

1. Pertinent information that should be present in the patient's sample container, EXCEPT:
 - A. Patient's name
 - B. Patient's ID
 - C. Physician's name
 - D. Suspected diagnosis
2. Typical stool collection protocol for routine examination:
 - A. 1 specimen collected anytime of the day
 - B. 2 specimens collected every other day
 - C. 3 specimens collected every other day
 - D. 4 specimens collected every other day
3. Which of the following explains why stool should not be contaminated with urine?
 - A. urine also contains human parasites
 - B. urine's acidic pH disintegrates protozoan cysts and trophozoite if present in the stool
 - C. urine contains urea that destroys parasite stages in the stool
 - D. urine's microscopic elements maybe interpreted as human parasites
4. Liquid specimens should be examined within _____.
 - A. 15 minutes
 - B. 30 minutes
 - C. 45 minutes
 - D. 60 minutes
5. Where motility of protozoan trophozoite should be demonstrated, _____ specimen is required.
 - A. fresh
 - B. liquid
 - C. semi-formed
 - D. formed
6. Semi-formed specimens should be examined within _____.
 - A. 15 minutes
 - B. 30 minutes
 - C. 45 minutes
 - D. 60 minutes
7. Which of the following specimens can be held 24 hours following collection?
 - A. formed
 - B. semi-formed
 - C. liquid
 - D. mucoidal
8. What is the universal ratio of stool to fixative?
 - A. 1 part stool to 2 parts fixative
 - B. 1 part stool to 3 parts fixative
 - C. 1 part stool to 4 parts fixative
 - D. 1 part stool to 5 parts fixative
9. Minimum time for stool fixation is _____.
 - A. 5 minutes
 - B. 20 minutes
 - C. 30 minutes
 - D. 60 minutes
10. Formalin concentration that ideally preserves protozoan cysts is _____.
 - A. 2%
 - B. 5%
 - C. 10%
 - D. 15%
11. Formalin concentration that ideally preserves helminth eggs and larvae is _____.
 - A. 2%
 - B. 5%
 - C. 10%
 - D. 15%
12. Which of the following is NOT true on the use of formalin as a fixative?
 - A. It has long shelf life.
 - B. It preserves specimens for up to several years.
 - C. It preserves parasite morphology adequately for permanent smears.
 - D. Morphologic details of cysts and eggs may fade with time.
13. This stool fixative contains plastic powder as an adhesive for the stool specimen:
 - A. Formalin
 - B. Schaudinn
 - C. Polyvinyl alcohol
 - D. Sodium Acetate Formalin
14. Mercuric chloride serves as a base of this fixative.
 - A. Formalin
 - B. Polyvinyl alcohol
 - C. Alternative Single-Vial System
 - D. Sodium Acetate Formalin

15. Which of the following fixatives is ideal both for concentration and permanent-stained smears?
 A. Formalin
 B. Schaudinn
 C. Polyvinyl alcohol
 D. Sodium acetate formalin
16. This fixative requires the use of albumin as adhesive.
 A. Formalin
 B. Schaudinn
 C. Polyvinyl alcohol
 D. Sodium acetate formalin
17. If SAF is used as a fixative for stool specimen, what is the ideal permanent stain?
 A. Iron hematoxylin
 B. Wheatley trichrome stain
 C. Giemsa Stain
 D. Wright's stain
18. Wheatley trichrome stain can be used as a permanent stain in all of the following fixatives, EXCEPT:
 A. SAF
 B. PVA
 C. Modified PVA
 D. Single-vial system
19. When using permanent stains to confirm the presence of protozoan cyst and trophozoite, how many fields should be examined before declaring negative?
 A. 100
 B. 200
 C. 300
 D. 500
20. Nuclear karyosomes of *E. histolytica* when stained with Trichrome is colored _____.
 A. light pink
 B. blue green
 C. bright red
 D. green
21. When using iron hematoxylin for protozoan structures, nuclear material is stained _____.
 A. pink
 B. purple
 C. red
 D. dark blue
22. Modified iron hematoxylin is incorporated with _____ to detect acid-fast protozoan.
 A. carbol fuchsin
 B. malachite green
 C. acid alcohol
 D. trichrome stain
23. Blood culture for *Leishmania* and *Trypanosoma* is carried out using what medium?
 A. Lowenstein-Jensen Medium
 B. Novy-McNeal-Nicolle Medium
 C. Rhodamine medium
 D. Lock-egg medium
24. Amount of stool needed for saline sedimentation technique:
 A. 5 g
 B. 10 g
 C. 15 g
 D. 20 g
25. Amount of stool needed for formalin-ether (ethyl acetate) sedimentation technique:
 A. 1 g
 B. 2 g
 C. 3 g
 D. 5 g
25. Amount of stool needed for formalin-ether (ethyl acetate) sedimentation technique:
 A. 1 g
 B. 2 g
 C. 3 g
 D. 5 g
26. What procedures constitute the Ova and Parasite examination?
 A. direct wet smear
 B. concentration
 C. fecal immunoassays
 D. permanent stained
27. What is the purpose of direct wet examination?
 A. to detect adult forms
 B. to detect motile trophozoites
 C. to demonstrate cysts
 D. to detect creeping larva
28. How should the direct wet preparation be examined?
 A. read up to 100 fields
 B. read up to 300 fields
 C. read the entire coverslip
 D. read up to 400 fields
29. In general, what is the recommended time and speed for centrifugation for the concentration method?
 A. 5 minutes at 500 x g
 B. 10 minutes at 500 x g
 C. 5 minutes at 1000 x g
 D. 10 minutes at 1000 x g
30. What happens when the required time and speed for centrifugation for the concentration method is not followed?
 A. *Ascaris* egg will disintegrate
 B. Trophozoites will disappear
 C. Hookworm shell will become too transparent
 D. Small coccidian oocysts and microsporidial spores may not be recovered

1. What is the purpose of ether in FECT?
A. fixative
B. adhesive
C. clearing agent
D. adsorbs fecal debris
2. When FECT procedure is correctly performed, the uppermost layer is the _____.
A. debris
B. formalin
C. ether
D. sediment
3. The relative centrifugal force (RCF) in FECT/FEACT when adding formalin:
A. 450 g
B. 500 g
C. 750 g
D. 1000 g
4. The relative centrifugal force (RCF) in FECT/FEACT when adding formalin:
A. 450 g
B. 600 g
C. 750 g
D. 1000 g
5. Which of the following is unlikely to be seen in the sediment from an FEACTION technique?
A. *Ascaris* egg
B. Larvae of *Strongyloides*
C. *Schistosoma mansoni*
D. operculated eggs of trematodes
6. A floatation technique using saturated saline solution is _____.
A. Sheather's
B. Brine
C. Zinc-sulfate
D. Baermann's
7. Oocysts of *Isospora* and *Cryptosporidium* are best demonstrated using what floatation technique?
A. Sheather's
B. Brine
C. Zinc-sulfate
D. Baermann's
8. A floatation technique using sugar solution is _____.
A. Sheather's
B. Brine
C. Zinc-sulfate
D. Baermann's
9. Eggs of small tapeworms are best demonstrated using what floatation technique?
A. Sheather's
B. Brine
C. Zinc-sulfate
D. Baermann's
10. Non-operculated tapeworm eggs are best demonstrated using what floatation technique?
A. Sheather's
B. Brine
C. Zinc-sulfate
D. Baermann's
11. What specific gravity zinc sulfate should be used for the routine floatation concentration procedure?
A. 1.14
B. 1.16
C. 1.18
D. 1.20
12. What specific gravity zinc sulfate should be used for a stool preserved in a formalin-based fixative?
A. 1.14
B. 1.16
C. 1.18
D. 1.20
13. Which of the following is NOT needed when doing Kato-katz technique?
A. Glycerine
B. NSS

- C. mesh screen
D. hole template
14. What is the purpose of glycerine in Kato-Katz technique?
A. fixative
B. adhesive
C. clearing
D. laking
15. When using a 41.7 mg template, the factor to report number of eggs/grams of stool sample is ____.
A. 20
B. 24
C. 30
D. 50
16. When using a 20 mg template, the factor to report number of eggs/grams of stool sample is ____.
A. 20
B. 24
C. 30
D. 50
17. When using a 20 mg template, the factor to report number of eggs/grams of stool sample is ____.
A. 20
B. 24
C. 30
D. 50
18. Which stool examination procedure uses 4g of 24 hour stool?
A. FEACTION
B. AECT
C. Stoll's
D. Sheather's
19. Relevant to your answer in item 55, what is the fixative used in this procedure?
A. 10% formalin
B. hydrochloric acid
C. NaOH
D. Sugar solution
20. This method of stool examination uses warm water for the larva to escape from the stool sample:
A. Sheather's
B. Baermann
C. Brine
D. Zinc sulfate
21. The following parasite infection may be diagnosed using filter paper culture, EXCEPT?
A. *Trichinella*
B. *Strongyloides*
C. *Hookworm*
D. *Trichostrongylus*
-
22. Defined as the amount of moisture content of the stool sample:
A. color
B. consistency
C. odor
D. shape
23. Iodine smear is ideal when suspecting for ____ infection.
A. Nematode
B. Cestode
C. Trematode
D. Protozoan
24. When urine sample for parasite examination appears chyluric, it may be associated with what infection?
A. malaria
B. schistosomiasis
C. filariasis
D. amoebiasis
25. Relevant to item 84, what should be added to clear the urine sample?
A. acetic acid
B. 5% HCl
C. ether
D. 10% formalin
26. Relevant to item 85, what is the purpose of adding such reagent?

- A. To lyze cellular elements like rbc
B. To clear the urine
C. To dissolve fat
D. To clear and fix the specimen
27. Relevant to item 85, what parasite stages are you expecting to demonstrate?
A. gametocytes
B. non-operculated trematode eggs
C. microfilaria
D. trophozoites
28. When urine sample for parasite examination appears smoky, it may be associated with what infection?
A. malaria
B. schistosomiasis
C. filariasis
D. amoebiasis
29. Relevant to item 88, what should be added to clear the urine sample?
A. acetic acid
B. 5% HCl
C. ether
D. 10% formalin
30. Relevant to item 88, what is the purpose of adding such reagent?
A. To lyze cellular elements like rbc
B. To clear the urine
C. To dissolve fat
D. To clear and fix the specimen

DIAGNOSTIC PARASITOLOGY

MTLE REVIEW QUESTIONS

DIRECTION:

Choose the best answer in each of the following questions or completion statements. Shade the letter of your choice on the provided answer sheet. Strictly no erasures.

- In processing blood films for parasite examination, which of the following is used for fixation?
A. acid alcohol
B. methyl alcohol
C. acetone alcohol
D. acetic acid
- Dehemoglobinization of blood films is achieved with the use of _____.
A. acid alcohol
B. methyl alcohol
C. water
D. acetic acid
- Dehemoglobinizing agent is no longer necessary when using _____.
A. Wright's stain
B. Acridine orange
C. Giemsa Stain
D. Rhodamine-123
- Laking is achieved with the use of _____.
A. acid alcohol
B. methyl alcohol
C. water
D. acetic acid
- Nuclear structures of the diagnostic stages of Leishmania, Trypanosoma, Plasmodium, and Babesia appear _____ when using Giemsa.
A. blue
B. red
C. purple
D. brown
- Red blood cells in Giemsa will stain _____.
A. purple
B. pink-purple
C. pale red
D. purple-red
- Which of the following is not a feature of Plasmodium trophozoite?
A. chromatin dot
B. cytoplasm
C. vacuole
D. granules
- Parasite identification is best carried out in _____.
A. thin smear
B. thick smear
C. both
D. neither

9. All of the following uses blood for diagnostic identification, EXCEPT:
- | | |
|----------------------|-----------------------|
| A. <i>Babesia</i> | C. <i>Wuchereria</i> |
| B. <i>Leishmania</i> | D. <i>Trichinella</i> |
10. The purpose of the thick smear is for parasite ____.
- | | |
|-------------------|--------------|
| A. identification | C. both |
| B. quantitation | D. measuring |
11. Which blood film is commonly used in the Philippines?
- | | |
|---------------|-----------|
| A. thin film | C. both |
| B. thick film | D. either |
12. Dyes in fluorescence microscopy will have a strong affinity to which organelle of the parasite cell?
- | | |
|--------------|-----------------------------|
| A. cytoplasm | C. mitochondria |
| B. nucleus | D. any locomotory organelle |
13. Which of the following dyes emits apple green or yellow fluorescence when excited at 490 nm?
- | | |
|---------------------------|------------------|
| A. Acridine orange | C. Rhodamine-123 |
| B. Benzoethiocarboxyurine | D. Fluorescein |
14. Rapid diagnostic tests (RDTs) for malaria parasites target which of the following antigenic enzymes?
- | | |
|---------------------|----------------|
| A. acid phosphatase | C. glucosidase |
| B. aldolase | D. hexokinase |
15. Malaria antigen suitable as target for rapid diagnostic tests for *P. falciparum* is:
- | | |
|---------------------------|---------------------|
| A. Lactate dehydrogenase | C. Acid phosphatase |
| B. Histidine-rich protein | D. Aldolase |
16. Which of the following stains is used in quantitative buffy coat method?
- | | |
|---------------------|--------------------|
| A. Crystal violet | C. Acridine orange |
| B. Iron hematoxylin | D. Iodine |
17. Fixative for Knott's concentration technique is ____.
- | | |
|----------------|-----------------|
| A. methanol | C. acid alcohol |
| B. 2% formalin | D. 5% formalin |
18. Knott's concentration technique uses what blood sample?
- | | |
|-------------------|----------------------|
| A. EDTA blood | C. Oxalated blood |
| B. Citrated blood | D. Heparinized blood |
19. Holes in the blood film are evidence of ____ in the slide.
- | | |
|-----------|------------|
| A. dirt | C. alcohol |
| B. grease | D. water |
20. The following are changes that may happen to EDTA blood sample from a person suspected with malaria, EXCEPT:
- | |
|---|
| A. stippling may not be possible |
| B. the male gametocyte (if present) may exflagellate |
| C. ring forms in rbc will continue schizogony |
| D. ookinetes of <i>Plasmodium</i> species other than <i>P. falciparum</i> may develop as if they were in the mosquito |
21. Morphologic characteristics of malaria parasites are best seen in:
- | | |
|----------------|------------|
| A. thin films | C. both |
| B. thick films | D. neither |
22. Which of the following is NOT true about thin blood films?
- | |
|--|
| A. The RBC morphology can be seen, as well as the size relationship of the parasite within the infected RBC. |
| B. The sizes of the infected RBCs can be compared to that of the uninfected RBCs. |
| C. It has higher sensitivity than thick film as parasitemia can be calculated. |
| D. It is much easier to identify malaria organisms to the species level. |
23. Why is laking in the thick smear no longer necessary when using Giemsa stain?
- | |
|---------------------------------------|
| A. Giemsa contains absolute methanol. |
| B. Giemsa contains absolute ethanol. |
| C. Giemsa contains water. |
| D. Giemsa contains acetone. |

24. Fixation with absolute methanol is not required when using ____.
- A. Giemsa
 - B. Wright
 - C. Acridine
 - D. Iron hematoxylin
25. Fixation with absolute methanol is required when using ____.
- A. Giemsa
 - B. Wright
 - C. Acridine
 - D. Iron hematoxylin
26. How long should staining of blood film for malaria parasite be done when using Wright's stain?
- A. 5 minutes
 - B. 10 minutes
 - C. 15 minutes
 - D. 20 minutes
27. Using Giemsa, sheath of microfilaria appear:
- A. blue
 - B. pink
 - C. clear
 - D. purple
28. Shuffner's dots will stain ____ when using Giemsa.
- A. red
 - B. blue
 - C. purple
 - D. pink
29. Cytoplasm of *Plasmodium* trophozoites when stained with Giemsa will appear ____.
- A. red
 - B. blue
 - C. purple
 - D. pink
30. When patient is in medication, stool should not be collected until ____ days after the completion of therapy.
- A. 3-5 days
 - B. 5-7 days
 - C. 7-10 days
 - D. 10-14 days

31. Pertinent information that should be present in the patient's sample container, EXCEPT:
- | | |
|-------------------|------------------------|
| A. Patient's name | C. Physician's name |
| B. Patient's ID | D. Suspected diagnosis |
32. Typical stool collection protocol for routine examination:
- | |
|--|
| A. 1 specimen collected anytime of the day |
| B. 2 specimens collected every other day |
| C. 3 specimens collected every other day |
| D. 4 specimens collected every other day |
33. Which of the following explains why stool should not be contaminated with urine?
- | |
|--|
| A. urine also contains human parasites |
| B. urine's acidic pH disintegrates protozoan cysts and trophozoite if present in the stool |
| C. urine contains urea that destroys parasite stages in the stool |
| D. urine's microscopic elements maybe interpreted as human parasites |
34. Liquid specimens should be examined within _____.
- | | |
|---------------|---------------|
| A. 15 minutes | C. 45 minutes |
| B. 30 minutes | D. 60 minutes |
35. Where motility of protozoan trophozoite should be demonstrated, _____ specimen is required.
- | | |
|-----------|----------------|
| A. fresh | C. semi-formed |
| B. liquid | D. formed |
36. Semi-formed specimens should be examined within _____.
- | | |
|---------------|---------------|
| A. 15 minutes | C. 45 minutes |
| B. 30 minutes | D. 60 minutes |
37. Which of the following specimens can be held 24 hours following collection?
- | | |
|----------------|-------------|
| A. formed | C. liquid |
| B. semi-formed | D. mucoidal |
38. What is the universal ratio of stool to fixative?
- | | |
|-------------------------------------|-------------------------------------|
| A. 1 part stool to 2 parts fixative | C. 1 part stool to 4 parts fixative |
| B. 1 part stool to 3 parts fixative | D. 1 part stool to 5 parts fixative |
39. Minimum time for stool fixation is _____.
- | | |
|---------------|---------------|
| A. 5 minutes | C. 30 minutes |
| B. 20 minutes | D. 60 minutes |
40. Formalin concentration that ideally preserves protozoan cysts is _____.
- | | |
|-------|--------|
| A. 2% | C. 10% |
| B. 5% | D. 15% |
41. Formalin concentration that ideally preserves helminth eggs and larvae is _____.
- | | |
|-------|--------|
| A. 2% | C. 10% |
| B. 5% | D. 15% |
42. Which of the following is NOT true on the use of formalin as a fixative?
- | |
|--|
| A. It has long shelf life. |
| B. It preserves specimens for up to several years. |
| C. It preserves parasite morphology adequately for permanent smears. |
| D. Morphologic details of cysts and eggs may fade with time. |
43. This stool fixative contains plastic powder as an adhesive for the stool specimen:
- | | |
|--------------|----------------------------|
| A. Formalin | C. Polyvinyl alcohol |
| B. Schaudinn | D. Sodium Acetate Formalin |
44. Mercuric chloride serves as a base of this fixative.
- | | |
|----------------------|-----------------------------------|
| A. Formalin | C. Alternative Single-Vial System |
| B. Polyvinyl alcohol | D. Sodium Acetate Formalin |
- 45.

- Which of the following fixatives is ideal both for concentration and permanent-stained smears?
- A. Formalin
B. Schaudinn
C. Polyvinyl alcohol
D. Sodium acetate formalin
46. This fixative requires the use of albumin as adhesive.
A. Formalin
B. Schaudinn
C. Polyvinyl alcohol
D. Sodium acetate formalin
47. If SAF is used as a fixative for stool specimen, what is the ideal permanent stain?
A. Iron hematoxylin
B. Wheatley trichrome stain
C. Giemsa Stain
D. Wright's stain
48. Wheatley trichrome stain can be used as a permanent stain in all of the following fixatives, EXCEPT:
A. SAF
B. PVA
C. Modified PVA
D. Single-vial system
49. When using permanent stains to confirm the presence of protozoan cyst and trophozoite, how many fields should be examined before declaring negative?
A. 100
B. 200
C. 300
D. 500
50. Nuclear karyosomes of *E. histolytica* when stained with Trichrome is colored _____.
A. light pink
B. blue green
C. bright red
D. green
51. When using iron hematoxylin for protozoan structures, nuclear material is stained _____.
A. pink
B. purple
C. red
D. dark blue
52. Modified iron hematoxylin is incorporated with _____ to detect acid-fast protozoan.
A. carbol fuchsin
B. malachite green
C. acid alcohol
D. trichrome stain
53. Blood culture for *Leishmania* and *Trypanosoma* is carried out using what medium?
A. Lowenstein-Jensen Medium
B. Novy-McNeal-Nicolle Medium
C. Rhodamine medium
D. Lock-egg medium
54. Amount of stool needed for saline sedimentation technique:
A. 5 g
B. 10 g
C. 15 g
D. 20 g
55. Amount of stool needed for formalin-ether (ethyl acetate) sedimentation technique:
A. 1 g
B. 2 g
C. 3 g
D. 5 g
56. What procedures constitute the Ova and Parasite examination?
A. direct wet smear
B. concentration
C. fecal immunoassays
D. permanent stained
57. What is the purpose of direct wet examination?
A. to detect adult forms
B. to detect motile trophozoites
C. to demonstrate cysts
D. to detect creeping larva
58. How should the direct wet preparation be examined?
A. read up to 100 fields
B. read up to 300 fields
C. read the entire coverslip
D. read up to 400 fields
59. In general, what is the recommended time and speed for centrifugation for the concentration method?
A. 5 minutes at 500 x g
B. 10 minutes at 500 x g
C. 5 minutes at 1000 x g
D. 10 minutes at 1000 x g
60. What happens when the required time and speed for centrifugation for the concentration method is not followed?
A. *Ascaris* egg will disintegrate
B. Trophozoites will disappear
C. Hookworm shell will become too transparent
D. Small coccidian oocysts and microsporidial spores may not be recovered

61. What is the purpose of ether in FECT?
 A. fixative
 B. adhesive
 C. clearing agent
 D. adsorbs fecal debris
62. When FECT procedure is correctly performed, the uppermost layer is the _____.
 A. debris
 B. formalin
 C. ether
 D. sediment
63. The relative centrifugal force (RCF) in FECT/FEACT when adding formalin:
 A. 450 g
 B. 500 g
 C. 750 g
 D. 1000 g
64. The relative centrifugal force (RCF) in FECT/FEACT when adding formalin:
 A. 450 g
 B. 600 g
 C. 750 g
 D. 1000 g
65. Which of the following is unlikely to be seen in the sediment from an FEACTION technique?
 A. *Ascaris* egg
 B. Larvae of *Strongyloides*
 C. *Schistosoma mansoni*
 D. operculated eggs of trematodes
66. A floatation technique using saturated saline solution is _____.
 A. Sheather's
 B. Brine
 C. Zinc-sulfate
 D. Baermann's
67. Oocysts of *Isospora* and *Cryptosporidium* are best demonstrated using what floatation technique?
 A. Sheather's
 B. Brine
 C. Zinc-sulfate
 D. Baermann's
68. A floatation technique using sugar solution is _____.
 A. Sheather's
 B. Brine
 C. Zinc-sulfate
 D. Baermann's
69. Eggs of small tapeworms are best demonstrated using what floatation technique?
 A. Sheather's
 B. Brine
 C. Zinc-sulfate
 D. Baermann's
70. Non-operculated tapeworm eggs are best demonstrated using what floatation technique?
 A. Sheather's
 B. Brine
 C. Zinc-sulfate
 D. Baermann's
71. What specific gravity zinc sulfate should be used for the routine floatation concentration procedure?
 A. 1.14
 B. 1.16
 C. 1.18
 D. 1.20
72. What specific gravity zinc sulfate should be used for a stool preserved in a formalin-based fixative?
 A. 1.14
 B. 1.16
 C. 1.18
 D. 1.20
73. Which of the following is NOT needed when doing Kato-katz technique?
 A. Glycerine
 B. NSS
 C. mesh screen
 D. hole template
74. What is the purpose of glycerine in Kato-Katz technique?
 A. fixative
 B. adhesive
 C. clearing
 D. laking
75. When using a 41.7 mg template, the factor to report number of eggs/grams of stool sample is _____.
 A. 20
 B. 24
 C. 30
 D. 50
76. When using a 20 mg template, the factor to report number of eggs/grams of stool sample is _____.
 A. 20
 B. 24
 C. 30
 D. 50
77. When using a 20 mg template, the factor to report number of eggs/grams of stool sample is _____.
 A. 20
 B. 24
 C. 30
 D. 50

78. Which stool examination procedure uses 4g of 24 hour stool?
 A. FEACT
 B. AECT
 C. Stoll's
 D. Sheather's
79. Relevant to your answer in item 55, what is the fixative used in this procedure?
 A. 10% formalin
 B. hydrochloric acid
 C. NaOH
 D. Sugar solution
80. This method of stool examination uses warm water for the larva to escape from the stool sample:
 A. Sheather's
 B. Baermann
 C. Brine
 D. ZnC sulfate
81. The following parasite infection may be diagnosed using filter paper culture, EXCEPT?
 A. *Trichinella*
 B. *Strongyloides*
 C. Hookworm
 D. *Trichostrongylus*
82. Defined as the amount of moisture content of the stool sample:
 A. color
 B. consistency
 C. odor
 D. shape
83. Iodine smear is ideal when suspecting for _____ infection.
 A. Nematode
 B. Cestode
 C. Trematode
 D. Protozoan
84. When urine sample for parasite examination appears chyluric, it may be associated with what infection?
 A. malaria
 B. schistosomiasis
 C. filariasis
 D. amoebiasis
85. Relevant to item 84, what should be added to clear the urine sample?
 A. acetic acid
 B. 5% HCl
 C. ether
 D. 10% formalin
86. Relevant to item 85, what is the purpose of adding such reagent?
 A. To lyze cellular elements like rbc
 B. To clear the urine
 C. To dissolve fat
 D. To clear and fix the specimen
87. Relevant to item 85, what parasite stages are you expecting to demonstrate?
 A. gametocytes
 B. non-operculated trematode eggs
 C. microfilaria
 D. trophozoites
88. When urine sample for parasite examination appears smoky, it may be associated with what infection?
 A. malaria
 B. schistosomiasis
 C. filariasis
 D. amoebiasis
89. Relevant to item 88, what should be added to clear the urine sample?
 A. acetic acid
 B. 5% HCl
 C. ether
 D. 10% formalin
90. Relevant to item 88, what is the purpose of adding such reagent?
 A. To lyze cellular elements like rbc
 B. To clear the urine
 C. To dissolve fat
 D. To clear and fix the specimen
91. Relevant to item 88, what parasite stages are you expecting to demonstrate?
 A. gametocytes
 B. non-operculated trematode eggs
 C. microfilaria
 D. trophozoites
- A. *S. haematobium*
 C. *S. mansoni*
- A. *Pthirus pubis*
 C. *Schistosoma haematobium*

94.

In doing sputum concentration technique, what is the reagent used?

- A. 10% formalin
B. 3% NaOH
C. 5% formalin
D. 2% formalin
95. Parasite living in the lung is ____.
A. *S. stercoralis*
B. *A. lumbricoides*
C. Hookworm
D. *P. westermani*
96. The following are parasites migrating in the lung EXCEPT:
A. *S. stercoralis*
B. *A. lumbricoides*
C. Hookworm
D. *P. westermani*
97. Skin snip is used for the diagnosis of ____.
A. *T. spiralis*
B. *O. volvulus*
C. *Schistosoma*
D. *T. solium*
98. Muscle digestion to demonstrate *T. spiralis* larva is carried out using ____.
A. HCl + trypsin
B. HCl + pepsin
C. HAc + trypsin
D. HAc + pepsin
99. Rectal biopsy may be a diagnostic procedure for:
A. *T. spiralis*
B. *O. volvulus*
C. *Schistosoma*
D. *T. solium*
100. Cerebrospinal fluid may be used for the diagnosis of all of the following parasites EXCEPT:
A. *Trypanosoma*
B. *Trichinella*
C. *Loa loa*
D. *Cryptococcus*
101. Duodenal aspirates maybe used for the diagnosis of:
A. *Leishmania*
B. *Trypanosoma*
C. *Loa loa*
D. *Cryptococcus*
102. Bone marrow aspirates maybe used for the diagnosis of:
A. *Leishmania*
B. *Trypanosoma*
C. *Plasmodium*
D. *Cryptococcus*
103. Doudenal capsule or enterotest maybe used for the diagnosis of:
A. *Wuchereria*
B. *Trypanosoma*
C. *Giardia*
D. *Leishmania*
104. Which of the following are key discoveries that contributed to current knowledge about parasites?
A. Consistent status quo preservation of samples
B. Techniques that indicate only the presence or absence of parasites
C. Modifications of traditional parasite identification techniques
D. Decrease in parasite incidence because of global travel
105. The primary function of a host in a parasite-host relationship is to:
A. Carry on the parasite's life cycle.
B. Provide immunologic protection for the host.
C. Carry on the host's life cycle.
D. Provide a food source for the host.
106. Which of the following key pieces of information may be extracted from the portion of a parasite's life cycle that occurs outside the body?
A. parasitic disease symptoms and disease processes
B. epidemiology and prevention and control measures
C. appropriate parasite diagnosis methodologies
D. selection of antiparasitic medication
107. Which of the following groups of symptoms represents those most commonly observed in parasitic infections?
A. diarrhea, abdominal cramping, and anemia
B. enlargement of the spleen, fever, and chills
C. skin lesions, abdominal pain, and diarrhea
D. abdominal cramping, abdominal pain, and diarrhea

108. Which of the following specimen types is most often submitted for parasite study?
A. Blood
B. Sputum
C. Urine
D. stool
109. How many stool samples should be collected when following the typical O & P collection protocol?
A. 1
B. 2
C. 3
D. 4
110. In the collection and transport of stool specimens for parasites, which parasite stage is most affected by the length of time from collection to examination?
A. Cyst
B. Trophozoites
C. Oocysts
D. Helminth larvae
111. One of the biggest disadvantages of formalin as a fixative for O & P is that:
A. It cannot be used for concentration procedures.
B. It cannot be used for permanent stained slides.
C. It cannot be used for direct microscopic examinations.
D. It cannot be used for detecting protozoan.
112. When using preservatives, what is the appropriate ratio of fixative to stool?
A. 1 part fixative to 1 part stool
B. 2 parts fixative to 1 part stool
C. 3 parts fixative to 1 part stool
D. 4 parts fixative to 1 part stool
113. Which of the preservatives contains mercuric chloride?
A. Formalin
B. SAF
C. PVA
D. Modified PVA
114. A main difference between the trophozoite of *E. histolytica* and *E. hartmanni* is which of the following?
A. Trophozoites of *E. histolytica* are smaller in size
B. Presence of pseudopods
C. Trophozoites of *E. hartmanni* do not contain ingested rbc
D. Nuclear structure and peripheral chromatin
115. The specimen of choice for the recovery of *N. fowleri*:
A. Sputum
B. Stool
C. CSF
D. urine
116. Flagellate morphologic structure is often not visible under microscopic examination:
A. Undulating membrane
B. Pseudopods
C. Flagella
D. Axostyle
117. Which specimen type and collection regimen would be most appropriate for the diagnosis of *G. intestinalis*:
A. 1 stool sample
B. 2 stool samples
C. Multiple stool samples collected on subsequent days
D. One stool sample and one blood sample
118. *Fasciolopsis buski* infects which organ in humans?
A. Bile ducts
B. Liver
C. Colon
D. Small intestine
119. The specimen of choice for the recovery of *Schistosoma japonicum* is which of the following?
A. Tissue biopsy
B. Urine
C. Sputum
D. Stool
120. In addition to its typical location, *Paragonimus* eggs are also known to cause serious complications when recovered in which of the following?
A. Bile
B. CSF
C. Brain tissue
D. Feces
- 121.

Normal saline serves as _____ in direct fecal smear.

- A. clearing agent
- B. adhesive agent
- C. fixative
- D. emulsifying agent

122. When is the best time for collecting specimen for scotch tape method?

- A. at bedtime
- B. early morning before the patient has taken a bath
- C. early morning after the patient has taken a bath
- D. at the peak of pruritus ani

123. In micrometry, which micrometer should be calibrated?

- A. stage
- B. ocular
- C. both
- D. neither

124. Known scale is provided by _____ micrometer.

- A. stage
- B. ocular
- C. both
- D. neither

125. Macroscopic examination of stool sample includes all of the following, EXCEPT:

- A. color
- B. consistency
- C. composition
- D. occult blood

Urine Analysis Common questions

1. Which sample of urine is suitable for routine examination?

Fresh sample collected anytime of the day is suitable, however first voided early morning urine sample is preferable as it is most concentrated and has acidic pH in which formed elements (cells and casts) are usually preserved.

2. Define oliguria, anuria, nocturia and polyuria?

- a. Oliguria: urine output, less than 1 mL/kg/hr in infants, less than 0.5 mL/kg/hr in children, and less than 400 mL/day in adults
- b. Anuria: cessation of urine flow or less than 100 ml/day in adults
- c. Nocturia: An increase in the nocturnal excretion of urine
- d. Polyuria: urine volume greater than 2.5 L/day in adults and 2.5–3 mL/kg/day in children.

3. What are the different types of urine specimen?

- a. Random collection- for routine screening
- b. Fasting and postprandial – for diabetes mellitus
- c. 24 hr sample- for quantitative tests
- d. Midstream clean catch urine- for culture as well as routine

- e. Catheterized- for culture
- f. Suprapubic aspiration – for bladder culture.

4. How do one collect urine in infants?

Soft/plastic bags attached to genital area by skin adhesives can be used to collect urine in infants.

5. What is a 24-hour urine sample?

After getting up in the morning, first morning sample is discarded. All subsequent samples during the rest of the day and night is collected in a large container (clean container of 2 litre capacity). The last sample is the next day's first morning sample. Urine should be preserved at 4-6-degree c during the period of collection and then immediately transported to laboratory. This is used for quantitative estimation of proteins and hormones.

6. What are the methods of preservation of urine and amount of preservatives used?

- a. Refrigeration at 4-6 degree C for 8 hours
- b. Toluene:1 ml per 50 ml of urine. It acts by forming a surface layer and it preserves the chemical constituents of urine.
- c. Formalin: 6-8 drops of 40% formalin per 100 ml of urine. It preserves rbcs and pus cells.
- d. Disadvantage is that it gives false positive test for sugars.
- e. Thymol: 1% of thymol is used. Disadvantage is that it gives false positive for proteins.
- f. Acids: hydrochloric acid, boric acid and sulphuric acid.

7. What are the changes that can occur in standing urine at room temperature?

- a. Increase in pH
- b. Formation of crystals
- c. Loss of ketone bodies
- d. Decrease in glucose
- e. Oxidation of bilirubin to biliverdin
- f. Oxidation of urobilinogen to urobilin
- g. Bacterial proliferation
- h. Disintegration of cellular elements.

8. What is the normal value of specific gravity and what does it signify?

Normal values of specific gravity is 1.003-1.030. it signifies the relative mass density. Specific gravity of urine is a measure of concentrating ability of kidneys and is determined to get information about its tubular function.

9. What are the factors affecting the specific gravity of urine?

Solute and temperature affect the specific gravity. Specific gravity increases as solute concentration increases and decreases when temperature increases.

10. What are the methods of estimation of specific gravity of urine?

The specific gravity can be measured by

- a. Urinometer : less accurate method. it needs to be corrected for temperature. If the specimen is cold, 0.001 must be subtracted from the reading for every 3 degreeC that the specimen temperature is below the urinometer calibration temperature. Conversely, 0.001 must be added to the reading for every 3degreeC that the specimen measures above the calibration temperature.
- b. Refractometer: determines the concentration of the dissolved particles in the specimen by measuring the refractive index. Advantages are, only one or two drops of urine is sufficient and temperature correction not necessary.
- c. Harmonic oscillation densitometry: the principle is – principle that the frequency of a sound wave entering a solution changes in proportion to the density of the solution. Advantages are that temperature corrections are not necessary.

11. What are the causes of increased specific gravity in urine?

Diabetes mellitus, nephritic syndrome, fever and dehydration.

12. What are the causes of decreased specific gravity in urine?

Diabetes insipidus, chronic renal failure (low and fixed at 1.010) due to loss of concentrating ability of tubules and compulsive water drinking.

13. What information does urine color give?

- a. Pale yellow- normal
- b. Dark yellow- concentrated
- c. Orange- Bilirubin or certain drugs like nitrafurantoin
- d. Green – in pseudomonas infection
- e. Pink to red – rbcs, consumption of beet, hemoglobin and porphyrins
- f. Brownblack – alkaptonuria.

14. What causes chyluria and how to confirm it?

Chyluria (milky urine) occurs because of rupture of dilated lymphatics in the bladder or in the kidney and the lymph mixes with urine. Dilated lymphatics may be because of filariasis or abdominal tumors.

Confirmation of chyluria is carried out by:

Mixing 1 ml of urine with 1 ml of sudan III stain and take 1 drop of it on the slide and place the coverslip, orange colored fat droplets confirms the presence of chyle.

Taking 1ml of urine and adding 1 ml of ether-chloroform mixture. Milkyness disappears as the fat of chyle dissolves in ether chloroform.

15. What leads to cloudy urine?

Urine is cloudy because of amorphous phosphates, urates, pus cells and bacterial contamination.

16. What is the significance of urine odor?

Urine is cloudy because of amorphous phosphates, urates, pus cells and bacterial contamination.

16. What is the significance of urine odor?

Normally it is slightly aromatic not much significance, however few characteristic odors are as below

- a. Foul smelling , ammonia like seen in bacterial decomposition
- b. Fruity odour in ketonuria
- c. Mousy odour in phenylketonuria
- d. Maple syrup in maple syrup urine disease.

17. What are the causes of acidic urine?

The pH ranges from 4.5 to 8, and it has to be correlated with clinical findings

- a. Acidic urine is normally found in starvation, dehydration, diarrhea, diabetes or in high protein diet
- b. Alkaline urine is found in hyperventilation, renal tubular acidosis and if the urine is kept for long(improperly preserved specimen).

18. What are the causes of proteinuria?

- a. Prerenal: multiple myeloma where there is markedly elevated levels of Bence Jones protein which is a low molecular weight protein and is excreted in urine
- b. Renal: glomerular diseases, tubular diseases.

19. What is benign proteinuria?

Transient and not of pathologic significance, usually found in people with vigorous exercise, high fever and even exposure to cold.

20. Why should urine be acidified before testing for albuminuria (if urine is alkaline)?

Phosphates precipitated in alkaline urine, while in acidic urine proteins are precipitated readily by various methods.

21. What is orthostatic proteinuria?

Also called postural proteinuria, usually found in young adults. Proteinuria seen after prolonged standing and disappears in horizontal position. In vertical position, there will be increased pressure on renal vein and is thought to be the cause.

22. What is microalbuminuria (micro proteinuria)?

It is defined as urinary excretion of 30-300 mg/24 hrs of albumin in urine. Sensitive strip tests are available to detect the presence of very low amount. This test is of use in identifying cases of early kidney damage in diabetes mellitus and it is an independent risk factor for cardiovascular disease in diabetes mellitus.

23. What causes myoglobinuria?

Myoglobin in urine due to muscle destruction. seen in trauma, crush syndromes, extensive excretion and alcoholism.

24. In which disease both albuminuria and Bence Jones proteins are present?

Myeloma kidney damages glomeruli and tubules resulting in albuminuria and BJ proteins as part of disease process- multiple myeloma.

25. In the heat test of proteins, why is only the upper part of the tube is heated?

On heating the upper part, the proteins flocculate and haziness is produced which is compared to the lower unheated part which acts as control. In addition convection currents are not produced which may disturb the haziness. On the other hand, if lower part of urine is heated, convection current are set up which make the whole tube hazy and traces of proteins may be missed since there is no control.

• 1.

Normal urine primarily consist of:

- A.
Water, protein, and sodium
- B.
Water, urea, and protein
- C.
Water, urea, and sodium chloride
- D.
Water, urea, and bilirubin

• 2.

Patient with diabetes mellitus have urine with:

- A.
Decreased volume and decreased specific gravity
- B.
Decreased volume and increased specific gravity
- C.
Increased volume and decreased specific gravity
- D.
Increased volume and increased specific gravity

• 3.

Cessation of urine flow is defined as:

- A. Azotemia
- B. Dysuria
- C. Diuresis
- D. Anuria

• 4.

Upon standing at room temperature a urine pH typically:

- A. Decreases
- B. Increases
- C. Remains the same
- D. Changes depending on bacterial concentration

• 5.

Antidiuretic hormone regulates the reabsorption of:

- A. Water
- B. Glucose
- C. Potassium
- D. Calcium

• 6.

A 17-year-old girl decided to go on a starvation diet. After 1 week of starving herself, what substance would most likely be found in her urine?

- A.

Protein

- B. Ketones
- C. Glucose
- D. Blood

• 7.

Which of the following crystals may be found in acidic urine?

- A. Calcium carbonate
- B. Calcium oxalate
- C. Calcium phosphate
- D. Triple phosphate

• 8.

A woman in her ninth month of pregnancy has a urine sugar that is negative with the urine reagent strip but gives a positive reaction with the copper reduction method. The sugar most likely responsible for these results is:

- A. Maltose
- B. Galactose
- C. Glucose
- D. Lactose

• 9.

Which of the following casts is most indicative of severe renal disease?

- A. Hemoglobin

- B.
Granular
- C.
Cellular
- D.
Waxy

• 10.

Which of the following is the primary reagent in the copper reduction tablet?

- A.
Sodium carbonate
- B.
Copper sulfate
- C.
Glucose oxidase
- D.
Polymerized diazonium salt

• 11.

Which of the following is an abnormal crystal described as a hexagonal plate?

- A.
Cystine
- B.
Tyrosine
- C.
Leucine
- D.
Cholesterol

• 12.

Which of the following cells is the largest?

- A.
Glitter
- B.
WBC
- C.

Transitional epithelial

- D.
Renal epithelial

• 13.

What cell is MOST commonly associated with vaginal contamination?

- A.
White
- B.
Transitional
- C.
Squamous
- D.
Glitter

• 14.

Urinary calculi most often consist of:

- A.
Calcium
- B.
Uric acid
- C.
Leucine
- D.
Cystine

• 15.

Small round objects found in a urine sediment that dissolve after addition of dilute acetic acid and do not polarize most likely are:

- A.
Air bubbles
- B.
Calcium oxalate
- C.
Red blood cells
- D.

Yeast cells

• 16.

Tiny colorless, dumbbell-shaped crystals were found in an alkaline urine sediment. They most likely are:

- A. Calcium oxalate
- B. Calcium carbonate
- C. Calcium phosphate
- D. Amorphous phosphate

• 17.

A clean-catch urine sample is submitted to the laboratory for routine urinalysis and culture. The routine urinalysis is done first, and the specimen is then sent to microbiology for culture. The specimen should:

- A. Be centrifuged and the supernatant cultured
- B. Be rejected due to possible contamination from routine urinalysis
- C. Not be cultured if no bacteria are seen
- D. Be immediately processed for culture regardless of urinalysis results

• 18.

A 24-hour urine from a man who had no evidence of kidney impairment was sent to the laboratory for hormone determination. The volume was 600 mL, but there was some question as to the completeness of the 24-hour collection. The next step would be to:

- A. Perform the hormone determination, since 600 mL is a normal urine 24-hour volume
- B. Check the creatinine level; if it is less than 1g do the procedure
- C.

Report the hormone determination in milligrams per deciliter in case the specimen was incomplete

- D.
Check the creatinine level; if it is greater than 1g do the procedure

• 19.

Urine samples should be examined with 1 hour of voiding because:

- A.
Red blood cells, leukocytes, and casts agglutinate after standing for several hours at room temperature
- B.
Urobilinogen increases and bilirubin decreases after prolonged exposure to light
- C.
Bacterial contamination will cause alkalinization of the urine
- D.
Ketones will increase due to bacterial and cellular metabolism

• 20.

The principle of the reagent strip test for urine protein depends on:

- A.
An enzyme reaction
- B.
Protein error of indicators
- C.
Copper reduction
- D.
The toluidine reaction

• 21.

After receiving a 24-hour urine sample for quantitative total protein analysis, the technician must first:

- A.
Subculture the urine for bacteria
- B.
Add the appropriate preservative
- C.
Screen for albumin using a dipstick

- D.
Measure the total volume

• 22.

Which of following is the best guide to consistent centrifugation?

- A.
Potentiometer setting
- B.
Armature settings
- C.
Tachnometer readings
- D.
Rheostat readings

• 23.

In addition to the sperm count in a fertility study, analysis of seminal fluid should also include:

- A.
Time of liquefaction, estimation of motility, morphology
- B.
Motility, morphology, test for alkaline phosphatase
- C.
Time of liquefaction, test for acid phosphatase, qualitative test for hemoglobin
- D.
Time of liquefaction, qualitative test for hemoglobin and motility

• 24.

A physician attempts to aspirate a knee joint and obtains 0.1 mL of slightly bloody fluid. Addition of acetic acid results in turbidity and a clot. This indicates that:

- A.
The fluid is synovial fluid
- B.
Plasma was obtained
- C.
Red blood cells caused a false-positive reaction
- D.
The specimen is not adequate

• 25.

Urine from a 50-year-old man was noted to turn dark red on standing. This change is caused by:

- A. Glucose
- B. Porphyrins
- C. Urochrome
- D. Creatinine

Microscopical urine examination

Questions and Answers

• 1.

RBC's normal range in urine:

- A. Upto 4/HPF
- B. Upto 40/HPF
- C. Upto 14/HPF

• 2.

Pyuria refers to:

- A. WBC's greater than 5/HPF
- B. RBC's greater than 5/HPF
- C. WBC's casts greater than 5?HPF

• 3.

RBC's casts are indicative of:

- A. Cystitis
- B. Nephritis
- C. Acute glomerulonephritis

• 4.

Crystals common in alkaline PH:

- A. Triple phosphate

- B.
Ca-oxalate
 - C.
Uric acid
- 5.
Needle-like crystals:
 - A.
Alkaline phosphate
 - B.
Uric acid
 - C.
Ca-oxalate
- 6.
Bilharzial ova seen in urine:
 - A.
Schistosoma hematobium(lateral spine)
 - B.
Schistosoma mansoni (terminal spine)
 - C.
Schistosoma haematobium (terminal spine)
- 7.
Type of epithelial cells:
 - A.
Renal tubular
 - B.
Transitional
 - C.
Squamous
 - D.
All of the above
- 8.
Crystals with envelope shape:
 - A.
Ca-oxalate
 - B.
Triple phosphate
 - C.
Uric acid
- 9.
Triple Phosphate crytals have.....shape:
 - A.
Envelope
 - B.
Needles
 - C.
Coffin lid
- 10.
Casts take the shape of:

- A. Renal tubules
- B. Cells
- C. Nephrons

URINALYSIS REVIEW QUESTIONS

1. _____ is the weight of a liquid compared to an equal volume of distilled water.
 - a. pH
 - b. surface area to volume ratio
 - c. specific gravity
 - d. molarity
2. A urinalysis is a clinical procedure that determines:
 - a. the composition of urine
 - b. health status of the patient
 - c. properties of a urine sample
 - d. all of the above
3. A urine test strip can be used to measure:
 - a. pH
 - b. specific gravity
 - c. protein concentration
 - d. ketone bodies
 - e. all of the above
4. The normally wide range of pH of urine samples is mainly due to:
 - a. individual differences
 - b. urinary tract infections
 - c. dietary differences
 - d. none of the above
5. Glucose is normally _____ in a urine specimen.
 - a. absent
 - b. the cause of the yellow color
 - c. present
 - d. in very high levels
6. It is normal to observe numerous red blood cells in a urine specimen when evaluating urine sediment.
 - a. true
 - b. false
7. The presence of ketone bodies in a urinalysis is a sign of:
 - a. excellent health
 - b. possible malnutrition
 - c. a diet high in carbohydrates
 - d. kidney disease