

## Self Discussion Questions

### ■ Microbiology:

#### \* Viruses:

1. Give name of RNA & DNA viruses

#### (-) RNA viruses

- Paramyxovirus
- Orthomyxovirus
- Rhabdovirus
- Filovirus
- Bunyavirus
- Arenavirus
- Reovirus
- Delta virus

#### (+) RNA viruses

- Calcivirus
- Picornavirus
- Flavivirus
- Togavirus
- Coronavirus
- Retrovirus (HIV)

#### DNA viruses

- Herpes virus
- Hep B virus
- Papova virus
- Parvovirus
- Poxvirus

2. How will you identify different viruses?

3. Which is the only (+) sense RNA virus with helical shaped?

4. Which is the only (-) sense RNA virus with icosahedral shaped?

5. Shape of all DNA viruses and exception to this

6. Which three RNA viruses are non-envelope?

7. Envelope DNA viruses

8. Which is the only RNA virus with double stranded RNA?

9. Which is the only DNA virus with single stranded DNA?

10. Which two RNA and two DNA viruses have circular nucleic acid?

11. What is the difference b/w positive sense and negative sense RNA viruses?

12. Name of segmented viruses

13. What is an importance of segmented viruses?

14. The site of viral replication

15. Which DNA virus replicates in cytoplasm?

16. Which two RNA viruses replicate in nucleus?

17. How replications in DNA viruses occur?

18. Which DNA virus has **self coded envelope**?

19. Give name of an important **viruses in Calcivirus family**

20. Give name of an important **viruses in Flavivirus family**

21. Give name of an important **viruses in Paramyxovirus family**

22. Give name of an important viruses in Picornavirus family

23. Give name of an **important viruses in Herpes family**

24. "**Clue words**" to diagnose important viruses from inclusion bodies

#### \* Intracytoplasmic inclusion body

- Rabies
- Poxvirus
- HPV
- Chlamydia

#### \* Intranuclear inclusion body

- Herpes

#### \* Both Intracytoplasmic & Intranuclear inclusion bodies:

- CMV

25. Important points to know about Rabies virus (Rhabdovirus family)
  - Bullet shaped – carrier (**dogs, bat, skunk**) – hydrophobia – **fatal once developed** – **Dx**: Negri bodies (Intracytoplasmic inclusion in brain tissue)
26. Most common cause of Aseptic meningitis [Sign & Symptoms of meningitis (headache, stiff neck) but patient appears less toxic]
27. Most common cause of viral encephalitis. Most common site.
28. Most common cause of viral pink eye
29. Causes of diarrhea due to virus
  - diarrhea in **Infants (<2 yrs)** –
  - diarrhea in **kids & adults** –
30. Cause of Hand Foot Mouth disease
31. Most common cause of acute Pericarditis
32. Give the name of virus family of Measles (Rubeola) & Rubella (German Measles)
33. “Clues” to diagnose Measles (Rubeola)
34. Which vitamin should **supplement in measles**
35. “Clues” to diagnose Mumps
36. “Clues” to diagnose Rubella (German Measles)
37. “Clues” to diagnose Roseola (Exanthema Subitum)
38. Virus causes Roseola
39. “Clues” to diagnose Varicella (chicken pox)
40. “Clues” to diagnose Molluscum Contagiosum
41. TORCH infections
42. Clinical importance of **Papova virus (HPV)**
43. For which virus we do Tzank test? What are we looking for in Tzank test?
44. What does Monospot test check? Is it specific?
45. What is **an importance of different Hep-B markers?** [HBsAg, Anti-HBcAb, HBeAg, Anti-HBeAb, Anti-HBsAb]
  - HBsAg:
  - Anti-HBcAb:
  - HBeAg:
  - Anti-HBeAb:
  - Anti-HBsAb:
  - Hep-B markers appear in following sequence [From first to last:]
46. What is a **window period**? How do we diagnose Hep-B and HIV infection when patient is in window period?
47. Diagnosis of acute infection (current infection) due to important Hepatitis viruses
  - Hep-B:
  - Hep-A:
  - Hep-C:
48. What does **Anti-HCV Ab** indicate?
49. Most common virus causes hepatocellular CA
50. **Transmission of different Hepatitis viruses**
  - Hep-A:
  - Hep-B:

- Hep-C:
- Hep-D:
- Hep-E:

51. Important points to know about Hep-D virus

- Delta virus, **incomplete virus, co-infection with Hep B required / super infection in previously infected with Hep B**, In combination with Hep B, it has **highest mortality** rate of all the hepatitis infections

52. Which hepatitis virus has highest mortality in pregnant women?

53. Which virus is a **causative agent for Kaposi sarcoma**?

54. Common feature of all hemorrhagic fever [Ebola, Dengue, Yellow fever]

- Fever + bleeding diathesis [Low platelet counts, DIC, shock]

55. Diagnosis of HIV

- **ELISA** – screening test (screen for **antibody** against HIV in patient's serum)
- **Western blot test** – confirmatory test (check antibody against p24, p17, gp120 and gp41), should demonstrate **presence of antibody to atleast 2 out of 3 antigens** [p24, gp41 and gp120]; if antibody to only one antigen present, then consider it negative and order **HIV PCR** to confirm the diagnosis

56. Which is the capsid protein in HIV? Importance of it

57. Give name of envelope proteins. Which envelope protein binds to CD4+ cells?

58. Which HIV gene down regulates host cell's immunity (MHC-1, MHC-2)?

59. Which gene is responsible for production of important viral enzymes? Function of these enzymes

- Reverse transcriptase:
- Integrase:
- Protease:

60. Clinical presentation of Hantavirus (Bunyavirus family)

- Myalgia, fever & **ARDS**, carrier common deer **mice**

61. Clinical presentation of Lassfever (Arenavirus family)

- Non-specific symptoms like fever, retro-sternal pain, mucosal bleeding, proteinuria, etc, 15-20% mortality; reservoir – rodents; spread through inhalation of tiny particle of rodents excretion, person-person transmission; Dx: ELISA, Tx: Ribavirin; Complications: deafness, spontaneous abortion

62. What are eclipse period and latent period?

- Eclipse period –
- Latent period –

\* **Parasites:**

1. What is the difference b/w intermediate host and definitive host?
2. What happen when men as an intermediate host
3. Give an example of conditions in which men as an intermediate host
4. Parasite causing Sparganosis; Clinical importance of it
5. **Carrier of Toxoplasmosis** (T. gondii)
6. Which form of Toxoplasma can cross placenta
7. Which form of maternal toxoplasmosis can infect fetus?

8. Presence of IgM against Toxoplasma in newborn indicates what? Clinical importance of it
9. Parasite causing Chagas disease. Vector (disease transmitting agent) of it. [common in Brazil]
10. Important sign specific to Chagas disease
11. Parasite causing African sleeping sickness. Vector of it.
12. Parasite causing Kala-azar. Vector of it.
13. Which form of L. Donovanii is present in liver & spleen?
14. Parasite causing Babesiosis [Similar to malaria; it causes hemolysis]
15. Parasite causing Giardiasis. Route of transmission
16. Parasite causing amoebiasis. Route of transmission
17. Parasite causing vaginosis. Route of transmission
18. Which free living amoeba present in contact lens solution causes keratitis & granulomatous Amoebic Meningitis?
19. Which free living amoeba present in fresh warm water causes Amoebic Meningitis?
20. Mosquitoes inject which form of plasmodia in human blood?
21. Which form of plasmodia causes relapse?
22. Which form of plasmodia is responsible for malarial paroxysm?
23. Which form is picked up by mosquitoes from patient infected with malaria?
24. Name of liver and bladder flukes. How do they transmit to our body?
25. Name of parasite causing cancer
26. “Buzz word” for pinworm infection [Enterobius Vermicularis]
27. How do you diagnose pinworm infestation?
28. Which worm causing rectal prolapse?
29. Life cycle of round worm [Ascaris lumbricoides]
30. How does hookworm [Necator Americans] transmit?
31. Which anemia occurs in hookworm manifestation?
32. “Clues” to diagnose **Cryptosporidium** [Causing diarrhea in patient with AIDS]
33. “Clues” to diagnose Trichinella spiralis

\* **Fungi:**

1. Which fungus is found in reticular endothelial system cells like macrophage?
2. “Clues” to diagnose Coccidioidomycosis [California, Arizona]
3. “Clues” to diagnose Blastomycosis
4. “Clues” to diagnose Cryptococcosis
5. “Clues” to diagnose Pneumocystis Carinii Pneumonia (PCP)
6. “Clues” to diagnose Aspergillosis
7. “Clues” to diagnose Candida
8. “Clues” to diagnose Sporothrix schenkii
9. “Clues” to diagnose Paracoccidioides
10. “Clues” to diagnose tinea infections
11. “Clues” to diagnose tinea versicolor
12. Causative agent for tinea versicolor
13. When should we start prophylaxis for PCP and Cryptococcosis in HIV patient
14. Difference b/w bacteria, virus, fungi and parasites

\* **Bacteria:**

1. What is unique to gram (+) bacteria only?
2. What is unique to gram (–) bacteria only?
3. What forms **capsule in bacteria**? Clinical importance of it.

4. Where do **metabolic process / electron transport take place in bacteria?**
5. What is the **purpose of Porins?**
6. What is **responsible for shock in gram (–) bacterial infection?**
7. Which **factor in streptococci is responsible for rheumatic fever?**
8. Color of gram (+) & gram (–) bacteria
  - Gram (+) – Purple/Blue [same color as Non-Acid Fast bacteria]
  - Gram (–) – Pink/Red [same color as Acid Fast bacilli]
9. Important characteristics of **all Staph?** How is it **differing from Strep?**
10. How would you **differentiate Staph aureus from other staph?**
11. How would you **differentiate Staph Epidermidis from Staph Saprophytics?**
12. Which staph is beta hemolytic?
13. How does staph aureus evade phagocytosis?
14. How would you differentiate Strep Pyogens from Strep Agalactiae?
15. What is the similarity b/w strep agalactiae and Cl.perfringens
16. How would you differentiate Viridans group (Strep mutans) from strep pneumonia?
17. How would you differentiate Enterococcus fecalis from Strep Bovis?
18. What are alpha, beta & gamma hemolysis?
  - Alpha hemolysis – reduction of iron in hemoglobin giving green color on blood agar; Examples: Strep Viridans group and Strep Pneumonia
  - Beta hemolysis – complete rupture of red blood cells, giving distinct, wide, clear areas around bacterial colonies on blood agar; Examples: Strep Pyogens and Strep Agalactiae
  - Gamma hemolysis: no hemolysis take place; Examples: Enterococcus fecalis and Strep bovis
19. On what basis we classify strep in class A, B, D, etc?
20. Clinical importance of all streptococci written below
  - Strep Pyogens:
  - Strep Agalactiae:
  - Strep Viridans:
  - Strep Pneumonia:
  - Enterococcus fecalis: UTI [Dipstick test – **positive leukocyte esterase & negative nitrite test.** (Nitrite test is positive in E.coli)]
  - Strep Bovis: affect **tricuspid** valve in **colon cancer patient**
21. How will you differentiate UTI due to E.coli and Enterococcus fecalis?
22. Characteristics of Bacillus
  - Obligate Aerobes, rod-shaped, beta-hemolytic, Catalase positive, substantial portion usually contain an oval endospores at one end, making it bulge [spore forming bacteria]
23. Clinical importance of Bacillus Anthrax
  - Cutaneous anthrax
  - Inhalational anthrax
  - Ingestion
24. “Clues” to diagnose B. cereus
25. Clinical importance of Listeria monocytogen
26. Characteristic of Listeria and Tx of its infection
27. Source of Listeria infection in humans

28. “Clue” to diagnose diphtheria
29. How does diphtheria toxin work? Which toxin is similar to diphtheria toxin?
30. Which important organ is affected in diphtheria?
31. Give name of selective and differential cultural media for diphtheria
32. “Clue” to diagnose Actinomycosis. Treatment of it
33. “Clue” to diagnose Nocardia. Treatment for it
34. “Clue” to diagnose Cl. Botulinum infection in infant
35. “Clue” to diagnose Pseudomembranous colitis [caused by Cl. Difficile]
36. Clinical importance of Cl. Perfringens
37. How does **tetanus toxin** work?
38. Which two factors are we looking for when we give Tetanus Toxoid (TT)?
39. “Clue” to diagnose Mycoplasma
40. Characteristics of Mycoplasma. Treatment of its infection
41. “Clue” to diagnose Acute Epiglottitis
42. Characteristics of H. Influenzae
43. Which type of H. influenzae cause epiglottis & meningitis and which type cause conjunctivitis, sinusitis & otitis media?
44. Characteristic of Neisseria
45. Clinical importance of Neisseria
  - N. Meningitidis:
  - N. gonococcus:
46. Important characteristics of N. gonococcus
47. Clinical importance of Moraxella Catarrhalis. Treatment of infection causing by it
48. How would you differentiate Enterobacteriaceae from other gram (–) bacteria?
49. Give name of bacteria in enterobacteriaceae
  - Citrobacter, Escherichia, Enterobacter, Klebsiella, Shigella, Yersinia, Proteus, Salmonella
50. Which enterobacteriaceae bacteria doesn't have flageller antigen (H)?
51. “Clue” for diagnosis of Proteus infection
52. Which is the only bacterium from enterobacteriaceae catalase negative?
53. Give name of important non-lactose fermenting enterobacteriaceae bacteria
54. Give name of important **lactose fermenting** enterobacteriaceae bacteria
55. Clinical importance of Yersinia
56. Patients with **Hemochromatosis** are susceptible to which organisms?
57. Diarrhea producing different E.coli and their clinical importance
  - Enterotoxigenic E.coli [ETEC]:
  - Enteropathogenic E. coli (EPEC):
  - Enteroinvasive E.coli [EIEC]:
  - Enterohemorrhagic E.coli [EHEC]:
58. Which capsular antigen do E coli possess?
59. Which capsular antigen do salmonella possess?
60. **Reservoir / Transmission of important bacteria**
  - S typhi:
  - S enterica:
  - Campylobacter jejunii:

- H pylori:
- Legionella:
- Francisella (tularemia):
- Chlamydia psittaci:
- Coxiella Burnetti:
- Borrelia burgdorferi:
- R rickettsii:
- R prowazakii:
- R typhi:
- Bartonella Henselae:
- Brucella:

61. “Clue” to diagnose Klebsiella
62. Clinical importance of H pylori
63. Clinical importance of C jejunii
64. “Clue” to diagnose Legionella
65. “Clue” to diagnose Pseudomonas
66. Clinical importance of Pseudomonas
67. What is an Alpha toxin? Give name of bacteria that produce it
68. Important points to remember about **Mycobacterium Tuberculosis**
  - Produce **Niacin; waxy envelope** (responsible for **Caseous necrosis**)
  - **Cord factor (trehalose dimycolate): Interferes with phagocytosis** by macrophages by preventing the fusion of the phagosome with the lysosome [It also present in Nocardia]
  - **Tuberculin + mycolic acid**: delayed HS, damage is done by immune system. **No** endotoxin / exotoxin
69. When will you consider PPD test positive?
70. “Clue” to diagnose Francisella (tularemia). Treatment of it.
71. “Clue” to diagnose Chlamydia
72. Which inclusion body form of Chlamydia is infectious?
73. Characteristics of Chlamydia
74. “Clue” to diagnose **Lyme disease** (Borrelia burgdorferi)
75. Organism present in **Human bite** / animal bite. **Treatment** of it.
76. How would you identify different Rickettsia infection easily?
77. “Clue” to diagnose Bartonella Henselae
78. “Clue” to diagnose Bordetella Pertusis
79. Which stage in Pertusis is infectious?
80. How does Pertusis toxin work?
81. Which other toxin work by increasing cAMP?
82. “Clue” to diagnose Vibrio cholera
83. Cultural media to grow cholera
84. Give name of Urease positive organism
85. Importance of Lysogenic phage conversion. Give name of bacteria that undergoes Lysogenic phage conversion
86. Organism causing Scarlet fever. “Clue” to diagnose it. Treatment for the same.
87. Important points to remember about Mycobacterium Avium intracellulareae
88. “Clue” to diagnose **Primary Syphilis**
89. How would you differentiate Chancroid from Primary syphilis, Lymphogranuloma venerum and Granuloma Inguinale?

90. Important points to remember about granuloma Inguinale
- Papule rapidly evolves into painless ulcer characterized by irregular border and brief red granular base
91. Important points to remember about Lymphogranuloma venerum
- Painless shallow ulcer and associated with nonspecific symptoms. **Inguinal lymphadenopathy** is inflammatory & **does not appear at the same time as the ulcer**
92. Which important infectious agents are not killed by Autoclave?
93. Clinical **importance of Prion**
94. “Clue” to diagnose Creutzfeldt-Jacob disease
95. What are conjugation, transformation and transduction?
- **Conjugation** –
  - **Transformation** –
  - **Transduction** –
    - General transduction –
    - Site-specific transduction –
  - **Examples of Bacteria which are able to Transform** –
96. What is the difference b/w direct and indirect fluorescence antibody (Ab) test?
97. Organism responsible for **rat bite fever in US**

## ■ **Immunology:**

1. What happen when organism enter to the body?
2. Chemotaxis factors
3. Phagocytic cells
4. Factors require for opsonization
5. Antigen presenting cells; How do they handle organisms?
6. How does killing occur in Neutrophils
7. Who kill extracellular organisms and how?
8. Who kill intracellular organism and how?
9. How CD 4 T-cell handle organism?
10. How CD 8 T-cell handle organism?
11. Importance of  $\gamma$  interferon
12. How does oxygen dependent & oxygen independent killing work?
13. How does killing occur in NADPH oxidase and Myeloperoxidase disease?
14. Between Strep & Staph, which one is still killed by patient with deficiency of Myeloperoxidase?
15. Important CD markers on different cells and their functions

CD Markers	Different Cells	Functions
▪ CD 3	▪	▪
▪ CD 2	▪	▪
▪ CD 4	▪	▪
▪ <b>CD 28</b>	▪	▪
▪ <b>CD 40 ligand</b>	▪	▪
▪ CD 14	▪	
▪ CD 16, CD 56, CD 2	▪	▪

▪ CD 19, CD 20, <b>CD 21, CD 40</b>	▪	▪
▪ CD 15, CD 30	▪	

16. Important antigen receptors on different cells

- TCR:
- BCR:
- MHC-1:
- MHC-2:

17. How does signal transduction occur in B & T cells

- B-cells –
- T-cells –

18. What are human leukocyte antigens? How many different classes?

19. Where do MHC-1 & MHC-2 antigens located?

20. Function of MHC-1 & MHC-2 antigens

21. How do MHC-1 & MHC-2 antigens differ?

22. What prevents interaction b/w endogenously produced peptide and MHC-2 molecules intracellularly?

23. How do MHC-1 & MHC-2 handle organisms?

24. How do ADCC [Antibody Dependent Cellular Cytotoxicity] and NK cells mediated cytotoxicity differed?

25. How do classical & alternative pathways of complement system differ?

26. Function of complement system

- C3b –
- C3a, C4a, C5a –
- C5b, 6, 7, 8, 9 –

27. Which is the only antibody where class switching is not required?

28. What happened if thymus [T-cells] is not involved in cell mediated immunity?

29. Which is the only antibody cross placenta?

30. Which is the main antibody in primary immune response?

31. Which is the main antibody in secondary immune system?

32. Which antibody is capable of opsonization?

33. Which is the largest antibody?

34. Which is the first antibody to appear in the blood after antigen exposure?

35. Which antibody is effective in complement fixation?

36. Which antibody is present in breast milk?

37. Which antibody is present in tears, saliva and GI secretion?

38. Which antibody is involved in allergic response?

39. Which antibody is involved in type-1 HS?

40. Which antibody is involved in type-2 HS?

41. What is the difference b/w papain & pepsin?

42. What is antigen specificity?

43. What are Allotype & Idiotype?

44. Important interleukins, other immune system cells & their functions

- IL-4 –
- IL-5 –

- Macrophage –
- **IL-10** –
- **$\gamma$  interferon** –
- **Th1** –
- Th2 –
- IL-1 –
- IL-6 –
- IL-3 –
- IL-7 –
- IL-2 –

45. Mechanism of type-I HS (hyper sensitivity) and example

46. Two types of type-II HS and their examples

47. Mechanism of type-III HS and example

48. Mechanism of type-IV HS and example

49. What are Allograft, Isograft, Autograft and Xenograft?

50. What is Graft-vs-Host Disease? Which HS is Graft Vs Host disease?

51. T-cells come from where in graft-Vs-host disease?

52. What is hyperacute rejection? Which type of HS is it?

53. What is acute rejection? Which type of HS is it?

54. What is chronic rejection? Which type of HS is it?

55. What is accelerated rejection? Which type of HS is it?

56. What are Hyperacute, acute, chronic and accelerated rejections?

57. Important HLA association with different diseases

- HLA-A3 –
- HLA-B27 –
- HLA-DR2 –
- HLA-DR2,DR3 –
- HLA-DR3 –
- HLA-DR3,DR4 –
- HLA-DR4 –
- HLA-DR5 –
- HLA-DR7 –

58. What is responsible for killing of pathogen intra-macrophage?

59. Which T-cells are involved in T-cells mediated cytotoxicity & Type-4 HS?

60. How would you determine that complement system is working fine?

61. What is the difference b/w rheumatic fever & rheumatoid arthritis?

62. What is the defect in Paroxysmal Nocturnal Hemoglobinuria (PNH)? “Clue” to diagnose it.

63. How does destruction occur in TB?

64. Which is deficient in Bruton’s Agammaglobulinemia?

65. Which malignancy is associated with Wiskott-Aldrich syndrome?

66. Triad of Wiskott-Aldrich syndrome

67. Name of X-linked recessive immune deficiency syndrome

68. Clue to diagnose chronic granulomatous disease

69. Clue to diagnose Chediak-Higashi syndrome

70. What is the defect in DiGeorge Syndrome

71. Why hypocalcemia is seen in DiGeorge Syndrome?

72. Which enzyme is deficient in SCID? (severe combined immune deficiency)
73. What will be different immunoglobulin level in patient with CD40 ligand deficiency?
74. Deficiency of different complements
  - C1 esterase deficiency –
  - C3 deficiency –
  - C1,C4 or C2 deficiency –
  - C5-8 deficiency –
75. “Clue” to diagnose leukocyte adhesion defect
76. Presentation of selective IgA deficiency
77. Which HS reaction is responsible for symptoms of nematodes infection?
78. Which HS reaction is responsible for destruction of filaria?
79. How does destruction of Toxoplasma occur?
80. How does CD8 & CD4 T-cells differentiate in thymus?
81. What are first & last events in maturation of B-cells?
82. What is normal ratio for T-cells to B-cells?
83. What are primary & secondary immune responses?
84. What are natural, acquired active and passive immunities?
85. How does Superantigen work?
86. What do we check in HIV screening & confirmatory test?
87. When do we consider western blot test positive?
88. Important autoantibodies in different diseases

<b>Autoantibodies</b>	<b>Disease</b>
Anti-acetylcholine receptor	
Anti-basement membrane	
Anticentromere	
Antiendomysial & Antigliadin	
Anti-insulin, Anti-islet cell	
Anti-intrinsic factor, Anti-parietal cell	
Antimicrosomal	
Antimitochondrial	
<b>p</b> -ANCA	
c-ANCA	
Antiribonucleoprotein	
Anti-TSH receptor	
Anti-Scl-70	
Anti-SS-A, Anti-SS-B	
Anti-smith, Anti-ds-DNA, ANA (antinuclear antibody)	
Anti-histone antibody	

## ■ Pharmacology:

### \* General Pharmacology:

1. Which form of the drug contributes to concentration gradient?
  - Only **free drug forms** contribute to the concentration gradient
2. Which form of the drug can cross cell membranes?
  - Only **non-ionized (uncharged)** form of a drug crosses biomembranes
3. How  $P^H$  and  $P^{K_a}$  will affect drugs?
  - $P^H$  and  $P^{K_a}$  will help us determine if drugs are in non-ionized form or ionized form. If  $P^H - P^{K_a}$  value is **negative**, **weak acid** acids are **in non-ionized form** and can absorb better. For example, if  $P^H - P^{K_a}$  value is -2, 99% of weak acids are in non-ionized form means they can cross cell membrane easily. If value is 0, 50% of drugs are in non-ionized form and 50% of drugs are in ionized form.
  - If  $P^H - P^{K_a}$  value is **positive**, **weak bases** are **in non-ionized form** and can absorb better.
4. In which medium weak acid will cross cell membrane?
5. In which medium weak base will cross cell membrane?
6. Which drug form is reabsorbed from the kidney?
7. How acidification and alkalization of urine will affect elimination of drug?
8. What are the things we use to acidify and alkalize urine?
9. Which route has 100% bioavailability (f)?
10. What is the relationship b/w distribution of drug ( $V_d$ ) and plasma concentration of drug?
11. What should I remember for drug with high  $V_d$ ?
12. What is loading dose? How will it affected by bioavailability?
13. What is the renal clearance of drug?
14. What is an infusion rate?
15. What is a maintenance rate?
16. What is elimination constant?
17. What is elimination half life?
18. What is steady state and on what it depends?
19. What is zero order elimination? Give 2 important examples
20. What is first order elimination? How it differs from zero order?
21. What happen to elimination when you increase drug dose in first order elimination?
22. What is potency? What is efficacy?
23. What is full agonist? What is partial agonist?
24. What happen if partial agonist is given to the patient who already received full agonist?
25. What is antagonist? Competitive, Non-competitive?
26. What are the difference b/w physiological antagonist and pharmacological antagonist?
27. What is therapeutic index (TI)? Importance of it? Give 2 examples of drugs with low TI
28. How intracellular receptors differ from membrane bounded receptors?
29. Give examples of receptors that directly couple with ion channels
30. Give examples of receptors that linked via protein to ion channels
31. What is the difference b/w  $G_s$  &  $G_i$  protein? Give examples of both
32. How  $G_q$  protein works? Give examples of receptors that use this pathway
33. Give examples of receptors that use cGMP
34. Give examples of receptors that work through transmembrane enzymes. How?
35. How cytokines work?

\* **ANS (Autonomic Nervous System):**

36. What are the ANS receptors and neurotransmitters? Where are they located?

- Nicotinic, Muscarinic, Alpha & Beta receptors
- Neurotransmitters: ACh (act on nicotinic and muscarinic receptors), Epinephrine & Norepinephrine (act on alpha and beta receptors)
- $N_N$  - Cell bodies in ganglia of both PANS & SANS & in the **adrenal Medulla**
- $N_M$  - Skeletal muscles
- $M_{1-3}$  – Located on the organ & tissues innervated by PANS & **on thermoregulatory sweat glands which are innervated by SANS**
- Alpha & Beta – Located on the organ & tissues innervated by SANS
- Easy way to remember important Muscarinic location: only Heart has  $M_2$ , all other places have  $M_3$ , GI glands have  $M_1$ ;
- Now remember  $M_2$  is operated through  $G_i$  so it has inhibitory effect on the organ. So whenever ACh stimulate  $M_2$  it causes decrease in heart rate and decrease in conduction velocity (AV block);  $M_{1-3}$  operated through  $G_q$  so they have stimulating effect whenever they are stimulated through ACh [Location of  $M_3$  – **Eye:** Miosis (constriction of pupils) through contraction of sphincter muscles of pupil and Accommodation for near vision through contraction of Ciliary muscles; **Bladder:** voiding of urine through contraction of detrusor muscles; **Sphincters:** contraction of all sphincters in the body except LES (lower esophageal sphincter) which relax; **Blood vessels:** dilation of blood vessels through nitrous oxide and EDRF; **GIT:** increase motility of stomach, increase secretions of GI glands
- Easy way to remember important Alpha receptors location:  $\alpha_2$  present at only three locations 3P [Platelets, Pancreas & Pre-junctional nerve terminal] All other places have  $\alpha_1$
- Now remember  $\alpha_2$  works through  $G_i$  so whenever they stimulate they have inhibitory effects. So they decrease norepinephrine secretion at pre-junctional nerve terminals, decrease release of pancreas and causes aggregation of platelets
- $\alpha_1$  receptors works opposite to ACh so they produce Mydriasis (dilatation of pupils), vasoconstrictions and urinary retention; other important location vas deference in male
- Easy way to remember important Beta receptors location:  $\beta_1$  presents on heart and kidney; all other places have  $\beta_2$
- Now remember both beta receptors work through  $G_s$  so they have stimulatory effect on the organ whenever they are stimulated;  $\beta_1$  increases every thing means it increases heart rate, conduction velocity, force of contraction and release of renin
- Stimulation of  $\beta_2$  receptors causes vasodilation, relaxation of uterus, bronchial dilation; other important location skeletal muscles (increase contractility – **tremors**), liver (increase glycconeogenesis) and pancreas (increase insulin secretion)

<b>Cholinergic</b>	<b>Anti-Ch</b>	<b><math>\alpha_1</math> Receptor</b>	<b><math>\alpha_2</math> Receptor</b>	<b><math>\beta_1</math> Receptor</b>	<b><math>\beta_2</math> Receptor</b>
<b>Miosis</b> (all cholinergic action occur through $M_3$ except in heart where it is $M_2$ )	<b>Mydriasis</b> Atropine enter in CNS will produce confusion, hallucination	<b>Mydriasis</b>	<b>↓ insulin secretion</b>	<b>Increase everything</b> (HR, force of contraction, conduction velocity Renin secretion.)	<b>↑ insulin secretion</b>
AV block	Urinary	Urinary	<b>↓ NE</b>		Dilation of

(M <sub>2</sub> )	retention	retention			bronchi
<u>Vasodilation</u>		<b>Constriction of vessels</b>			<u>vasodilation</u>
Voiding of urine	Dry mouth				Relaxation of uterus

- **Agonist** of above receptors produce **same effect as above** receptors
- **Indirect agonist** produce same effect as agonist but different mechanism
- **Antagonist** of above receptors produce **opposite effects than above** receptors

37. What is an important thing about thermoregulatory gland and which ANS receptors are present there?
38. Which neurotransmitter is present at pre-ganglionic fibers of both PANS & SANS?
39. What are the neurotransmitters for post-ganglionic fibers of PANS & SANS?
  - Post-ganglionic PANS –
  - Post-ganglionic SANS –
40. Which is dominant in the tissue with dual innervation? (PANS & SANS) What is an exception to this rule?
41. Synthesis & Degradation of ACh
42. Which drug inhibits choline uptake?
43. Which drug inhibits Ach release?
44. Give the name of drugs which directly stimulates Ach receptors
45. Give the name of indirectly acting cholinomimetics drugs
46. Give the name of Muscarinic receptor antagonist
47. Give the name of Nicotinic receptor antagonist (Ganglion blockers)
48. Give the name of Neuromuscular blockers
49. Difference b/w succinylcholine and other neuromuscular blockers
50. Why do we use pilocarpine in acute angle closure glaucoma?
51. Use of drugs that directly stimulate Ach receptors
  - Pilocarpine:
  - Bethanechol:
  - Methacholine:
52. Use of drugs that indirectly stimulate Ach receptors (AChE inhibitors)
  - Physostigmine:
  - Neostigmine, Pyridostigmine:
  - Edrophonium:
  - Donepezil, Tacrine (enter in CNS):
53. Use of anti-cholinergic drugs
  - Atropine (enter in CNS):
  - Ipratropium:
  - Scopolamine:
54. Use of neuromuscular blockers
55. Important side effects of succinylcholine
56. Important side effects of Atracurium

57. Treatment of overdose of non-depolarizing neuromuscular blockers
58. Difference b/w Physostigmine & Neostigmine, Pyridostigmine
59. Treatment of AchE Inhibitors poisoning.
60. How anti-cholinergic drugs are helpful in Parkinsonism? Which symptom is not improved by anti-cholinergic drugs?
61. What is the difference b/w Atropine and Phenylephrine when it comes to use for eye dilatation?
62. How ANS work to control BP
63. Difference b/w Norepinephrine & Epinephrine
64. What is Epinephrine reversal
65. Use of epinephrine
66. Give Name of Alpha & Beta receptors agonist
  - $\alpha_1$  agonist:
  - $\alpha_2$  agonist:
  - $\beta_2$  agonist:
67. Give Name of Alpha & Beta receptors antagonist
  - $\alpha_1$  antagonist:
  - $\alpha_2$  antagonist:
  - Non-selective  $\alpha$  antagonist:
  - Non-selective  $\beta$  antagonist:
  - Selective  $\beta_1$  antagonist:
68. Use of Alpha agonists:
  - Methoxamine:
  - Phenylephrine:
  - Clonidine:
  - Methyldopa
69. Use of Alpha antagonist:
  - Phenoxybenzamine:
  - Doxazosin:
  - Yohimbine:
70. Use of Beta agonist:
  - Salmeterol, Salbutamol:
  - Terbutaline, Ritodrine:
71. Use of Beta antagonist:
- 72. Important side effect of Clonidine**
  - Rebound HTN on abrupt withdrawal
- 73. Important side effect of alpha blocker**
  - First dose syncope
74. Important **contraindications of beta blockers**
  - Bronchial Asthma, COPD, PVD

75. Important side effects of non-selective beta blockers

- Sexual dysfunction, delayed hypoglycemia, alter plasma lipids, fatigue, heart block, depression

76. Dopamine receptor locations:

77. Difference b/w Dopamine & Dobutamine

78. What is an important thing to remember about indirect acting adrenoceptor agonist?

- Indirect agonist act only on effector tissues innervated by SANS. Denervated tissues are non-responsive. (e.g. If Heart is transplanted, then SANS fibers are not present there, so in that pt. indirect acting adrenoceptor agonist give **no** response)

79. What is tachyphylaxis?

80. What is the main difference b/w Phenoxybenzamine & Phentolamine?

81. Name of non-selective beta blockers with ISA (intrinsic Sympathomimetic action)

82. Name of selective beta-1 antagonist with ISA

83. Usefulness of beta-blockers with ISA

84. Drugs with both alpha-1 & beta blocking activity

\* **CVS (Cardiovascular System):**

85. Mechanism of different classes of Antiarrhythmic drugs

- Class 1:
- Class 2:
- Class 3:
- Class 4:

86. Name of drugs according to different classes [class 1 to 4]

- Class 1a:
- Class 1b:
- Class 1c:
- Class 2:
- Class 3:
- Class 4:

87. What are important characteristics of quinidine?

88. Use of quinidine

89. Important AE (adverse effects) of quinidine

90. Important use of **Procainamide**

91. What is the characteristic of Lidocaine?

92. Use & AE of Lidocaine

93. Anti-arrhythmic use of Phenytoin

94. What are important points I should remember about Amiodarone?

- Mimic all 4 classes, long half lives
- AE: Interstitial lung disease (**pulmonary fibrosis**), **Thyroid dysfunction** (hypothyroidism / hyperthyroidism), Increase LDL, Torsade de pointes

95. What is an important point I should remember about Sotalol?

96. What is the main difference b/w Verapamil and Nifedipine

97. Where shouldn't we use calcium channel blockers (CCB)?

98. Mechanism & Use of Adenosine

99. Drugs causing Torsade. **Treatment of Torsade**
100. Safe anti-hypertensive drug in Pregnancy & renal dysfunction
101. Anti-hypertensive (HTN) drug that is contraindicated in pregnancy
102. Mechanism of water retention when we use anti-HTN drugs
103. Between alpha & beta blockers which affect plasma lipid level
104. Name & Mechanism of vasodilators
105. Drugs for **HTN emergency**
106. Side effect of Hydralazine
107. Side effects of Nitroprusside
108. Side effect of Minoxidil for which this drug is used clinically
109. Side effect of Diazoxide for which this drug is used clinically
110. Which CCB is used in subarachnoid hemorrhage?
111. Name of ACEI and AT-1 receptor blockers
112. Which are the most important side effects of ACE inhibitors?
113. Contraindication of ACEI
114. What is the difference b/w ACEI and AT-1 receptor blocker?
115. What are the side effects of Loop & Thiazide diuretics in regards to pH & Potassium?
116. What are the side effects of Carbonic anhydrase (CA) diuretics in regards to pH & Potassium?
117. What are the side effects of K<sup>+</sup> sparing diuretics in regards to pH & Potassium?
118. What is the mechanism of action of Mannitol? Important uses
119. In which condition Mannitol is C/I?
120. What is the site of action of CA inhibitors? Important uses & AE
121. What is the mechanism and site of action of Loop diuretics? Important AE
122. What is the mechanism and site of action of Thiazide diuretics?
123. What is the relationship b/w GFR & thiazide diuretic?
124. How will I identify loop & thiazide diuretics from urine analysis?
125. What is the mechanism and site of action of K<sup>+</sup> sparing diuretics? Important AE of Spironolactone
126. What is the main difference b/w mechanism of action of Reserpine & Guanethidine?
127. Important side effect of Reserpine
128. Important side effect of Guanethidine
129. What is the MA of ACEI in CHF?
130. What is the mechanism of action (MA) of digitalis?
131. Is digitalis prolongs survival of patient with CHF?
132. Uses of digitalis. (Vagomimetic effect)
133. Symptoms of digitalis toxicity; treatment of the same
134. What increases digitalis toxicity?
135. In which condition CCB & digitalis should avoid?
136. Which drug has shown to reduce mortality in patient with CHF when use in conjunction with ACEI?
137. What is the MA of Nitrates? What is the MA of Sildenafil (Viagra)?
138. What happen if we use Viagra and Nitrates together?
139. Use of Sildenafil besides erectile dysfunction
140. What is the half life of Nitrates?
141. Are beta-blockers helpful in Prinzmetal angina?
142. What is the MA of CCB in angina?
143. Which drugs are useful in hyper-TGs?
144. Which is the only "statins" lower TG?

145. What is the MA & side effect of bile acid sequestrers?
146. What are the main AE of HMG-CoA reductase inhibitors?
147. What are the important effects of Nicotinic acid? Important AE
148. What are the MA & important AE of gemfibrozil?

\* **CNS (Central Nervous System):**

149. MA of Barbiturates and Benzodiazepines
150. Which benzodiazepines metabolized outside of liver (means doesn't require phase-1 metabolism)? What's the advantage of it?
151. Non-benzodiazepine drugs that activate benzodiazepine receptors
152. Drug use in barbiturates withdrawal
153. DOC for status epileptics
154. Important C/I of barbiturates
155. M/A of Buspirone and **Indication**
156. **DOC for social and performance anxiety**
157. **DOC for alcohol overdose.** M/A of it
158. Reason for giving Ethanol in Methanol poisoning
159. M/A of Disulfiram. Use of it. Drug causing Disulfiram like reaction when use with alcohol
160. M/A of different anti-epileptic drugs
161. **Safe anti-epileptic drug during pregnancy**
162. **DOC for Absence (Petitmal) seizure**
163. Usually a DOC for all other seizure
164. Important drug interaction of all anticonvulsants
165. **Important AE of all anticonvulsants**
  - Phenytoin: horizontal nystagmus, gingival overgrowth, Megaloblastic anemia (folic acid depletion), Fetal hydantoin syndrome (teratogenic)
  - Carbamazepine: **SIADH**, teratogenic (supply folic acid)
  - Valproic acid: **thrombocytopenia**
  - Ethosuximide: GI distress
166. **DOC for trigeminal neuralgia**
167. M/A of newer anticonvulsants
  - Block AMPA receptor –
  - Block NMDA receptor –
168. M/A of general anesthetics
169. Importance of Blood-gas ratio for inhaled anesthetics
  - High blood-gas ratio – quick redistribution in adipose tissue
  - Quick redistribution in fat – require high dose to maintain blood level
  - High dose – late recovery
  - Importance: High blood-gas ratio – late recovery, Low blood-gas ratio – fast recovery
170. **Important AE of Halothane** and Tx of that adverse reaction. M/A of drug that used to Tx adverse reaction of Halothane
171. Which inhaled anesthetic produce dose related depression of myocardial contractility?
172. Name and uses of IV anesthetics
173. What is a neuroleptic anesthesia?
174. Which drug produce “dissociative anesthesia”?
175. M/A of local anesthetics. Two groups of local anesthetics

- 176. How pH affect action of local anesthetics**  
 177. What is the main AE of amino ester group of local anesthetic  
**178. C/I of Morphine**  
 179. Important characteristic of Morphine  
 180. Name of **partial opioid agonist**  
 181. Which drug is an exception to all opioids? How?  
**182. DOC for opioid overdose**

\* **Anti-Microbial Drugs:**

183. Best initial antibiotics for different microorganisms
- Staph Aureus:
  - If patient is allergic to first line groups –
  - If patient has MRSA –
  - Streptococcus:
  - Strep Pneumonia:
  - Strep Viridans:
  - Strep Pyogens:
  - Strep Meningitis:
  - Listeria Monocytogens:
  - Legionella Pneumonia:
  - Rickettsia in children:
  - Rickettsia in adults:
  - Lyme disease in children < 9yrs of age:
  - Lyme disease in children >9 yrs of age and adults:
  - Lyme disease in Pregnant women:
  - Disseminated Lyme disease [Bell’s palsy, Cardiac involvement, CNS involvement]:
  - Syphilis:
  - Gonococcus:
  - Chlamydia, Mycoplasma:
  - C.Jejunii:
  - H Influenzae:
  - E coli:
  - Pseudomonas:
  - Klebsiella:
  - Cryptococcus: (severe), (prophylaxis)
  - Candida:
  - Dermatophytes: (oral) / (local)
  - PCP:
  - Actinomycetes:
  - Nocardia:
  - Anaerobes:
  - Penicillin and Aminoglycosides have **synergistic effects** so combination of both (Penicillin + Aminoglycosides) is used in Enterobacteraceae and Pseudomonas infections
- 184. M/A of Penicillins**  
**185. Mechanism of resistance to Penicillins**  
 186. Difference b/w Benzathine penicillin and Benzylpenicillin (Penicillin G)  
 187. Important AE of Penicillins. What is Jarisch–Herxheimer Reaction?

188. Name of beta lactamase resistant penicillin
189. Name of cephalosporins according to different generation
- First Generation:
  - Second Generation:
  - Third Generation:
  - Fourth Generation:
190. Coverage of all generation of cephalosporin
- First:
  - Second:
  - Third:
  - Fourth:
191. M/A of Cephalosporin / Mechanism of resistance
- 192. Important AE of Cephalosporin**
193. Which drug group should we use in patient allergic to Penicillins and Cephalosporins
- For Gram (+) infection –
  - For Gram (-) infection –
194. Reason for using Cilastatin with Imipenem. AE of Imipenem
195. M/A of Vancomycin. Mechanism of resistance to Vancomycin
196. Can Vancomycin penetrate CNS?
197. Important use & AE of Vancomycin
198. Is cephalosporin & Penicillins has cross-allergenicity?
199. What is an important feature of **Aztreonam**?
200. M/A of Macrolides / Mechanism of resistance of macrolides
201. Should erythromycin dose be reduced in patient with renal dysfunction?
202. Is Macrolide has any effect on P450 metabolism system?
203. Important AE of Macrolide
204. Name of important antimicrobial agents that should be avoided in pregnancy
205. M/A of Tetracycline / Mechanism of resistance
206. Important organism **coverage of tetracycline**
207. Important use of **Demeclocycline**
208. Effect of antacid on absorption of tetracycline
209. Which tetracycline can use safely in renal dysfunction?
210. Important AE of tetracyclines
211. Important AE of Clindamycin
212. Important use of clindamycin
213. M/A and resistance of Aminoglycosides
214. Why anaerobes are resistant to Aminoglycosides?
215. Use of neomycin. Is it useful systemically?
216. Name important **Nephrotoxic antimicrobial drugs**
217. Use of Aminoglycosides
218. M/A and resistance of Chloramphenicol
219. AE of Chloramphenicol. Is dose reduction required in LIVER dysfunction
220. Drugs use for **Vancomycin resistant organisms**
221. M/A of sulfa drugs
222. Uses & Important AE of Sulfa drugs

223. Which other drugs have sulfa component?
- Thiazide diuretics, Celecoxib and Glipizide/Glyburide
224. M/A of Trimethoprim & Pyrimethamine
225. M/A of Fluoroquinolones
226. Important side effect in adults
227. Effect of antacid on absorption
228. M/A of Amphotericin B and Nystatin
229. How can we prevent AE of Amphotericin
230. M/A of Azoles
231. AE of Ketoconazole
232. Important use of **Fluconazole**
233. Which is the only azole that can penetrate in CNS?
234. Drug use for **topical fungal infection**
235. What is the M/A of Flucytosin?
236. AE of Flucytosin
237. What are M/A and AE of Gresiofulvin?
238. What is the M/A of Terbinafine?
239. M/A and **Uses of Metronidazole**
240. Important **AE of anti-tubercular drugs**
- Rifampin:
  - INH:
  - Ethambutol:
  - Pyrazinamide:
241. M/A anti-tubercular drugs
242. M/A and use of acyclovir
- 243. Is acyclovir has any effect on post herpetic neuralgia?**
244. Drugs use in **shingles**
245. M/A of **ganciclovir**
246. What are the characteristics of Foscarnet?
247. Important AE of Foscarnet when it is used with Pentamidine
- 248. Difference b/w NRTI & Non-NRTI**
249. Important **AE of Zidovudine**
250. Drugs that increase Zidovudine toxicity
- 251. Use of Lamivudin**
252. M/A and Important **AE of protease inhibitors**
- 253. Only teratogenic anti-HIV drug name**
254. M/A of Amantadine. Other use of Amantadine. Is Amantadine useful against Influenza B? AE of Amantadine
- 255. Difference b/w Amantadine and Zenamivir & Oseltamivir**
256. M/A and Use of Ribavirin. **Is it used in Hep C?**
257. Important Anti-Protozoal drugs
- **Mebendazole, Albendazole:**
  - **Pyrantel Pamoate:**
  - **Anti-Leishmaniasis:**
  - **Praziquantel:**
  - **Anti-malarial drugs: Prophylaxis:**

\* **Anticoagulants, Thrombolytics & Anti-platelets:**

- 258. M/A and important AE of Heparin
- 259. Drug use in heparin induced thrombocytopenia
- 260. Can heparin be used in pregnancy?**
- 261. How we monitor patient on Heparin / Warfarin
- 262. Antagonist of Heparin & Warfarin
- 263. M/A of Warfarin
- 264. Most important AE to keep in mind when we give Warfarin
- 265. M/A of thrombolytics. Difference b/w Streptokinase & Alteplase
- 266. Antagonist of thrombolytics
- 267. Difference b/w Aspirin, Clopidogrel and Abciximab

\* **Endocrine Pharmacology:**

- 268. M/A of Propyl thiouracil (PTU) & Methimazole?
- 269. Which one is **safe in pregnancy** out of above two drugs?
- 270. AE of PTU**
- 271. Use of Propranolol in hyperthyroidism**
- 272. M/A and important AE of <sup>131</sup>I**
- 273. Name & use of GH agonist
- 274. Name & use of Somatostatin
- 275. Name & use of ACTH agonist
- 276. Name & use of GNRH agonist
- 277. Name & use of Prolactin inhibiting hormones (Dopamine agonist)
- 278. Use of oxytocin
- 279. Use of Vasopressin
- 280. M/A and use of Cyproheptadine
- 281. Use of Megestrol acetate
- 282. Name of drugs that block steroid receptors
- 283. Name of drugs that inhibit steroid synthesis
- 284. Important AE of Estrogen, Progesterone & Androgens
- 285. Name & M/A of anti-androgens
- 286. M/A & use of Anastrozole, Danazol, Clomiphene citrate, Tamoxifen and Raloxifen. Difference b/w Tamoxifen & Raloxifen
- 287. Insulin forms that can be used as IV**
- 288. M/A of Sulfonylureas
- 289. Important **AE of Chlorpropamide** (1<sup>st</sup> generation sulfonylurea)
- 290. M/A & important **AE of Metformin**
- 291. M/A of Acarbose
- 292. M/A of Thiazolidinediones
- 293. M/A of Repaglinide
- 294. M/A of Bisphosphonates
- 295. Important AE of Alendronate / why do we ask patient to take alendronate with full glass of water

\* **Anti-cancer Drugs:**

- 296. Do anticancer drugs kill fixed percentage of tumor cells or fixed number of tumor cells?
- 297. Drugs known as spindle poisons
- 298. **AE of Methotrexate, Cyclophosphamide and Doxorubicin.** How can we prevent it?
- 299. M/A of Azathioprine, 6-MP & 5-FU

300. M/A & use of cyclosporine  
301. M/A and **AE of Bleomycin**

\* **Drugs for Gout:**

302. Give name of drugs that used in acute gouty attack (NSAID)  
303. M/A & Important **AE of Colchicine**  
304. Difference b/w Allopurinol and Probenecid  
**305. Relationship b/w Probenecid & GFR**  
306. Is Allopurinol has any effect on 6-MP metabolism

\* **Drugs for Asthma:**

307. Name of drugs that used in treatment of Asthma  
308. M/A of Theophylline  
309. M/A of Cromolyn. **Is Cromolyn useful in acute attack of asthma?**  
310. Difference b/w Zafirlukast & Ziluton. Uses of both

\* **Miscellaneous:**

311. Name & use of different PGs
- PGE<sub>1</sub>: Alprostadil;
  - PGE<sub>2</sub>: Dinoprostone;
  - PGE<sub>2α</sub>: Carboprost;
- 312. Difference b/w Aspirin (ASA) & other NSAID**  
**313. Reason for using low Aspirin**
314. How Aspirin eliminate from the body at high toxic dose  
315. Symptoms specific for Salicylism  
316. Treatment of Aspirin overdose  
317. Give name of selective COX-2 inhibitor and advantage of it over other NSAID  
318. Difference b/w Acetaminophen & other NSAID  
319. Tx of acetaminophen overdose  
320. Name of anti-emetic drugs according to different groups
- 5-HT<sub>3</sub> antagonist –
  - DA antagonist –
  - H<sub>1</sub> antagonist –
  - M antagonist –
321. Use of Cisapride. Why is it withdrawn from market?  
322. M/A of Sucralfate. Important things to remember about it

**GOOD LUCK**