CLINICAL MICROSCOPY

MTLE BOARD EXAM RECALLS

MTLE *MARCH* *2023* RECALLS

MTLE *AUGUST* *2023* RECALLS

MTLE *MARCH* *2024* RECALLS

MTLE *AUGUST* *2024* RECALLS

STUDY QUESTIONS

500 ITEMS

2022-2024

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1. If alcohol is added to urine with tyrosine crystals, this other type of abnormal crystal may be precipitated:

a. bilirubin
b. sulfonamide
c. leucine
d. cystine

2. Urine samples should be examined within one hour of voiding because:
a. RBC, leukocytes and casts agglutinate on standing for several hours at room temperature
b. Urobilinogen and bilirubin increase after prolonged exposure to light
c. Bacterial contamination will cause alkalinization of urine
d. Ketones will increase due to bacterial and cellular metabolism

3. Urine reagent strips should be stored in a/an:
a. incubator
b. cool dry place
c. refrigerator
d. freezer

4. SSA turbidity: "turbidity with granulation, no flocculation"
a. 1+
b. 2+
c. 3+
d. 4+

5. A renal calculi described as very hard, dark in color with rough surface:
a. calcium oxalate
b. uric acid
c. cystine
d. phosphate

6. Renal disease whose etiology is the deposition of anti- glomerular basement membrane antibody to glomerular and alveolar basement membranes:
a. Berger's disease
b. Wegener's granulomatosis
c. Goodpasture syndrome
d. membranous glomerulonephritis

7. The sperm acrosomal cap should encompass approximately _____ of the head and covers approximately ___ of the nucleus.
a. One half, two-thirds
b. One third, one half
c. Two-thirds, one fourth
d. One fourth, one third

8. Transitional epithelial cells seen in urine specimens may be reported using rare/few/moderate/many by using the:
a. scanner field
b. low power field
c. high power field
d. oil immersion field

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9. In a urine specimen, ten calcium oxalate crystal were seen per high power field (HPF). How do you report the finding?
a. rare
b. few
c. moderate
d. many

10. In a urine specimen, nine bacteria were seen per high power field (HPF). How do you report the finding?
a. rare
b. few
c. moderate
d. many

11. Computer- Assisted Semen Analysis (CASA) is used to determine sperm cell:
a. vertical movement
b. lateral movement
c. circular movement
d. velocity and trajectory

12. Florence test, which detects choline, uses which reagent?
a. potassium iodine
b. picric acid
c. trichloroacetic acid
d. silver nitroprusside

13. Ascorbic acid causes false negative reactions in what urine reagent strip?
a. Blood
b. Bilirubin
c. Leukocytes
d. All of the above

14. Ascending sequence of casts:
a. waxy- hyaline- coarsely granular- finely granular- cellular
b. coarsely granular- finely granular- hyaline granular- waxy- cellular
c. hyaline- cellular- coarsely granular- finely granular- waxy
d. cellular- hyaline- finely granular- coarsely granular- waxy

15. The protein section of urine reagent strip is most sensitive to:
a. albumin
b. bence jones protein
c. mucoprotein
d. globulin

16. The best aid for chemical spills is flushing the area with large amounts of water for at least ___ minutes then seek medical attention
a. 15
b. 20
c. 25
d. 30

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17. The clarity of urine sample should be determined:
a. using glass tubes only, never plastic
b. following thorough mixing of the specimen
c. after addition of salicylic acid
d. after the specimen cools to room temperature

18. Normal synovial fluid glucose should be more than ___ mg/dL lower than the blood value
a. 5
b. 10
c. 15
d. 20

19. Arsenal fire:
a. Type A fire
b. Type E fire
c. Type C fire
d. Type F fire

20. Soluble in ether, except:
a. red blood cells
b. lipids
c. chyle
d. lymphatic fluid

21. Soluble in dilute acetic acid, except:
a. red blood cells
b. amorphous phosphates
c. calcium carbonates
d. white blood cells

22. Which method for the determination of urine specific gravity is based on refractive index?
a. total solids meter
b. hydrometer
c. reagent strip
d. harmonic oscillation densitometry

23. Sperm motility grading: " slow speed, some lateral movement"
a. 4.0
b. 3.0
c. 2.0
d. 1.0

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1. Total magnification for grading casts:
a) 100x
b) 40x
c) 10x
d) 1000x

Rare Few Moderate Many RFMoMa/LPF **"SM"** - Squamous epithelial cells - Mucus threads	Rare Few Moderate Many RFMoMa/HPF **"TBYN"** - Transitional epithelial cells - Bacteria - Yeasts - Normal crystals
Average/LPF **"Casts CrAb"** - Casts - Abnormal crystals	Average/HPF **"ROWR"** - RBC - Oval fat bodies - WBC - RTE cells

2. Which of the following would be least affected in a specimen that has remained unpreserved at room temperature for more than 2 hours?
a) Urobilinogen
b) Ketones
c) Protein
d) Nitrite

3. The best way to break the chain of infection is:
a) Hand sanitizing
b) Personal protective equipment
c) Aerosol prevention
d) Decontamination

4. Pregnancy (POCT) test kits uses what principle:
a) Immunochromatography
b) Chemiluminescence

5. Review: PASS | RACE

To operate the fire extinguishers:
The acronym PASS can be used to remember the steps:
1. Pull pin
2. Aim at the base of the fire
3. Squeeze handles
4. Sweep nozzle side to side

When a fire is discovered, all employees are expected to take the actions in the acronym RACE:
Rescue—rescue anyone in immediate danger
Alarm—activate the institutional fire alarm system
Contain—close all doors to potentially affected areas
Extinguish/Evacuate—attempt to extinguish the fire, if possible or evacuate, closing the door

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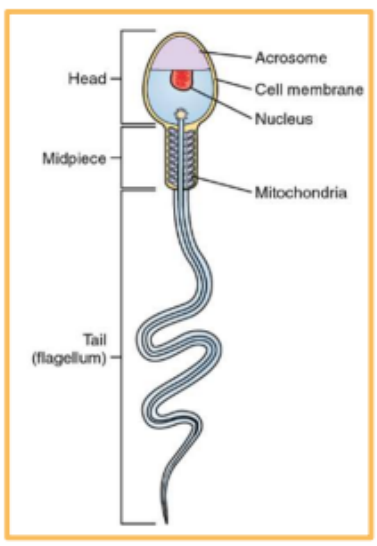
6. Review: Reference Values for Semen Analysis
Volume : 2 to 5 mL
Viscosity: Pours in droplets
pH: 7.2 to 8.0
Sperm concentration: >20 million/mL
Sperm count: >40 million/ejaculate
Motility: >50% within 1 h
Quality: >2.0 or a, b, c in Table 10–3
Morphology:
>14% normal forms (strict criteria)
>30% normal forms (routine criteria)
Round cells: <1.0 million/mL

Liquefaction - A fresh semen specimen is clotted and should liquefy within 30 to 60 minutes after collection; therefore, recording the time of collection is essential for evaluating semen liquefaction. - Failure of liquefaction to occur within 60 minutes may be caused by a deficiency in prostatic enzymes and should be reported.

Failure of laboratory personnel to document the time a semen sample is collected primarily affects the interpretation of semen:
A. Appearance
B. Volume
C. pH
D. Viscosity

Sperm Morphology



Sperm morphology is evaluated with respect to the structure of the head, neckpiece, midpiece, and tail.
Head abnormalities: poor ovum penetration, Neckpiece, midpiece, and tail abnormalities: motility

The acrosomal cap should encompass approximately half of the head and cover approximately two thirds of the sperm nucleus.

The **normal sperm** has an oval-shaped head approximately 5 µm long and 3 µm wide and a long, flagellar tail approximately 45 µm long.

Calculating Round Cells $$C = \frac{N \times S}{100}$$

where N is the number of spermatids or neutrophils counted per 100 mature sperm, and S is the sperm concentration in millions per milliliter

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Computer-assisted semen analysis (CASA)

CASA provides objective determination of both sperm velocity and trajectory (direction of motion). Sperm concentration and morphology are also included in the analysis.

7. Measurement of a -glucosidase is performed to detect a disorder of the:

a) Seminiferous tubules

b) Epididymis

c) Prostate gland

d) Bulbourethral glands

8. Kohler illumination

Type of microscopic illumination in which a lamp condenser (located above the light source) focuses the image of the light source (lamp filament) onto the front focal plane of the substage condenser (where the aperture diaphragm is located). The substage condenser sharply focuses the image of the field diaphragm (located at or slightly in front of the lamp condenser) at the same plane as the focused specimen. As a result, the filament image does not appear in the field of view, and bright, even illumination is obtained. Kohler illumination requires appropriate adjustments of the condenser and the field and aperture diaphragms.

9. Most common contamination in urine from female patients if it is NOT collected using the midstream clean-catch technique:

squamous epithelial cells

10. A variation of the squamous epithelial cell is the clue cell, which does have pathologic significance. Clue cells are indicative of vaginal infection by the bacterium

Gardnerella vaginalis

11. Aspergillosis – appearance of pleural fluid:

a) Red

b) White

c) Black

d) Turbid

Appearance	Disorder
Clear, pale yellow	Normal
Turbid, white	Microbial infection (tuberculosis)
Bloody	Hemothorax
	Hemorrhagic effusion, pulmonary embolus, tuberculosis, malignancy
Milky	Chylous material from thoracic duct leakage
	Pseudochylous material from chronic inflammation
Brown	Rupture of amoebic liver abscess
Black	Aspergillus
Viscous	Malignant mesothelioma (increased hyaluronic acid)

12. First lens system:

objective Second lens system:

ocular lens (magnifies image from the objective lens)

13. Cylindroids have the same significance as casts.

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14. Order of degeneration of Casts:

Hyaline casts → Cellular casts → Coarsely granular → Finely granular → Waxy Casts

15. Cast disintegration is based on?

a) Alkalinity of urine

b) Acidity of urine

Hypotonic and alkaline urine promotes the disintegration of casts in the urine sediment.

16. Protein range (mg/dL) for grade of 2+

a) 30–100

b) 200–400

c) 100–200

d) 6–30

Grade	Turbidity	Protein Range (mg/dL)
Negative	No increase in turbidity	Less than 6
Trace	Noticeable turbidity	6–30
1+	Distinct turbidity no granulation	30–100
2+	Turbidity, granulation, no flocculation	100–200
3+	Turbidity, granulation, flocculation	200–400
4+	Clumps of protein	Greater than 400

17. Urine Clarity

Freshly voided normal urine is usually clear, particularly if it is a midstream clean-catch specimen. Precipitation of amorphous phosphates and carbonates may cause a white cloudiness.

Clarity	Term
Clear	No visible particulates, transparent
Hazy	Few particulates, print easily seen through urine
Cloudy	Many particulates, print blurred through urine
Turbid	Print cannot be seen through urine
Milky	May precipitate or be clotted

18. Watson Schwartz test – a classic test for differentiating between urobilinogen, porphobilinogen, and Ehrlich-reactive compounds

19. First morning urine is not required in:

a) pregnancy test

b) orthostatic proteinuria

c) urobilinogen

d) urine culture

20. Copper sulfate tests the ____ ability of glucose:

a) reducing

b) oxidizing

Copper Reduction Test (Clinitest) Measurement of glucose by the copper reduction method was one of the earliest chemical tests performed on urine. The test relies on the ability of glucose and other substances to reduce copper sulfate to cuprous oxide in the presence of alkali and heat. A color change progressing from a negative blue ($CuSO_4$) through green, yellow, and orange/red (Cu_2O) occurs when the reaction takes place.

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21. Staghorn calculi:
a) spiky thorns
b) hard large branching
c) coffin-shaped
d) hexagonal

22. Antiglomerular basement membrane antibody is seen with:
a) Wegener granulomatosis
b) IgA nephropathy
c) Goodpasture syndrome
d) Diabetic nephropathy

23. The only protein produced by the kidney is:
a) Albumin
b) Uromodulin
c) Uroprotein
d) Globulin

24. To distinguish yeast cells from RBC: Yeast cells usually exhibit budding.

25. Nuclear detail can be enhanced by:
a) Prussian blue
b) Toluidine blue
c) Acetic acid
d) Both B and C

26. NORMAL odor of urine
a) sweet
b) ammoniacal
c) fragrant
d) fruity

27. O.D.
410 nm Oxyhemoglobin
450 nm Bilirubin
650 nm Lamellar Bodies

A significant rise in the OD of amniotic fluid at 450 nm indicates the presence of which analyte?
A. Bilirubin
B. Lecithin
C. Oxyhemoglobin
D. Sphingomyelin

28. Review: Urinary crystals

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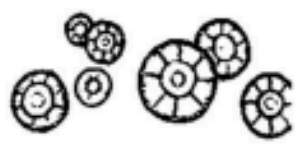
Crystal	pH	Color	Appearance
Uric acid	Acid	Yellow-brown (rosettes, wedges)	
Amorphous urates	Acid	Brick dust or yellow brown	
Calcium oxalate	Acid/neutral (alkaline)	Colorless (envelopes, oval, dumbbell)	
Amorphous phosphates	Alkaline/ neutral	White–colorless	
Calcium phosphate	Alkaline/ neutral	Colorless	
Triple phosphate	Alkaline	Colorless ("coffin lids")	
Ammonium biurate	Alkaline	Yellow-brown ("thorny apples")	
Calcium carbonate	Alkaline	Colorless (dumbbells)	

Crystal	pH	Color/Form	Disorders	Appearance
Cystine	Acid	Colorless (hexagonal plates)	Inherited cystinuria	
Cholesterol	Acid	Colorless (notched plates)	Nephrotic syndrome	
Leucine	Acid/neutral	Yellow (concentric circles)	Liver disease	
Tyrosine	Acid/neutral	Colorless–yellow (needles)	Liver disease	
Bilirubin	Acid	Yellow	Liver disease	
Sulfonamides	Acid/neutral	Varied	Infection treatment	
Radiographic dye	Acid	Colorless (flat plates)	Radiographic procedure	
Ampicillin	Acid/neutral	Colorless (needles)	Infection treatment	

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29. Amniotic fluid is:
a) metabolic products of fetus
b) waste product of uterus

Amniotic fluid
is a product of fetal metabolism, the constituents that are present in the fluid provide information about the metabolic processes taking place during—as well as the progress of—fetal maturation.

30. What should be done in a refrigerated specimen with presence of pink precipitates before testing?
a) Warm
b) Boil
c) Add acid

31. Bloody CSF indicative of intracranial hemorrhage: Even distribution of blood in all tubes

Features That Aid in Differentiating Hemorrhage From Traumatic Tap

Traumatic Tap
- Amount of blood decreases or clears progressively from first to last collection tube
- Streaking of blood in CSF during collection
- CSF may clot
- Usually no xanthochromia
- No hemosiderin present

Hemorrhage
- Amount of blood the same in all collection tubes
- Blood evenly dispersed during collection
- CSF does not clot owing to defibrination in vivo
- Xanthochromia present
- Presence of hemosiderin
-laden macrophages (siderophage)

32.CSF collection:
a) 3rd, 4th, 5th Lumbar
b) 5 th,6th,7th Lumbar
c) 3rd, 4th, 5th Cervical
d) 5th,6th,7th Cervical

Usually a physician performs a lumbar puncture in the third or fourth lumbar interspace (or lower) in adults or the fourth or fifth interspace in children.

33. Non-invasive procedure for gastric analysis:
a) Urea breath test
b) Sham feeding

34. Positive color of Ictotest:
a) Pink
b) Blue blue-to-purple

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35. Hemoglobinuria:
In the presence of free hemoglobin/myoglobin, uniform color ranging from a negative yellow through green to a strongly positive green-blue appears on the pad

Hematuria:
Intact red blood cells are lysed when they come in contact with the pad, and the liberated hemoglobin produces an isolated reaction that results in a speckled pattern on the pad

36. Which of the following parameters best identifies a fluid as a transudate or an exudate?
a) Color and clarity
b) Leukocyte and differential counts
c) Total protein and specific gravity measurements
d) Total protein ratio and lactate dehydrogenase ratio

37. Tubercular peritonitis ~lab tests
- Decreased glucose
- Acid-fast stain
- Adenosine deaminase

39. A web-like pellicle in a refrigerated CSF specimen indicates:
a) Tubercular meningitis
b) Multiple sclerosis
c) Primary CNS malignancy
d) Viral meningitis

Table 9–6 Major Laboratory Results for Differential Diagnosis of Meningitis

Bacterial	Viral	Tubercular	Fungal
Elevated WBC count	Elevated WBC count	Elevated WBC count	Elevated WBC count
Neutrophils present	Lymphocytes present	Lymphocytes and monocytes present	Lymphocytes and monocytes present
Marked protein elevation	Moderate protein elevation	Moderate to marked protein elevation	Moderate to marked protein elevation
Markedly decreased glucose level	Normal glucose level	Decreased glucose level	Normal to decreased glucose level
Lactate level >35 mg/dL	Normal lactate level	Lactate level >25 mg/dL	Lactate level >25 mg/dL
		Pellicle formation	Positive India ink with *Cryptococcus neoformans*
Positive Gram stain and bacterial antigen tests			Positive immunologic test for *C. neoformans*

40. A CSF Total count is diluted with:
a) Distilled water
b) Normal saline
c) Acetic acid (WBC count)
d) Hypotonic saline

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1. Copper sulfate was used to test sugar in urine. Which colors indicate glycosuria?
a. Blue, green and yellow
b. Green, yellow and orange
c. Orange and red
d. Blue and green

2. Which urine clarity described as few particulates, print easily seen through newsprint?
a. Very cloudy
b. clear
c. Hazy
d. Cloudy

3. Which form of bilirubin is detectable in urine?
a. Conjugated
b. Unconjugated
c. Biliverdin
d. All forms

4. What part of a microscope is replaced to convert a bright field to a dark field microscope?
a. Polarizing filter
b. A split aperture
c. Iris diaphragm
d. Condenser

5. One of the following is a diluent for CSF WBC?
a. 3% HAc
b. HABA
c. 0.1 HCL
d. 10% H2S04

6. Which reagent is necessary for cytocentrifugation of CSF to increase the cell yield?
a. LISS
b. 30% Albumin
c. 10% albumin
d. NSS

7. A urine sample has a specific gravity of 1.005, what is the appropriate term for this condition?
a. Oligosthenuria
b. Hyposthenuria
c. Isosthenuria
d. Hypersthenuria

8. After a 12 round boxing game, the boxer's urine was red in color. Other than blood, what could cause such color?
a. Urobilinogen
b. Myoglobin
c. Haptoglobin
d. Biliburin

9. What causes the normal color of feces?
a. Pancreatic enzymes
b. Muscle fibers
c. Urobilin
d. Cellulose

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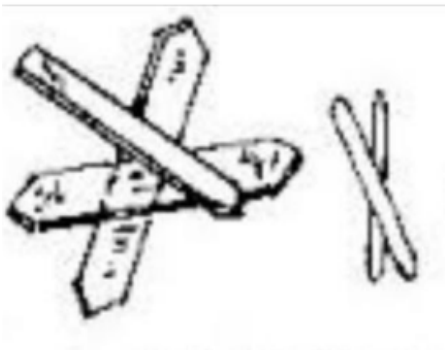
10. In manual, routine urinalysis, how are squamous epithelial cells reported?
a. Average number /0 HPF
b. Few, moderate, many, abundant / LPF
c. Few, moderate, many, abundant / HPF
d. Present / none seen

11. Which of the following are the designated fire hazard flash points?
a. 0 to 4
b. A to D
c. 0 TO 10
d. A,B,C

12. Identify the urinary crystals shown in the picture below:
a. Hippuric acid crystals
b. Uric acid
c. Triple phosphate



13. Differentiation among RBCs, yeast and oil droplets may be accomplished by all of the following, EXCEPT:
Answer: Lysis of yeast cells by acetic acid

14. A urine volume of less than 400 mL/day in adults is termed
Answer: Oliguria

15. Which of the following is the characteristics appearance of WBCs observed in hypotonic urine?
Answer: Glitter cell

16.Hand washing
Answer: Downward position

17. If a chemical gets into the person's eyes
Answer: Flush the area with cool water for at least 15 minutes

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1. Maltese cross formation
A. Cholesterol
B. Starch
C. Pollen grains
D. WBCs

2. High protein intake causes _____ urine
A. Alkaline
B. Acidic
C. Concentrated
D. Diluted

3. Correct evaluation of urine turbidity
A. Against white background
B. Against black background
C. Light source behind analyst
D. Light source in front of analyst

4. More representative measure of renal concentrating ability
A. SG
B. Osmolality
C. pH
D. Protein

5. Each kidney contains approximately how many nephrons?
A. 0.5-1 million
B. 1-1.5 million
C. 1.6-1.8 million
D. 1-2 million

6. Correct way of adding reagents together
A. Mix water and acid at the same time
B. Add acid to water
C. Add water to acid
D. Do not mix acid and water

7. Used for GFR. Except?
A. BUN
B. BUA
C. Serum creatinine
D. eGFR

8. Ketones is seen in urine due to:
A. Incomplete fat metabolism
B. Fatty acid consumption
C. High carbohydrate diet
D. Low carbohydrate diet

9. Which differentiates CSF Protein from Serum Protein:
A. Absence of fibrinogen
B. Presence of fibrinogen
C. Presence of IgG
D. Presence of ceruloplasmin

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10. Amniotic fluid is a specimen of choice, except
A. Test for neural tube defect
B. Test for FLM
C. Test for Fetal lung distress
D. Test for Fetal liver

11. What is the best preservative for urine?
A. Formalin
B. Boric acid
C. Toluidine
D. Thymol

12. All are factors affecting the formation of urinary crystals, EXCEPT:
A. pH
B. Solute concentration
C. Temperature
D. Protein concentration

13. Stain used for Hemosiderin?
A. Guiac stain
B. Giemsa stain
C. Sternheimer Malbin
D. Perl's Prussian Blue

14. Which results needs to be rerun?
A. pH 5.0, urate crystals
B. Ketones
C. Glucose
D. pH 8.0, WBC casts

15. Other term for mucin clot test?
A. Strings test
B. Ropes test
C. Rivaltas test
D. Barbiero test

16. Urine for chemistry shaken well for what analysis?
A. RBC and WBC
B. pH and SG
C. Ketone and Glucose
D. Bilirubin and Urobilinogen

17. Black tarry stool is indicative of
A. Excessive fats
B. Lower GIT bleeding
C. Upper GIT bleeding
D. Excessive carbohydrates

18. What urine sample is used to quantitate sediments?
A. MSCC
B. First morning
C. Timed
D. 12-hour urine

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19. The integrity of urine specimen is important because:
A. Accurate assessments
B. Monitor disease progress
C. Monitor treatment effectivity

20. How much diluent is needed to make a 1/2 dilution if the solute is 1.5 (g?)
A. 0.5
B. 1.5
C. 1.2
D. 0.05

21. Not a shape of transitional epithelial cells.
A. Caudate
B. Convoluted
C. Spherical
D. Polyhedral

22. Characteristics of cholesterol crystals
A. Plates with notched ends
B. Pillow shape
C. Hexagonal plates
D. Needle shape

23. Tablet test for Bilirubin?
A. Acetest
B. Clinitest
C. Ictotest
D. Bilitest

24. Hexagonal plate crystals that are characterized by greasy appearance
A. Leucine
B. Cysteine
C. Uric acid
D. Tyrosine

25. Mousy odor urine
A. Alkaptonuria
B. Phenylketonuria
C. Homogentisic acid
D. MSUD

26. Affected when urine is unpreserved, except?
A. SG
B. Bilirubin
C. Protein
D. Glucose

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27. Instruction given for the collection of 24-hour urine specimen

A. Patient empties bladder into toilet at the start time, then collect all the following urine until end time

B. Patient empties bladder into the container at the start time until the end time

C. Patient empties bladder into toilet at start time and end time

28. Use of catheterized urine specimen

A. Microscopy

B. Culture

29. Cause of yellow urine

A. Stercobilin

B. Urochrome

C. Urobilin

30. Principle of urine protein reagent strip

A. Albumin accepts hydrogen ions from the indicator

B. Albumin accepts hydroxyl ions from the indicator

31. Component of copper reduction tablet test

A. Copper sulfate

B. Copper hydroxide

32. Fecal sample with diarrhea without WBC

A. Salmonella

B. Vibrio

C. Shigella

D. E.coli

33. Causes black color stool except

A. Charcoal

B. Bismuth

C. Vegetables

34. Round cells computation

35. Included in Expanded newborn screening except:

A. CAH

B. Congenital hypothyroidism

C. Neonatal diabetes

D. MSUD

36. Characterized with problem in a-glucocerebrosidase

A. Testes

B. Epididymis

C. Prostate gland

37. Most useful for renal concentrating ability

a. SG

b. osmolality

c. glucose

d. protein

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38. Most critical step in handwashing
a. soap
b. water
c. friction
d. alcohol

39. The ultimate goal of automated urinalysis
a. to replace human medical technologists
b. to improve reproducibility and color discrimination
c. to eliminate microscopy
d. to demolish clinical microscopy section

40. which of the following is not appropriate instruction for specimen collection
a. collecting stool directly into the container
b. collecting urine directly into the container
c. collecting stool using newspaper then transfer into the container
d. collect sputum after waking up

41. Copper reduction reagent that prevents room air interference
a. sodium citrate
b. sodium sulfate
c. copper sulfate
d. sodium carbonate

42. WBC cast is associated with
a. Glomerulonephritis
b. pyelonepthritis
c. cyctitis
d. necrosis

43. Ketone body that is not measured by reagent strip
a. acetone
b. acetoacetic acid
c. B- hydroxybutyric acid

44. Order of illumination microscope
a. stage- condenser- objective
b. light source- stage- objectives- eyepiece
c. objectives- stage- condenser
d. eyepiece- stage- condenser- light source

45. The best way to break the chain of infection
a. hand hygiene
b. PPE
c. aerosol prevention
d. decontamination

46. Measurement of a-glucoside is performed to detect the disorder of the:
a. Seminiferous tubules
b. Epididymis
c. prostate gland
d. bulbourethral glands

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47. Which of is considered abnormal when present in feces?
a. carbohydrate
b. protein
c. blood
d. water

48. Positive color of ictotest:
a. pink
b. green
c. blue
d. yellow

49. A physician performed thoracentesis on a patient. Analysis of the fluid revealed a cholesterol level of more than 100 mg/dL. Identify the fluid collected.
a. ascitic transudate
b. ascitic exudate
c. pleural transudate
d. pleural exudate

50. A significant rise in the OD of amniotic fluid at 450nm indicates the presence of which analyte?
a. bilirubin
b. lecithin
c. oxyhemoglobin
d. sphingomyelin

51. What should be done in a refrigerated specimen with presence of pink precipitates before testing?
a. warm
b. boil
c. add acid
d. add NSS

52. What is the classic test used for urobilinogen, porphobilinogen, and Ehrlich- reactive compounds?
a. Acetest
b. Benedict's
c. SSA
d. Watson- Schwartz test

MTLE AUGUST 2024 RECALLS

God bless, future RMT!

1. Why might a creatinine level be requested on an amniotic fluid?
A. Detect oligohydramnios
B. Detect polyhydramnios
C. Differentiate amniotic fluid from maternal urine
D. Evaluate lung maturity

2. Which urinalysis reagent strip test will never be reported out as "negative"?
A. Protein
B. Urobilinogen
C. Bilirubin
D. Nitrite

3. Which of the following tubes could be used for a bacterial culture of serous fluid?
A. EDTA
B. Sodium citrate
C. Sodium fluoride
D. Sodium heparin

4. Which of the following lipids is/are capable of polarizing light?
A. Cholesterol
B. Neutral fats
C. Triglycerides
D. Both neutral fats and triglycerides

5. Which of the following is not considered personal protective equipment?
A. Gloves
B. Lab coat
C. Disinfectants
D. Goggles

6. Which of the following is NOT a physical hazard?
A. Ergonomic
B. Noise
C. Chemical fumes
D. Ionizing radiation

7. Which microscope part is used to sharpen the image?
A. Coarse adjustment knob
B. Fine adjustment knob

8. Which is NOT a nonbacterial increase in WBC?
A. Systemic lupus erythematosus (SLE)
B. Rheumatoid arthritis (RA)
C. UTI

9. Where does urochrome originate from?
A. Breakdown product of heme
B. Metabolic product of protein
C. Breakdown product of lipid
D. Metabolic product of carbohydrates

10. What is the screening test used for detecting phenylketonuria (PKU)? Guthrie

MTLE AUGUST 2024 RECALLS

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11. What is the pH of semen?
A. Acidic
B. Alkaline
C. Slightly acidic
D. Slightly alkaline

12. What is the normal value for CSF glucose?
60-70% of plasma

13. What color indicates a positive result on a Clinitest?
Orange/red

14. The reference range for CSF protein is:
A. 6 to 8 g/dL
B. 15 to 45 g/dL
C. 6 to 8 mg/dL
D. 15 to 45 mg/dL

15. The principle of the reagent strip test for pH is the:
A. protein error of indicators
B. greiss reaction
C. dissociation of a polyelectrolyte
D. double indicator system

16. The presence of WBCs and WBC casts with no bacteria isindicative of:
A. Chronic pyelonephritis
B. Acute tubular necrosis
C. Acute interstitial nephritis
D. Both B and C

17. The percentage of sperm showing average motility that is considered normal is:
A. 25%
B. 50%
C. 60%
D. 75%

18. The most valuable initial aid for the identification of crystals in a urine specimen is:
A. pH
B. Solubility
C. Staining
D. Polarized microscopy

19. Struvite crystals
A. Calcium carbonate
B. Amorphous phosphate
C. Amorphous urate
D. Magnesium ammonium phosphate

20. Serous fluid for bacterial culture should be stored at
A.20°C.
B. 2°C to 8°
C. C. 20°C to 24°C.
D. 36°C to 38°C

MTLE AUGUST 2024 RECALLS

God bless, future RMT!

21. Reagent used in Lange test for detection of acetone
A. 10% ferric chloride
B. Saturated sodium nitroprusside
C. 10% Absolute alcohol
D. 20% SSA

22. How would you classify the presence of 10 bacteria in a sample?
A. Rare
B. Few
C. Moderate
D. Many

23. Chronic renal failure often develops in each of the following diseases except
A. amyloidosis.
B. diabetes mellitus.
C. diabetes insipidus.
D. systemic lupus erythematosus.

24. An unpreserved urine specimen collected at midnight is kept at room temperature until the morning hospital shift. Which of the following changes will most likely occur?
A. Decrease in urine color and clarity
B. Decrease in pH and specific gravity
C. Decrease in glucose and ketones
D. Decrease in bacteria and nitrite

25. All are factors affecting the formation of urinary crystals, EXCEPT:
a. Protein Concentration
b. Solute concentration
c. temperature
d. pH

26. A cloudy urine specimen turns black upon standing and has a specific gravity of 1.012. The major concern about this specimen would be:
A. Color
B. Turbidity
C. Specific gravity
D. All of the above

27. A clinically significant squamous epithelial cell is the _____.
A. Cuboidal cell
B. Clue cell
C. Caudate cell
D. Columnar cell

28. A 25-year-old woman complains of painful urination and is suspected of having a urinary tract infection. Which of the following specimens should be collected for a routine urinalysis and urine culture?
A. First morning specimen
B. Timed collection
C. Midstream "clean catch" specimen
D. Random specimen

CLINICAL MICROSCOPY EXAMINATION AND RATIO

1. Pyelonephritis can be differentiated from cystitis by the presence of:
a. Eosinophils
b. Hyaline casts
c. White blood cell casts
d. Bacteriuria

2. Positive color of Ictotest:
a. Pink
b. Red
c. Green
d. Blue

3. The most important sugar found in semen is:
a. Sucrose
b. Maltose
c. Fructose
d. Lactose

4. Cerebrospinal fluid is produced primarily by which of the following?
a. Secretion by the choroid plexus cells
b. Diffusion from the plasma into the central nervous system
c. Ultrafiltration of plasma in the choroid plexuses
d. Excretions from the ependymal cells lining the central nervous system

5. CSF lactate is used to verify cases of which of the following?
a. Multiple sclerosis
b. Bacterial meningitis
c. Reye's syndrome
d. Tertiary syphilis

6. Which of the following sets of results most closely indicates a transudate?
a. Clear, fluid-to–serum LD ratio: 0.8, fluid-to– serum protein ratio: 0.7, WBC count: 1000/mL
b. Cloudy, fluid-to–serum LD ratio: 0.5, fluid- to–serum protein ratio: 0.6, WBC count: 1200/mL
c. Cloudy, fluid-to–serum LD ratio: 0.8, fluid- to–serum protein ratio: 0.7, WBC count: 2500/mL
d. Clear, fluid-to–serum LD ratio: 0.45, fluid-to–serum protein ratio: 0.40, WBC count: 800/mL

7. Amniotic fluid for fetal lung maturity testing should be preserved _____.
a. In the refrigerator
b. At room temperature
c. In a dark container
d. At 37 C

8. The presence of waxy casts in a microscopic examination of urine is consistent with a diagnosis of:
a. Strenuous exercise
b. Pyelonephritis
c. Glomerulonephritis
d. Chronic renal failure

9. The most probable explanation for a patient who presents with an elevated osmolal gap, metabolic acidosis, and calcium oxalate crystal in the urine is:
a. Methanol intoxication
b. Ethanol overdose
c. Ethylene glycol intoxication
d. Cyanide poisoning

10. Post-vasectomy semen analysis are routinely tested at:
a. 1 month post-vasectomy, and continuing until two consecutive monthly specimens show less spermatozoa
b. 2 months post-vasectomy, and continuing until three consecutive monthly specimens show less spermatozoa
c. 2 months post-vasectomy, and continuing until two consecutive monthly specimens show no spermatozoa
d. 1 month post-vasectomy, and continuing until three consecutive monthly specimens show no spermatozoa

11. Preservative for seminal fluid fructose:
a. Refrigeration
b. Freezing
c. Formalin
d. Boric acid

12. Slow forward progression, noticeable lateral movement:
a. a
b. b
c. 1
d. 0

13. The sperm acrosomal cap should encompass approximately __ of the head and covers approximately __ of the nucleus.
a. One-half, two thirds
b. One third, one half
c. Two-thirds, one-fourth
d. One-fourth, one-third

14. Following an abnormal sperm motility test with a normal sperm count, what additional test might be ordered?
a. Fructose level
b. Zinc level
c. MAR test
d. Eosin-nigrosin stain

15. Synovial fluid cultures are often plated on chocolate agar to detect the presence of:
a. N. gonorrhoaeae
b. S. agalactiae
c. S. viridans
d. E. faecalis

16. A synovial fluid string measuring __ cm is considered normal:
a. 1 to 2 cm
b. 2 to 4 cm
c. 3 to 5 cm
d. 4 to 6 cm

17. The difference between blood glucose and synovial fluid glucose:
a. <10 mg/dL
b. <20 mg/dL
c. <15 mg/dL
d. <30 mg/dL

18. The most frequently performed chemical test on synovial fluid is:
a. Total protein
b. Uric acid
c. Calcium
d. Glucose

19. Crystals that have the ability to polarize light are:
a. Corticosteroid
b. MSU
c. Calcium oxalate
d. AOTA

20. Vacuolated macrophage with ingested neutrophils:
a. LE cells
b. RA cells
c. Reiter cells
d. Rice bodies

21. An effusion is considered an exudate if:
a. Appearance: Clear, Fluid:serum protein ratio: >0.5, WBC count: 800/uL
b. Appearance: Cloudy, Fluid:serum protein ratio: >0.5, WBC count: 1080/uL
c. Appearance: Clear, Fluid:serum protein ratio: >0.5, WBC count: 1000/uL
d. Appearance: Turbid, Fluid:serum protein ratio: <0.5, WBC count: 2000/uL

22. Which of the following group statements match?
a. Thoracentesis: peritoneal fluid: three collection tubes
b. Pericardiocentesis: pericardial fluid: two collection tubes
c. Paracentesis: pleural fluid: three collection tubes
d. Thoracentesis: pleural fluid: three collection tubes

23. A pleural fluid arrived in the laboratory: appearance: bloody; Blood Hct: 30, Fluid Hct: 10. What parameter can differentiate between a hemorrhagic exudate and a hemothorax.
a. Fluid Hematocrit
b. Blood Hematocrit
c. None
d. All of the Above

24. Bleeding from upper GIT can cause what color of the stool?
a. Red
b. Black
c. Reddish-brown
d. Brown

25. The normal brown color of the feces is produced by:
a. Cellulose
b. Pancreatic enzymes
c. Undigested food
d. Urobilin

26. What is the significance of an APT test that remains pink after the addition of sodium hydroxide?
a. Fecal fat is present
b. Fetal Hgb is present
c. Fecal trypsin is present
d. Vitamin C is present

27. A patient whose stool exhibits increased fats, undigested muscle fibers, and the inability to digest gelatin may have:
a. Bacterial dysentery
b. A duodenal ulcer
c. Cystic fibrosis
d. Lactose intolerance

28. Which of the following is the best indicator of Reye syndrome for CSF?
a. Glutamine
b. Ammonia
c. ALT
d. Bilirubin

29. The tau isoform of transferrin is a carbohydrate deficient protein found only in:
a. CSF
b. Sweat
c. Amniotic fluid
d. Semen

30. A web-like pellicle in a refrigerated CSF specimen indicates:
a. Tubercular meningitis
b. Multiple sclerosis
c. Primary CNS malignancy
d. Viral meningitis

31. WBC casts are associated primarily with:
a. Pyelonephritis
b. Cystitis
c. Glomerulonephritis
d. Viral infections

32. Cylindroids has same significance as
a. Cast
b. Crystal
c. RBC
d. WBC

33. Which of the following pairings of crystal shape and cause does not match?
a. Coffin lids, prism shape, staghorn – Triple phosphate
b. Concentric circles – Leucine
c. Flat plates – Radiographic dye
d. Notched corners, staircase pattern - Magnesium phosphate

34. Normal odor of urine:
a. Sweet
b. Ammoniacal
c. Fragrant
d. Fruity

35. In the chemical test for urine hold the strip __ while comparing it with the color chart is recommended
a. Horizontally
b. Diagonally
c. Vertically
d. None of the above

36. Which of the following is the manner of reporting for casts?
a. Average number per 10 LPF
b. Present, based on laboratory protocol
c. Rare, few, moderate, or many per HPF
d. Rare, few, moderate, or many per LPF

37. Which of the following is the manner of reporting for normal crystals?
a. Average number per 10 LPF
b. Present, based on laboratory protocol
c. Rare, few, moderate, or many per HPF
d. Rare, few, moderate, or many per LPF

38. Which of the following is the manner of reporting for transitional epithelial cells
a. Average number per 10 LPF
b. Present, based on laboratory protocol
c. Rare, few, moderate, or many per HPF
d. Rare, few, moderate, or many per LPF

39. The only elements found in the urinary sediment that are unique to the kidney.
a. Cast
b. Crystals
c. RBC
d. WBC

40. A viscosity report of 4 indicates semen that is?
a. Watery
b. Gel-like
c. Sticky
d. Creamy

41. Failure of the laboratory to document the time a semen sample is collected primarily affects the interpretation of semen:
a. Appearance
b. Volume c
. pH
d. Viscosity

42. Which of the following tests is affected least by standing or improperly stored urine?
a. Glucose
b. Protein
c. pH
d. Bilirubin

43. In renal tubular acidosis, the pH of urine is:
a. Consistently acid
b. Consistently alkaline
c. Neutral
d. Variable, depending on diet

44. The normal daily urine output for an adult is approximately:
a. 0.2 to 0.5 L
b. 0.6 to 1.6 L
c. 2.7 to 3.0 L
d. 3.2 to 3.5 L

45. Measurement of a-glucosidase is performed to detect a disorder of the:
a. Seminiferous tubules
b. Epididymis
c. Prostate gland
d. Bulbourethral glands

46. Which of the following is the characteristic appearance of WBCs observed in hypotonic urine?
a. Crenated
b. Ghost cell
c. Dysmorphic
d. Glitter cell

47. The best way to break the chain of infection
a. Hand sanitizing
b. PPE
c. Aerosol prevention
d. Decontamination

48. An acceptable disinfectant for blood and body fluid decontamination is:
a. Sodium hydroxide
b. Antimicrobial soap
c. Hydrogen peroxide
d. Sodium hypochlorite

49. Centrifuging an uncapped specimen may produce a biological hazard in the form of:
a. Vectors
b. Sharps contamination
c. Aerosols
d. Specimen contamination

50. Quality control of reagent strips is performed:
a. Using positive and negative controls
b. When results are questionable
c. At least once every 24 hours
d. All of the above

51. A positive amine (Whiff) test is observed in which of the following syndromes?
a. Bacterial vaginosis
b. Vulvovaginal candidiasis
c. Atrophic vaginitis
d. Desquamative inflammatory vaginitis

52. The presence of fetal fibronectin in vaginal secretions between 24 and 34 weeks' gestation is associated with:
a. Bacterial vaginosis
b. Candidiasis
c. Desquamative inflammatory vaginitis
d. Preterm delivery

53. Major variable in urinalysis testing:
a. TAT
b. Interpretation of color reactions
c. QC
d. Release of results

54. All of the following will result to a false positive urine hCG test, EXCEPT:
a. Increased protein
b. Hydatidiform mole
c. Dilute urine
d. Testicular tumors in men

55. Calibration of centrifuges is customarily performed every _____.
a. Daily
b. Weekly
c. Monthly
d. Every 3 months (quarterly)

56. Reflectance photometry uses the principle that light reflection from the test pads _____ in proportion to the intensity of color produced by the concentration of the test substance.
a. Increases
b. Decreases
c. Variable
d. Undetermined

57. What is the lowest level of hormone for which most current serum hCG tests can give a positive result?
a. 25 mIU/mL
b. 50 mIU/mL
c. 100 mIU/mL
d. 100,000 mIU/mL

58. In automated microscopy, the nuclear membranes, mitochondria and negatively charged cell membranes are stained by the green dye:
a. Phenanthridine
b. Carbocyanine
c. FITC
d. TRITC

59. The most specific assays for human chorionic gonadotropin (hCG) use antibody reagents against which subunit of hCG?
a. Alpha
b. Beta
c. Gamma
d. Chorionic

60. Hypoglycemia is induced with which of the following to test for the completeness of vagotomy?
a. Histamine
b. Histalog
c. Insulin
d. Pentagastri

61. Normal fasting gastric fluid appears:
a. Dark red-brown
b. Clear and pale yellow
c. Pale yellow with food particles
d. Pale gray and slightly mucoid

62. Gastric fluid is collected after overnight fasting; four 15-minute samples are collected:
a. Basal acid output (BAO)
b. Maximum acid output (MAO)
c. Both of these
d. None of these

63. Gastric tube inserted through the mouth:
a. Levin tube
b. Rehfuss tube
c. Test tube
d. Glass tube

64. Which of the following may resemble myelin globule in sputum?
a. Blastomyces
b. Coccidioides
c. Cryptococcus
d. Histoplasma

65. Formed elements in sputum are best studied by which cytological techniques?
a. AFB stain
b. Gram's stain
c. Pap's stain
d. Wright's stain

66. With the two-slide qualitative fecal fat determination, the first slide produces a normal amount of staining fat present, whereas the second slide, following acid addition and heat, produces an abnormally increased amount of fat. These results indicate:
a. Malabsorption
b. Maldigestion
c. Parasitic infestation
d. Disaccharidase deficiency

667. TRUE for sputum:
a. Green in color
b. Secreted by the tracheobronchial tree
c. Healthy individual normally produce sputum
d. All of these

68. Which test is the most sensitive and specific enzyme in detecting persons with chronic pancreatitis?
a. Fecal trypsin
b. Fecal chymotrypsin
c. Fecal elastin-1
d. Plasma lipase

69. What is the fecal test that requires a 3-day specimen?
a. Fecal occult blood
b. APT test
c. Elastase 1
d. Quantitative fecal fat testing

70. A patient whose stool exhibits increased fats, undigested muscle fibers, and the inability to digest gelatin may have:
a. Bacterial dysentery
b. A duodenal ulcer
c. Cystic fibrosis
d. Lactose intolerance

71. Microscopic examination reveals presence of fecal WBCs EXCEPT in diarrhea caused by:
a. Enteroinvasive E. coli (EIEC)
b. Salmonella, Shigella
c. S. aureus, Vibrio spp.
d. Yersinia, Campylobacter

72. Normal stool pH:
a. Between pH 4 and 5
b. Between pH 5 and 6
c. Between pH 7 and 8
d. Between pH 8 and 9

73. Bulky and frothy stool:
a. Upper GI bleeding
b. Lower GI bleeding
c. Barium sulfate
d. Pancreatic disorders

74. Reagent for the APT test:
a. 1% NaOH
b. 10% NaOH
c. 70% ethanol
d. 95% ethanol

75. Black stool EXCEPT
a. Iron
b. Vegetables
c. Blood
d. Charcoal

76. Blood that originates from the esophagus, stomach, or duodenum takes approximately ___ day(s) to appear in the stool.
a. Approximately 1 day to appear in stool
b. Approximately 3 days to appear in stool
c. Approximately 7 days to appear in stool
d. Approximately 10 days to appear in stool

77. The brown color of feces is due to:
a. Urochrome
b. Uroerythrin
c. Urobilinogen
d. Urobilin

78. For post-vasectomy semen analysis, specimens are tested:
a. Beginning 1 month post-vasectomy and continuing until two consecutive monthly specimens show no sperm
b. Beginning 2 months post-vasectomy and continuing until two consecutive monthly specimens show no sperm
c. Beginning 3 months post-vasectomy and continuing until two consecutive monthly specimens show no sperm
d. Beginning 3 months post-vasectomy and continuing until three consecutive monthly specimens show no sperm

79. By far the most frequently performed fecal analysis is the detection of:
a. Carbohydrates
b. Fats
c. Occult blood
d. pH

80. The acrosomal cap should encompass approximately ___ of the head and cover approximately___ of the sperm nucleus.
a. Half of the head and covers half of the sperm nucleus
b. Half of the head and covers 2/3 of the sperm nucleus
c. Two-thirds of the head and covers half of the sperm nucleus
d. Two-thirds of the head and covers 2/3 of the sperm nucleus

81. Seminal fluid specimens can be screened for the presence of fructose using the resorcinol test that produces an _____ color when fructose is present
a. Black
b. Blue
c. Green
d. Orange

82. Sperm production
a. Testes
b. Epididymis
c. Bulbourethral gland
d. Prostate gland

83. SPERM MOTILITY: slower speed, some lateral movement
a. 1.0
b. 2.0
c. 3.0
d. 4.0

84. Semen is collected following a period of sexual abstinence of at least___ days to not more than ___ days.
a. At least 1 day to not more than 3 days
b. At least 2 days to not more than 7 days
c. At least 5 days to not more than 7 days
d. At least 7 days to not more than 10 days

85. Liquefaction of a semen specimen should take place within:
a. 1 hour
b. 2 hours
c. 3 hours
d. 4 hours

86. CSF can be differentiated from serum by the presence of:
a. Albumin
b. Globulin
c. Prealbumin
d. Tau transferrin

87. The finding of oligoclonal bands in the CSF and not in the serum is seen with:
a. Multiple myeloma
b. CNS malignancy
c. Multiple sclerosis
d. Viral infections

88. As little as 0.1 mL of CSF combined with one drop of _____ produces an adequate cell yield when processed with the cytocentrifuge.
a. 10% albumin
b. 30% albumin
c. 1% HCl
d. 3% acetic acid

89. Fungal infection associated with increased eosinophils in CSF:
a. Blastomyces dermatitidis
b. Coccidioides immitis
c. Cryptococcus neoformans
d. Histoplasma capsulatum

90. A web-like pellicle in a refrigerated CSF specimen indicates:
a. Tubercular meningitis
b. Multiple sclerosis
c. Primary CNS malignancy
d. Viral meningitis

91. A CSF total cell count is diluted with:
a. Distilled water
b. Normal saline
c. Acetic acid
d. Hypotonic saline

92. Amniotic fluid specimens are placed in amber colored tubes prior to sending them to the laboratory to prevent the destruction of:
a. Alpha-fetoprotein
b. Bilirubin
c. Cytogenetics
d. Lecithin

93. Typical number of CSF tubes
a. Two
b. Five
c. Four
d. Three

94. In the foam or shake test, amniotic fluid is mixed with:
a. 1% NaOH
b. 10% NaOH
c. 70% ethanol
d. 95% ethanol

95. When severe HDN is present, which of the following tests on the amniotic fluid would the physician NOT ORDER to determine whether the fetal lungs are mature enough to withstand a premature delivery?
a. AFP levels
b. Foam stability index
c. Lecithin/sphingomyelin ratio
d. Phosphatidylglycerol detection

96. Presence of meconium in amniotic fluid:
a. Blood-streaked
b. Yellow
c. Dark green
d. Dark red-brown

97. How are specimens for FLM testing delivered to and stored in the laboratory?
a. Delivered on ice and refrigerated
b. Immediately centrifuged
c. Kept at room temperature
d. Delivered in a vacuum tube

98. Amniotic fluid bilirubin is measured by:
a. Turbidimetric method
b. Dye-binding method
c. Spectrophotometric analysis
d. Fluorometric analysis
99. A ΔA450 value that falls into Zone I indicates:
a. Normal finding without significant hemolysis
b. Moderate hemolysis
c. Severe hemolysis
d. High fetal risk

100. Which of the following should be used to reduce light intensity in bright-field microscopy?
a. Aperture diaphragm
b. Rheostat
c. Condenser
d. Objective

101. Microscope component that gathers and focuses the illumination light onto the specimen for viewing.
a. Aperture diaphragm
b. Rheostat
c. Condenser
d. Ocular

102. First lens system, EXCEPT:
a. Oil-immersion objective
b. Ocular
c. High-power objective
d. Low-power objective

103. A type of microscope that produces a three dimensional microscopy image and layer-by layer imaging of a specimen.
a. Fluorescence microscope
b. Interference-contrast microscope
c. Phase-contrast microscope
d. Polarizing microscope

104. Type of microscope that enhances visualization of elements with low refractive indices, such as hyaline casts, mixed cellular casts, mucous threads, and Trichomonas.
a. Fluorescence microscope
b. Interference-contrast microscope
c. Phase-contrast microscope
d. Polarizing microscope

105. Pollen grains are misidentified as: (RECALL)
a. Urates
b. Cast
c. Large ova parasite
d. Crystals

106. **Most frequent parasite encountered in urine:**
a. Enterobius vermicularis
b. Schistosoma haematobium
c. Trichomonas vaginalis
d. Entamoeba histolytica

107. **Reporting of bacteria:**
a. Do not report
b. Rare, few, moderate or many per LPF
c. Rare, few, moderate or many per HPF
d. Present, based on laboratory protocol

108. **Only elements found in the urinary sediment that are unique to the kidney:**
a. Red blood cells
b. Epithelial cells
c. Casts
d. Crystals

109.**All of the following could be a broad cast, EXCEPT:**
a. Hyaline cast
b. Granular cast
c. Waxy cast
d. None of the above

110. Apatite crystals:
a. Calcium phosphate
b. Monohydrate calcium oxalate
c. Dihydrate calcium oxalate
d. Triple phosphate

111. **A MedTech notices calcium oxalate crystals in urine, but the atypical form. To confirm identity of these crystals:**
a. Soluble with acetic acid
b. Soluble with dilute HCl
c. Soluble with acetic acid and dilute HCl
d. None of these

112. **Observed in hypotonic urine** (RECALL)
a. Leukocytes
b. Erythrocytes
c. Glitter cells
d. Crenated cells

113. The most common composition of renal calculi is:
a. Calcium oxalate
b. Magnesium ammonium phosphate
c. Cystine
d. Uric acid

114. The only protein produced by the kidney is:
a. Albumin
b. Uromodulin
c. Uroprotein
d. Globulin

115. All of the following statements are incorrect, EXCEPT:
a. Sternheimer Malbin stain is composed of Methylene blue and Eosin Y
b. Hansel stain is composed of Crystal violet and Safranin
c. Prussian blue stain differentiates gram positive and gram-negative bacteria
d. Cholesterol is not stained by the lipid stains Oil Red O and Sudan III

116. It is a pathologic squamous epithelial cell that is covered with Gardnerella vaginalis.
a. RTE cells
b. Bubble cells
c. Clue cells
d. Oval fat bodies

117. Crystals formed in alkaline urine EXCEPT:
a. Calcium oxalate
b. Struvite
c. Triple phosphate
d. Amorphous phosphate

118. Uric acid crystals can be mistaken as cystine crystals, how can you differentiate the two?
a. Both are insoluble in ammonia
b. Uric acid crystal is soluble in dilute HCl
c. Cystine crystal has a positive birefringence
d. Cystine crystal is positive for cyanide nitroprusside reaction

119. Differentiation among RBCs, yeast, and oil droplets may be accomplished by all of the following EXCEPT:
a. Observation of budding in yeast cells
b. Increased refractility of oil droplets
c. Lysis of yeast cells by acetic acid
d. Lysis of RBCs by acetic acid

120. Key to the diagnosis is the demonstration of antineutrophil cytoplasmic antibody (ANCA) in the patient's serum:
a. Berger disease
b. Goodpasture's syndrome
c. Henoch-Schonlein purpura
d. Wegener granulomatosis

121. The presence of renal tubular epithelial cells and casts is an indication of:
a. Acute interstitial nephritis
b. Chronic glomerulonephritis
c. Minimal change disease
d. Acute tubular necrosis

122. Positive result for the acid-albumin and CTAB test for mucopolysaccharides:
a. White turbidity
b. Yellow turbidity
c. Yellow spot
d. Blue spot

123. Increased eosinophils, WBC casts without bacteria:
a. Acute glomerulonephritis
b. Interstitial nephritis
c. Acute pyelonephritis
d. Acute tubular necrosis

124. WBC casts are seen in:
a. Urethritis
b. Cystitis
c. Lower UTI
d. Pyelonephritis

125. Dysmorphic RBCs are seen in:
a. Glomerular bleeding
b. Traumatic injury
c. Renal calculi
d. Pyelonephritis

126. Granular, dirty, brown casts representing hemoglobin degradation products are associated with:
a. Cystitis
b. Acute pyelonephritis
c. Acute interstitial nephritis
d. Acute tubular necrosis

127. Urinalysis on a patient with severe back pain being evaluated for renal calculi would be most beneficial if it showed:
a. Heavy proteinuria
b. Low specific gravity
c. Uric acid crystals
d. Microscopic hematuria

128. A generalized failure of tubular reaction in the PCT:
a. Acute glomerulonephritis
b. Interstitial nephritis
c. Fanconi syndrome
d. Fanconi anemia

129. A synovial fluid string measuring _____ is considered normal.
a. 0.5 to 1 cm string
b. 1 to 2 cm string
c. 2 to 4 cm string
d. 4 to 6 cm string

130. Normal volume of synovial fluid:
a. Less than 1.5 mL
b. Less than 3.5 mL
c. Less than 7.5 mL
d. Less than 10.5 mL

131. Before testing, very viscous synovial fluid should NOT be treated with the following, EXCEPT:
a. Normal saline
b. Hyaluronidase
c. Distilled water
d. Hypotonic saline

132. Mucin clot test is also known as:
a. Ropes test
b. Foam shake test
c. Microviscosity testing
d. Lamellar body count

133. When diluting a synovial fluid WBC count, all of the following are acceptable except:
a. Acetic acid
b. Isotonic saline
c. Hypotonic saline
d. Saline with saponin

134. Neutrophil with dark cytoplasmic granules containing immune complexes: a. LE cell
b. Ragocyte
c. Reiter cell
d. Rice bodies

135. Synovial fluid crystals found in cases of gout:
a. Calcium phosphate (apatite)
b. Calcium pyrophosphate
c. Calcium oxalate
d. Monosodium urate

136. Shape of calcium pyrophosphate crystals in synovial fluid:
a. Envelopes
b. Flat, variable-shaped plates
c. Needles
d. Rhomboid square, rods

137. Most frequently requested test in synovial fluid:
a. Gram stain and culture
b. Glucose
c. Protein
d. Uric acid

138. Required tube for synovial fluid glucose analysis:
a. Sterile heparinized
b. Non-anticoagulated
c. Tube with liquid EDTA
d. Tube with sodium fluoride

139. Serous fluid for pH determination must be:
a. Maintained aerobically and incubated at 37C
b. Maintained anaerobically and incubated at 37C
c. Maintained aerobically in ice
d. Maintained anaerobically in ice

140. Detection of the CA 125 tumor marker in peritoneal fluid indicates:
a. Colon cancer
b. Ovarian cancer
c. Gastric malignancy
d. Prostate cancer

141. Elements containing concentric striations of collagen-like material and can be seen in benign conditions and are also associated with ovarian and thyroid malignancies:
a. Lipophages
b. Macrophages
c. Mesothelial cells
d. Psammoma bodies

142. The recommended test for determining whether peritoneal fluid is a transudate or an exudate is the:
a. Fluid:serum albumin ratio
b. Serum ascites albumin gradient
c. Fluid:serum lactic dehydrogenase ratio
d. Absolute neutrophil count

143. Adenosine deaminase (ADA) levels higher than 40 U/L are highly indicative of:
a. Chylous effusion
b. Pancreatitis
c. Tuberculosis
d. Rheumatoid inflammation

144. These cells are increased in pleural effusions resulting from pancreatitis and pulmonary infarction:
a. Mesothelial cells
b. Neutrophils
c. Lymphocytes
d. Plasma cells

145. If the blood is from a hemothorax, the fluid hematocrit is _____ of the whole blood hematocrit.
a. Less than 20% of the whole blood hematocrit
b. More than 20% of the whole blood hematocrit
c. Less than 50% of the whole blood hematocrit
d. More than 50% of the whole blood hematocrit

146. Which of the following match is CORRECT:
a. Thoracentesis = Pericardial fluid = Lungs
b. Pericardiocentesis = Pleural fluid = Heart
c. Paracentesis = Pericardial fluid = Heart
d. Paracentesis = Peritoneal fluid = Abdominal cavity/organs

147. All of the following may result to the formation of exudate EXCEPT:
a. CHF
b. Lymphatic duct obstruction
c. Malignancy
d. Infection

148. Which of the following may be an indication of a transudate?
a. SG of >1.015
b. WBC count of >1,000 cells/uL
c. Pleural fluid: bilirubin ratio of >0.6
d. Pleural fluid: bilirubin ratio of <0.6

149. Initial magnification:
a. Objective
b. Ocular
c. Fine adjustment knob
d. Coarse adjustment knob

150. Chemical testing in urine that requires patients to include diet that contains green vegetables:
a. Bilirubin
b. Glucose
c. Ketone
d. Nitrite

151. All of the following can be detected by the leukocyte esterase reaction, EXCEPT:
a. Neutrophils
b. Eosinophils
c. Lymphocytes
d. Basophils

152. Nitrite tests should be performed on first morning specimens or specimens collected after urine has remained in the bladder for at least ___ hours.
a. At least 1 hour
b. At least 2 hours
c. At least 3 hours
d. At least 4 hours

153. The primary reagent in the reagent strip test for ketones is:
a. Glycine
b. Lactose
c. Sodium hydroxide
d. Sodium nitroprusside

154. Positive result in the ketone reagent pad:
a. Brown
b. Blue
c. Pink
d. Purple

155. A speckled pattern on the blood pad of the reagent strip indicates:
a. Hematuria
b. Hemoglobinuria
c. Myoglobinuria
d. All of the above

156. Negative Clinitest:
a. Glucose
b. Galactose
c. Lactose
d. Sucrose

157. The primary reason for performing a Clinitest is to:
a. Check for high ascorbic acid levels
b. Confirm a positive reagent strip glucose
c. Check for newborn galactosuria
d. Confirm a negative glucose reading

158. Ketonuria may be caused by all of the following EXCEPT:
a. Bacterial infections
b. Diabetic acidosis
c. Starvation
d. Vomiting

159. Most frequently performed chemical analysis on urine:
a. Bilirubin
b. Glucose
c. Ketone
d. Protein

160. Glucosuria not accompanied by hyperglycemia can be seen in which of the following?
a. Hormonal disorders
b. Gestational diabetes
c. Diabetes mellitus
d. Renal disease

161. A patient's random urine consistently contains a trace of protein but no casts, cells, or other biochemical abnormality. The first voided morning sample is consistently negative for protein. These findings can be explained by:
a. Normal diurnal variation in protein loss
b. Early glomerulonephritis
c. Orthostatic or postural albuminuria
d. Microalbuminuria

162. A urine specimen is tested by a reagent strip test and the sulfosalicylic acid test to determine whether protein is present. The former yields a negative protein, whereas the latter results in a reading of 2+ protein. Which of the following statements best explains this difference?
a. Urine contained excessive amount of amorphous urates or phosphates that caused the turbidity seen with SSA
b. Urine pH was greater than 8, exceeding the buffering capacity of the strip, thus causing false-negative reaction
c. Protein other than albumin must be present in the urine
d. Reading time of the reagent strip test was exceeded, causing a false negative reaction to be detected

163. Best way to break the chain of infection (RECALL)
a. PPE
b. Handwashing
c. No smoking
d. Standard precautions

164. Bence Jones protein precipitates at temperatures between ___, and redissolves at near ___ ° C.
a. Precipitates at 100-120C, and redissolves at 60C
b. Precipitates at 10 to 20C, and redissolves at 100C
c. Precipitates at 80-100C, and redissolves at 60C
d. Precipitates at 40 to 60C, and redissolves at 100C

165. The principle of "protein error of indicators" is based on:
a. Protein changing the pH of the specimen
b. Protein changing the pKa of the specimen
c. Protein accepting hydrogen from the indicator
d. Protein giving up hydrogen to the indicaton

166. Concentration of SSA in the cold precipitation method:
a. 1% sulfosalicylic acid
b. 3% sulfosalicylic acid
c. 5% sulfosalicylic acid
d. 10% sulfosalicylic acid

167. All of the following are important to protect the integrity of reagent strips EXCEPT:
a. Removing the desiccant from the bottle
b. Storing in an opaque bottle
c. Storing at room temperature
d. Resealing the bottle after removing a strip

168. Which of the following tests is affected LEAST by standing or improperly stored urine?
a. Glucose
b. Protein
c. pH
d. Bilirubin

169. An indicator of PREECLAMPSIA:
a. Cylindruria
b. Hematuria
c. Ketonuria
d. Proteinuria

170. A routine urinalysis on a urine specimen collected from a hospitalized patient revealed a specific gravity greater than 1.050 with the use of refractometry. The best explanation for this specific gravity result is that the urine:
a. Old and has deteriorated
b. Contains radiographic contrast media
c. Concentrated because the patient is ill and dehydrated
d. Contains abnormally high levels of sodium and other electrolytes because the patient is taking diuretics

171. Sensitivity of the urine specific gravity reagent pad:
a. 1.010 to 1.035
b. 1.015 to 1.035
c. 1.000 to 1.002
d. 1.000 to 1.030

172. A lack of any urine odor may indicate:
a. Acute tubular necrosis
b. Isovaleric acidemia
c. Methionine malabsorption
d. Phenylketonuria

173. The clarity of a urine sample should be determined:
a. Using glass tubes only, never plastic
b. Following thorough mixing of the specimen
c. After addition of salicylic acid d
d. After the specimen cools to room temperature

174. Many particulates, print blurred through urine:
a. Hazy
b. Cloudy
c. Turbid
d. Milky

175. First-morning urine, EXCEPT:
a. Routine screening
b. Pregnancy testing
c. Urobilinogen determination
d. Evaluation of orthostatic proteinuria

176. The correct method for labeling urine specimen containers is to:
a. Attach the label to the lid
b. Attach the label to the bottom
c. Attach the label to the container
d. Use only a wax pencil for labeling

177. Phenol derivatives found in certain intravenous medications produce _____ urine on oxidation.
a. Yellow
b. Orange
c. Green
d. Purple

178. Storage of urine specimens for bilirubin and urobilinogen testing:
a. Clear container
b. Amber container
c. Preserved with formalin
d. None of these

179. All of the following should be discarded in biohazardous waste containers EXCEPT:
a. Urine specimen containers, urine
b. Towels used for decontamination
c. Disposable lab coats Blood
d. collection tubes

180. A catheterized urine specimen is collected:
a. After stimulating urine production with intravenous histamine
b. By aspirating it with a sterile syringe inserted into the bladder
c. Following midstream, clean-catch urine collection procedures
d. From a sterile tube passed through the urethra into the bladder

181. Patients with DIABETES INSIPIDUS tend to produce urine in _____ volume with _____ specific gravity.
a. Increased; decreased
b. Increased; increased
c. Decreased; decreased
d. Decreased; increased

182. The test most commonly associated with tubular secretion and renal blood flow
a. Creatinine clearance
b. Fishberg test
c. Mosenthal test
d. p-aminohippuric acid (PAH) test

183. Calculate the creatinine clearance using these date obtained from a person with 1.73 m2 body surface area: serum creatinine: 1.8 mg/dL; urine creatinine: 54 mg/dL; and urine volume 640 mL in 24 hours.
a. 3 mL/min
b. 13 mL/min
c. 21 mL/min
d. 68 mL/min

184. It corrects renal blood flow in the following ways: causing vasodilation of the afferent arterioles and constriction of the efferent arterioles:
a. Renin
b. Angiotensin I
c. Angiotensin II
d. Aldosterone

185. Calculate the creatinine clearance using these data: Serum creatinine: 1.8 mg/dL; urine volume: 640 mL in 24 hours; urine creatinine: 54 mg/dL; and body surface area: 1.25 m2.
a. 1.1 mL/min
b. 5 mL/min
c. 13 mL/min
d. 18 mL/min

186. A 24-hour urine for catecholamine determination may be preserved with:
a. Formalin
b. Boric acid
c. Hydrochloric acid, 6N
d. Sodium fluoride

187. The human kidneys receive approximately ___ % of the blood pumped through the heart at all times.
a. Approximately 5%
b. Approximately 15%
c. Approximately 25%
d. Approximately 50%

188. In the three-glass collection technique for diagnosis of prostatic infection, which tube is used as a control for bladder and kidney infection?
a. First specimen
b. Second specimen
c. Third specimen
d. None of these

189. The most routinely used method of urine preservation is
a. Boric acid
b. Formalin
c. Refrigeration
d. Sodium fluoride

190. What is the differentiating factor between diabetes mellitus and diabetes insipidus?
a. DM = Decreased urine SG; DI = Increased urine SG
b. Cannot be differentiated
c. DM = Increased urine SG; DI = Decreased urine SG
d. DM = decreased production or function of ADH; DI = defect in production of insulin

CLINICAL MICROSCOPY EXAMINATION AND RATIO

191. Acceptable urine temperature for drug testing:
a. 20 to 24C
b. 30 to 35C
c. 32.5 to 37.7C
d. 37.7 to 42C

192. All of the following are organic components of urine EXCEPT:
a. Urea
b. Chloride
c. Creatinine
d. Uric Acid

193. Polyuria, an increase in daily urine volume:
a. Greater than 400 mL/day in adults
b. Greater than 1200 mL/day in adults
c. Greater than 2L/day in adults
d. Greater than 2.5 L/day in adults

194. What is the last step in the handwashing procedure?
a. Dry hands with a paper towel.
b. Turn off the faucet with a clean paper towel to prevent recontamination.
c. Rub to form lather, create friction, and loosen debris.
d. Rinse hands in a downward position.

195. All of the following are included in the chain of infection, EXCEPT:
a. Mode of transmission
b. Reservoir
c. Susceptible host
d. Hazard

196. The required amount of urine for drug testing:
a. 5 to 10 mL
b. 10 to 15 mL
c. 20 to 30 mL
d. 30 to 45 mL

197. Which of the following is NOT included in correct handwashing technique?
a. Rinse hands in an upward position.
b. Dry hands with a paper towel.
c. Rub to form lather, create friction, and loosen debris.
d. Rinse hands in a downward position

198. When a reagent strip is positive for bilirubin, it can be assumed that the bilirubin:
a. Is conjugated
b. Has passed through the small intestine
c. Is attached to protein
d. Is unconjugated

199. Cast disintegrates when urine is:
a. Alkaline
b. Acidic
c. Concentrated
d. Odorless

200. What is the principle of the copper test for glucose?
a. Reduction
b. Oxidation
c. Polarography
d. Spectrophotometry

201. It has the longest reaction time.
a. Glucose
b. Bilirubin
c. Nitrite
d. Leukocyte esterase

202. Anti–glomerular basement antibody is seen with:
a. Wegener's granulomatosis
b. IgA nephropathy
c. Goodpasture's syndrome
d. Diabetic nephropathy

203. Urinary casts are formed in which of the following?
a. Distal tubules and collecting ducts
b. Distal tubules and loops of Henle
c. Proximal and distal tubules
d. Proximal tubules and loops of Henle

204. The only protein produced by the kidney is:
a. Albumin
b. Uromodulin
c. Globulin
d. Tau protein

205. The principal mucin in synovial fluid is:
a. Hyaluronate
b. Albumin
c. Orosomucoid
d. Pepsin

206. Rapid forward progression of sperm is rated as:
a. 1.0
b. 2.0
c. 3.0
d. 4.0

207. An eosinophil count may be requested on urine from a patient with suspected:
a. Acute glomerulonephritis
b. Cystitis
c. Renal lithiasis
d. Acute interstitial nephritis

208. In most compound light microscopes, the ocular lens has a magnification of
a. 10x
b. 40x
c. 50x
d. 100x

209. The best way to lower the light intensity of the microscope is to:
a. Lower the condenser
b. Adjust the aperture diaphragm
c. Lower the rheostat
d. Raise the condenser

210. Ghost red blood cells are seen in urine that is:
a. acidic and dilute
b. alkaline and dilute
c. acidic and concentrated
d. alkaline and concentrated

211. Refractive index is a comparison of:
a. Light velocity in solutions to light velocity in solids
b. Light velocity in air to light velocity in solutions
c. Light scattering by air to light scattering by solutions
d. Light scattering by particles in solution

212. Which of the following would be least affected in a specimen that has remain unpreserved at room temperature for more than 2 hours?
a. Urobilinogen
b. Ketones
c. Protein
d. Nitrite

213. The fluid leaving the glomerulus normally has a specific gravity of:
a. 1.001
b. 1.010
c. 1.020
d. 1.030

214. Which of the tubules is impermeable to water?
a. Proximal convoluted tubule
b. Descending loop of Henle
c. Ascending loop of Henle
d. Distal convoluted tubule

215. Many particulates, print blurred through the urine
a. Clear
b. Hazy
c. Cloudy
d. Turbid

216. Few particulates, print easily seen through urine
a. Clear
b. Hazy
c. Cloudy
d. Turbid

217. Another term for mucin clot test?
a. Ropes
b. String
c. Rivalta
d. Serosamucin clot

218. Black tarry stool is indicative of:
a. Lower GI
b. Excessive fats
c. Upper GI
d. Excessive carbohydrate

219. The clarity of a urine sample should be determined:
a. Using glass tubes only; never plastic
b. Following thorough mixing of the specimen
c. After addition of sulfosalicylic acid
d. After the specimen cools to room temperature

220. The simple test for measuring the viscosity of synovial fluid.
a. Mucin
b. Rope
c. String
d. Rivalta

221. Which differentiate CSF from serum protein electrophoresis?
a. Absence of fibrinogen
b. Presence of fibrinogen
c. Presence of IgG
d. Presence of ceruloplasmin

222. How is the CSF differential done?
a. Centrifuge undiluted then stain
b. Use counting chamber
c. Stain diluted
d. Centrifuge then use the counting chamber

223. Amniotic fluid is a specimen of choice for EXCEPT:
a. Test for neural tube defect
b. Test for fetal lung
c. Test for fetal liver
d. Test for congenital diseases

224. Which results need to be rerun?
a. Urate, pH 5
b. Amorphous phosphate, pH 6
c. Cystine, pH 5
d. Calcium phosphate, pH 8

225. Crystal present in acidic urine, colorless and needle-like
a. Tyrosine
b. Hippuric acid
c. Bilirubin
d. Cystine

226. Mononuclear blood cells can be mistaken as:
a. WBC
b. Immature RBC
c. RTE
d. Lymphocyte

227. Pollen grain often mistaken as ___ urine
a. Cast
b. Egg of parasite
c. RBC
d. Uric acid

228. Maltese cross pattern under the polarized light with a negative birefringence
a. Cholesterol
b. Starch
c. Leucine
d. Air bubble

229. Differentiation among RBCs, yeast, and oil droplets may be accomplished by all of the following except:
a. Observation of budding in yeast cells
b. Increased refractility of oil droplets
c. Lysis of yeast cells by acetic acid
d. Lysis of RBCs by acetic acid

230. All are factors affecting the formation of urinary crystals, EXCEPT:
a. pH
b. Solute concentration
c. Temperature
d. Protein Concentration

231. Which stain is used for hemosiderin?
a. Guaiac
b. Sternheimer
c. Perl Prussian
d. Hematoxylin

232. Not a shape of transitional epithelial cells
a. Caudate
b. Convoluted
c. Spherical
d. Polyhedral

234. Ketones is seen in urine due to:
a. Incomplete fat metabolism
b. Fatty acid consumption
c. High carbohydrate diet
d. Low carbohydrate diet

235. Parameters used in GFR EXCEPT:
a. BUN
b. BUA
c. Serum creatinine
d. eGFR

236. More representative measure of renal concentrating ability
a. SG
b. Osmolality
c. pH
d. Protein

237. Allowing the strip to remain in the urine for an extended period will cause:
a. RBC not detected
b. Leaching of reagents
c. Runover of reagents
d. WBC not detected

238. High protein intake causes the urine to become
a. Concentrated
b. Diluted
c. Alkaline
d. Acidic

239. The integrity of urine specimen is important for:
a. Accurate assessment
b. Monitor disease progress
c. Monitor treatment
d. Diagnose

240. Urine should be shaken before analysis of:
a. pH and SG
b. Red and white blood cell
c. Ketones and glucose
d. Bilirubin and urobilinogen

CLINICAL MICROSCOPY EXAMINATION AND RATIO

241. What is the best preservative for urine sediment?
a. Formalin
b. Boric acid
c. Toluene
d. Thymol

242. What urine specimen is best used to quantitate sediments?
a. MSCC
b. First morning
c. Timed
d. Midday

243. The correct way to evaluate urine turbidity
a. Against a white background
b. Against a black background
c. Light source behind analyst
d. Light source in front of analyst

244. Organ that stores urine
a. Ureter
b. Bladder
c. Urethra
d. Pelvis

245. Each kidney contains approximately how many nephrons:
a. 0.5-1 million
b. 1-1.5 million
c. 2-2.5 million
d. 1-2 million

246. The renal tubule exchanges hydrogen for sodium. The urine will become ___.
a. Concentrated
b. Diluted
c. Acidic
d. Alkaline

247. The correct way of adding reagents together
a. Mix water and acid at the same time
b. Do not mix acid and water
c. Add water to acid
d. Add acid to water

248. A quantitative serum hCG is ordered on a male patient. The technologist should:
A. Perform the test and report the result
B. Request that the order be cancelled
C. Perform the test and report the result if negative
D. Perform the test and report the result only if greater than 25 IU/L

249. Which of the following tests is a specific measureof glomerular filtration?
A. p-Aminohippuric acid (PAH) clearance
B. Fishberg concentration test
C. Mosenthal dilution test
D. Cystatin C

250. What is the most common cause of male infertility?
A. Mumps
B. Klinefelter's syndrome
C. Varicocele
D. Malignancy

251. In which condition is the highest level of serum gastrin usually seen?
A. Atrophic gastritis
B. Pernicious anemia
C. Z–E syndrome
D. Cancer of the stomach

252. Before performing a Gram stain on CSF, the specimen must be:
A. Filtered
B. Warmed to 37C
C. Centrifuged
D. Mixed

253. Normal lymphocyte count in bronchoalveolar lavage (BAL):
A. Less than 1%
B. Less than 3%
C. 1 to 15%
D. 56 to 80%

254. What is the preferred gastric stimulant?
A. Histamine
B. Histalog
C. Insulin
D. Pentagastrin

255. Sysmex UF series, the DNA within the cells is stained by the orange dye:
A. Carbocyanine
B. Phenathridine
C. Coomassie brilliant blue
D. Bromcresol green

256. What calculation is used to determine if there is a breach in the blood-brain barrier?
A. IgG index
B. CSF/serum albumin index
C. fluid/serum LD ratio
D. albumin gradient

257. The protein present in vaginal secretions that can identify patients who are at risk for preterm delivery is:
A. Human chorionic gonadotropin
B. Estrogen
C. PAMG-1
D. Fetal fibronectin

258. A positive amine (Whiff) test is observed in which of the following syndromes?
A. Bacterial vaginosis
B. Vulvovaginal candidiasis
C. Atrophic vaginitis
D. Desquamative inflammatory vaginitis

259. Most commonly used dilution in sperm count
A. 1:5
B. 1:10
C. 1:15
D. 1:20

260. All of the following proteins are normally present in the CSF except for
A. Albumin
B. Fibrinogen
C. Transthyretin
D. Transferrin

261. A build-up of fluid in a body cavity is called a(n):
A. Metastasis
B. Exudate
C. Effusion
D. Transudate

262. Stool specimens that appear ribbon-like are indicative of which condition?
A. Colitis
B. Malignancy
C. Bile duct obstruction
D. Intestinal constriction

263. False-positive results can occur for fecal occult blood due to ingestion of:
A. Ascorbic acid
B. Horseradish
C. Acetaminophen
D. Blueberries

264. Which pair does not match with respect to amniotic fluid?
A. Dark green - hemolytic disease of the newborn
B. Dark red-brown - fetal death
C. Colorless - normal
D. Blood-streaked - traumatic collection

265. Which is the reference method for determining fetal lung maturity?
A. L/S ratio
B. Urinary estriol
C. Amniotic fluid bilirubin
D. Human placental lactogen

266. Acetylcholinesterase activity may be measured on amniotic fluid when a positive alpha fetoprotein result is obtained to evaluate for:
A. Fetal lung maturity
B. Neural tube defects
C. Respiratory distress syndrome
D. Hemolytic disease of the newborn

267. Most frequently seen cell in BAL
A. Macrophage
B. Lymphocyte
C. Eosinophil
D. Mast cells

268. Synovial fluid from a 68-year-old male reveals rhombic crystals with weak positive birefringence when viewed using polarizing microscopy. These crystals can be identified as:
A. Cholesterol
B. Hydroxyapatite
C. Calcium pyrophosphate dihydrate
D. Monosodium urate

269. The most sensitive fecal enzyme test for the diagnosis of pancreatic insufficiency measures_____.
A. Lipase
B. Trypsin
C. Elastase I
D. Chymotrypsin

270. The most likely cause of increased neutrophils is a pericardial fluid exudate is _____.
A. Tuberculosis
B. Bacterial endocarditis
C. Cardiac puncture
D. Pneumonia

271. The presence of rice bodies in a synovial fluid is strongly associated with:
A. Gouty arthritis
B. Rheumatoid arthritis
C. Traumatic collection
D. Infection wtih Staphylococcus aureus

272. Sperm are usually counted in the four corner and center squares of the large center square. Both sides of the hemocytometer are loaded and allowed to settle for 3 to 5 minutes; then they are counted, and the counts should agree within _____
A. Agree within 10%
B. Agree within 11%
C. Agree within 12 %
D. Agree within 13 %

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

274. What is added to synovial fluid to determine the viscosity?
A. Sodium hydroxide
B. Acetic acid
C. Hydrochloric acid
D. Hyaluronic acid

275. Which of the following can be used to identify a fluid as CSF?
A. Oligoclonal bands
B. Xanthochromia
C. Transferrin t protein
D. Absence of glucose

276. These constituents are primarily seen in urine with an:
A. Acid pH and a positive protein
B. Alkaline pH and bacteria
C. Acid pH and a positive glucose
D. Alkaline pH and a positive protein

277. A sweat chloride >70 mEq/L (70 mmol/L) is indicative of:
A. Multiple sclerosis
B. Muscular dystrophy
C. Respiratory distress syndrome
D. Cystic fibrosis

278. Plotting the amniotic fluid OD on a Liley graph represents the severity of hemolytic disease of the newborn. A value that is plotted in zone II indicates what condition of the fetus?
A. No hemolysis
B. Mildly affected fetus
C. Moderately affected fetus that requires close monitoring
D. Severely affected fetus that requires intervention

279. The _____ is the thickest part of the tail because it is surrounded by a mitochondrial sheath that produces the energy required by the tail for motility.
A. Head
B. Acrosome
C. Neckpiece
D. Midpiece

280. Which of the following is the best indicator of Reye syndrome for CSF?
A. Ammonia
B. Glutamine
C. ALT
D. Bilirubin

281. The most frequently seen parasite in urine
A. Trichomonas vaginalis
B. Schistosoma haematobium
C. Wuchereria bancroftii
D. Enterobius vermicularis

282. What condition is suggested by picture?
A. Glomerulonephritis
B. Improperly collected specimen
C. Pyelonephritis
D. Normal sample

283. Nitrite in a urine specimen suggests the presence of:
A. White blood cells
B. Red blood cells
C. Bacteria
D. Yeasts

284. Seminal fluid are collected following a period of sexual abstinence of:
A. 6 to 8 days
B. 3 to 5 days
C. 8 to 10 days
D. 2 to 7 days

285. A maximum of ___ mL of amniotic fluid is collected in sterile syringes.
A. 10 mL
B. 20 mL
C. 30 mL
D. 50 mL

286. Normal vitality requires ____ or more living cells and should correspond to the previously evaluated motility.
A. 30%
B. 40%
C. 50%
D. 60%

287. A normal quantitative level of fructose is equal to or _____ µmol per ejaculate
A. Greater than 12
B. Greater than 13
C. Greater than 14
D. Greater than 15

288. Specimens can be screened for the presence of fructose using the resorcinol test that produces an _____ color when fructose is present.
A. Orange
B. Bluish White
C. Red
D. Purple

289. Following an episode of hemoglobinuria, RTE cells may contain _____.
A. Bilirubin
B. Hemosiderin granules
C. Porphobilinogen
D. Myoglobin

290. The presence of oligoclonal bands in CSF but not in serum is associated with:
A. Spina bifida
B. Multiple sclerosis
C. Reye's Syndrome
D. Hydrocephalus

291. The presence of tyrosine and leucine crystals together in a urine sediment usually indicates:
A. Liver disease
B. Hartnup disease
C. Lesch Nyhan syndrome
D. Renal tubular damage

292. For glucose, the plasma renal threshold is _____, and glucose appears in the urine when the plasma concentration reaches this level
A. 190 to 200 mg/dL
B. 150 to 250 mg/dL
C. 100 to 150 mg/dL
D. 160 to 180 mg/dL

293. Which of the following crystals are seen in urine of patients who are receiving chemotherapy due to leukemia
a. Ammonium biurates
b. Uric acid
c. Calcium oxalate
D. Leucine

294. Choroid plexus produces ___ amount of CSF per hour
A. 30 mL
B. 40 mL
C. 20 mL
D. 50 mL

295. Daily control slide for bacteria (albumin contamination)
A. 0.3 mL saline + 3 drops of 30% albumin
B. 0.4 mL saline + 3 drops of 20% albumin
C. 0.2 mL saline + 2 drops of 30% albumin
D. 0.1 mL saline + 2 drops of 20% albumin

296. In cytocentrifuge, Addition of 50% Albumin is to:
A. Increases cell yield
B. Decreases cellular distortion
C. A & B
D. None of the above

297. Volume of gastric fluid
A. 50 – 75 mL
B. 5 – 10 mL
C. 100 – 150 mL
D. 1 – 5 mL

298. LDH pattern in CSF
A. 1>2>3>4>5
B. 2>1>3>4>5
C. 5>4>3>2>1
D. 4>3>2>1>5

299. Seen in conjunction with leucine in specimens positive test for bilirubin.
A. Tyrosine
B. Cholesterol
C. Uric acid
D. Cystine

300. Similar with radiographic contrast media
A. Tyrosine
B. Cholesterol
C. Uric acid
D. Cystine

301. Confused with sulfonamide when urine pH is in neutral
A. Calcium carbonate
B. Calcium phosphate
C. Amorphous phosphate
D. Amorphous urate

302. The presence of hyaline indicates:
A. Acute glomerulonephritis
B. Acute pyelonephritis
C. Diabetic nephropathy
D. Strenuous exercise

303. When urine decomposes, the pH:
a. Becomes more alkaline
b. Becomes more acidic
c. Does not change
d. Causes crystals associated with acidic urine to form

304. The final phase of degeneration that granular casts undergo is represented by which of the following casts?
A. Fine
B. Coarse
C. Cellular
D. Waxy

305. A reagent test strip impregnated with a diazonium salt such as diazotized 2,4-dichloroaniline may be used to determine which analyte?
A. Glucose
B. Ketone
C. Bilirubin
D. Hemoglobin

306. What is the most common crystal in alkaline urine?
A. Staghorn calculi
B. Struvite
C. Calcium phosphate
D. Calcium carbonate

307. Which of the following is the major organic substance found in urine?
A. Sodium
B. Potassium
C. Glucose
D. Urea

308. Positive nitrite corresponds to
A. 100,000 organism/mL
B. 100 organism/mL
C. 1,000 organism/mL
D. 10,000 organism/mL

309. Convert bright field to dark field
A. Replace condenser
B. Two polarizing filters must be installed in a crossed configuration.
C. Two phase rings that appear as "targets" are placed in the condenser and the objective

310. False positive in Formalin
A. Blood
B. Urobilinogen
C. Leukocyte esterate
D. Bilirubin

311. Used for culture and albumin
A. Boric Acid
B. Sodium Fluoride
C. Thymol
D. Formalin

312. For testing of Catecholamines what type of urine specimen should be collected?
A. 24 hour urine
B. First morning
C. Random
D. Fasting second morning

313. Aldosterone acts on
A. PCT
B. DCT
C. Collecting Duct
D. Loop of Henle

314. Vasopressin/ADH acts on
A. PCT
B. DCT
C. Collecting Duct
D. Loop of Henle

315. Which of the tubules is impermeable to water?
A. Proximal convoluted tubule
B. Descending loop of Henle
C. Ascending loop of Henle
D. Distal convoluted tubule

316. Final concentration of filtrate happens on:
A. PCT
B. DCT
C. Collecting Duct
D. Loop of Henle

317. Urine pH is:
A. An indicator of proteinuria
B. Helpful in the identification of some types of crystals in the urine
C. Unaffected by diet
D. Unchanged for each individual

318. Imparts a black color to alkaline urine?
A. Phenindione
B. Phenazopyridine
C. Homogentisic acid
D. Nitrofurantoin

319. What is the required volume of urine for drug testing?
A. 30 – 45 mL
B. 10 – 15 mL
C. 60 mL
D. 50 mL

320. Monitoring whether the sample migrated through the test strip properly in lateral flow test methods is an example of:
A. External QC
B. Equivalent QC
C. Internal QC
D. Proficiency testing

321. Failure to call critical values
1. Preexamination
2. Examination
3. Postexamination
A. 1, 2
B. 1, 3
C. 2
D. 3

322. Which of the following is true about the first morning urine specimen?
A. It contains high levels of analytes and cellular elements.
B. It is preferred for culture and sensitivity testing.
C. It is used for substances affected by diurnal variation.
D. It is the most common type of specimen collected

323. The formation of urine begins in the:
A. Nephron
B. Glomerulus
C. Ureter
D. Bladder

324. The acronym PASS refers to:
A. Presence of vital chemicals
B. Operation of a fire extinguisher
C. Labeling of hazardous material
D. Presence of radioactive substances

325. All of the following should be discarded in biohazardous waste containers except:
A. Urine specimen containers
B. Towels used for decontamination.
C. Disposable lab coats
D. Blood collection tubes

326. In which condition is the highest level of serum gastrin usually seen?
A. Atrophic gastritis
B. Pernicious anemia
C. Z–E syndrome
D. Cancer of the stomach

327. Which condition is most often associated with gastric ulcers?
A. Cancer of the stomach
B. H. pylori infection
C. Zollinger–Ellison (Z–E) syndrome
D. Pernicious anemia

328. In determining free HCl, the gastric fluid is titrated to pH ___.
A. 6.5
B. 4.5
C. 3.5
D. 2.0

329. A positive amine (Whiff) test is observed in which of the following syndromes?
A. Bacterial vaginosis
B. Vulvovaginal candidiasis
C. Atrophic vaginitis
D. Desquamative inflammatory vaginitis

330. A normal range for a vaginal pH is:
A. 3.8 to 4.5
B. 5.0 to 6.0
C. 6.0 to 7.0
D. 7.0 to 7.4

331. In the Van de Kamer method for quantitative fecal fat determinations, fecal lipids are:
A. Converted to fatty acids prior to titrating with sodium hydroxide
B. Homogenized and titrated to a neutral endpoint with sodium hydroxide
C. Measured gravimetrically after washing
D. Measured by spectrophotometer after addition of Sudan III

332. Which of the following tests differentiates a malabsorp- tion cause from a maldigestion cause in steatorrhea?
A. APT test
B. D-xylose test
C. Lactose tolerance test
D. Occult blood test

333. When severe HDN is present, which of the following tests on the amniotic fluid would the physician not order to determine whether the fetal lungs are mature enough to withstand a premature delivery?
A. AFP levels
B. Foam stability index
C. Lecithin/sphingomyelin ratio
D. Phosphatidyl glycerol detection

334. A lamellar body count of 50,000 correlates with:
A. Absent phosphatidyl glycerol and L/S ratio of 1.0
B. L/S ratio of 1.5 and absent phosphatidyl glycerol
C. OD at 650 nm of 1.010 and an L/S ratio of 1.1
D. OD at 650 nm of 0.150 and an L/S ratio of 2.0

335. Secretory diarrhea is caused by:
A. Antibiotic administration
B. Lactose intolerance
C. Celiac sprue
D. Vibrio cholera

336. Microscopic examination of stools mixed with Sudan III and glacial acetic acid and then heated will show small orange-red droplets that represent:
A. Fatty acids and soaps
B. Fatty acids and neutral fats
C. Fatty acids, soaps, and neutral fats
D. Soaps

337. Differentiation between bacterial peritonitis and cirrhosis is done by performing a/an:
A. WBC count
B. Differential
C. Absolute neutrophil count
D. Absolute lymphocyte count

338. When performing an L/S ratio by thin-layer chromatography, a mature fetal lung will show:
A. Sphingomyelin twice as concentrated as lecithin
B. No sphingomyelin
C. Lecithin twice as concentrated as sphingomyelin
D. Equal concentrations of lecithin and sphingomyelin

339. Which of the following best represents a hemothorax?
A. Blood HCT: 42 Fluid HCT: 15
B. Blood HCT: 42 Fluid HCT: 10
C. Blood HCT: 30 Fluid HCT: 10
D. Blood HCT: 30 Fluid HCT: 20

340. During normal production of serous fluid, the slight excess of fluid is:
A. Absorbed by the lymphatic system
B. Absorbed through the visceral capillaries
C. Stored in the mesothelial cells
D. Metabolized by the mesothelial cells

341. Plasma cells seen in pleural fluid indicate:
A. Bacterial endocarditis
B. Primary malignancy
C. Metastatic lung malignancy
D. Tuberculosis infection

342. Another name for a peritoneal effusion is:
A. Peritonitis
B. Lavage
C. Ascites
D. Cirrhosis

343. Normal sperm morphology when using the WHO criteria is:
A. >30% normal forms
B. <30% normal forms
C. >15% abnormal forms
D. <15% normal forms

344. Which of the following is not a frequently performed test on synovial fluid?
A. Uric acid
B. WBC count
C. Crystal examination
D. Gram stain

345. Addition of a cloudy, yellow synovial fluid to acetic acid produces a/an:
A. Yellow-white precipitate
B. Easily dispersed clot
C. Solid clot
D. Opalescent appearance

346. Crystals that have the ability to polarize light are:
A. Corticosteroid
B. Monosodium urate
C. Calcium oxalate
D. All of the above

347. The percentage of sperm showing average motility that is considered normal is:
A. 25%
B. 50%
C. 60%
D. 75%

348. Before performing a Gram stain on CSF, the specimen must be:
A. Filtered
B. Warmed to 37°C
C. Centrifuged
D. Mixed

349. The reference range for CSF protein is:
A. 6 to 8 g/dL
B. 15 to 45 g/dL
C. 6 to 8 mg/dL
D. 15 to 45 mg/dL

350. Given the following information, calculate the sperm con- centration: dilution, 1:20; sperm counted in five RBC squares on each side of the hemocytometer, 80 and 86; volume, 3 mL.
A. 80 million/mL
B. 83 million/mL
C. 86 million/mL
D. 169 million/µ L

351. The major component of seminal fluid is:
A. Glucose
B. Fructose
C. Acid phosphatase
D. Citric acid

352. Measurement of which of the following can be replaced by CSF glutamine analysis in children with Reye syndrome?
A. Ammonia
B. Lactate
C. Glucose
D. α –Ketoglutarate

353. In serum, the second most prevalent protein is IgG; in CSF, the second most prevalent protein is:
A. Transferrin
B. Prealbumin
C. IgA
D. Ceruloplasmin

354. A CSF glucose of 15 mg/dL, WBC count of 5000, 90% neutrophils, and protein of 80 mg/dL suggests:
A. Fungal meningitis
B. Viral meningitis
C. Tubercular meningitis
D. Bacterial meningitis

355. The finding of oligoclonal bands in the CSF and not in the serum is seen with:
A. Multiple myeloma
B. CNS malignancy
C. Multiple sclerosis
D. Viral infections

356. Elevated urinary levels of 5-HIAA are associated with:
A. Carcinoid tumors
B. Hartnup disease
C. Cystinuria
D. Platelet disorders

357. Acetyl acetone is added to the urine before performing the Ehrlich test when checking for:
A. Aminolevulinic acid
B. Porphobilinogen
C. Uroporphyrin
D. Coproporphyrin

358. The CSF tube that should be kept at room temperature is:
A. Tube 1
B. Tube 2
C. Tube 3
D. Tube 4

359. The presence of xanthochromia can be caused by all of the following except:
A. Immature liver function
B. RBC degradation
C. A recent hemorrhage
D. Elevated CSF protein

360. Differentiation between cystitis and pyelonephritis is aided by the presence of:
A. WBC casts
B. RBC casts
C. Bacteria
D. Granular casts

361. All states require newborn screening for PKU for early:
A. Modifications of diet
B. Administration of antibiotics
C. Detection of diabetes
D. Initiation of gene therapy

362. Hartnup disease is a disorder associated with the metabolism of:
A. Organic acids
B. Tryptophan
C. Cystine
D. Phenylalanine

363. All of the following are common characteristics of the nephrotic syndrome except:
A. Hyperlipidemia
B. Hypoalbuminemia
C. Hematuria and pyuria
D. Severe edema

364. The presence of tyrosine and leucine crystals together in a urine sediment usually indicates:
A. Renal failure
B. Chronic liver disease
C. Hemolytic anemia
D. Hartnup disease

366. At which pH are ammonium biurate crystals usually found in urine?
A. Acid urine only
B. Acid or neutral urine
C. Neutral or alkaline urine
D. Alkaline urine only

367. Which crystal appears in urine as a long, thin hexagonal plate, and is linked to ingestion of large amounts of benzoic acid?
A. Cystine
B. Hippuric acid
C. Oxalic acid
D. Uric acid

368. Acute pyelonephritis is commonly caused by:
A. Bacterial infection of medullary interstitium
B. Circulatory failure
C. Renal calculi
D. Antigen–antibody reactions within the glomeruli

369. Urinalysis of a sample from a patient suspected of having a transfusion reaction reveals small yellow-brown crystals in the microscopic examination. Dry reagent strip tests are normal with the exception of a positive blood reaction (moderate) and trace positive protein. The pH of the urine is 6.5. What test should be performed to positively identify the crystals?
A. Confirmatory test for bilirubin
B. Cyanide–nitroprusside test
C. Polarizing microscopy
D. Prussian blue stain

370. The mucoprotein that forms the matrix of a hyaline cast is called:
A. Bence–Jones protein
B. β-Microglobulin
C. Tamm–Horsfall protein
D. Arginine-rich glycoprotein

371. A sediment with moderate hematuria and RBC casts most likely results from:
A. Chronic pyelonephritis
B. Nephrotic syndrome
C. Acute glomerulonephritis
D. Lower urinary tract obstruction

372. Which of the following statements regarding RBCs in the urinary sediment is true?
A. Yeast cells will lyse in dilute acetic acid but RBCs will not
B. RBCs are often swollen in hypertonic urine
C. RBCs of glomerular origin often appear dysmorphic
D. Yeast cells will tumble when the cover glass is touched but RBCs will not

373. Renal tubular epithelial cells are shed into the urine in largest numbers in which condition?
A. Malignant renal disease
B. Acute glomerulonephritis
C. Nephrotic syndrome
D. Cytomegalovirus (CMV) infection of the kidney

374. Oval fat bodies are often seen in:
A. Chronic glomerulonephritis
B. Nephrotic syndrome
C. Acute tubular nephrosis
D. Renal failure of any cause

375. Which condition promotes the formation of casts in the urine?
A. Chronic production of alkaline urine
B. Polyuria
C. Reduced filtrate formation
D. Low urine SG

376. A 5-mL urine specimen is submitted for routine urinalysis and analyzed immediately. The SG of the sample is 1.012 and the pH is 6.5. The dry reagent strip test for blood is a large positive (3+) and the microscopic examination shows 11–20 RBCs per HPF. The leukocyte esterase reaction is a small positive (1+), and the microscopic examination shows 0–5 WBCs per HPF. What is the most likely cause of these results?
A. Myoglobin is present in the sample
B. Free hemoglobin is present
C. Insufficient volume is causing microscopic results to be underestimated
D. Some WBCs have been misidentified as RBCs

377. Which description of sediment with Sternheimer–Malbin stain is correct?
A. Transitional epithelium: cytoplasm pale blue, nucleus dark blue
B. Renal epithelium: cytoplasm light blue, nucleus dark purple
C. Glitter cells: cytoplasm dark blue, nucleus dark purple
D. Squamous epithelium: cytoplasm pink, nucleus pale blue

378. A urine sediment could have which of the following formed elements and still be considered "normal"?
A. Two or fewer hyaline casts
B. Five to 10 red blood cells
C. A few bacteria
D. A few yeast cells

379. The microscopic identification of hemosiderin is enhanced when the urine sediment is stained with
A. Gram stain.
B. Hansel stain.
C. Prussian blue stain.
D. Sudan III stain.

380. When the laboratorian performs the microscopic examination of urine sediment, which of the following are enumerated using low-power magnification?
A. Bacteria
B. Casts
C. Red blood cells
D. Renal tubular cells

381. The purpose of the special mat supplied with the Ictotest tablets is that:
A. Bilirubin remains on the surface of the mat.
B. It contains the dye needed to produce color.
C. It removes interfering substances.
D. Bilirubin is absorbed into the mat.

382. Screening tests for urinary infection combine the leuko- cyte esterase test with the test for:
A. pH
B. Nitrite
C. Protein
D. Blood

383. A positive nitrite test and a negative leukocyte esterase test is an indication of a:
A. Dilute random specimen
B. Specimen with lysed leukocytes
C. Vaginal yeast infection
D. Specimen older than 2 hours

384. When urine sediment is viewed, stains and various microscopic techniques are used to
1. enhance the observation of fine detail.
2. confirm the identity of suspected components.
3. differentiate formed elements that look alike.
4. facilitate the visualization of low-refractile components.
A. 1, 2, and 3 are correct.
B. 1 and 3 are correct.
C. 4 is correct.
D. All are correct.

385. A moderate-positive blood test and trace protein test are seen on the dry reagent strip, and 11–20 red blood cells per high-power field are seen in the microscopic exam. These results are most likely caused by which of the following?
A. Transfusion reaction
B. Myoglobinuria
C. Intravascular hemolytic anemia
D. Recent urinary tract catheterization

386. Which of the following reagents is used to detect urobilinogen in urine?
A. p-Dinitrobenzene
B. p-Aminosalicylate
C. p-Dimethylaminobenzaldehyde
D. p-Dichloroaniline

387. The primary reason for performing a Clinitest is to:
A. Check for high ascorbic acid levels
B. Confirm a positive reagent strip glucose
C. Check for newborn galactosuria
D. Confirm a negative glucose reading

388. 4A positive glucose oxidase test and a negative test for reducing sugars indicates:
A. True glycosuria
B. False-positive reagent strip test
C. False-negative reducing test caused by ascorbate
D. Galactosuria

389. AAA is detected in urine by reaction with:
A. Sodium nitroprusside
B. o-Toluidine
C. m-Dinitrobenzene
D. m-Dinitrophenylhydrazine

390. Which of the following statements regarding the classical nitroprusside reaction for ketones is true?
A. The reaction is most sensitive to acetone
B. Nitroprusside reacts with acetone, AAA, and β-hydroxybutyric acid
C. It may be falsely positive in phenylketonuria
D. The reaction is recommended for diagnosing Ketoacidosis

391. Which of the following conditions is associated with a negative blood test and an increase in urine urobilinogen?
A. Calculi of the kidney or bladder
B. Malignancy of the kidney or urinary system
C. Crush injury
D. Extravascular hemolytic anemia

392. A discrepancy between the urine SG determined by measuring refractive index and urine osmolality would be most likely to occur:
A. After catheterization of the urinary tract
B. In diabetes mellitus
C. After an intravenous pyelogram (IVP)
D. In uremia

393. Which statement best describes the clinical utility of tests for microalbuminuria?
A. Testing may detect early renal involvement in diabetes mellitus
B. Microalbuminuria refers to a specific subfraction of albumin found only in persons with diabetic nephropathy
C. A positive test result indicates the presence of orthostatic albuminuria
D. Testing should be part of the routine urinalysis

394. The normal renal threshold for glucose is:
A. 70–85 mg/dL
B. 100–115 mg/dL
C. 130–145 mg/dL
D. 165–180 mg/dL

395. In which of the following conditions is glycosuria most likely?
A. Addison's disease
B. Hypothyroidism
C. Pregnancy
D. Hypopituitarism

396. A single substance can impart different colors to urine depending on the
1. amount of the substance present.
2. storage conditions of the urine.
3. pH of the urine.
4. structural form of the substance.

A. 1, 2, and 3 are correct.
B. 1 and 3 are correct.
C. 4 is correct.
D. All are correct.

397. Which of the following methods used to determine the specific gravity of urine does not detect the presence of urine protein or glucose?
A. Harmonic oscillation densitometry
B. Reagent strip
C. Refractometry
D. Urinometry

398. Which of the following specific gravity values is physiologically impossible?
A. 1.000
B. 1.010
C. 1.020
D. 1.030

399. A urine specific gravity measured by refractometer is 1.029, and the temperature of the urine is 14°C. The spe- cific gravity should be reported as:
A. 1.023
B. 1.027
C. 1.029
D. 1.032

400. The microscopic of a clear red urine is reported as many WBCs and epithelial cells. What does this suggest?
A. Urinary tract infection
B. Dilute random specimen
C. Hematuria
D. Possible mix-up of specimen and sediment

401. The presence of a pink precipitate in a refrigerated specimen is caused by:
A. Hemoglobin
B. Urobilin
C. Uroerythrin
D. Beet

402. A patient with a viscous orange specimen may have been:
A. Treated for a urinary tract infection
B. Taking vitamin B pills
C. Eating fresh carrots
D. Taking antidepressants

403. Which of the following substances is secreted into the tubular lumen to eliminate hydrogen ions?
A. Ammonia (NH3)
B. Ammonium ions (NH_4^+)
C. Disodium phosphate (Na2HPO4)
D. Monosodium phosphate (NaH2PO4)

404. The final concentration of the urine is determined within the
A. collecting ducts.
B. distal convoluted tubules.
C. loops of Henle.
D. proximal convoluted tubules.

405. Specimens that contain hemoglobin can be visually distinguished from those that contain RBCs because:
A. Hemoglobin produces a clear, yellow specimen
B. Hemoglobin produces a cloudy pink specimen
C. RBCs produce a cloudy red specimen
D. RBCs produce a clear red specimen

406. Clearance tests used to determine the glomerular filtration rate must measure substances that are:
A. Not filtered by the glomerulus
B. Completely reabsorbed by the proximal convoluted tubule
C. Secreted in the distal convoluted tubule
D. Neither reabsorbed or secreted by the tubules

407. Variables that are included in the MDRD-IDSM estimated creatinine clearance calculations include all of the following except:
A. Serum creatinine
B. Weight
C. Age
D. Gender

408. The ability of a solute to cross the glomerular filtration barrier is determined by its
1. molecular size.
2. molecular radius.
3. electrical charge.
4. plasma concentration.

A. 1, 2, and 3 are correct.
B. 1 and 3 are correct.
C. 4 is correct.
D. All are correct.

409. For active transport to occur, a chemical:
A. Must combine with a carrier protein to create electrochemical energy
B. Must be filtered through the proximal convoluted tubule
C. Must be in higher concentration in the filtrate than in the blood
D. Must be in higher concentration in the blood than in the filtrate

410. Which of the tubules is impermeable to water?
A. Proximal convoluted tubule
B. Descending loop of Henle
C. Ascending loop of Henle
D. Distal convoluted tubule

411. Decreased production of ADH:
A. Produces a low urine volume
B. Produces a high urine volume
C. Increases ammonia excretion
D. Affects active transport of sodium

412. The fluid leaving the glomerulus has a specific gravity of:
A. 1.005
B. 1.010
C. 1.015
D. 1.020

413. The renin-angiotensin-aldosterone system is responsible for all of the following except:
A. Vasoconstriction of the afferent arteriole
B. Vasoconstriction of the efferent arteriole
C. Reabsorbing sodium
D. Releasing aldosterone

414. The primary chemical affected by the renin angiotensin- aldosterone system is:
A. Chloride
B. Sodium
C. Potassium
D. Hydrogen

415. Which of the following would be least affected in a specimen that has remained unpreserved at room temperature for more than 2 hours?
A. Urobilinogen
B. Ketones
C. Protein
D. Nitrite

416. Substances that show diurnal variation in their urinary excretion pattern are best evaluated using a
A. first morning specimen.
B. midstream "clean catch" specimen.
C. random specimen.
D. timed collection.

417. A 25-year-old woman complains of painful urination and is suspected of having a urinary tract infection. Which of the following specimens should be collected for a routine urinalysis and urine culture?
A. First morning specimen
B. Timed collection
C. Midstream "clean catch" specimen
D. Random specimen

418. A patient with oliguria might progress to having:
A. Nocturia
B. Polyuria
C. Polydipsia
D. Anuria

419. Prolonged exposure of a preserved urine specimen to light will cause:
A. Decreased glucose
B. Increased cells and casts
C. Decreased bilirubin
D. Increased bacteria

420. A patient presenting with polyuria, nocturia, polydipsia, and a low urine specific gravity is exhibiting symptoms of:
A. Diabetes insipidus
B. Diabetes mellitus
C. Urinary tract infection
D. Uremia

421. The most sterile specimen collected is a:
A. Catheterized
B. Midstream clean-catch
C. Three-glass
D. Suprapubic aspiration

422. Which of the following would not be given to a patient prior to the collection of a midstream clean-catch specimen?
A. Sterile container
B. Iodine cleanser
C. Antiseptic towelette
D. Instructions

423. All of the following are characteristics of recommended urine containers except:
A. A flat bottom
B. A capacity of 50 mL
C. A snap-on lid
D. Are disposable

424. A urine specimen may be rejected by the laboratory for all of the following reasons except the fact that the:
A. Requisition states the specimen is catheterized
B. Specimen contains toilet paper
C. Label and requisition do not match
D. Outside of the container has fecal material Contamination

425. A cloudy specimen received in the laboratory may have been preserved using:
A. Boric acid
B. Chloroform
C. Refrigeration
D. Formalin

426. Labels for urine containers are:
A. Attached to the container
B. Attached to the lid
C. Placed on the container prior to collection
D. Not detachable

427. The primary cause of unsatisfactory results in an un- preserved routine specimen not tested for 8 hours is:
A. Bacterial growth
B. Glycolysis
C. Decreased pH
D. Chemical oxidation

428. The average daily output of urine is:
A. 200 mL
B. 500 mL
C. 1200 mL
D. 2500 mL

429. An unidentified fluid is received in the laboratory with a request to determine whether the fluid is urine or another body fluid. Using routine laboratory tests, what tests would determine that the fluid is most probably urine?
A. Glucose and ketones
B. Urea and creatinine
C. Uric acid and amino acids
D. Protein and amino acids

430. The primary advantage of a first morning specimen over a random specimen is that it:
A. Is less contaminated
B. Is more concentrated
C. Is less concentrated
D. Has a higher volume

431. All of the following should be discarded in biohazardous waste containers except:
A. Urine specimen containers
B. Towels used for decontamination
C. Disposable lab coats
D. Blood collection tubes

432. Employees should not work with radioisotopes if they are:
A. Wearing contact lenses
B. Allergic to iodine
C. Sensitive to latex
D. Pregnant

433. The acronym PASS refers to:
A. Presence of vital chemicals
B. Operation of a fire extinguisher
C. Labeling of hazardous material
D. Presence of radioactive substances

434. If a red rash is observed after removing gloves, the employee:
A. May be washing her hands too often
B. May have developed a latex allergy
C. Should apply cortisone cream
D. Should not rub the hands so vigorously

435. Most useful marker for concentrating ability
a. SG
b. Osmolality
c. Glucose
d. Protein

436. High protein intake causes
a. alkaline urine
b. acidic urine
c. neutral
d. variable

437. A kidney contains how many nephrons?
a. 4-5 million
b. 1-1.5 million
c. 6-10 million
d. 8-9million

438. Amount of light to view casts
a. low light
b. high light
c. normal
d. good

439. Order of illumination microscope
a. stage> condenser> objectives
b. light source> stage> objectives> eyepiece
c. objectives> stage> condenser
d. eyepiece> stage> condenser> light source

440. Transitional epithelial cell shapes EXCEPT:
a. caudate
b. cuboidal
c. spherical
d. rectangular

441. black tarry stool indicates
a. upper GI bleeding
b. lower GI bleeding
c. cholera
d. constipation

442. Copper reduction reagent that prevents room air interference
a. sodium citrate
b. sodium sulfate
c. copper sulfate
d. sodium carbonate

443. WBC casts is associated with
a. glomerulonephritis
b. pyelonephritis
c. cystitis
d. necrosis

444. ketone body that is not measured by reagent strip
a. acetone
b. acetoacetic acid
c. B-hydroxybutyric acid

445. most critical step in handwashing
a. soap
b. water
c. friction
d. alcohol

446. Which of the following is an abnormal crystal described as a hexagonal plate?
a. Cystine
b. Tyrosine
c. Leucine
d. Cholesterol

447. The primary component of urinary mucus is:
a. Bence Jones protein
b. Microalbumin
c. Tamm-Horsfall protein
d. Orthostatic protein

448. Which of the following produces sweet or fruity odor in urine?
a. Bacteria
b. Ketone
c. Maple syrup urine disease
d. Phenylketonuria

449. Indicators change color even though the pH of the reagent remains constant:
a. pH
b. Specific gravity
c. Protein
d. Noneof these

450.Specimens from patients receiving treatment for urinary tract infections frequently appear:
a. Clear and red
b. Viscous and orange
c. Dilute and pale yellow
d. Cloudy and red

451. The double-indicator system used by commercial reagent strips to determine urine pH uses which two indicator dyes?
a. Methyl orange and bromphenol blue
b. Methyl red and bromthymol blue
c. Phenol red and thymol blue
d. Phenolphthalein and litmus

452. Crystals in an amber-colored urine that appear as clumped needles or granules with the characteristic yellow color. These crystals are characteristic of:
a. Acute glomerulonephritis
b. Acute pyelonephritis
c. Hepatic disorders
d. Lipiduria example, nephrotic syndrome

453. Mononuclear leukocytes are sometimes mistaken for:
a. Yeast cells
b. Squamous epithelial cells
c. Pollen grains
d. Renal tubular cells

454. Neutrophils lyse rapidly in:
a. Acetic acid
b. Ether
c. Dilute acid urine
d. Dilute alkaline urine

455. The master mix solution used for PCR contains which of the following reagents?
a. Deoxyribonucleotide triphosphates
b. Deoxyribonucleotide monophosphates
c. Deoxyribonucleosides
d. Ribonucleotide monophosphates

456. All are components of the Clinitest tablets, EXCEPT:
a. Copper sulfate
b. Lactose
c. Sodium carbonate
d. Sodium hydroxide

457. Positive result in the metachromatic staining procedure for mucopolysaccharides:
a. Black precipitate
b. White turbidity
c. Blue spot
d. Redspot

458. Which of the following is not a potential source of post examination errors?
a. Excessive delay in reporting or retrieving a test result
b. Interpretation of result
c. Verbal notification of test result
d. Labeling the specimen at the nurses' station

459. CSF cell count should be performed immediately, because WBCs and RBCs begin to lyse within:
a. 1 hour
b. 2 hours
c. 3 hours
d. 4 hours

460. Failure of laboratory personnel to document the time a semen sample is collected primarily affects the interpretation of semen:
a. Appearance
b. Volume
c. pH
d. Viscosity

461. Highly refractile spheres, usually with a dimpled center:
a. Hair fibers
b. Oil droplets
c. Pollen grains
d. Starch granules

462. In PASS, A stands for:
a. Activate
b. Alarm
c. Aim
d. Alert

463. Composition of urine:
a. Organic chemicals dissolved in water
b. Inorganic chemicals dissolved in water
c. Organic and inorganic chemicals
d. Organic and inorganic chemicals dissolved in water

464. Normal synovial fluid protein:
a. Less than 10 g/dL of protein
b. More than 10 g/dL of protein
c. Less than 3 g/dL of protein
d. More than 3 g/dL of protein

465. The principle of "protein error of indicators" is based on:
a. Protein changing the pH of the specimen
b. Protein changing the pKa of the specimen
c. Protein accepting hydrogen from the indicator
d. Protein giving up hydrogen to the indicator

466. Positive urine blood reagent pad:
a. Degrees of tan
b. Red to brown
c. Yellow to orange
d. Green to blue

467. Most common contamination in urine from female patients if it is not collected using the midstream clean-catch technique:
a. Mucus threads
b. Bacteria
c. WBCs
d. Squamous epithelial cells

468. A urine specimen with a pH of 9.0:
a. Is indicative of metabolic acidosis
b. Should be recollected
c. May contain calcium oxalate crystals
d. Is seen after drinking cranberry juice

469. Pharmaceutical and chemical wastes:
a. Yellow
b. Yellow with black band
c. Red
d. Orange

470. The uric acid concentration in synovial fluid is _____ to that in blood plasma.
a. Higher
b. Lower
c. Equivalent
d. Variable

471. How long is the tail of a sperm?
a. 20 um long
b. 35 um long
c. 45 um long
d. 55 um long

472. What is the second lens system which magnifies image from the objective lens?
a. Objective
b. Ocular
c. Condenser
d. Diaphragm

473. Brown pleural fluid:
a. Aspergillus infection
b. Chylous effusion
c. Hemothorax
d. Rupture of amoebic liver abscess

474. Family history of chromosome abnormalities, such as trisomy 21, amniocentesis may be indicated at:
a. 1to 14 weeks
b. 15 to 18 weeks
c. 20 to 42 weeks
d. Any of these

4475. Most frequently performed fecal analysis is the detection of:
a. Carbohydrates
b. Fats
c. Leukocytes
d. Occult blood

476. Specimen of choice for quantitative chemical analysis:
a. First morning
b. Timed
c. Random
d. MSCC

477. RTE cell from the proximal convoluted tubules:
a. Columnar or convoluted
b. Cuboidal
c. Round or oval
d. None of these

478. CSF cell count should be performed:
a. Immediately
b. Within 5 minutes
c. Within 30 minutes
d. Within 1 hour

479. Which of the following substances is not a component of normal feces?
a. Bacteria
b. Blood
c. Electrolytes
d. Water

480. When testing for drugs of abuse in urine, which of the following test results indicate dilution and would be cause for rejecting the sample?
a. Temperature upon sample submission 92°F
b. Specific gravity 1.002; Creatinine 15 mg/dL
c. pH5.8; temperature 94°F
d. Specific gravity 1.012, creatinine 25 mg/dL

481. When pyuria is detected in a sediment, the slide should be carefully checked for the presence of:
a. RBCs
b. Bacteria
c. Hyaline casts
d. Mucus

482. In the foam or shake test, amniotic fluid is mixed with:
a. 1%NaOH
b. 3%acetic acid
c. 70%ethanol
d. 95%ethanol

483. A classic test for differentiating between urobilinogen, porphobilinogen, and Ehrlich-reactive compounds:
a. SSAPrecipitation test
b. Watson Schwartz test
c. Copper Reduction test
d. Reagent strip test

484. Component of the Acetest tablet:
a. Copper sulfate
b. Lactose
c. Sodium carbonate
d. Sodium hydroxide

485. Which of the following conditions is associated with normal urine color but produces red fluorescence when urine is examined with an ultraviolet lamp?
a. Acute intermittent porphyria
b. Lead poisoning
c. Erythropoietic porphyria
d. Porphyria cutanea tarda

486. In severe yeast infection:
a. Gram-negative coccobacilli
b. Pear-shaped flagellate with undulating membrane
c. Oval structures that may or may not contain a bud
d. Appear as branched, mycelial form

487. A rapid test for FLM that does not require performance of thin-layer chromatography is:
a. AFPlevels
b. Amniotic acetylcholinesterase
c. Amniostat-FLM
d. Bilirubin scan

488. Maldigestion and malabsorption contribute to:
a. Osmotic diarrhea
b. Secretory diarrhea
c. Either of these
d. None of these

489. If refrigeration is used to preserve a urine specimen, which of the following may occur?
a. Cellular or bacterial glycolysis will be enhanced
b. Formed elements will be destroyed
c. Amorphous crystals may precipitate
d. Bacteria will proliferate

490. All of the following are not found in normal CSF, EXCEPT:
a. IgM
b. IgG
c. Fibrinogen
d. Beta lipoprotein

491. Test for _____ requires patients on a diet that contains green vegetables.
a. Bilirubin
b. Glucose
c. Ketone
d. Nitrite

492. Identify the correct sequence of events for a polymerase chain reaction (PCR) cycle.
a. Anneal, extend, and denature
b. Denature, anneal, and extend
c. Extend, anneal, and denature
d. Extend, denature, and anneal

493. The most reliable differentiation of transudate and exudate is usually obtained by:
a. Rivalta's test
b. Determining the WBC count
c. Determining the fluid: blood ratios for protein and LDH
d. Determining the pleural fluid: serum cholesterol ratio

494. Hyaline cast in KOVA stain:
a. Dark shade of orange-purple
b. Dark shade of blue-purple
c. Pale pink or pale purple
d. Donot stain

495. Direct fat stain:
a. 10%alcoholic eosin
b. 1%sodium hydroxide
c. Sudan III in 95% ethanol
d. Sudan III, acetic acid and heat

496. Type of microscope used for routine urinalysis:
a. Bright-field microscope
b. Phase contrast microscope
c. Polarizing microscope
d. Interference contrast microscope

497. The presence of phosphatidylglycerol in amniotic fluid fetal lung maturity tests must be confirmed when:
a. Hemolytic disease of the newborn is present
b. The mother has diabetes
c. Amniotic fluid is contaminated by hemoglobin
d. Neural tube disorder is suspected

498. Which inorganic substance has the highest concentration in urine?
a. Creatinine
b. Sodium
c. Phosphates
d. Urea

499. Centrifugation for urine microscopic examination:
a. RCFof100 for 2 minutes
b. RCFof400 for 5 minutes
c. RCFof500 for 5 minutes
d. RCFof500 for 10 minutes

500. What should you do to a positive drug test specimen if it has not been contested within 15 days?
a. Dispose in the sink
b. Freeze in the refrigerator
c. Dispose as biohazard
d. Record then discard