Name a few flowmeters
how does rotameter work
where does drag force in rotameter work
how does pitot tube work
where can you take the free stream pressure for pitot tube.
Difference between Reciprocating and Centrifugal pump
Why we use extraction (compared to say distillation for some processes)

1.) Where is the non linear term in rate equation?
2) What are the types of ideal reactors?
3) Why are they called ideal? What are non-ideal reactors?

3) What is offset?
4) Do you eliminate all the errors in P only controller? Why? Mathematical expression.
5) Nusselt number and Biot number difference?
6) Fundamental differences of Conduction, Radiation and Convection?
7) Significance of 'h"

3) Derive how flow is measured by a flowmeter and orifice plate :(
4) When do we use Centrifugal and Reciprocating pump? Why?
5) Name some separation processes
6) When do we use Extraction over distillation?

why are baffles used, what are tie rods

- hydraulic dia of a square pipe
- reynolds analogy : what number equals f/2
- gross n net calorific value
- difference between vapour and gas
- calorific value of coal
- draw a nozzle with ring pad and shell
- centrifugal pumps - graph of H versus Q , shutoff head, operating zone, NPSH
- what are the impurities from refinery
- how to design 1-2 heat exchanger
- how to remove co2 , so2 and no2 from gas
- what is critical temperature and pressure

showed me truncated navier stokes eqn, asked me to identify what it was and explain physical significance of each term

- showed the above equations momentum integral soln and asked to identify boundary conditions after guessing the non-dimensional forms needed
- asked what is view factor in radiation..i said never heard of it..so he gave me the definition and asked me to calculate view factors of flat, curved and spherical surfaces
- asked me the reynolds analogy qs asked by dd kar
- asked me the terms in bernoullis equation and "which subject would be needed to incorporate viscous terms in this eqn"

Which will you arrange a large reactor and small reactor in a series combination?
Given equilibrium constant, how will you find equilibrium conversion?

Where rotameter cannot be used?
Force balance for the same
Schematic diagram of 2-4 heat exchanger
Write formula for overall heat transfer coefficient in tubes
Significance of Nusselt no
Lubricants used in fans?
What type of fluid are they?
Draw shear stress curve for it
Diff types of fluid?
How flow is measured for waste water flowing in drains in industry?

Instruments used to measure flow?
Give example of variable head and area flowmeter?
Non invasive techniques of measuring flow?
Pitot tube
What type of material is bottle - thermoplastic
Boundary layer in pipe with distance for laminar and turbulent flow
WHAT is boundary layer?
On what factor does boundary layer height depends? - velocity, length
What is difference between biochemical and chemical reactions?
Name one biochemical reaction?
Antibiotic production
Stefan Boltzman law
What kind of heat transfer can take place from a table top?

What is viscoelastic fluid?
Give example
What kind of forces come into play in micro-channel?
Why microchannnel?
Separation in microchannel

What is Standard temp and pressure? Normal temperature and pressure?
H_2SO_4 production? What is meant by 20% oleum?
Air liquefaction?
What kind of column used?
What comes out at the bottom and the top?

How to design diameter of feed nozzle in distillation column?
What is channeling? How do you prevent it?

1)Dittus-Boelter Equation
2)Sieder -Tate Equation
3)Significance of Re , Pr and Nu.
4)Define Emissivity
5)Planck's & Stefan's Law
6)View Factor & its Significance
7)Forces acting on a body immersed in fluid.
6)Drag force and its importance.
7)Corelation between fanning factor and Drag coefficient
8)Do u know anything about Mechanical Operations... "err sir I am nt sure."
9)Ok ,whats filtration ?
10)Bond's Law & Work Index
11)Genralized Filtration Equation.

4)Flowmeters classification ?
5) write down the popular ones..
6)Difference between Venturi and orifice meters?
7)WHich is better?
8) How does Drag coefficient effect them ?
9)Flow ranges of both ?

- Choose fav subject among Fuel, combustion, Process Control, Mass Transfer, Design.
- What is Feed Forward control. And does it have to always contain Feedback control inside it.
- What is a 'bias' value in the PID equation.
- Give the order of Calorific Value of Coal.
- Draw an Engg Diagram of a nozzle connected to the heat exchanger wall.
- What is SORP.
- Temperature gradient inside a Distillation column.
- Pressure gradient inside a distillation column.
- What is NPSH?
- What is the direction of impeller blades in a centrifugal pump, direction of flow.
- What are the characteristic curves for a pump.

- What is a tie rod? Where is it connected to in the HE?
- What is Reynold's analogy? and Which dimensionless number contributed to a crucial equation here. (St=f/2).

Meikap :

What is priming of a pump ? How will you accomplish it ?
What is NPSH ?
What is cavitation ?
How would you come to know if there is cavitation in a pump ?
What type of pressure devise is used to measure pressure just after a centrifugal pump . Why ?
LMTD in countercurrent is less than LMTD in co-current in a special situation . What is that ?
Draw the flooding vs liquid velocity curve for a packed tower ?

What is octane number ?
What is cetane number ?
What is knocking and how would you describe knocking as a chemical engineer ?
Why do higher branched hydrocarbons have higher octane number ?
What is unleaded petrol ?
Why is the chemical used in unleaded petrol used ? And what is its mechanism of improving the quality of petrol ?
In terms of deltaG , thermodynamically explain how boiling takes place ?

What is the fundamental difference between petrol and diesel ? In terms of composition ?
In steam pipelines , how will you ensure there is no condensation ?
When there is condensation , how will you remove it ?
What are steam traps ?
What is cloud point ?
What is pour point ?
How will you pump highly viscous liquids ?
What is PPD ? (Pour point depressant)
What are different types of packing in the packed column ?
Suppose you are a construction engineer , how will you fill up the column with the packing ?

1. non interacting CSTR
2. block diagram for feedback ctrler

Crushers, Mills, critical velocity(to derive the expression)
Kick's law Bonds law and rittinger's law..and what is the basic difference
Settling: free and hindered
Different types of settlers
What is thermistor,
temperature dependent resistor
how does a thermocouple work
thermometers which use conductors's resistance
Transfer function, stability of a process, poles and zeroes
Urea manufacturing
Ammonia manufacturing..starting from how we obtain H2 and N2
producer gas, water gas, the difference between them

Derive NS equation of heat conduction in a cylinder
Derive the unsteady state conduction equation of a sphere with initial temp T1 fully submerged in fluid of temp T2. Boundary conditions.
Heat conduction equation in three slabs of diff k and length

Derive equation in a CSTR, unsteady state and A->B+C
Competitive reaction in a CSTR if initial mole flow rates are fixed and k1/k2 is given how would you control product formation
Eigen values for matrix

1. Overall heat transfer coefficient

2. Dirt Factor

- Draw a three effect evaporator. Co current, Counter current
- Draw a shell-tube 1-2 HEx
- Derive the LMTD for that (Ans: one of the tube passes will be cocurrent, other pass countercurrent)
- Draw the temperature profile for the shell side and tube side fluids along the length of the HEx
- Write the Stokes Equation
- What is Particle Reynolds Number?
- Basic equation of filtration?
- What do you know about Pool Boiling?
- What are single effect evaporators, multiple effect evaporators, and their advantages and disadvantages?
- Do we use saturated steam or super heated steam in evaporators?
- Draw a HEx
- Do we have 1-3, 1-5 HExes in the market (odd no. of tube-side passes)? Why not?
- If the shell side fluid is a gas, and tube side is a liquid, where will u fill the liquid from, top or bottom?
- Why do we not have too many baffles? Won't it increase turbulence and heat transfer? (Ans: pressure drop will inc, cleaning will be difficult)
- Do you have any idea about the pitch? Advantages and disadvantages of square pitch and triangular pitch? (Ans: triangular - more compact, square - less pressure drop, easier to clean)
- Draw a distillation column
- Where is the temperature higher?
- Can we design a system to exchange heat from the top portion to heat the reboiler? Is it more economical to heat the reboiler separately or to heat the already warm gases and then make them lose heat by exchanging with the reboiler so that the warm gases are also condensed and the reboiler is also heated? Will the control of such a process still be easy?
- Name 5 mechanical operations
- Plot the graph of e^(-1/x) (via with pen and paper only)
- Various methods of solving PDEs?
- Difference between crushing and grinding?
- Use of analogies in FF, HT, MT?

1. Darcy equation?
2. equal velocity for Stroke n newton regime
3. Kozney karmen equation
4. Filtration equation and derive for constant flow rate and constant pressure difference
5. Specific cake resistance significance
6. how it varies with compressible/incompressible flow
7. Settling types
8. Power number
9. Work index
10. particle reynold number

1.) Kinetic model.. collision therory etc..
2.) write three formulas for k as func of Temp. ans one is Arhenius
3.) What is CSTR and PFR main diff : 1.) Back mixing 2.) dispersion
4.) Write NH_3 disosiation rxn. Write eq. constant
5.) two CSTR 1 liter and 10 liter which one first
6.) CSTR 5 liter PFR 5 liter which one first