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Code.No: R05010802 | R05 | SET-1

I B.TECH – EXAMINATIONS, JUNE - 2011
PHYSICAL CHEMISTRY
(CHEMICAL ENGINEERING)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks

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1. Draw the diagram of Pb-Ag system forming eutectic alloy and label all the phases in the diagram. [16]

2.a) Write down the cell reaction involving alkaline battery.
b) Write down the cell reaction during charging and discharging of lead storage battery.
c) The standard electrode potential for the reaction is as follows:
i) $Fe^{+2} + 2e^{-} \rightleftharpoons Fe$, $E^0 = 0.441$ V
ii) $Fe^{+3} + e^{-} \rightleftharpoons Fe^{+2}$, $E^0 = 0.771$ V.
Calculate the standard electrodes potential for $Fe^{3+} + 3e \rightleftharpoons Fe$. [5+5+6]

3.a) Describe the theory of homogeneous and heterogeneous catalysis.
b) Give an example each for enzyme catalysis and acid-base catalysis. [8+8]

4.a) Define Quantum yield. How can it be experimentally determined?
b) Explain briefly fluorescence and chemiluminescence. [8+8]

5. Give an account of the various methods employed for the purification of colloides solution. [16]

6.a) What is the principle involved in conductometric titrations? Discuss the titration of strong acid against strong base.
b) Explain the calculation of absolute Ionic mobilities with the help of Kohlrausch's law. [8+8]

7.a) Define:
i) Order of the reaction
ii) Molecularity
iii) Rate of reaction.
b) Explain how modified collision theory is superior to collision theory. [9+7]

8. The distribution coefficient of Isobutyric acid between ether and water is 3 at 25^0C. What will be the amount Isobutyric acid removes if 4 gm of Isobutyric acid in 100 ml of water is extracted with 100 ml of ethony ethane (ether) at 25^0C? What would be the effect if two successive 50 ml portion of ether had been used to entrust the aqueous layer? [16]

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Code.No: R05010802 | R05 | SET-2

I B.TECH – EXAMINATIONS, JUNE - 2011
PHYSICAL CHEMISTRY
(CHEMICAL ENGINEERING)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks

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1.a) Describe the theory of homogeneous and heterogeneous catalysis.
b) Give an example each for enzyme catalysis and acid-base catalysis. [8+8]

2.a) Define Quantum yield. How can it be experimentally determined?
b) Explain briefly fluorescence and chemiluminescence. [8+8]

3. Give an account of the various methods employed for the purification of colloides solution. [16]

4.a) What is the principle involved in conductometric titrations? Discuss the titration of strong acid against strong base.
b) Explain the calculation of absolute Ionic mobilities with the help of Kohlrausch's law. [8+8]

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i) Order of the reaction
ii) Molecularity
iii) Rate of reaction.
b) Explain how modified collision theory is superior to collision theory. [9+7]

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7. Draw the diagram of Pb-Ag system forming eutectic alloy and label all the phases in the diagram. [16]

8.a) Write down the cell reaction involving alkaline battery.
b) Write down the cell reaction during charging and discharging of lead storage battery.
c) The standard electrode potential for the reaction is as follows:
i) $Fe^{+2} + 2e^- \rightleftharpoons Fe$, $E^0 = 0.441$ V
ii) $Fe^{+3} + e^- \rightleftharpoons Fe^{+2}$, $E^0 = 0.771$ V.
Calculate the standard electrodes potential for $Fe^{3+} + 3e \rightleftharpoons Fe$. [5+5+6]

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Code.No: R05010802 | R05 | SET-3

I B.TECH – EXAMINATIONS, JUNE - 2011
PHYSICAL CHEMISTRY
(CHEMICAL ENGINEERING)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks

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1. Give an account of the various methods employed for the purification of colloides solution. [16]

2.a) What is the principle involved in conductometric titrations? Discuss the titration of strong acid against strong base.
b) Explain the calculation of absolute Ionic mobilities with the help of Kohlrausch's law. [8+8]

3.a) Define:
i) Order of the reaction
ii) Molecularity
iii) Rate of reaction.
b) Explain how modified collision theory is superior to collision theory. [9+7]

4. The distribution coefficient of Isobutyric acid between ether and water is 3 at 25^0C. What will be the amount Isobutyric acid removes if 4 gm of Isobutyric acid in 100 ml of water is extracted with 100 ml of ethony ethane (ether) at 25^0C? What would be the effect if two successive 50 ml portion of ether had been used to entrust the aqueous layer? [16]

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ii) $Fe^{+3} + e^- \rightleftharpoons Fe^{+2}$, $E^0 = 0.771$ V.
Calculate the standard electrodes potential for $Fe^{3+} + 3e \rightleftharpoons Fe$. [5+5+6]

7.a) Describe the theory of homogeneous and heterogeneous catalysis.
b) Give an example each for enzyme catalysis and acid-base catalysis. [8+8]

8.a) Define Quantum yield. How can it be experimentally determined?
b) Explain briefly fluorescence and chemiluminescence. [8+8]

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Code.No: R05010802 | R05 | SET-4

I B.TECH – EXAMINATIONS, JUNE - 2011
PHYSICAL CHEMISTRY
(CHEMICAL ENGINEERING)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks
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1.a) Define:
i) Order of the reaction
ii) Molecularity
iii) Rate of reaction.
b) Explain how modified collision theory is superior to collision theory. [9+7]

2. The distribution coefficient of Isobutyric acid between ether and water is 3 at 25^0C. What will be the amount Isobutyric acid removes if 4 gm of Isobutyric acid in 100 ml of water is extracted with 100 ml of ethony ethane (ether) at 25^0C? What would be the effect if two successive 50 ml portion of ether had been used to entrust the aqueous layer? [16]

3. Draw the diagram of Pb-Ag system forming eutectic alloy and label all the phases in the diagram. [16]

4.a) Write down the cell reaction involving alkaline battery.
b) Write down the cell reaction during charging and discharging of lead storage battery.
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Calculate the standard electrodes potential for $Fe^{3+} + 3e \rightleftharpoons Fe$. [5+5+6]

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6.a) Define Quantum yield. How can it be experimentally determined?
b) Explain briefly fluorescence and chemiluminescence. [8+8]

7. Give an account of the various methods employed for the purification of colloides solution. [16]

8.a) What is the principle involved in conductometric titrations? Discuss the titration of strong acid against strong base.
b) Explain the calculation of absolute Ionic mobilities with the help of Kohlrausch's law. [8+8]

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