parameters of water i) pH and ii) color.
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Seat No.	
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Total No. of Pages: 2

SHIVAJI UNIVERSITY, KOLHAPUR
DATTAJIRAO KADAM ARTS, SCIENCE AND COMMERCE COLLEGE, ICHALKARANJI
B.Sc. (Part – I) (Semester – II) (CBCS)
Examination February, 2023
DSC-4B-Chemistry Paper IV (Analytical Chemistry)
Sub. Code: 72844

Day and Date: Tuesday, 21-02-2023

Total Marks: 50

Time: 10.30 a.m. to 12.30 p.m.

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Q.1: Choose the correct alternative for each of the following and rewrite the sentence: [10]

1. Determinate errors are associated with..... failures.
a) personal
b) instrumental
c) both (a) and (b)
d) none of these
2. Standard deviation is oftenly used as a mesure of
a) accuracy
b) mean
c) precision
d) non of these
3. In paper chromatography stationary phase is.....
a) cellulose fibre
b) aqueous
c) organic
d) gaseous
4. Phenolphthalein is
a) weak base
b) strong acid
c) weak organic acid
d) inorganic base
5. pH range of methyl red indicator is
a) 3.1 to 4.2
b) 4.2 to 6.3
c) 6.3 to 7.1
d) 5.2 to 6.3
6. The solution of known strength is known as.....
a) normal
b) standard
c) molar
d) molal

7. The method used to determine total nitrogen is,
- | | |
|--------------|---------------------|
| a) STPB | b) phosphomolybdate |
| c) Kjeldahls | d) urease |
8. A good fertilizer is expected to.....
- | | |
|-------------------------------|-------------------------------------|
| a) be soluble in water | b) have easily absorbable nutrients |
| c) stable in climatic changes | d) all these |
9. Alkalinity of water is due toions
- | | |
|-----------------------------------|---------------------------------|
| a) OH ⁻ | b) CO ₃ ⁻ |
| c) H CO ₃ ⁻ | d) All of these |
10. BOD means.....
- | | |
|-----------------------------------|-------------------------------|
| a) Biological oxygen demand | b) Biochemical oxygen demand |
| c) Biochemical oxygenated density | d) Biological oxygenated data |

Q.2: Attempt any TWO of the following: [20]

- What are errors ? State and explain types of errors .
- What is chromatography? Explain TLC methodology in detail.
- Explain the choice of indicator for titration between strong acid and weak base with help of neutralization curve.

Q.3: Attempt any FOUR of the following: [20]

- Explain hardness of water in detail.
- What is Ostwalds quinonoid theory of indicators? Explain with respect to phenolphthalein or methyl orange.
- Compare Paper and Thin layer chromatography.
- Explain necessity and qualities of good fertilizer.
- Explain sampling of solid, liquid and Gases.
- Calculate mean and median of following observations :- 17, 32, 35, 33, 15, 21

Seat No.	
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Total No. of Pages: 2

SHIVAJI UNIVERSITY, KOLHAPUR
DATTAJIRAO KADAM ARTS, SCIENCE AND COMMERCE COLLEGE, ICHALKARANJI
B.Sc. (Part – I) (Semester – I) (New) (CBCS) (NEP)
Examination March/April, 2023
CHEMISTRY (Paper - IV)
DSC– 4B: Analytical Chemistry
Sub. Code: 90225

Day and Date: Monday, 06-06-2023
Time: 10.30 p.m. to 12.30 p.m.

Total Marks: 40

- Instructions:**
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Draw neat labeled diagrams wherever necessary.
 - 4) Use of Scientific calculator is allowed.

Q. 1 A. Select the most correct alternative from the following. [04]

1. RF value is the ratio of.....
 - a) Two concentrations
 - b) two distances
 - c) rate of migration
 - d) either a or b
2. ----- is process of extracting a small portion of the material from its large quantity which truly represent the composition of the whole material
 - a) error
 - b) sampling
 - c) significant figure
 - d) variation
3. Which one of the following is an acid-base indicator?
 - a) phenolphthalein
 - b) methyl orange
 - c) methyl red
 - d) all of the above
4. BOD stands for ?
 - a) Biological oxygen demand
 - b) basic oxygen demand
 - c) bicarbonate oxygen demand
 - d) CHCl_3

B. Answer in one sentence only. [04]

- a) Define qualitative analysis
- b) What do you mean by hard water?.
- c) Name the phases used in chromatography.
- d) What is mean by standard solution?

Q. 2 Attempt any TWO of the following. [16]

- a) With the help of neutralization curve explain the choice of indicator for titration between strong acid and strong base.
- b) Explain the Kjeldahl's method for estimation of total nitrogen in fertilizers.
- c) What are errors? State and explain types of error.

Q. 3 Attempt any FOUR of the following.

[16]

- a) Compare between paper chromatography and TLC.
 - b) Write qualities of good fertilizer.
 - c) Types of EDTA titrations.
 - d) Explain the terms dissolved oxygen (DO) and COD.
 - e) List the advantages and disadvantages of chromatography.
 - f) There are following seven observations (values) of the analysis. Find the mean and median. 44, 49, 45, 58, 37, 42, 47
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Seat No.	
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Total No. of Pages: 2

SHIVAJI UNIVERSITY, KOLHAPUR
DATTAJIRAO KADAM ARTS, SCIENCE AND COMMERCE COLLEGE, ICHALKARANJI
B.Sc. (Part– I) (Semester– II) (New) (CBCS) (NEP)
Examination March/April, 2023
CHEMISTRY (Paper - IV)
DSC– 4B: Analytical Chemistry
Sub. Code: 90225

Day and Date: Tuesday, 06-06-2023

Total Marks: 40

Time: 10.30 a.m. to 12.30 p.m.

- Instructions:**
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Draw neat labeled diagrams wherever necessary.
 - 4) Use of Scientific calculator is allowed.

Q. 1 A. Select the most correct alternative from the following. [04]

1. RF value is the ratio of.....
 - a) Two concentrations
 - b) two distances
 - c) rate of migration
 - d) either a or b
2. ----- is process of extracting a small portion of the material from its large quantity which truly represent the composition of the whole material
 - a) error
 - b) sampling
 - c) significant figure
 - d) variation
3. Which one of the following is an acid-base indicator?
 - a) phenolphthalein
 - b) methyl orange
 - c) methyl red
 - d) all of the above
4. BOD stands for ?
 - a) Biological oxygen demand
 - b) basic oxygen demand
 - c) bicarbonate oxygen demand
 - d) CHCl_3

B. Answer in one sentence only. [04]

- a) Define qualitative analysis
- b) What do you mean by hard water?.
- c) Name the phases used in chromatography.
- d) What is mean by standard solution?

Q. 2 Attempt any TWO of the following. [16]

- a) With the help of neutralization curve explain the choice of indicator for titration between strong acid and strong base.
- b) Explain the Kjeldahl's method for estimation of total nitrogen in fertilizers.
- c) What are errors? State and explain types of error.

Q. 3 Attempt any FOUR of the following.

[16]

- a) Compare between paper chromatography and TLC.
 - b) Write qualities of good fertilizer.
 - c) Types of EDTA titrations.
 - d) Explain the terms dissolved oxygen (DO) and COD.
 - e) List the advantages and disadvantages of chromatography.
 - f) There are following seven observations (values) of the analysis. Find the mean and median. 44, 49, 45, 58, 37, 42, 47
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SHIVAJI UNIVERSITY KOLHAPUR

DATTAJIRAO KADAM ARTS, SCIENCE AND COMMERCE COLLEGE, ICHALKARANJI

B. Sc. (Part – I) Sem – II Examination March/April 2022

Title of Subject :- Chemistry

Paper No. IV

Title of Paper :- Analytical Chemistry

Subject Code :- 72844

Day & Date :-

Total Marks:- 50

Time :-

Instructions

Instructions:

- 1) All questions are compulsory.**
 - 2) Figures to the right indicate full marks.**
 - 3) Draw neat diagrams and give equations wherever necessary.**
-

Q.1: Choose the correct alternative for each of the following and rewrite the sentence: [10]

- a)is the process of extracting a small portion of the material from its large quantity which truly represent the composition of the whole material.
- | | |
|-------------------------|---------------|
| i) error | ii) sampling |
| iii) significant figure | iv) variation |
- b) The Precision is used to describe..... of the result.
- | | |
|----------------|---------------------|
| i) correctness | ii) reproducibility |
| iii) ability | iv) inability |
- c) When an examination is restricted to the identification of one or more constituents of a sample it is known as
- | | |
|----------------------------|--------------------------|
| i) analysis | ii) qualitative analysis |
| iii) quantitative analysis | iv) all of these |
- d) Chromatography technique is developed by
- | | |
|---------------------|-------------------|
| i) Michael's Tswetz | ii) Newton |
| iii) Mary Curie | iv) none of these |

- e) RF value is the ratio of.....
- i) two concentrations
 - ii) two distances
 - iii) rate of migration
 - iv) either i or ii
- f) The number of phases operating in Chromatography
- i) 4
 - ii) 2
 - iii) 3
 - iv) varies with the type
- g) Which one of the following is acid base indicator?
- i) phenolphthalein
 - ii) methyl red
 - iii) methyl orange
 - iv) all of above
- h) Eriochrome black T is also known as.....
- i) solochrome black
 - ii) monochrome black
 - iii) acid base indicator
 - iv) monochrome black T
- i) The chemical reaction between acid and base to form salt and water is termed as.....
- i) redox
 - ii) complexation
 - iii) neutralization
 - iv) precipitation
- j) BOD stands for
- i) Biological oxygen demand
 - ii) Basic oxygen demand
 - iii) Bicarbonate oxygen demand
 - iv) None of these

Q.2: Solve Any Two of the following:

[20]

- a) What are errors? State and explain types of error.
- b) Explain the paper chromatography in detail. Give two applications of paper chromatography.
- c) Explain the Kjeldahl's method for estimation of total nitrogen in fertilizers.

Q.3: Solve Any Four of the following:

[20]

- a) Compare between Paper chromatography and TLC
- b) Write necessity and qualities of good fertilizer.
- c) Explain the following terms
 - a) standard solution
 - b) molar solution
 - c) normality of solution
- d) Explain in detail the terms, Dissolved Oxygen (DO) and Chemical Oxygen Demand
- e) Write short note on 'Basic principle of chromatography'.

Seat No.

Total No. of Pages: 2

SHIVAJI UNIVERSITY KOLHAPUR

DATTAJIRAO KADAM ARTS, SCIENCE AND COMMERCE COLLEGE, ICHALKARANJI

B. Sc. (Part – I) Sem – II Examination March/April 2022

Title of Subject :- Chemistry

Paper No. IV

Title of Paper :- Analytical Chemistry

Subject Code :- 72844

Day & Date :-

Total Marks:- 50

Time :-

Instructions

Instructions:

- 1) All questions are compulsory.**
 - 2) Figures to the right indicate full marks.**
 - 3) Draw neat diagrams and give equations wherever necessary.**
-

Q.1: Choose the correct alternative for each of the following and rewrite the sentence: [10]

- a)is the process of extracting a small portion of the material from its large quantity which truly represent the composition of the whole material.
- | | |
|-------------------------|---------------|
| i) error | ii) sampling |
| iii) significant figure | iv) variation |
- b) The Precision is used to describe..... of the result.
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| i) correctness | ii) reproducibility |
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| i) analysis | ii) qualitative analysis |
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| i) Michael's Tswetz | ii) Newton |
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- e) RF value is the ratio of.....
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| i) two concentrations | ii) two distances |
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- f) The number of phases operating in Chromatography
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| i) 4 | ii) 2 |
| iii) 3 | iv) varies with the type |
- g) Which one of the following is acid base indicator?
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| i) phenolphthalein | ii) methyl red |
| iii) methyl orange | iv) all of above |
- h) Eriochrome black T is also known as.....
- | | |
|--------------------------|------------------------|
| i) solochrome black | ii) monochrome black |
| iii) acid base indicator | iv) monochrome black T |
- i) The chemical reaction between acid and base to form salt and water is termed as.....
- | | |
|---------------------|-------------------|
| i) redox | ii) complexation |
| iii) neutralization | iv) precipitation |
- j) BOD stands for
- | | |
|--------------------------------|-------------------------|
| i) Biological oxygen demand | ii) Basic oxygen demand |
| iii) Bicarbonate oxygen demand | iv) None of these |

Q.2: Solve Any Two of the following:

[20]

- What are errors? State and explain types of error.
- Explain the paper chromatography in detail. Give two applications of paper chromatography.
- Explain the Kjeldahl's method for estimation of total nitrogen in fertilizers.

Q.3: Solve Any Four of the following:

[20]

- Compare between Paper chromatography and TLC
- Write necessity and qualities of good fertilizer.
- Explain the following terms
 - standard solution
 - molar solution
 - normality of solution
- Explain in detail the terms, Dissolved Oxygen (DO) and Chemical Oxygen Demand
- Write short note on 'Basic principle of chromatography'.