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MEDICAL TECHNOLOGY REVIEWER
MICROBIOLOGY

1. **Which of the following produces macroconidia that are large, multicellular and club-shaped with smooth walls?**
a. *Fonsecaea pedrosi*
b. *Microsporum audouinii*
c. *Trichophyton rubrum*
d. *Epidermophyton floccosum*

2. **Corn meal agar test is used to identify *Candida albicans* through the organism's production of:**
a. Chlamydospore
b. Urease
c. Germ tube
d. Inositol

3. **This presumptive test for *Candida* uses serum.**
a. Germ tube test
b. Latex agglutination
c. Hair perforation test
d. Chlamydospore test

4. In order to demonstrate of the encapsulated yeast *Cryptococcus neoformans* in wet preparations of patient specimens, what should be used?
a. Methylene blue
b. India ink
c. Malachite green
d. Safranin

5. **Which of the following is diagnostic for chromoblastomycosis?**
a. Flowerette conidia
b. Asteroid body
c. Sclerotic body
d. Germ tube

6. **Rose gardener's disease:**
a. Sporotrichosis
b. Histoplasmosis
c. Coccidioidomycosis
d. Blastomycosis

7. **Which of the following media identifies species of *Aspergillus*?**
a. Urease medium
b. Rice agar
c. Czapek's agar
d. Blood agar

8. **Which of the following parasite larva can be isolated in sputum?**
a. *Paragonimus westermani*
b. *Entamoeba histolytica*
c. *Taenia saginata*
d. *Ascaris lumbricoides*

9. **The following are techniques used for detection of parasitic infection and their corresponding causative agent. Which of the following is correctly matched?**
a. Harada Mori Technique and *Capillaria philippinensis*
b. Xenodiagnosis and *Leishmania*
c. Knott's Technique and Microfilariae
d. Sellotape Method and *Trichuris trichiura*

10. **Proper collection of a sample for recovery of *Enterobius vermicularis* includes collecting:**
a. A 24-hour urine collection
b. A first morning stool with proper preservative
c. Capillary blood
d. A scotch tape preparation from the perianal region

11. **Heart-lung migration except:**
a. Roundworm
b. Whipworm
c. Hookworm
d. Seatworm

12. ***Diphyllobothrium latum* adult resembles the adult form of:**
a. *Paragonimus westermani*
b. *Echinococcus granulosus*
c. *Taenia saginata*
d. *Spirometra*

13. **Second intermediate host of *Paragonimus westermani*:**
a. Snail
b. Fish
c. Freshwater crab
d. Vegetation

14. **What is a schistosomule?**
a. Cercaria minus a tail
b. Cercaria minus a head

c. Metacercaria
d. Cercaria with a tail

15.The third *teania spp.*:

a. *T. asiatica*
b. *T. crassiceps*
c. *T. taeniaeformis*
d. *T. saginata*

16.The definitive host to *Plasmodium* is the:

a. Tsetse fly (*Glossina*)
b. Sandfly (*Phlebotomus*)
c. Mosquito (*Female Anopheles*)
d. Reduviid bug (*Male Triatoma*)

17.What is the infective stage of *Leishmania spp.* to humans?

a. Amastigote
b. Trypomastigote
c. Promastigote
d. Sporozoites

18.Cytomegalovirus isolation is best accomplished using:

a. Monkey kidney cells
b. A549 cells
c. Human embryonic fibroblasts
d. Embryonated hen's eggs

19.It is the smallest RNA virus:

a. Enterovirus
b. Picornavirus
c. Cytomehalovirus
d. Togavirus

20.Enteroviruses can be differentiated from rhinoviruses by:

a. Size
b. Ether stability
c. Ribonuclease treatment
d. Acid resistance

21.**A medium that aids in the presumptive identification of organisms based on their appearance on the medium is called:**

a. Enriched
b. Differential
c. Selective
d. Transport

22.**Which of the following is a suitable transport medium for bacteria and virus?**

a. Phosphate buffered sucrose (2SP)
b. Hank's balanced salt solution
c. Eagles minimum essential medium
d. Stuart's medium

23.**Lysostaphin susceptibility is a test used to differentiate:**

a. *Staphylococcus spp.* from *Micrococcus spp.*
b. *Streptococcus spp.* from *Staphylococcus spp.*
c. *Staphylococcus spp.* from *Pseudomonas spp.*
d. *Streptococcus spp.* from *Micrococcus spp.*

24.Prosthetic heart valve endocarditis is most commonly caused by this staphylococcal species:

a. *S. aureus*
b. *S. epidermidis*
c. *S. saprophyticus*
d. *S. pyogenes*

25.Which *Staphylococcus spp.* is resistant to 5µg novobiocin?

a. *S. aureus*
b. *S. epidermidis*
c. *S. saprophyticus*
d. *S. pyogenes*

26.In the β-lactamase chromogenic cephalosporin method, which of the following indicates a positive reaction?

a. Production of acid
b. Reduction of nitrates
c. Color change
d. Turbidity

27.The following are DNase positive, except:

a. *Staphylococcus aureus*
b. *Neisseria gonorrhoeae*
c. *Moraxella catarrhalis*
d. *Serratia marcescens*

28.**For the antibiotic susceptibility testing of group A beta-hemolytic streptococci, how many units of bacitracin is used?**

a. 10.00
b. 0.02 – 0.04
c. 5.00
d. 1.00 – 2.00

29.**Characteristically, species from the genus *Enterococcus* are:**

a. Unable to grow in 6.5% NaCl

b. Bile esculin positive
c. Relatively sensitive to penicillin
d. Sodium hippurate negative

30.A positive Quellung test is:

a. Virtual proof that the organism is a pathogen
b. Visible only by fluorescent light
c. From capsular swelling due to an antigen-antibodyreaction
d. Oxidation but not fermentation

31.**A medical technologist cultured a specimen from a suspected cystic fibrosis patient. After 24 hours of incubation, the MT noticed colonies which were spreading and flat, with serrated edges and a metallic sheen. There was a characteristic corn taco-like odor. Identify the bacteria.**

a. *Klebsiella pneumoniae*
b. *Escherichia coli*
c. *Staphylococcus aureus*
d. *Pseudomonas aeruginosa*

32.***Serratia* strains are readily differentiated from *Klebsiella* on the basis of their:**

a. Failure to produce gas from inositol
b. Slowness and reluctance to ferment lactose
c. Rapid gelatin liquefaction
d. All of the above

33.**Diagnosis of typhoid fever can be confirmed best by culture of:**

a. Stool
b. Urine
c. Bone marrow
d. Blood

34.**Cultures of *Staphylococcus* supplies which of the following for cultures of *Haemophilus*?**

a. III factor
b. I factor
c. X factor
d. V factor

35.**String test is used for the diagnosis of which bacteria?**

a. *Stenotrophomonas maltophilia*
b. *Elizabethkingia meningoseptica*
c. *Vibrio cholerae*
d. *Campylobacter jejuni*

36.**Which diphtheroid has the same morphology as *Corynebacterium diphtheriae* on blood agar plate (BAP)?**

a. *C. ulcerans*
b. *C. minutissimum*
c. *C. jeikeium*
d. *C. urealyticum*

37.*Mycobacterium tuberculosis* is best differentiated from *Mycobacterium bovis* by:

a. Growth rate
b. Niacin and nitrate reduction tests
c. Hydrolysis of Tween 80
d. Catalase test at 68°C

38.Woolsorter's disease is caused by the ___ form of anthrax.

a. Gastrointestinal
b. Cutaneous
c. Pulmonary
d. Urinary

39.Which anaerobic, gram-positive rods produce terminal "lollipop" spores?

a. *Clostridium tetani*
b. *Eubacterium lentum*
c. *Clostridium butyricum*
d. *Bacteroides ureolyticus*

40.In water bacteriology, the following are used as confirmatory test media except:

a. Lactose broth
b. Endo agar
c. Eosin methylene blue agar
d. Brilliant green lactose broth

1. How to prepare agar plates?

a. 1/3water first
b. Pour all agar first
c. ½ agar first
d. Pour all water first

2. Water bacteriology completed test?

a. Gram neg, non-sporulating on agar slant
b. Lactose broth -Acid with gas
c. Metallic sheen on EMB
d. Lactose broth -Acid only

3. By product of acetamide utilization?
a. Carbon dioxide
b. Ammonia
4. Incubation period for fungal development in bone marrow and CSF?
a. 14 days
b. 7 days
c. 28 days
d. 20 days
5. **Microscope for spirochetes**
a. Brightfield
b. Fluorescent
c. Electron
d. Phase contrast

6. How is water bacteriology reported?
a. CFU
b. Colonies/ml
c. MPN/100ml
d. IU/ml
7. Household bleach inactivated at?
a. 1 hour
b. 60 minutes
c. 10 minutes
d. 60 seconds
8. **What is bench marking? Asked twice.**
a. Interlaboratory marketing (1st)
b. Interlaboraty monitoring (2nd)
c. Bench so others have space
d. Comparing results with peers
9. **Gravid segments contain?**
a. Male reproductive organ
b. Female reproductive organ
c. Egg
d. Scolex

10. **Recovered from cestodes in stool are?**
a. Filariform larva
b. Microfilaria
c. Ova
d. Proglottids, scolex, ova

11. **Enhancement media?**
a. BAP
b. Thioglycollate broth
c. Selenite broth
d. all

12. Elevated cream yellow colored colonies?
a. Staphylococcus epidermidis
b. Staphylococcus haemolyticus
c. Staphylococcus aureus
d. ALL

13. **Optochin test for S. pneumonia?**
a. <10 mm zone of inhibition in 6mm disk
b. >14mm zone of inhibition in 6mm disk
c. <14mm zone of inhibition in 6mm disk
d. >16mm zone of inhibition in 6mm disk

14. **Double zone of hemolysis?**
a. **C. perfringes**
b. C. difficile
c. C. botulinum
d. B. cereus

15. Cause of whooping cough?
a. Bordetella parapertusis
b. Bordetella pertussis
c. Bordetella bronchiseptica
d. ALL

16. Test for influenza & rubella?
a. Hemagglutination inhibition
b. Neutralization
c. MIT

17. **True of Leptorspirosis**
a. Smear of urine sediment for diagnosis
b. Difficult to stain and look for in microscope
c. Stained with PAPs
d. all
18. **Best Quality control in parasitology Laboratory**
a. Slides with ova and adult
b. Hanging drop from preserved stools
c. Parasitology atlas
d. all

19. **Stool delayed for 30 minutes must be transported in**

a. **Stuart medium**
b. Anderson medium
c. Francis medium
d. Saline Mary medium

20. Undulating membrane (MOORSE TYPE)
a. Trichomonas
b. Euglena
c. Giardia
d. Trypanosoma

21. **Rhabditiform larvae:** Thread worm
22. **Stool sample enrichment:** Selenite broth
23. **Vinegar:** flukes can't be killed
24. **True of schistosomiasis**: Skin penetration of cercaria in contaminated water
25. **Normal oral flora**: Viridans
26. **Common pathogen**: Group A
27. **Stool contaminated with S. aureus what to do?** Plate with MSA (7.5%NaCl)
28. **8 nuclei**: Entamoeba coli.
29. **Differentiate histolytica and hartmanii:** size
30. **90% cause of malaria:** Falciparum and vivax
31. **POCT for dx of malaria**: Falciparum, vivax, malariae
32. **Dwarf:** H. nana
33. **Herpesviridae**-ether sensitive
34. **True of W.bancroftii**: no terminal nuclei (B. malayi yun)
35. **Cutaneous larva migrans:** Ancylostoma brasilense
36. **Used in coagulase test:** Human

CLINICAL CHEMISTRY

1.Method of urea determination that is inexpensive but lacks specificity:
a. Colorimetric and point
b. Enzymatic
c. Colorimetric kinetic
d. IDMS

2. Method of measurement of ceratinine that measures ammonia colorimetrically or with ISE:
a. Colorimetric and point
b. Enzymatic
c. Colorimetric kinetic
d. IDMS

3. One international unit of enzyme activity is the amount of enzyme that under specified reaction conditions of substrate concentration, pH and temperature, causes usage of substrate at the rate of:
a. 1 millimole/min
b. 1 nanomole/min
c. 1 micromole/min
d. 1 picomole/min

4. Which of the following enzymes are classified as transferases?
1. ACP
2. ALP
3. PK
4. Glycogen phosphorylase
a. 1, 2, 3 and 4
b. 1, 2 and 4
c. 1, 2 and 3
d. 1 and 2
e. 3 and 4

5. This measures the amount of reducing sugars produced by the hydrolysis of starch by the usual glucose methods. Classic reference method expressed in Somogyi units
a. Saccharogenic
b. Chromogenic
c. Amyloclastic
d. Coupled-enzyme

6. The reference method for determination of lipase:

a. Tietz and Fiereck
b. Peroxidase coupling
c. Cherry Crandal
d. Kermen

7. When an enzyme requires an inorganic substance such as zinc for activity, this substance is termed as a(n):

a. Activator
b. Conezyme
c. Facilitator
d. Regulator

8. Which of the following are considered primary tissue source of alkaline phosphatase?

a. Liver, bone, kidney
b. Liver, heart, kidney
c. Kidney, pancreas, heart
d. Prostate, liver, bone

9. Which of the following enzymes exhibits the least tissue specificity?

a. ACP
b. AST
c. CK
d. LD

10. Which of the following may be associated with the creatine kinase isoenzymes?

a. CK-1 referred to as CK-MM
b. CK-3 remains close to the origin during electrophorosis
c. CK-MM is found in skeletal muscles
d. Both B and C
e. A, B and C

11. Which of the following enzymes is most useful in establishing the hepatic origin of an elevated serum alkaline phosphatase?

a. Alanine aminotransferase
b. Aspartate aminotransferase
c. Ornithine carbamyltransferase
d. Gamma-glutamyltranspeptidase
e. Lactate dehydrogenase

12. In the Bessey-Lowry-Brock method for determining alkaline phosphatase activity, the substrate used is:

a. Monophosphate
b. Phenylphosphate
c. Disodium phenylphosphate
d. Para-nitrophenylphosphate

13. Regan isoenzyme has the same properties as alkaline phosphatase that originates in the:

a. Skeleton
b. Intestine
c. Kidney
d. Placenta

14. Which of the following may be classified as being a function of the liver?

a. Detoxification of drugs
b. Excretion of bile acids
c. Metabolism of glucose
d. Synthesis of proteins
e. All of the above

15. Increased blood ammonia levels may be associated with:

a. Hepatic encephalopathy
b. Neurological changes
c. Coma
d. Both B and C
e. A, B and C

16. Which of the following methods estimates the urine sugar concentration by measuring total reducing substances?

a. Copper sulfate
b. Glucose oxidase
c. Hexokinase
d. Ferricyanide

17. A patient with insulinoma may exhibit dizziness and fainting attributable to:

a. Acidosis
b. Ketosis
c. Hypoglycemia
d. Hyperglycemia

18. Precipitating agents used to remove VLDL and HDL from serum so that only the HDL cholesterol remains for measurement include all of the following, except:

a. Citrate/fluoride
b. Heparin/manganese
c. Phosphotungstate/magnesium
d. Dextran sulfate

19. Which electrolyte is significantly involved in the transmission of nerve impulse?
a. Iron
b. Phosphorus
c. Potassium
d. Sodium

20. The composition of the electrode used to measure blood pH is:
a. Glass
b. Plastic
c. Platinum
d. Valinomycin

21. The role of calciumin body metabolism is that of:
a. Structural contribution to bone formation
b. An activator of the coagulation system
c. Facilitating transmission form of nerve impulse
d. Both A and B
e. A, B and C

22. The physiologically active form of calcium is:
a. Complexes
b. Ionized
c. Lipid-bound
d. Protein-bound

23. A hospitalized patient is experiencing increased neuromuscular irritability (tetany). Which of the following tests should be ordered immediately?
a. Calcium
b. Phosphorus
c. BUN
d. Glucose

24. The formation of molybdenum blue complex is assocaited with the quantitation of:
a. Calcium
b. Iron
c. Magnesium
d. Phosphate

25. Which of the following clinical disorders is/are associated with magnesium deficiency?
a. Tetany
b. Convulsions
c. Abnormal cardiac rhythm
d. Both A and B
e. All of the above

26. Increased anion gap:
1. Uremia
2. Poisoning by methanol
3. Ketoacidosis
4. Hypoalbuminemia

a. 1 and 3
b. 2 and 4
c. 1, 2 and 3
d. 1, 2, 3 and 4

27. Glucose tolerance factor contains the following trace metal:
a. Copper
b. Chromium
c. Selenium
d. Zinc

28. The following metal is most associated with the "dimentia of dialysis":
a. Aluminum
b. Fluorine
c. Cadmium
d. Zinc

29. An emphysema patient suffering from fluid accumulation in the alveolar spaces is likely to be in what metabolic state?
a. Respiratory acidosis
b. Metabolic acidosis
c. Respiratory alkalosis
d. Metabolic alkalosis

30. The neurohypophysis is the:
a. Hypothalamus
b. Anterior pituitary
c. Pineal gland
d. Thyroid gland
e. Posterior pituitary

31. The anterior pituitary produces all of the following hormones, except:
a. ACTH
b. FSH
c. PTH
d. TSH

32. For a hormone to be biochemically active and able to bind its receptor site, the hormone must be:
a. Bound to glucose
b. Bound to lipoprotein

c. Bound to protein
d. Free, not bound to protein

33. Which amino acid is directly involved in thyroid synthesis?
a. Alanine
b. Glutamine
c. Threonine
d. Tyrosine

34. TSH test is the most important thyroid function test. The best screening test. It is increased in:
1. primary hypothyroidism
2. hashimoto's thyroidism
3. thyrotoxicosis due to pituitary tumor
4. primary hyperthyroidism
a. 1 and 3
b. 2 and 4
c. 1, 2 and 3
d. 1, 2, 3 and 4

35. In patients with developing subclinical hyperthyroidism, TSH levels will likely be ___, and fT4 will be likely ___.
a. Decreased, increased
b. Increased, decreased
c. Decreased, normal
d. Increased, normal

36. Which of the following tests may be used in the differential diagnosis of depression?
a. ACTH stimulation test
b. Dexamethasone suppression test
c. Metapirone inhibition test
d. Metyrapone inhibition test

37. The parent substance in the biosynthesis of androgens and estrogen is:
a. Cortisol
b. Catecholamines
c. Progesterone
d. Cholesterol

38. The biologically most active, naturally occuring androgen is:
a. Androstenedione
b. Epiandrosterone
c. Dehydroepiandrosteron
d. Testosterone

39. The amino acid that is the immediate precursor for the biogensis of the catecholamine is:
a. Tryptophan
b. Threonine
c. Tyrosine
d. Phenylalanine

40. All of the following biochemical changes are seen during pregnancy, except:
a. Decreased albumin
b. Increased alkaline phosphatase
c. Increased FSH and LH
d. Increased estrogens

41. Major actions of angiotensin II include:
a. Increased pituitary secretion of rennin
b. Increased parathyroid hormone secretion by the parathyroid
c. Increased vasoconstriction
d. Decreased adrenal secretion of aldosterone

42. Estrogen and progestrogen receptor assays are useful in assessing prognosis in which of the following?
a. Ovarian cancer
b. Endometriosis
c. Breast canser
d. Amenorrhea

43. Zinc protoporphyrin or free erythrocyte protoporphyrin measurements are useful to assess blood concentrations of:
a. Lead
b. Mercury
c. Arsenic
d. Beryllium

44. Pharmacological parameters that determine serum drug concentration:
1. Liberation
2. Absorption
3. Distribution
4. Metabolism
5. Excretion
a. 1 and 3
b. 2 and 4
c. 1, 2, 3 and 4
d. 1, 2, 3, 4 and 5

45. A cardiac glycoside that is used in the treatment of congenital heavy failure

and arrythmias by increasing the force and velocity of myocardial contraction is:

a. Digoxin
b. Acetaminophen
c. Lithium
d. Phenytoin

46. It is used for treatment of petit mal (absence seizure) and grand mal.

a. Theophylline
b. Lithium
c. Valproic acid (Depakene)
d. Digoxin

47. The drug of choice for controlling petit mal (absence seizure).

a. Phenobarbital
b. Carbamazepine
c. Vancomycin
d. Ethosuximide (Zarontin)

48. All of the following may be used to cleanse the skin when drawing blood for ethanol analysis, except:

a. Alcohol swab
b. Merthiolate
c. Soap and water
d. Zephiran

49. Substances with modified structures that are analogs of prescription pharmaceuticals or abused are known as:

a. Designer drugs
b. Generic drugs
c. Trade drugs
d. Toxic drugs

50. Morphine is the major metabolism of:

a. Cocaine
b. Heroin
c. Marijauna
d. Phnecyclidine

1. The process that encompasses all aspects of laboratory operating including patient identification, specimen collection, equipment maintenance, and the reporting of patient results:

a. Accuracy
b. Reliability
c. Quality assurance
d. Quality control

2. The process that monitor's each laboratory analysis, using material with known constituent concentrations, in order to ensure the accuracy of the test results is:

a. Pooled control
b. Quality assurance
c. Quality control
d. Accuracy monitoring

3. A technique used to detect unlikely combination of values.

a. Previous value check
b. Alert check
c. Pattern recognition
d. Randomized duplicate specimens

4. A mean value of 100 and standards deviation of 1.8 mg/dL were obtained from a set of glucose measurements on a control solution. The 95% confidence interval in mg/dL would be:

a. 94.6-105.4
b. 96.4-103.6
c. 97.3-102.7
d. 98.2-101.8

5. The following five sodium control value (mEq/L) were obtained:
140, 135, 138, 140, 142
Calculate the coefficient of variation.

a. 1.9%
b. 5.6%
c. 2.7%
d. 6.1%

6. This test is used to compare means between two groups of data.

a. T-test
b. Pattern recognition
c. F-test
d. Average of normal

7. If the sample population and the method used in the same as those described in the manual, what is the minimum number of individuals that can be tested to obtain the reference range,

provided that no more than 2 results outside the expected range?

a. 5
b. 15
c. 10
d. 20

8. The pairest type of reagent water is:

a. Type I
b. Type II
c. Type III
d. All

9. Type of extinguisher for Class C fires:

a. Water, dry chemical, loaded stream
b. Carbon dioxide, dry chemical, halon
c. Metal X
d. None

10. Chemicals should be stored:

a. Alphabetically, for easy accessibility
b. Inside a safety cabinet with proper ventilation
c. According to their chemical properties and classification
d. Inside a fume hood, if toxic vapors can be released when opened

11. 20°C = ___°F

a. 25
b. 53
c. 68
d. 86

12. 75°F = ___°C

a. 15.5
b. 21.0
c. 23.8
d. 32.6

13. It is used for nonviscous fluid, self-draining; small amount left in the tip should not be blown out.

a. Volumetric pipet
b. Ostwald Folin
c. Micropipattes
d. Pasteur pipet

14. The etched rings on the top of a pipette means:

a. The pipette should be allowed to drain and the last drop should remain in the pipette
b. The last drop is to be known out after the pipettes drain
c. The pipette is color coded
d. The pipette is a volumetric pipette

15. The preferred length of the lancet for skin puncture should be ___ to avoid penetrating the bone.

a. 1.75 mm
b. 2.0 mm
c. 2.25 mm
d. 2.5 mm

16. Specimens that require chilling (4°C)

1. Ammonia
2. Lactic acid
3. Blood gases
4. Renin

a. 1 and 3
b. 2 and 4
c. 1, 2 and 3
d. 1, 2, 3 and 4

17. A medical technologies on duty in the Clinical Chemistry section received a sterile bottle containing CSF. What should he or she do first?

a. Centrifuge the fluid
b. Measure the volume
c. Put it inside the freezer set at 2o degrees Celsius
d. should verify if it is the only bottle collected from the patient

18. Analytical testing performed outside the confines of the central laboratory, usually by nonlaboratorian personnel (nurse, respiratory therapist etc.)

1. Point of care testing (POCT)
2. Decentralized testing
3. Near-patient testing
4. Alternate site testing

a. 1 and 3
b. 2 and 4
c. 1, 2 and 3
d. 1, 2, 3 and 4

19. Beer's law states that the concentration of a substance is (1)___ proportional to the amount of light absorbed or (2)___ proportional to the logarithm of the transmitted light.

a. Directly, inversely
b. Inversely
c. Both directly proportional

d. Both inversely proportional

20. The more light absorbed, the higher the concentration of analyte in this technique of measuring the amount of light absorbed by a solution.

a. Atomic absorption

b. Fluorometry

c. Nephelometry

d. Spectrophotometry

21. The process by which fluorescence of an analyte is reduced due to the excited molecule losing some of its energy by interacting with other substances in solution is known as:

a. Ionization

b. Quenching

c. Phosphorescence

d. Self-absorption

22. One sample sequentially following another through the system so that different analytical functions are being carried on simultaneously on more than one sample best describes:

a. Automatic clinical analysis

b. Centrifugal analysis

c. Continuous-flow analysis

d. Dry-slide analysis

23. Direct injection of a sample into very small diameter tubing, thus minimizing lateral diffusion best describes:

a. Automatic clinical analysis

b. Centrifugal analysis

c. Continuous-flow analysis

d. Flow-injection analysis.

24. Which analyzer requires that the sample and reagent be pipeted inyo separate chambers in a rotor prior to the chemical analysis being performed?

a. Centrifugal

b. Continuous flow

c. DuPont aca

d. Kodak dry, slide

25. An instrument that can analyze patient samples for only those tests specifically ordered and can analyze stat samples by interrupting the normal sequence of patient analyses is referred to as:

a. Batch analyzer

b. Discrete analyzer

c. Multitest analyzer

d. Random-access analyzer

26. In a chemical reaction, the amount of product formed is measured at specific intervals during a specified period and then related to the concentration of the analyte in the unknown. This type of measurement is known as:

a. Colorimetric

b. End-point

c. Rate

d. Ultraviolet

27. Dubowski method for glucose utilizes:

a. Phosphomolybdic acid

b. Arsenomolybdic acid

c. Ortho-toluidine

d. Potassium ferricyanide

28. C-peptide is formed during the conversion of pro-insulin to insulin. The amount of circulating C-peptide provides reliable indicators for pancreatic and insulin secretions (beta cell function). It is decreased in:

a. Insulinoma

b. Ingestion of hypoglycemic drugs

c. Type 1 DM

d. Type 2 DM

29. CSF glucose concentration is approximately ___ that of plasma concentration.

a. 50%

b. 60-70%

c. 80-100%

d. 65-85%

30. Every 1% change in the HBA1C value causes a change of approximately ___ in the plasma glucose.

a. 10 mg/dL

b. 25 mg/dL

c. 15 mg/dL

d. 35 mg/dL

31. A turbidimetric method used for the quantitation of total protein in urine and cerebrospinal fluid specimens is:

a. Biuret

b. HABA

c. Coomassie blue

d. SSA

32. Which of the following nutritional markers has been found to be most sensitive and helpful indicator of nutritional status in very ill patients?

a. Transthyretin
b. Transferrin
c. Albumin
d. Somatomedin C

33. Patient with Nephrotic Syndrome is expected to have which of the following results in serum protein electrophoresis?

a. Decreased in all fractions except albumin region
b. Decreased in all fractions except alpha 1 region
c. Decreased in all fractions except alpha 2 region
d. Decreased in all fractions except beta region

34. Decreased serum albumin levels may be associated with:

a. Malnutrition
b. Liver disease
c. Kidney disease
d. Both B and C
e. A, B and C

35. Which of the following is a negative acute phase reactant?

a. Prealbumin
b. Ceruloplasmin
c. Albumin
d. Haptoglobin

36. A protein that precipitates in acid solution but redissolves upon heating best describes:

a. Albumin
b. Bence Jones
c. Haptoglobin
d. Transferrin

37. Which dye may be used to stain serum protein fractions following electrphorosis?

a. Amido black
b. Ponceau S
c. Fat red
d. Both A and B
e. A, B and C

38. The method of choice for quantifying protein fractions following electrophoresis?

a. Densitometry
b. Fluorometry
c. Spectrophotometry
d. Nephelometry

39. The acute-phase reactant that is able to inhibit enzymatic proteolysis is:

a. Alpha$_1$ antitrypsin
b. Complement
c. Haptoglobin
d. Prealbumin

40. The screening procedure useful in detecting PKU is:

a. Copper reduction
b. Glucose oxidase
c. Ferric chloride
d. Nitroprusside

41. Which of the following elevates carboxyhemoglobin?

a. Nitrite poisoning
b. Exposure to carbon monoxide
c. Sulfa drug toxicity
d. Sickle cell anemia

42. CDC reference method for determination of cholesterol:

a. Liebermann Burchardt reaction
b. Salkowski reaction
c. Cholesterol oxidase reaction
d. Abell, Levy and Brodie method

43. When TAG and LDL-c are being measured, fasting becomes a requirement. Require fasting of patients:

a. 2 to 4 hours
b. 4 to 6 hours
c. 6 to 8 hours
d. 12 to 14 hours

44. A cholesterol QC chart has the following date for the normal control:

x = mean of data
x = 137 mg/dL Sx = 1,918 mg/dL
2 SD = 6 mg/dL N = 14

The coefficient of variation for this control is:

a. 1.14%
b. 4.38%

c. 2.19%
d. 9.49%

45. The function of the major lipid components of the very low density lipoproteins (VLDL) is to transport:

a. Cholesterol from peripheral cells to the liver
b. Exogenous triglycerides
c. Cholesterol and phospholipids to peripheral cells
d. Endogenous triglycerise

46. What is the reference method for quantitation of lipoproteins (LPPs)

a. Liberman Burchardt
b. Van Handel and Zilversmith
c. Abell-Kendall
d. Ultracentrifugation

47. Which of the following lipoproteins is the smallest of all the lipoproteins and is composed of 50% proteins?

a. HDL
b. LDL
c. Chylomicrons
d. Triglycerides

48. It is the major and product from the cetabolism of VLDL. It constitutes about 50% of the total LPP in plasma:

a. CM
b. LDL
c. VLDL
d. HDL

49. Which of the following would be most adversely affected by a nonfasting sample?

a. HDL
b. Cholesterol
c. LDL
d. Triglycerides

50. Method of uric acid determination that has problem with turbidity and several common drugs interface:

a. Colorimetric
b. Enzymatic H2O2
c. Enzymic UV
d. IDMS

1. What does U stand for in Clearance = urine UxV/P? Urine Creatinine in mg/dl
2. 12 mg/dl of uric acid to mmol/l = 0.71
3. TC=200; HDL=30; TAG=150 compute for LDL = 140mg/dl
4. Which one is not needed in computation for LDL?

LDL = TC – (HDL + VLDL)

a. HDL
b. VLDL
c. TAG- indirectly needed
d. TC

5. Abrupt change to new mean in Levy Jenning's chart

a. Dispersion
b. Shift
c. Trend

6. Hypothyroidism T3 and T4 uptake are?

a. Both high
b. Both low
c. One is very high and one is moderately high
d. Inversely proportional

7. Primary hyperthyroidism with normal T4. Confirm with

a. TBG
b. TSH
c. T3 uptake

8. Chloride and Bicarbonate relationship? Reciprocal
9. Active male hormone? Testosterone
10. Screening test for Cushing's syndrome

a. Low dexamethasone -----
b. 24 hour urine cortisol
c. All items
d. Insulin hypoglycaemia test

11. Hepatic jaundice: Increase in direct and indirect bilirubin (both)
12. Cholelithiasis: Increase in unconjugated bilirubin (increase TB > 90% is conjugated)
13. In case of liver transplant which are monitored? Hepatic enzymes, Bilirubin, Coagulation factos
14. Glucose oxidase negative; Benedict's test positive in new born: Inborn error of metabolism
15. TAG has fasting 12-15 hrs (ideal- 12hrs)
16. RACE meaning. = rescue, alarm, contain, extinguish

17. <50 mg/dl alcohol level or 0.05%. What is the presumption
a. Not under influence of alcohol
b. Presumed to be under influence of alcohol
c. No presumption can be done
18. Endogenous TAG: VLDL
19. Exogenous TAG: Chylomicrons
20. HEPA meaning= high efficiency particulate air
21. Uricase: Enzymatic:H202
22. Fahey and Mancini method: Fahey 48-72 hours and sensitive
23. Convert 0.5mg/dl IgD to mmol/L: 5.0
24. pH measurement: Potentiometry
25. Involved in female hormones:
a. Hirsutism
b. Polycistic ovarian dse
c. Infertility
d. All
26. pC02: increase 3% when increase 1' temp
27. Blood with no anticoagulant blood glucose decreases: 7mg/dl per hour
28. Activity depends on increase substrate concentration. Increase in substrate - - - - -for enzyme excess: First order kinetics
29. Rape victims: ACP
30. Renal threshold for glucose: 160-180mg/dl
31. Which enzyme is the least specific?
a. LDH
b. ALT
c. CK
d. ACP
32. Increase in gauge of needle: decrease in bore of needle.
33. All are true for Sodium except: for nerve impulses
34. Middle value of date: Median
35. Frequently seen in date: Mode
36. Total divided by the number of populations: Mean
37. True about continuous flow:
a. Use of separate cuvets
b. Use of stirring rod
c. Continuous tubing
d. Allows STAT
38. Differentiate VLDL from LDL and HDL: TAG and chole content daw po (?)
39. Characteristics of DM: Destruction of B cells (sa pancreas hindi sa immunes system ibig sabihin nito); deficiency of insulin receptors; increase blood glucose
40. Which of the following is not considered emergency: ans is Glycosuria
41. Measure of substance in relation to other substance in solution: concentration
42. Color of <350 nm
a. Red
b. Orange
c. UV
d. Infrared
43. Newborn screening:
a. Blood spot test
b. Capillary
c. Venipuncture
d. Heat at 42'c----
44. LDL mmol/L: use TAG/2.175 (Binigay po both friedwald and de long but friedwald ang commonly used)
45. Variation in basal state: exercise, diet (All of the above)

HEMATOLOGY

1. The degree of effective erythropoiesis is best assessed by:
a. Serum iron labels
b. Hemoglobin determinations
c. Ferrokinetic studies with Fe^{59}
d. Reticulocyte counts

2. Any turbidity in a peripheral blood specimen will result in a falsely elevated hemoglobin determination. Which of the following is NOT a potential source of turbidity?
a. Lipemia
b. Increased leukocyte counts
c. Increased level of carboxyhemoglobin
d. Presence of hemoglobin S

3. The following erythrocyte data were obtained from an EDTA-anticoagulated specimen: erythrocyte count = 2.84 x 10^{12}/L, hemoglobin = 7.2 g/dL, hematocrit = 26% (0.26 L/L), calculate the MCV.
a. 25.3 fL
b. 27.7 fL
c. 65.9 fL
d. 91.5 fL

4. Which of the following is NOT a condition associated with an elevated ESR?
a. Rheumatoid arthritis
b. Polycythemia vera
c. Multiple myeloma
d. Chronic infection

5. Which stain is commonly used to perform a reticulocyte count?
a. Wright stain
b. Crystal violet
c. New methylene blue
d. Natural red

6. Which of the following is an appropriate screening test for the presence of hemoglobin S?
a. Dithionate solubility test
b. Hemoglobin electrophoresis
c. Heat instability test
d. Acid elution test

7. Which of the following does NOT increase the sedimentation of red cells?
a. Rouleaux
b. Poikilocytosis
c. Increased globulins
d. Low erythrocyte count

8. Which of the following is not detected by the DAT with polyspecific AHG?
a. Erythrocyte sensitization with antibodies "in vivo"
b. Erythrocyte sensitization with incomplete antibodies "in vivo"
c. Erythrocyte sensitization with complement "in vivo"
d. Erythrocyte sensitization with antibodies "in vitro"

9. The Donath-Landsteiner test is positive in:
a. PNH
b. CHD
c. PCH
d. Warm AIHA

10. A positive sucrose hemolysis test was followed by a Ham test. There was hemolysis of the patient's cells in acidified serum. These results are indicative of:
a. G6PD deficiency
b. Hereditary spherocytosis
c. Pyruvate kinase deficiency
d. PNH

11. The principal test in the diagnosis of heredity spherocytosis is:
a. Autohemolysis test
b. Ham test
c. Osmotic fragility test

d. Thermal stability test

12. Which laboratory test is more appropriate screen for unstable hemoglobulin disorders?

a. Heat instability test

b. Hemoglobin electrophoresis

c. Osmotic fragility

d. Serum bilirubin

13. The slowest moving hemoglobin on electrophoresis at pH 8.4 is:

a. Hemoglobin A

b. Hemoglobin F

c. Hemoglobin C

d. Hemoglobin G

14. In cellulose acetate electrophoresis, hemoglobin S has the same mobility as:

a. Hemoglobin E

b. Hemoglobin F

c. Hemoglobin D

d. Hemoglobin C

15. Which of the following hemoglobin electrophoresis results is most typical of sickle cell trait?

a. 85% Hb S and 15% Hb A

b. 85% Hb F and 15% Hb S

c. 45% Hb S and 55% Hb A

d. 55% Hb F and 455 Hb S

16. The substance that will hasten the sickling of erythrocyte is:

a. Sodium oxalate

b. Sodium metabisulfite

c. Sodium citrate

d. Sodium phosphate

17. Hemoglobin S and D can be differentiated by which test?

a. Autohemolysis test

b. Acid serum test

c. Hemoglobin electrophoresis at pH 8.6

d. Solubility test

18. Increased osmotic fragility could be expected in which of the following disorders?

a. Iron deficiency anemia

b. Thalassemia

c. Sickle cell anemia

d. Hereditary spherocytosis

19. Which of the following erythrocyte inclusions cannot be stained and visualized with Romanowsky stain?

a. Pappenheimer bodies

b. Howell-Jolly bodies

c. Heinz bodies

d. Basophilic stippling

20. Which of the following laboratory tests is most specific for vitamins B12 or folic acid deficiency?

a. Low ferriti

b. High RDW

c. Coomb's test

d. MCV > 105

21. Which laboratory result is most useful in distinguishing iron deficiency anemia from anemia of chronic disease?

a. Serum iron

b. MCV

c. Hemoglobin

d. Transferrin receptor

22. If a serum transferring receptor assay were performed on an iron deficient individual, what would you expect the result to be:

a. Increased

b. Decreased

c. Normal

d. AOTA

23. The electrical impedance principle is based on the fact that:

a. Blood cells are good conductors of electricity

b. Blood cells are poor conductors of electricity

c. Resistance of the electrical path is decreased as the individual cells passes through the aperture

d. Blood cells have a relative density greater than that of saline

24. B-lymphocytes can be distinguished from T-lymphocytes by:

a. Morphology on Romanowsky-stained smear

b. Size of the cell

c. Monoclonal antibodies to surface antigens

d. Presence of granules

25. A manual leukocyte count was performed on an EDTA-anticoagulated specimen. The specimen was diluted 1:20 and a total of 165 leukocytes were counted in the four corner squares of the hemacytometer. What is the leukocyte count?

a. 1.3 x 10^9/L
b. 3.3 x 10^9/L
c. 4.1 x 10^9/L
d. 8.3 x 10^9/L

26. Chromosome analysis revealed the presence of the Philadelphia chromosome. What myeloproliferative disorder is present?

a. CML
b. PV
c. ET
d. MMM

27. What cytochemical stain is used to help differentiate a leukomoid reaction from CML?

a. Peroxidase
b. New methylene blue
c. Leukocyte alkaline phosphatase
d. Perl's Prussian blue

28. What cytochemical stain is most useful in the differentiation of a myeloblast from a lymphoblast?

a. Periodic acid-Schiff reaction
b. Acid phosphatase
c. Myeloperoxidase
d. α-naphthyl acetate esterase

29. The esterase cytochemical stains are useful to differentiate:

a. Granulocytic from monocytic leukemias
b. Lymphocytic leukemias from myelocytoc leukemias
c. Monocytic leukemias from megakaryocytic leukemias
d. Lymphocytic leukemias from monocytic leukemias

30. A leukomoid reaction may be distinguished from chronic myelocytic leukemia by:

a. The total leukocyte count
b. The presence or absence of immature neutrophils
c. Chromosome studies
d. The presence or absence of anemia

31. Which of the following stains is not useful in the differentiation of acute myelogenous leukemia from acute lymphocytic leukemia?

a. Chloracetate esterase stain
b. Sudan black B stain
c. Myeloperoxidase stain
d. Periodic acid-Schiff stain

32. Based on the results obtained from the evaluation of a leukocyte alkaline phosphatas (LAP) stain, what is the total LAP score?

Cell Rating	
0	
1+	
2+	
3+	
4+	

a. 65
b. 75
c. 95
d. 130

33. The niroblue tetrazolium test would be most useful in detecting:

a. Chediak-Higashi syndrome
b. Infectious mononucleosis
c. Chronic granulomatous disease
d. Niemann-Pick disease

34. Heterophil antibodies found in infectious mononucleosis are absorbed by:

a. Beef erythrocytes but not guinea pig kidney cells
b. Both beef erythrocytes and guinea pig kidney cells
c. Neither beef erythrocytes and guinea pig kidney cells
d. Guinea pig kidney cells but not beef erythrocytes

1. Haptoglobin may become depleted in:

a. Inflammatory conditions
b. Acute hemolytic anemia

c. Infectious diseases
d. Kidney disease

2. This form of hemoglobin has iron in the ferric state:
a. Sulhemoglubin
b. Methemoglobin
c. Carboxyhemoglobin
d. Deoxyhemoglobin

3. Which of the following is a cause of neutrophilia:
a. Viral infection
b. Acute bacterial infection
c. Allergic reaction
d. Myeloperoxidase deficiency

4. Which of the following findings would be most typical of severe septicemia?
a. Toxic granulation
b. Auer rods
c. Hypersegmentation
d. Alder-Reilly anomaly

5. The plasma cell develops from the:
a. Basophil
b. T lymphocyte
c. B lymphocyte
d. Monocyte

6. In the neutrophil series of leukocyte development, the earliest stage to normally appear in the peripheral blood is the:
a. Myeloblast
b. Promyelocyte
c. Myelocyte
d. Band

7. The primary function of neutrophils is:
a. A mediator of hypersensitivity
b. Control of parasitic infections
c. Initiation of the immune response
d. Phagocytic defense against microorganism

8. Sézary cells are:
a. Lipid-filled histiocytes
b. Abnormal plasma cells
c. Abnormal cells in Hodgkin's disease
d. Abnormal T lymphocytes

9. This is the first heavy immunoglobulin chain produced in the maturing B-lymphocyte:
a. a
b. β
c. g
d. μ

10. A peripheral blood smear that has a mixture of macrocytes, microcytes and normal erythrocytes present can be best described by which term?
a. Polkilocytosis
b. Polychromatophilia
c. Megaloblastosis
d. Anisocytosis

11. What is the iron transport protein?
a. Ferritin
b. Transferrin
c. Hemosiderin
d. Albumin

12. What are DÖhle bodies?
a. Aggregates of rough endoplasmic reticulum
b. Primary granules
c. Fat globules
d. Liposomes containing partially degraded mucopolysaccharides

13. Multiple myeloma is a disorder of:
a. T lymphocytes
b. Plasma cells
c. Megakaryocytes
d. Erythrocytes

14. The cells considered to be distinctive of Hodgkin's disease is:
a. Turk's cells
b. Ferrata cells
c. Reed-Sternberg cells
d. Flame cells

15. Alder-Reilly anomaly has effect on leukocytes that closely resembles:
a. Toxic granulation
b. Hyposegmention
c. Dohle-like inclusion bodies
d. Hypersegmentation

16. Aleukoerythrobalstic reaction is characterized by the presence of ___ in the peripheral blood:
a. Immature leukocytes and nucleated erythrocytes
b. Lymphocytosis and neutropenia
c. Leukocytosis and erythrocytosis

d. Pseudo-Pelger Huet cells

17. An increased in basophils is associated with:

a. Chronic myeloproliferative diseases

b. Parasitic infection

c. Chronic infection

d. Administration of glucocorticoids

18. HJV (Human immunodeficiency virus) infects:

a. B lymphocytes

b. Suppressor T lymphocytes

c. Helper T lymphocytes

d. Cytotoxic T lymphocytes

19. A 2-year old child has a total leukocyte count of 10 x 10^9/L and 60% lymphocytes. The following best describes this blood picture:

a. Absolutely lymphocytosis

b. Relative lymphocytosis

c. Normal lymphocyte count for a given age

d. Absolute lymphocytopenia

20. Auer rods are inclusions found in:

a. Myeloblasts

b. Lymphoblasts

c. Erythrocytes

d. Prolymphocytes

21. Extensive bone marrow fibrosis, leukoerythroblastic peripheral blood and the presence of anisocytosis with dacyocytes are most characteristic of:

a. CML

b. PV

c. ET

d. MMM

22. What is the minimum number of bone marrow blasts needed for the diagnosis of acute leukemia?

a. 29%

b. 50%

c. 5%

d. 30%

23. In addition to the number of blasts, what other criterion is essential for the diagnosis of RARS?

a. More than 15% ringed sideroblasts

b. More than 30% ringed sideroblasts

c. Dyshematopoiesis in all three cell lineages

d. Pancytopenia

24. The FAB classification of a leukemia with large blasts that are myeloperoxidase and specific esterase negative but have strong Positivity for nonspecific esterase inhibited by sodium fluoride is:

a. M1

b. M4

c. M5

d. M7

25. The highest levels of serum and urine muramidase are found in this leukemia:

a. M0 AML

b. M2 AML

c. CML

d. M5 AML

26. When Auer rods (bodies) are found in blasts of a case of acute leukemia, the leukemia is most probably:

a. Undifferentiated leukemia

b. B lymphocytic leukemia

c. T lymphocytic leukemia

d. Myelocytic leukemia

27. The normal lifespan of the platelets in the peripheral blood is:

a. 8 hours

b. 1 day

c. 10 days

d. 100 days

28. Platelet dense granules are storage organelles for ___, which are released after activation.

a. Calcium, ADP and serotonin

b. Fibrinogen, glycoprotein Ib, and von Willebrand factor

c. ADP, thromboxane A_2, and fibrinogen

d. Lysosomal granules, ATP, and factor V

29. Which of the following is needed for platelets to aggregate?

a. Thrombin

b. Actin

c. von Willebrand factor

d. Fibrinogen

30. Platelet glycoprotein IIb/IIIa complex is:

a. Membrane receptor for fibrinogen

b. Secreted from the dense bodies
c. Secreted by endothelial cells
d. Also called actin

31. The formation of thromboxane A_2 in the activated platelet:
a. Is needed for platelets to adhere to collagen
b. Is caused by the alpha granule proteins
c. Requires the enzyme cyclooxygenase
d. Occurs *via* a pathway involving von Willebrand factor

32. A humoral factor which regulates platelet production by speeding up the maturation time of megakaryocyte is called;
a. Thrombocyte
b. Thrombopoeitin
c. Interleukin 3
d. prostaglandin

33. which of the following is true about relationship between ADP and platelets?
a. ADP is necessary for platelet adhesion
b. ADP released from the granules is required for platelet aggregation
c. ADP is synthesized in the platelet from arachidonic acid
d. ADP is released from the alpha granule of the platelet

34. Thrombocytopenia may be associated with all of the following, EXCEPT:
a. Prolonged bleeding time
b. Prolonged clotting time
c. Poor clot retraction
d. Positive tourniquet test

35. Approximately ___ of the total number of platelets circulate in the systemic circulation?
a. One-fourth
b. One-third
c. One-half
d. Two-thirds

36. Clot retraction is a function of:
a. Thromboxane A_2
b. Factor XIII
c. Thrombosthenin
d. Thromboplastin

37. A patient with Bernard Soulier disease will probably have:
a. Increased bleeding time
b. Increased prothrombin time
c. Increased platelet count
d. Abnormal aggregation with ADP and collagen

38. A patient with Glanzmann thrombasthenia has:
a. A mutation in the gene for fibrinogen
b. An acquired abnormality of von Willebrand factor
c. A genetic abnormality of glycoprotein IIb or IIIa
d. An acquired vascular disorder

39. A patient with hereditary telangiectasia has:
a. Abnormal platelet adhesion t collagen
b. Thrombocytosis
c. A deficiency of platelet dense bodies
d. Dilated capillaries on mucous membranes that are likely to cause bleeding

40. The bleeding time is expected to be normal in:
a. Hemophilia
b. Drug-induced thrombocytopenia
c. Uremia
d. Bernard-Soulier disease

41. Platelet adhesion is abnormal in Bernard-Soulier disease because:
a. Glycoprotein Ib of the platelet membrane is defective
b. A plasma factor needed for platelet adhesion is absent
c. Antibodies to phospholipid are present
d. Abnormal proteins in the plasma coat the platelet membrane

42. An elevated platelet count is associated with:
a. Hemorrhage
b. Megaloblastic anemia
c. Myelodysplastic syndromes
d. Immune thrombocytopenic purpura

43. Platelet aggregation studies revealed normal aggregation curves with collagen, epinephrine, and ADP, but an abnormal aggregation curve with

ristocetin. Based on these findings, what is the differential diagnosis?

a. Von Willebrand disease and Bernard-Soulier syndrome

b. Glanzmann's thrombasthenia and von disease

c. Storage pool disease and Glanzmann's thrombasthenia

d. Bernard-Soulier syndrome and storage pool disease

44. Bleeding disorder/s in which platelets fail to aggregate with ristocetin:

1. von Willebrand's disease
2. Glanzmann's disease
3. Bernard-Soulier syndrome
4. Storage pool disease

a. 1 and 3

b. 2 and 4

c. 1, 2 and 3

d. 1, 2, 3 and 4

45. Which of the following platelet responses is most likely associated with Glanzmann's thrombasthenia?

a. Decreased platelet aggregation to ristocetin

b. Defective ADP release; normal response to ADP

c. Decreased amount of ADP in platelets

d. Markedly decreased aggregation to epinephrine, ADP and collage

46. Platelet function is impaired after ingesting aspirin because:

a. Aspirin blocks certain glycoprotein receptors on the surface of the platelet

b. Aspirin interferes with liver synthesis of a number of coagulation factors

c. Aspirin alters the structure of the glycocalyx

d. Aspirin decreases thromboxane A_2 formation by inhibiting cyclooxygenase

47. Aspirin ingestion has the following hemostatic effect in a normal person:

a. Prolonged prothrombin time

b. Prolonged bleeding time

c. Prolonged APTT

d. All of the above

48. Using manual techniques, the most reproducible test of the following is:

a. Leukocyte count

b. Erythrocyte count

c. Hemoglobin determination

d. Hematocrit determination

49. Hemoglobin is measured spectrophotometrically at which of the following wavelength:

a. 340 nm

b. 440 nm

c. 450 nm

d. 540 nm

50. Which of the following may be confused with reticulocytes in a brilliant cresyl blue stained smear:

a. Hemoglobin C crystal

b. Basophilic stipplings

c. Hemoglobin H bodies

d. Cabot rings

1. Which of the following is not an appropriate safety practice?

a. Disposing of needles in biohazard, puncture-proof containers

b. Frequent hand-washing

c. Sterilizing lancets for reuse

d. Keeping food out of the same areas as specimens

2. Factors involved with initial activation of the coagulation system and that require contact with a negatively charged surface for their activity belong to the following group of factors:

a. Prothrombin group

b. Fibrinogen group

c. Fibrinolytic

d. Contact group

3. Factor X can be activated by:

a. Factor XIa

b. Factor IXa, VIIIa, PF3, Ca++

c. Factor XIIa

d. Factor Va and VIIa

4. Which of the following cleaves pro-thrombin to thrombin?

a. Xa, Va, PF3, Ca++
b. IXa, VIIa, PF3, Ca++
c. VIIa / TF
d. XIa

5. Activated protein C together with its cofactor, protein S is an inhibitor of:
a. Factors VIIIa and Va
b. Plasmin
c. Thrombin
d. Plasminogen activators

6. The most concentrated coagulation factor in the blood is:
a. XII
b. IX
c. X
d. Fibrinogen

7. Which of the following is requires in adequate amounts for stabilization of the fibrin clot?
a. Factor I
b. Factor X
c. Factor XI
d. Factor XIII

8. Hemophilia B is a deficiency of:
a. Factor XI
b. Factor VIII
c. Factor IX
d. Fibrinogen

9. In which of the following disease would you most likely find an abnormal pro-thrombin time:
a. Hemophilia A
b. Hemophilia B
c. DIC
d. Prekallikrein deficiency

10. Heparin inhibits the clotting of blood by neutralizing the effects of:
a. Calcium
b. Thrombin
c. Platelets
d. Factor XIII

11. High molecular weight kinninogen (HMWK) and kallikrein are coagulation factors involved in:
a. Synergistic action with factor III
b. Activation of intrinsic coagulation
c. Induction of viscous metamorphosis
d. Formation of covalent bonds between fibrin monomers

12. Prekallikrein is also known as:
a. Fletcher factor
b. Fitzgerald factor
c. Williams factor
d. Flaujeac factor

13. High molecular weight kinninogen is also known as:
a. Extrinsic factor
b. Passavoy factor
c. Fletcher factor
d. Fitzgerald factor

14. In the APTT procedure the time is taken for clot formation is measured after the addition of:
a. Tissue thromboplastin
b. Calcium chloride
c. Phospholipid
d. Activator

15. Which of the following factors is not present in $BaSO_4$ adsorbed plasma?
a. VIII
b. II
c. XII
d. V

16. The integrity of the intrinsic coagulation system is evaluated by the:
a. Thrombin time test
b. PT
c. APTT
d. Bleeding time

17. The activated partial thromboplastin time (APTT) is used as a screen for the laboratory evaluation of inherited or acquired deficiencies in the:
a. Extrinsic pathway of the coagulation cascade
b. Intrinsic pathway of the coagulation cascade
c. Platelets
d. Vascular system

18. A deficiency in Factor X would affect:
a. Pro-thrombin time and activated partial thromboplastin time
b. Activated partial thromboplastin time and template bleeding time

c. Activated partial thromboplastin time and thrombin time
d. Thrombin time and template bleeding time

19. A prolonged Stypven (Russell viper venom) time is associated with deficiency of the following factors EXCEPT:
a. Factor I
b. Factor II
c. Factor X
d. Factor VII

20. If a patient has a prolonged PT and prolonged APTT but both are corrected by aged plasma and serum but not corrected with adsorbed plasma, the most likely deficiency is factor:
a. X
b. V
c. II
d. I

21. The urea solubility test is specific for detecting deficiencies of factor:
a. X
b. XII
c. XIII
d. IX

22. A patient has a prolonged PT but a normal APTT. What is the most likely deficiency?
a. Factor VII
b. Factor X
c. Factor IX
d. Factor V

23. The D-dimer test is a specific test for:
a. Plasminogen activation
b. Plasmin degradation of fibrinogen
c. Plasmin degragation of fibrin
d. Factor XIII

24. Based on the following data, what is the most likely factor deficiency?

PT normal
APTT prolonged
APTT + normal plasma correction
APTT + adsorbed plasma no correction
APTT + aged serum correction

a. Factor V
b. Factor VIII
c. Factor IX
d. Factor XI

25. The combination of prolonged APTT and a prolonged test with the mixing study procedures indicates the presence of:
a. Circulating inhibitor
b. Factor VIII deficiency
c. Anti-platelet antibodies
d. Excessive vitamin K

26. Which laboratory test is specific for fibrinolysis?
a. D-dimer test
b. Fibrinogen defeciency
c. Euglobulin clot lysis
d. Antithrombin III

27. An abnormal thrombin time is associated with:
a. Factor X deficiency
b. Fibrinogen deficiency
c. Excess plasminogen
d. Protein C deficiency

28. The observation of a normal reptilase time and a prolonged thrombin time is indicative of:
a. Presence of fibrin degradation products
b. Dysfibrinogenemia
c. Hypoplasminogenemia
d. Presence of heparin

29. These cells are important in the transport of oxygen and carbon dioxide between the lungs and body tissues:
a. Platelets
b. Leukocytes
c. Thrombocytes
d. Erythrocytes

30. Leukocytes are necessary for:
a. Defense against foreign antigens
b. Hemostasis
c. Oxygen transport
d. Excretion of cellular metabolism

31. This organ is important in maturation of T-lymphocytes:
a. Lymph nodes
b. Liver
c. Spleen
d. Thymus

32. Nucleoli of cells contain predominantly which of the following:
a. DNA
b. RNA
c. ALP
d. Peroxidase

33. The major erythrocyte production site is the:
a. Bone marrow
b. Kidney
c. Liver
d. Spleen

34. The correct maturation order of erythrocyte morphologic stages is:
a. Prorubricyte, rubricyte, rubriblast, metarubricyte
b. Rubriblast, prorubricyte, rubricyte, metarubricyte
c. Rubriblast, metarubricyte, rubricyte, prorubricyte
d. Rubriblast, rubricyte, prorubricyte, metarubricyte

35. The earliest recognizable erythroid precursor on a Wright-stained smear of the bone marrow is:
a. Pronormoblast
b. Basophilic mormoblast
c. CFU-E
d. BFU-E

36. A normal erythrocyte has a lifespan of:
a. 8.2 hours
b. 5 days
c. 28 days
d. 120 days

37. Erythrocytes that contain a marked decrease in spectrin would most likely cause:
a. An increase in membrane permeability
b. Methemoglobinemia
c. An absence of MN antigens
d. Decreased erythrocyte membrane permeability

38. Most of the erythrocyte's energy comes from the:
a. Embden-Meyerhoff pathway
b. Hexose-monophosphate shunt
c. Rapoport-Luebering
d. Metheglobulin reduction pathway

39. This metabolic pathway facilities oxygen release from hemoglobin to tissues:
a. Embden-Meyerhoff
b. Hexose-monophosphate shunt
c. Rapoport-Luebering
d. Metheglobulin reductase

40. In the red blood cell, the hexose monophosphate shunt:
a. Produces adenosine triphosphate (ATP)
b. Produces 2,3-diphosphoglycerate (2,3-DPG)
c. Helps prevent oxidation of hemoglobin
d. Maintains membrane integrity

41. The major site for removal of normal aged erythrocytes is:
a. Bone marrow
b. Kidney
c. Liver
d. Spleen

42. Relative erythrocytosis may be found:
a. In pulmonary disorders
b. At high altitudes
c. With high oxygen affinity hemoglobin
d. In dehydration

43. This renal hormone stimulates erythropoiesis in the bone marrow:
a. IL-1
b. Erythropoietin
c. Granulopoietin
d. Thrombopoietin

44. These pairs of chains make up the majority of hemoglobin in normal adults:
a. a2β2
b. a2g2
c. a2δ2
d. z2l2

45. A shift to the right in the ODC (oxygen dissociation curve) occurs when there is a/an:
a. Increase in O_2
b. Increase in CO_2
c. Increase in pH
d. Decrease in CO_2

46. The sigmoid shape of the ODC is due to:
a. The cooperative binding of O^2 by hemoglobin

b. The Bohr effect
c. The presence of glycosylated hemoglobin
d. Erythropoietin

47. Which of the following is unable to bind oxygen?
a. Carboxyhemoglobin
b. Sulfhemoglobin
c. Methemoglobin
d. All of the above

48. Bite cells are associated with:
a. Pyruvate kinase deficiency
b. PNH
c. G6PD deficiency
d. Heredity pyropoikilocytosis

49. Patients with beta thalassemia major may show increased amounts of:
a. Hemoglobin F
b. Hemoglobin C
c. Hemoglobin H
d. Hemoglobin A

50. Which of the following is a pure red cell aplasia?
a. Bernard-Soulier syndrome
b. DiGuglielmo's disease
c. Diamond-Blackfan anemia
d. Fanconi's anemia

Sex chromosome: Barr body,

2. Gray , brown, bluish dots containing ribosomes: Basophilic stipplings
3. Associated with lead poisoning: Basophilic stipplings
4. Wintrobe tube: 115 mm long 3 mm internal bore
5. Tilt tube test size of test tubes: 75x10mm
6. Average life span of platelets: 10 days
7. Not true cell which fragments only from the mother cell in the bone marrow?
a. Erythrocyte
b. Leukocyte
c. Thombocyte ans
d. All

8. Computations for corrected WBC count (2 questions)
9. When is nRBC considered significant? 5nRBC present
10. Vitamin K dependent (asked twice): 2,7,9,10
11. >30 x 10^9 WBC: Dilute at 1:200
12. 0.1 to 30x10^9: Dilute at 1;20
13. Patient is bleeding while being treated with thrombolytic infusion something. Blood results of blood taken DURING infusion (heparin)
PTT: Very Prolong.
Fibrinogen: Very Low. What is the most likely disease?
a. Hypofibrinogenemia
b. Hyperplasminemia
c. Liver and kidney disease
d. DIC ans
14. Stem cell to blast: 3-5 days. Life span in circulation: 121 days. What cell?
a. Monocyte
b. Erythrocyte ans
c. Lymphocyte
d. Basophil
15. Stem cell to blast: 5. Life span in tissue: 10 days. What cell?
a. Monocyte an
b. Erythrocyte
c. Lymphocyte
d. Basophil
16. Patient is bleeding while being treated with thrombolytic infusion something.
Blood results of blood taken BEFORE heparin
PTT: Prolong. Fibrinogen: Very low
a. Hypofibrinogenemia
b. Hyperplasminemia
c. Liver and Kidney disease
d. DIC
17. Bone marrow smear is prepared by:
a. Crush
b. Concentrate
c. Particulate
d. All ans
18. How to make good smear?
a. Smooth and rapid
b. Smooth ans

c. Slow
d. Rapid
19. What can be made with automated smear maker?
a. Wedge ans
b. Cover slip
c. All
20. Failure to create secondary enzymes: Pelger huet
21. Hyposegmentation: Pelger huet
22. FAB classification of acute myeloblastic leukemia WITHOUT maturation = M1
23. Differentiate ALL from AML in that ALL is: Negative to both esterase and peroxidise
24. Differentiate CML from leukemoid
a. Basophils present
b. LAP score of more than 100
25. Grading of codocytes 20-50/oif: +3
26. MCV <85; MCHC <31
a. Macrocytic, normochromic
b. Microcytic, hypochromic ans
c. Normo,normo
d. Marco, hypo
27. Increase in WBC:
a. Strenuous exercise
b. Emotions
c. Crying
d. All ans

CLINICAL MICROSCOPY

The primary chemical affected by the renin-angiotensin-aldosterone system is:

a. Chloride
b. Sodium
c. Potassium
d. Hydrogen

2. The fluid leaving the glomerulus has a specific gravity of:

a. 1.005
b. 1.010
c. 1.015
d. 1.020

3. What are the variables included in the Cockgroft and Gault formula for creatinine clearance?

1. Age
2. Sex
3. Urine creatinine
4. Body weight

a. 1, 2 and 3
b. 1 and 3
c. 1, 2 and 4
d. 1, 2, 3 and 4

4. The average total volume of urine produced by a normal adult every 24 hours is about:

a. 750 mL
b. 1200 mL
c. 2000 mL
d. 2400 mL

5. An abnormal decrease in urine production is called:

a. Anuria
b. Oliguria
c. Polyuria
d. Dysuria

6. Cloudiness in a freshly-voided urine could indicate the presence of:

a. Protein
b. Sugar
c. WBCs
d. Any of these

7. Which of these plasma substances is NOT normally filtered through the glomerulus in significant amounts?

a. Protein
b. Glucose
c. Creatinine
d. Urea

8. Which term is defined as a urine volume in excess of 2000 mL excreted over a 24-hour period?

a. Anuria
b. Oliguria
c. Polyuria
d. Hypersthenuria

9. Which of the following will contribute to a specimen's specific gravity if it is present in a person's urine?

a. 50-100 RBC/hpf
b. 85 mg/dL glucose
c. 3+ amorphous phosphates
d. Moderate bacteria

10. Why is the first-voided morning urine specimen the most desirable specimen for routine urinalysis?

a. Most dilute specimen of the day
b. Less contamination by microorganisms
c. It can detect orthostatic proteinuria
d. Most concentrated specimen of the day

11. Freshly voided normal urine is usually clear; however, if it is alkaline, a white turbidity may be present due to:

a. Yeast cells
b. Uroerythrin
c. WBCs
d. Amorphous phosphates

12. A strong odor of cabbage in a urine specimen could indicate:

a. Methionine malabsorption
b. Trimethylaminuria
c. Phenylketonuria
d. Tyrosyluria

13. A specimen with a strong ammonia odor and a heavy white precipitate when it arrives in the laboratory may require:
a. Collection of a fresh specimen
b. Centrifugation
c. Dilution for specific gravity
d. Testing under a hood

14. A correlation exists between a specific gravity of 1.050 and a:
a. 2+ protein
b. 2+ glucose
c. Radiographic dye infusion
d. First morning specimen

15. A yellow-brown specimen that produces a yellow foam when shaken can be suspected of containing:
a. Carrots
b. Hemoglobin
c. Rhubarb
d. Bilirubin

16. A patient with a 1+ protein reading in the afternoon is asked to submit a first morning specimen. The second specimen also has a 1+ protein. This patient is:
a. Positive for orthostatic proteinuria
b. Negative for orthostatic proteinuria
c. Positive for Bence Jones proteinuria
d. Negative for clinical proteinuria

17. Urinalysis on a patient with severe back and abnominal pain is frequently performed to check for:
a. Bilirubinuria
b. Proteinuria
c. Hematuria
d. Hemoglobinuria

18. Reagent strip – specific gravity readings are affected by:
a. Glucose
b. Radiographic dye
c. Alkaline urine
d. All of the above

19. The reagent strip reaction that requires the longest reaction time is:
a. Bilirubin
b. Leukocyte esterase
c. pH
d. Glucose

20. The enzyme dipstick test for glucose has a sensitivity of:
a. 10 mg/dL
b. 50 mg/dL
c. 100 mg/dL
d. 200 mg/dL

21. Which of the following is true of the detection of urinary glucose?
a. Any reducing substance can give a false positive reaction w/ copper reduction test for glucose
b. The copper reduction method is specific for glucose
c. Glucose cannot appear in the urine in the absence of elevated plasma glucose
d. Ketonuria may produce a false positive dipstick test for glucose

22. Which of the reagents below is used to detect urobilinogen in urine?
a. p-Dinitrobenzene
b. p-Aminosalicylate
c. p-Dichloroaniline
d. p-Dimethylaminobenzaldehyde

23. All of the statements below regarding urine bilirubin tests are true EXCEPT:

a. A positive test indicates either liver or hepatobiliary disease

b. The test detects only conjugated bilirubin

c. High levels of ascorbate usually do not interfere

d. Standing urine may become falsely negative due to bacterial hydrolysis

24. A positive test for blood in urine can occur in the following EXCEPT:

a. Extravascular hemolytic anemia

b. Crush injury

c. Malignancy of the kidney or urinary system

d. Renal calculi

25. Which of the following is the major organic substance found in urine?

a. Sodium

b. Glucose

c. Chloride

d. Urea

26. A reagent test strip impregnated with an aromatic amine such as p-arsanilic acid or sulfanilamide may be used to detect which analyte?

a. Bilirubin

b. Blood

c. Nitrite

d. Urobilinogen

27. What is the expected pH range of a freshly voided urine specimen?

a. 3.5-8.0

b. 3.5-9.0

c. 4.0-8.5

d. 4.5-8.0

28. False positive levels of 5-HIAA can be caused by a diet high in:

a. Bananas

b. Tomatoes

c. Pineapples

d. All of these

29. Blue diaper syndrome is associated with:

a. Lesch-Nyhan syndrome

b. Hartnup disease

c. Alkaptonuria

d. Dubin-Johnson syndrome

30. Hurler, Hunter and Sanfilippo syndrome are hereditary disorders affecting metabolism of:

a. Tryptophan

b. Purines

c. Mucopolysaccharides

d. Porphyrins

31. Uroporphyrinogen decarboxylase deficiency is associated with which of the following?

a. Acute intermittent porphyria (AIN)

b. Hereditary coproporphyria (HCP)

c. Congenital erythropoietic porphyria (CEP)

d. Porphyria cutanea tarda (PCT)

32. Urinary screening tests for mucopolysaccharides:

1. Acid albumin 3. Cyanide-Nitroprusside

2. CTAB 4. Nitroso-naphthol

a. 1 and 2

b. 2 only

c. 1, 2 and 3

d. 3 and 4

33. He discovered phenylketonuria from a mentally retarded child with a peculiar mousy odor to his urine:

a. Ivan Folling

b. Garrod

c. Cotugno

d. Frederik Dekkers

34. A clinically significant epithelial cell is the:

a. Cuboidal cell

b. Clue cell

c. Caudate cell
d. Squamous epithelial cell

35. When using the glass slide and coverslip method, which of the following might be missed if the coverslip is overflowed?

a. RBCs
b. WBCs
c. Casts
d. Bacteria

36. Which of the following should be used to reduce light intensity in bright-field microscopy?

a. Centering screws
b. Aperture diaphragm
c. Rheostat
d. Condenser aperture diaphragm

37. The finding of dysmorphic RBCs is indicative of:

a. Renal calculi
b. Traumatic injury
c. Glomerular bleeding
d. Coagulation disorders

38. The primary component of urinary mucus is:

a. Albumin
b. Uromodulin
c. Goblet cells
d. Beta$_2$-microglobulin

39. The purpose of the Hansel stain is to identify:

a. Neutrophils
b. Monocytes
c. Renal tubular cells
d. Eosinophils

40. What is the normal value for urinary eosinophils?

a. >10%
b. <1%
c. >1%
d. <10%

41. A disorder characterized by the disruption of the electrical charges that produce the tightly fitting podocyte barrier resulting in massive loss of proteins and lipids:

a. Alport syndrome
b. Nephrotic syndrome
c. IgA nephropathy
d. Lipid nephrosis

42. Visicoureteral reflux or the reflux of urine from the bladder back into the ureters may result to:

a. Acute glomerulonephritis
b. Cystitis
c. Acute pyelonephritis
d. Acute interstitial nephritis

43. 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

44. End-stage renal disease is characterized by all of the following EXCEPT:

a. Electrolyte imbalance
b. Azotemia
c. Hypersthenuria
d. Isosthenuria

45. Broad and waxy casts are most likely associated with:

a. Nephrotic syndrome
b. Acute renal failure
c. Chronic renal failure
d. Focal segmental glomerulosclerosis

46. It is described as a genetic disorder showing lamellated and thinning of glomerular basement membrane:

a. Goodpasture syndrome
b. Alport syndrome
c. Nephrotic syndrome
d. Wegener's granulomatosis

47. Casts are formed primarily in which portion of the kidney?

a. Distal convoluted tubule
b. Glomerulus
c. Loop of Henle
d. Proximal convoluted tubule

48. A parasite associated with a positive leukocyte esterase is:

a. *Enterobius vermicularis*
b. *Trichomonas vaginalis*
c. *Schistosoma haematobium*
d. *Candida albicans*

49. The hormone characteristically present in the blood of pregnant women and which, when its concentration in the blood reaches a certain point, also appears in the urine is:

a. Estradiol
b. Aldosterone
c. Progesterone
d. hCG

50. HCG is produced by which of the following?

a. Cytotrophoblast cells
b. Argentaffin cells
c. Endocervical glandular cells
d. Type II pneumocytes

51. The most common composition of renal calculi is:

a. Calcium oxalate
b. Magnesium ammonium phosphate
c. Cystine
d. Uric acid

52. A renal calculi described as yellowish to brownish red in color with a moderately hard consistency is:

a. Cystine
b. Phosphate
c. Calcium oxalate
d. Uric acid

53. A renal calculi described as pale and friable is:

a. Cystine
b. Phosphate
c. Calcium oxalate
d. Uric acid

54. A stool specimen collected from an infant with diarrhea has a pH of 5.0. This result correlates with a:

a. Positive APT test
b. Negative trypsin test
c. Positive Clinitest
d. Negative occult blood test

55. What is the gold standard for fecal fat determination?

a. Van de Kamer titration
b. Van den Berg reaction
c. APT test
d, D-Xylose test

56. Which of the following pairings of stool appearance and cause does not match?

a. Pale, frothy: steatorrhea
b. Black, tarry: blood
c. Yellow-gray: bile duct obstruction
d. Yellow-green: barium sulfate

57. All of the following statements about CSF are true EXCEPT:

a. CSF is formed by ultrafiltration of plasma through the choroid plexus
b. CSF circulates in the subarachnoid space and ventricles of the brain
c. The chemical composition of CSF is similar to plasma
d. Reabsorption of CSF occurs via vessels in the sagittal sinus

58. All of the following are indication of CSF traumatic tap EXCEPT:
a. Clearing of fluid as it is aspirated
b. A clear supernatant after centrifugation
c. Xanthochromia
d. Presence of a clot in the sample

59. The term used to denote a high WBC count in the CSF is:
a. Empyema
b. Neutrophilia
c. Pleocytosis
d. Lymphocytosis

60. The limulus lysate test on CSF is a sensitive assay for:
a. Viral meningitis
b. Cryptococcal meningitis
c. Gram positive bacterial exotoxin
d. Gram negative bacterial endotoxin

61. A normal CSF glucose and lactate level is associated with which type of meningitis?
a. Viral meningitis
b. Bacterial meningitis
c. Fungal meningitis
d. Tubercular meningitis

62. The most common cause of male infertility is:
a. Mumps
b. Klinefelter's syndrome
c. Varicocele
d. Malignancy

63. Which of the following stains is used to determine sperm viability?
a. Eosin
b. Hematoxylin
c. Papanicolau
d. Methylene blue

64. Seminal fluid viscosity graded as 4 is described as:
a. Watery
b. Fair
c. Friable
d. Gel-like

65. The sugar present in the seminal fluid in high concentration is:
a. Glucose
b. Lactose
c. Fructose
d. Sucrose

66. Maturation of spermatozoa takes place in the:
a. Sertoli cells
b. Seminiferous tubules
c. Epididymis
d. Seminal vesicles

67. Which test for FLM is least affected by contamination with hemoglobin and meconium?
a. Amniostat-FLM
b. Foam stability
c. Lamellar body count
d. L/S ratio

68. How are specimens for FLM testing delivered to and stored in the laboratory?
a. Delivered on ice and refrigerated or frozen
b. Immediately centrifuged
c. Kept at room temperature
d. Protected from light

69. The presence of a fetal neural tube disorder may be detected by:
a. Increased amniotic fluid bilirubin

b. Increased maternal serum alpha-fetoprotein
c. Decreased amniotic fluid phosphatidyl glycerol
d. Decreased maternal serum acetylcholinesterase

70. What type of tube for gastric fluid collection is inserted through the mouth?
a. Rehfuss tube
b. Levine tube
c. Diagnex tube
d. None of these

71. A gastric disorder characterized by achlorhydria due to the presence of anti-parietal cell antibodies:
a. Zollinger-Ellison disease
b. *Helicobacter pylori* infection
c. Pernicious anemia
d. Cystic fibrosis

72. All of the following may be associated with bronchial asthma EXCEPT:
a. Creola bodies
b. Curschmann's spirals
c. Charcot-Leyden crystals
d. Pneumoliths

73. A sputum that is rusty-colored and filled with pus is associated with:
a. Congestive heart failure
b. Lobar pneumonia
c. Tuberculosis
d. Anthracosis

74. Rice bodies are called so because:
a. It was discovered by Dr. Rice
b. It resembles cooked rice
c. It resembles uncooked rice
d. It resembles polished rice

75. Lyme arthritis is caused by:
a. *Borrelia recurrentis*
b. *Borrelia hermsii*
c. *Borrelia burgdorferi*
d. *Neisseria gonorrhoeae*

76. CYFRA 21-1 is a tumor marker for:
a. Uterine cancer
b. Colon cancer
c. Lung cancer
d. Breast cancer

77. This is a sensitive test for the detection of intra-abdominal bleeding:
a. Peritoneal lavage
b. Bronchioalveolar lavage
c. Thoracic lavage
d. Pericardial lavage

78. What is the method of choice for preservation of routine urinalysis samples?
a. Boric acid
b. Formalin
c. Sodium fluoride
d. Refrigeration

79. A urine specimen for routine urinalysis would be rejected by the laboratory because:
a. The specimen had been refrigerated
b. More than 50 mL was in the container
c. The label was placed on the side of the container
d. The specimen and accompanying request did not match

80. Which of the following is the preferred urine specimen for cytology studies?
a. Catheterized
b. First morning
c. Suprapubic aspiration
d. Three-glass collection

81. Following collection, urine specimens should be delivered to the laboratory promptly and tested within ___ hour(s)

a. 1
b. 2
c. 3
d. 4

82. All of the following changes occur in unpreserved urine EXCEPT:

1. Decreased glucose 3. Increased ketones 5. Incr. urobilinogen
2. Increased pH 4. Increased clarity
6. Increased bacteria

a. 3, 4 and 5
b. 1, 2 and 6
c. 1, 3 and 5
d. 1, 2, 3, 4, 5 and 6

83. Which of the following matches regarding specimen collection is/are incorrect?

1. Arthrocentesis – synovial fluid 3. Thoracentesis – Ascitic fluid
Pericardiocentesis – Pleural fluid

a. 1 and 2
b. 3 and 4
c. 1 and 3
d. 2 and 4

84. The most representative sample for fecal fat analysis is:

a. First morning
b. 3-day collection
c. 2-day collection
d. None of the above

85. Three labeled tubes of CSF specimen were sent to the laboratory. Which of these tubes will be used for cell counting?

a. Tube 1
b. Tube 2
c. Tube 3
d. Any of these

86. If seminal fluid fructose analysis will be delayed for more than 2 hours, the sample should be stored at what condition?

a. Refrigerator temperature
b. Frozen
c. Body temperature
d. Room temperature

87. It is the process that provides documentation of proper sample identification from the time of collection to the receipt of laboratory results:

a. Proficiency testing
b. Accreditation
c. Chain of custody
d. Pre-analytical phase

88. This is also known as the modulation contrast microscope:

a. Nomarski
b. Hoffman
c. Kohler
d. Phase-contrast

89. It refers to the ability of a microscopic lens to distinguish two small objects that are a specific distance apart:

a. Parfocal
b. Birefringence
c. Illumination
d. Resolution

90. Which type of microscopy is used to aid in identification of cholesterol in oval fat bodies, fatty casts and crystals?

a. Polarizing
b. Phase-contrast
c. Interference-contrast
d. Dark-field

91. It is based on the principle that the frequency of a sound wave entering a solution changes in proportion to the density of the solution

a. Harmonic oscillation densitometry
b. Refractive index
c. Urinometer
d. Reagent strip

92. What is the minimum urine volume required by the Clinitek Atlas automated instrument?

a. 1 mL
b. 2 mL
c. 7 mL
d. 15 mL

93. All of the following are important to protect the integrity of reagent strips EXCEPT:

a. Storing in an opaque bottle
b. Storing at room temperature
c. Removing the dessicant from the bottle
d. Resealing the bottle after removing a strip

94. When a control is run, what information is documented?

a. The lot number
b. Expiration date of the control
c. The test results
d. All of the above

95. Given the following, identify the preanalytical errors:

1. Patient misidentification
2. Poor handwriting
3. Reagent deterioration
4. Insufficient urine volume
5. Delayed transport of urine to lab
6. Instrument malfunction

a. 1, 4 and 5
b. 2, 3 and 6
c. 1, 2 and 3
d. 4, 5 and 6

96. The best way to break the chain of infection is:

a. Decontamination
b. PPE
c. Aerosol prevention
d. Handwashing

97. An acceptable disinfectant for blood and body fluid decontamination is:

a. NaOH
b. Antimicrobial soap
c. H_2O_2
d. Sodium hypochlorite

98. The last thing to do when a fire is discovered is to:

a. Rescue persons in danger
b. Activate the alarm system
c. Close doors to other areas
d. Extinguish the fire if possible

99. A class ABC fire extinguisher contains:

a. Water
b. Dry chemicals
c. Sand
d. Acid

100. Correct procedure for handwashing, EXCEPT:

a. Wet hands with warm water
b. Thoroughly clean between fingers for at least 15 seconds
c. Rinse hands in an upward position
d. Turn off faucets with a clean paper towel

1. B
2. B
3. C
4. B
5. B
6. C
7. A
8. C
9. B
10. D
11. D
12. A
13. A
14. C
15. D
16. B
17. C
18. C
19. B
20. C
21. A
22. D
23. C
24. A
25. D
26. C
27. D
28. D
29. B
30. C
31. D
32. A
33. A
34. B
35. C
36. C
37. C
38. B
39. D
40. B
41. B
42. C
43. D
44. C
45. C
46. B
47. A
48. B
49. D
50. A
51. A
52. D
53. B
54. C
55. A
56. D
57. C
58. C
59. C
60. D
61. A
62. C
63. A
64. D
65. C
66. C
67. A
68. A
69. B
70. A
71. C
72. D
73. B
74. D
75. C
76. C
77. A
78. C
79. D
80. C
81. B
82. A
83. B
84. B
85. C
86. B
87. C
88. B
89. D
90. A
91. A
92. B
93. C
94. D
95. A
96. D
97. D
98. D
99. B
100. C

1. Urinometer steps: 1. Fill urine; 2. Place urinometer in twisting motion; 3. Read at lower meniscus
2. Principle of protein strip? Protein errors of indicators.
3. Stain that best differentiates small cells and monocytic cells?

a. PAPS
b. Gram stain
c. Giemsa
d. NMB

4. Gives greatest problem in refractometer?

a. bubbles
b. Cells
c. Crystals
d. High protein

5. Same patient voided urine thrice. Which has highest specific gravity?

a. All have same SG
b. 30 ml
c. 100ml
d. 80ml

6. High renin corresponds to?

a. Low sodium and low plasma volume
b. High potassium and low plasma volume
c. Low aldosterone

7. Low EPO due to:

a. Renal disease
b. Cardiomegaly

8. Diluent for WBC CSF Count: Acetic Acid
9. Dilute urine effect on RBC: Swell; appears like a halo
10. Curshman spirals

a. Elongated crystals with Charcot Leyden
b. Spiral microorganisms staining gram negative

11. How much can the glomerulus filter? Less than…

a. <50kDa
b. <60kDa
c. <70kDa
d. 7000

12. Temperature for Total WBC CSF count: Refrigeration temp.
13. Phosphate: Aluminum molybdate for determination
14. Fructose in seminalysis if delayed for 2 hours: store at Freezing temp till available for analysis
15. CaOx Monohydrate shape: Elongated hourglass shape
16. True about sputum

a. Normal body fluid
b. Usually green color
c. All of the items
d. From tracheo-bronchial

17. First stage in spermatogenesis: Spermatogonia
18. For newborn screening specimen collection: Blood spot test
19. Bilirubin conjugated with albumin to be processed in the liver?

a. Unconjugated
b. Conjugated
c. Direct
d. None

20. Bilirubin measurement in amniotic fluid: Spectrophotometry
21. True of Biosafety cabinet II: Laminar flow
22. Biohazard symbol: Three circles arrange in a triangle connected by a circle in the middle
23. Sharps sympol: Syringe enclosed in a circle to make it look like an "X"
24. Oligoclonal band: Neurosyphilis not Multiple MYELOMA (common mistake)
25. Occult blood in stool: Pseudoperoxidase activity of haemoglobin
26. Blondheim: To differentiate myoglobin and haemoglobin
27. Principle of protein reagent strip: Albumin accepts hydrogen ions which changes the pH
28. Ketone reagent strip color: Purple
29. Ketone reagent strip:

a. Acetoacetic acid and nitroprusside
b. Acetone and phenosuphthalein
c. All items
d. Betahydroxybutyric acid and ---

30. What tell patient in collection for seminalysis: (MOORSE TYPE)
a. Abstain for 2-3 weeks = (2-7 days)
b. No alcohol driking
c. Place in penicillin bottle
d. No smoking
31. Stool WBC differential count:
a. Polymorphonuclear cells and Monocyte
b. Phagocytic and non-phagocytic
c. Segmenters, Monocytes, Eosinophils
32. Most abundant WBC in urine: Neutrophil (?)
33. Best indicator for urinary bladder infection: Neutrophil
34. Indicator for Acute tubular necrosis:
a. Brown cast
b. >1000WBC
c. Renal cell- renal tubular epithelial cells
d. Hemoglobinuria
35. Most significant cell: Renal cell (RTE)
36. Blood in peritoneal fluid
a. TB peritonitis
b. Malignancy
37. Least significant to most significant cast: hyaline > wbc > granular >rbc >Waxy > broad
hyaline - rbc – granular- wbc-Waxy

38. Cast in athlete: Cylinduria
39. Granular cast derived from: Cells (Apollon)
40. Associated with Melanuria: Albinism

41. Which is not a PPE: sharp's container

BLOOD BANKING

1. He was said to have been given the world's first blood transfusion by his Jewish physician Giacomo di San Genesio, who had him drink the blood of three 10-year-old boys.

a. Pope Innocent VII
b. Pope Pius I
c. Pope Gregory III
d. Pope Boniface IV

2. The number of H antigen structures currently identified are:

a. Two
b. Four
c. Six
d. Eight

3. Greatest amount of H antigen:

a. A_1
b. O
c. AB
d. B

4. Identify the blood type based on the following reactions:

FORWARD GROUPING		REVERSE GROUPING	
Anti-A	Anti-B	A cells	B cells
0	4+	3+	0

a. Type O
b. Type A
c. Type B
d. Type AB

5. Bombay phenotype antibodies include:

a. Anti-A
b. Anti-B
c. Anti-H
d. All of the choices

6. What type of blood should be given in an emergency transfusion when there is no time to type the recipient's sample?

a. O Rh-negative, whole blood
b. O Rh-positive, whole blood
c. O Rh-negative, pRBCs
d. O Rh-positive, pRBCs

7. This blood group is an anthropological marker in Asian ancestry:

a. Diego
b. Cartwright
c. Colton
d. Gerbich

8. The activity of this antibody is enhanced in an acidic environment.

a. Anti-S
b. Anti-U
c. Anti-N
d. Anti-M

9. Shelf-life of packed red blood cells obtained through open system with ACD anticoagulant:

a. 21 days
b. 35 days
c. 42 days
d. None of the choices

10. Indication for transfusion of neocytes:

a. Immune thrombocytopenic purpura
b. Hemolytic transfusion reaction
c. Thalassemia
d. Hydrops fetalis

11. Citrate in ACD functions as:

a. Anticoagulant
b. ATP source
c. RBC membrane stabilizer
d. Caramelization inhibitor

12. The most common cause of transfusion-related sepsis:

a. Whole blood
b. Packed red blood cells
c. Leukocyte concentrates
d. Platelets concentrates

13. Major advantage of gel technology:

a. Decreased sample volume
b. Improved productivity
c. Enhanced sensitivity
d. Standardization

14. Agglutination reaction: "Several large clumps with clear background"

a. 4+
b. 3+
c. 2+
d. 1+

15. This type of autologous donation occurs when blood is collected from the patient before the start of surgery. The patient's blood volume is returned to normal with fluids, and autologous blood may be returned to the patient after the surgery is complete.

a. Preoperative
b. Normovolemic hemodilution
c. Intraoperative salvage
d. Postoperative salvage

16. The anticoagulant preferred in direct antiglobulin testing is:

a. EDTA
b. Heparin
c. Citrate
d. Oxalate

17. A donor was deferred by the physician due to the presence of bluish purple areas under the skin of the donor. This is typical of:

a. Syphilis
b. Herpes simplex
c. Candidiasis
d. Kaposi's sarcoma

18. A febrile transfusion reaction is defined as a rise in body temperature of ___ occurring in association with the transfusion of blood or components and without any other explanation.

a. 1°C or more
b. 1°F or more
c. 3°C or more
d. 3°F or more

19. The most severe form of HDN is associated with:

a. Anti-A
b. Anti-B
c. Anti-K
d. Anti-D

20. This is a diagnostic prenatal test in which a sample of the baby's blood is removed from the umbilical cord for testing:

a. Cordocentesis
b. PUBS
c. Both
d. None of the above

21. Year of discovery of the T cell receptor gene:

a. 1964
b. 1974
c. 1984
d. 1994

22. Percentage of B cells present in the circulation

a. 2-5%
b. 5-10%
c. 10-15%
d. 75-85%

23. C3b

a. Anaphylatoxin
b. Opsonin
c. Chemotaxin
d. Cytokine

24. What is the most common complement component deficiency?

a. C1
b. C2
c. C3
d. C4

25. Which of the following is the most common congenital immonudeficiency?

a. Severe combined immonudeficiency
b. Selective IgA deficiency
c. X-linked agammaglobulinemia
d. Common variable immunodeficiency

26. Which disease might be indicated by antibodies to smooth muscle?

a. Chronic active hepatitis
b. Primary biliary cirrhosis
c. Hashimoto's thyroiditis
d. Myasthenia gravis

27. The most common fungal infection for AIDS patients is caused by:

a. *Candida albicans*
b. *Cryptococcus neoformans*
c. *Blastomyces dermatitidis*
d. *Cryptosporidium parvum*

28. This dengue antigen has been detected in the serum of dengue virus infected patients as early as 1-day post onset of symptoms (DPO), and up to 18 DPO.

a. NS1
b. C
c. E
d. prM

29. These are expressed in the developing fetus and in rapidly dividing tissue, such as that associated with tumors, but that are absent in normal adult tissue:

a. Oncogenes
b. Sarcoma
c. Oncofetal antigens
d. Tumor specific antigen

30. Polymerase chain reaction (PCR) is a/an ___ assay.

a. Chemical
b. Molecular
c. Enzymatic
d. Biologic

31. Restriction Fragment Length Polymorphism (RFLP) is a/an ___ assay.

a. Chemical
b. Molecular
c. Enzymatic
d. Biologic

32. Hives and itching are under what type of hypersensitivity?

a. Type I
b. Type II
c. Type III
d. Type IV

33. Gamma counter uses these substances as labels:

a. Isotopes
b. Fluorochromes
c. Enzymes
d. Immune complexes

34. *Treponema pallidum immobilization* (TPI) test: 10% treponemes are immobilized. Interpret the result.

a. Positive
b. Negative
c. Doubtful
d. Indeterminate

35. When reading for a slide agglutination for Salmonella, macroscopic agglutination is graded as 25%. Interpret.

a. Non-reactive
b. Negative
c. Positive
d. 1+

36. Other name for "HCV RNA":

a. Viral clade
b. Surface antigen
c. Viral load
d. Core antigen

37. Not included as a Hepatitis B serologic marker:

a. HBcAg
b. HBeAg
c. Anti-HBeAg
d. Anti-HBcAg

38. Autoimmune diseases are mostly associated with which class of HLA?

a. Class II
c. Class III
d. Class IV

39. Which of the following activates both T and B cells?

a. Pokeweed mitogen
b. Lipopolysaccharide
c. Concanavalin A
d. Phytohemagglutinin

40. It is used as the receptor for the sheep red blood cells (sRBC) for e-rosette assay:

a. CD2
b. CD4
c. CD8
d. CD12