**QUESTIONS FOR FINAL CONTROL ON THE SUBJECT**

**"PROCESSES AND DEVICES OF CHEMICAL ENGINEERING"**

**FOR SEMESTER 6**

1. **1. Fundamentals of mass transfer .**

*Mass transfer , velocity, phase, equilibrium, component, material balance, equations, molecular , turbulent , convective , mass transfer .*

**2.The driving force is mass transfer .**

*Driving force, phase, equation, amount of substance, concentration, process, diffusion, speed, size, diameter, height , step.*

1. **Mass transfer process .**

*Mass transfer , phase, component, model, amount of matter, equations, coefficient, layer, hydrodynamic similarities, Nusselt, Fourier, Peclet, Prandtl.*

1. **Absorption.**

*Absorption, absorbent , absorbent, chemosorption , gas, liquid, phase, equilibrium, Henry coefficient, specific consumption, absorbent consumption, process rate, equations.*

1. **Absorber device.**

*Type , surface , film , nozzle , characteristics of nozzles, choice of nozzles, types of plates, with draining devices, liquid, spreading , advantages, disadvantages.*

1. **Absorber calculation.**

*Consumption, concentration, absorbent, material balance, heat balance, diameter, height , equation, nozzle, plate, Reynolds , number of plates, hydraulic resistance.*

1. **Distillation of liquids.**

*Distillation, distillate, distillation residue, simple, rectification, fractional, deglemation , steam, periodic, continuous , equations, number of reflux , multicomponent .*

1. **The device of distillation apparatuses.**

*, application, dephlegmator . Nozzles, Rashig , characteristics, requirements, plate , bubbling , film , advantages, disadvantages.*

1. **Calculation of distillation apparatuses.**

*Diameter, height , speed, mass velocity, equations, plate, nozzle, hydraulic resistance, material balance, heat balance, dry plate.*

1. **liquid extraction.**

*Extraction, type , refined, extractant , selection , equilibrium, equation, extraction method , process speed, amount of substance, mass transfer .*

1. **The device of extraction apparatuses.**

*Type , injector, tubular , settling tanks, column , nozzle , sktchatka , spreader , shelf , rotary disk , device, centrifuge , dignity.*

1. **Calculation of extracts.**

*Size , diameter, height , equations, plate, perforation, coefficient, speed, section, layer height , distance between plates, hydraulic resistance.*

1. **Adsorption.**

*Adsorption, adsorbent , adsorbent, application, physical, chemosortion , requirement, type , type of adsorbents, equilibrium, equation, speed.*

1. **adsorber devices.**

*Type , fixed bed, moving bed, fluidized bed, screw , multi -chamber , process stage, ion exchange , periodic, continuous , bed volume, number of plates, adsorbent consumption.*

1. **Calculation of adsorbers.**

*Size , diameter, speed, height , periodic, time, speed , movement , layer height , continuous , layer volume, number of plates, adsorbent consumption, desorption.*

1. **Dissolution and extraction of solid materials .**

*Extraction, solution , application, solvent, method , speed, equilibrium, equation, closed, direct- flow , counter- flow , fixed layer, criteria.*

1. **Extractor device.**

*Type , requirement, fixed bed, pneumatic multi -stage , screw , belt , tubular , fluidized bed, material balance, heat balance, process acceleration.*

1. **Drying.**

*Drying, method , type , artificial , natural , wet gas, absolute humidity, relative humidity, moisture content, enthalpy, equilibrium, kinetics, diagram.*

1. **Dryer device.**

*Type , design of dryers, chamber , tunnel , lenchatka , drum , fluidized bed, spreader , pneumatic, vacuum dryer wardrobe , rowing, rolling , special .*

1. **Calculation of the dryer.**

*Air consumption, wet material, dry material, moisture, material balance, heat balance, diameter, length, angle, dianrama , speed.*

1. **Crystallization.**

*Crystallization, polymorphism, crystalline hydrate, saturated , crossed , stage, dissolution, equilibrium, speed, equation, diagram, method .*

1. **Crystallizer device.**

*Type , drum , vacuum m- crystallizer , fluidized bed, multi-stage, oscillating, with a belt mixer, roller , equation, material balance, heat balance, diameter, height .*

1. **Grinding of solid materials.**

*Mechanical process, type , grinding, equation, crushing, method , classification, degree of grinding, grinding law , requirements, fundamental schema .*

1. **The device of grinding machines.**

*Type , coarse crushing, auger , cone , roller , impact centrifugal , fine grinding, drum , ring mill , equation, power, height , particle size.*

**TICKETS FOR FINAL CONTROL FOR 6 SEMESTER.**

**jet ,**

OPTION-#1

**1. Calculation of distillation apparatuses.**

*Diameter, height , speed, mass velocity, equations, plate, nozzle, hydraulic resistance, material balance, heat balance, dry plate.*

**2. Device extractors.**

*Type , requirement, fixed bed, pneumatic multi -stage , screw , belt , tubular , fluidized bed, material balance, heat balance, process acceleration.*

**3. Basic mass transfer .**

*Mass transfer , velocity, phase, equilibrium, component, material balance, equations, molecular , turbulent , convective , mass transfer .*

**Compiled by:**

OPTION-#2

**1. Mass transfer process .**

*Mass transfer , phase, component, model, amount of matter, equations, coefficient, layer, hydrodynamic similarities, Nusselt, Fourier, Peclet, Prandtl.*

**2. Liquid extraction.**

*Extraction, type , refined, extractant , selection , equilibrium, equation, extraction method , process speed, amount of substance, mass transfer .*

**3. Drying.**

*Drying, method , type , artificial , natural , wet gas, absolute humidity, relative humidity, moisture content, enthalpy, equilibrium, kinetics, diagram.*

**Compiled by:**

OPTION-#3

**1. The driving force is mass transfer .**

*Driving force, phase, equation, amount of substance, concentration, process, diffusion, speed, size, diameter, height , step.*

**2. Arrangement of extraction apparatuses.**

*Type , injector, tubular , settling tanks, column , nozzle , sktchatka , spreader , shelf , rotary disk , device, centrifuge , dignity.*

**3. Calculation of the dryer.**

*Air consumption, wet material, dry material, moisture, material balance, heat balance, diameter, length, angle, dianrama , speed.*

**Compiled by:**

OPTION-№4

**1. Absorption.**

*Absorption, absorbent , absorbent, chemosorption , gas, liquid, phase, equilibrium, Henry coefficient, specific consumption, absorbent consumption, process rate, equations.*

**2. Calculation of extracts.**

*Size , diameter, height , equations, plate, perforation, coefficient, speed, section, layer height , distance between plates, hydraulic resistance.*

**3. The device of dryers.**

*Type , design of dryers, chamber , tunnel , lenchatka , drum , fluidized bed, spreader , pneumatic, vacuum dryer wardrobe , rowing, rolling , special .*

**Compiled by:**

OPTION-#5

**1. Device absorbers .**

*Type , surface , film , nozzle , characteristics of nozzles, choice of nozzles, types of plates, with draining devices, liquid, spreading , advantages, disadvantages.*

**2. Adsorption.**

*Adsorption, adsorbent , adsorbent, application, physical, chemosortion , requirement, type , type of adsorbents, equilibrium, equation, speed.*

**3. Crystallization.**

*Crystallization, polymorphism, crystalline hydrate, saturated , crossed , stage, dissolution, equilibrium, speed, equation, diagram, method .*

**Compiled by:**

OPTION-№6

**1. Calculation of absorbers.**

*Consumption, concentration, absorbent, material balance, heat balance, diameter, height , equation, nozzle, plate, Reynolds , number of plates, hydraulic resistance.*

**2. Adsorber devices.**

*Type , fixed bed, moving bed, fluidized bed, screw , multi -chamber , process stage, ion exchange , periodic, continuous , bed volume, number of plates, adsorbent consumption.*

**3. The device of crystallizers.**

*Type , drum , vacuum m- crystallizer , fluidized bed, multi-stage, oscillating, with a belt mixer, roller , equation, material balance, heat balance, diameter, height .*

**Compiled by:**

OPTION-№7

**1. Distillation of liquids.**

*Distillation, distillate, distillation residue, simple, rectification, fractional, deglemation , steam, periodic, continuous , equations, number of reflux , multicomponent .*

**2. Calculation of adsorbers.**

*Size , diameter, speed, height , periodic, time, speed , movement , layer height , continuous , layer volume, number of plates, adsorbent consumption, desorption.*

**3. Grinding of hard materials.**

*Mechanical process, types, grinding, equation, crushing, method , classification, degree of grinding, grinding law , requirements, principal schema .*

**Compiled by:**

OPTION-#8

**1. The device of distillation apparatuses.**

*, application, dephlegmator . Nozzles, Rashig , characteristics, requirements, plate , bubbling , film , advantages, disadvantages.*

**2. Dissolution and extraction of solid materials .**

*Extraction, solution , application, solvent, method , speed, equilibrium, equation, closed, direct- flow , counter- flow , fixed layer, criteria.*

**3. The device of grinding machines.**

*Type , coarse crushing, auger , cone , roller , impact centrifugal , fine grinding, drum , ring mill , equation, power, height , particle size.*

**Compressor, compression ratio, type , equation, compression, power, reciprocating, vane , jet ,**

**Compiled by:**