1- What is the most common cause of esophageal rupture:
   A- Iatrogenic
   B- Closed chest trauma
   C- Retained foreign body

2- Hepatodudenal ligament suspends in which site
   A- First part
   B- Second
   C- Third
   D- Fourth

3- Right gastric artery arises from
   A- Hepatic artery
   B- Gastrodoudenal
   C- SMA
   D- Celiac

4- Cystic artery is a branch of
   A- Hepatic artery
   B- SMA
   C- Gastroduodenal

5- Which of the following has free edge of lesser sac
   A- SMV
   B- Hepatic vein
   C- CBD
6- The followings are correct regarding lesser sac boundaries.
   A- Lesser omentum, gasrtosplenic and splenorenal.
   B- Lesser omentum, umbilical legamnet , duodenum
   C- Lesser omentum, duodenum, triangular ligament

7- Which of the following pass through the esophageal hiatus
   A- Thorasic duct
   B- Vagus nerve
   C- Phrenic nerve

8- Which is the upper limit in mm of the right inerlobar pulmonary artery
   A- 3
   B- 4
   C- 8
   D- 16

9- Which of the following is the size of uteric junction in mm
   A- 4-7
   B- 8-13
   C- 13-20

10- Inferior relation to the prostate
    A- Inferior part of bladder
    B- Urogenital diaphragm
    C- Denonvilliers fascia
    D- Another fascia I forgot the name

11- Which ligament connect to the labia majora
    A- Broad
    B- Round
    C- Cardinal
    D- Uretrosacral
12- Regarding the space of Retzius
   A- Communicate with morison pouch
   B- Communicate with para colic gutter space
   C- Between bladder and pubic symphesis

13- The best MRI sequence to evaluate pigmented villonodular synovitis:
   A- STAI
   B- T1
   C- T1 fat sat
   D- Gradient

14- MR coil that control slide thickness: (repeated)
   A- Shim
   B- Surface
   C- Gradient
   D- Main something

15- MR coil that produce uniformity : (repeated)
   A- Shim
   B- Surface
   C- Gradient

16- In US, the transducer frequency depends on:
   A- The crystal thickness
   B- The Q factor

17- Case about avulsion than a question about The insertion of Sartorius muscle: : (repeated)
   A- inferior pubic ramus
   B- lesser trochanter
   C- superior anterior iliac spine
   D- inferior anterior iliac spin
18- case scenario asking about which muscle is attached to the anterior inferior iliac spine:
   A- rectus femoris
   B- Sartorius

19- patient presented with vomiting and dilated bowel loops with two adjacent zone of transition, the most likely diagnosis:
   A- paradoudenal hernia
   B- closed loop obstruction
   C- winslow hernia
   D- volvulus

20- 30 years old patient with caroli disease presented with jaundice and pain, the likely diagnosis:
   A- Lymphoma
   B- Hepatocellular carcinoma
   C- Cholangiosarcoma

21- Pediatric patient with pigmentation of lips and fingers and intestinal polyps, the likely diagnosis:
   A- Puetz-geghers syndrome

22- Patint presented with shortness of breath and lower limb edema , you will find in x ray:
   A- Bilateral perihilar opacities
   B- Fine septal lines ?
   C- Enlarged upper pulmonary vessels

23- Patient presented with vomiting and dilated loops and in CT you find Reglers triad, the diagnosis:
   A- Paralytic ilius
24- Patient with acute right iliac fossa pain in X ray you found RIF calcification with biliary tree air, the diagnosis: (repeated) 
   A- Gallstone in ilius (bouvert )

25- Patient with flank colicky pain, when you performed CT you found multiple abdominal masses and you find in his previous images high uptake of sulfur colloid, what is the most likely diagnosis:
   A- Splenosis
   B- Lymphoma

26- In spect study the resolusion
   A- High in the center
   B- High in the 25% center area
   C- High in 75% center areas
   D- The posterior part of the body is the clearest

27- A case of a patient underwent biopsy of the duodenum then he presented with pain, when you did x ray you found air under the diaphragm, which part was the biopsy taken from
   A- First
   B- Fifth
   C- Transvers
   D- Descending

28- Patient with signs of acute appendicitis, on exam you found tender mass in the inguinal canal, the most likely diagnosis:
   A- Amyand hernia ?
   B- De garengeort
   C- Spegelian
   D- Litters

29- The best view for hemoarthrosis:
   A- Ski line view
   B- Lateral view
30- Case of a patient after MVA presented with SOB and pain in the left side and low blood pressure and other things, he cannot stand up due to lower limb fracture, what you will find in the x ray:
A- Deep left CP line
B- Left apical opacity
C- Concavity of the heart shadow

31- 57 years old female presented with acute left flank pain and hematuria, no history of trauma, no fever, high BUN, blood and urine culture negative, CT shows enlarged kidney and perinephric edema, the likely diagnosis:
A- RCC
B- Pyelonephritis
C- Laceration
D- Nutcracker syndrome

32- Patient claustrophobic presented with signs of spinal cord compression, the best sagittal sequence:
A- T1
B- T2
C- FLAIR

33- The fastest MRI sequence: (repeated)
A- Echoplaner

34- Patient in MVA presented with low blood pressure, widended paraspinal space. Loss of upper limb motor and sensory, what to do next?
A- Sagittal T2
B- CT aortogram
C- Ct spine with contrast
35- A technologist started to do aortogram, first he started to give a small bolus of contrast than he gave another large bolus, (smart prep) this technique is called:
   A- Test bolus?
   B- Peak bolus?
   C- Double bolus

36- Characteristic of neuropathy atherosclerosis (repeated)
   A- Intraarticular debris
   B- Periosteal reaction
   C- Cortical distruction

37- The SI acoustic impedance unit is
   A- Pascal
   B- Rayl?
   C- Dc/kg

38- The attenuation coefficient unit
   A- Db/cm

39- Lateral resolution in US is increased by: (repeated)
   A- High scan lines density

40- The relation between frequency and deep penetration in ultrasound
   A- Proportionally related
   B- Inversely related
   C- No relation

41- The reaction of x ray of 40 kev with bone will result in:
   A- Compton
   B- Scatter
   C- Photoelectric?
   D- Pair production
42- In brahumstralung, 
   A- Zx mAs x kev
   B- mAs x kev2
   C- z x mAs x kev2

43- in ultrasound, the transmission of frequency will be least in:
   A- air
   B- bone
   C- muscle
   D- fat

44- which one of the following doesn’t prolonge the time of study in MRI
   A- pulse encoding
   B- phase encoding
   C- number of acquisition
   D- frequency encoding

45- long scenario about a dual ct generator to perform angiogram the technologist decrease the pitch from something to something, this will lead to:
   A- increase patient radiation dose
   B- increase the spatial resolution
   C- decrease patient radiation dose

46- the binding energy of the K shell depends on:
   A- atomic number
   B- atomic mass

47- in a neutral element, the atomic number will be equal to
   A- atomic mass
   B- atomic energy
48- electron went from L shell to K shell, if the L=8 and K=70 what will be the energy produced:
A- 60
B- 62
C- 40
D- 150

49- In Fluroscopy the Automatic brightness control princible by:
A- Adjust the kvp and mAs ?
B- Adjust the intensifier screen
C- Magnify the image on the film

50- Regarding the heel effect:
A- It is more pronounced at the cathode side? (There was nothing mentioned about the anode)

51- Another question about the heel effect I forgot it

52- In a healthy young male, when performing x ray, the position should be:
A- Erect
B- Hold his breath
C- Hand on side

53- In PET scan, we image the emesion of:
A- Electron
B- Positron
C- Auger electron

54- In MRI, RF signal in which angle:
A- 90
B- 45
C- 180

55- The radiation dose to the critical organ is:
A- 0.01 Sv
B- 0.05 Sv
C- 0.005 Sv
D- 5 Sv
56- In nuclear imaging the detector is used to: (repeated)
   A- Convert electron to light
   B- Convert light to electron

57- Collimation in nuclear imaging: (repeated)
   A- Increase spatial resolution

58- Heat energy ratio: (repeated)
   A- 99:1
   B- 1:99

59- 10 days old pediatric patient presented with bilious vomiting when you want to perform upper GI study, the most important view is:
   A- Supine
   B- Prone
   C- Left lateral
   D- Right lateral

60- The coronary vessel that divides at the cardiac crus is:
   A- Acute marginal
   B- Lateral anterior descending
   C- Posterior

61- Which of the following give rise to the second trigonal artery
   A- LAD
   B- Posterior

62- Which of the following is excreted 40-60 % by renal tubuls: (repeated)
   A- DMSA
   B- MAG 3

63- The optic nerve pass through: (repeated)
   A- Greater wing of sphenoid
   B- Lesser wing of sphenoid
   C- Zygomatic arch

64- Which of the following pass through the auditiray canal: (repeated)
   A- Facial nerve
65- Which of the following is the most common tumor arising from CP angel:
   A- Meningioma
   B- Shwanoma
   C- Cavernoma

66- Patient couldn’t look upward and inward, which nerve is affected:
   A- III
   B- IV
   C- V
   D- VI

67- 26 years old soldier came with pain in the metatarsal bone on x ray you found sclerosis, what is you likely diagnosis:
   A- Ostioma
   B- Enchondroma
   C- Stress fracture
   D- Insufficiency fracture

68- Regarding disc buldge, which nerve will be affected: : (repeated)
   A- One level above
   B- One level below
   C- The same level
   D- The next level but below

69- Patient presented with acute crohns exacerbation what you will see in CT:
   A- Submucosal fat
   B- Prominent vasa recti and fat mesenteric fat stranding

70- Features of plicae on MRI will be
   A- Hypointnse in T1 and hyper intense in T2

71- Early feature of multiple sclerosis plaques in: : (repeated)
   A- Ceptum pellucidum
   B- Septocallosum

72- The typical frequency of ultrasound transducer is
   A- 30 – 60 mHz
   B- 3-6 MHz
   C- 30 – 60 Mhz
   D- 300 – 600 Hz
73- The ghost artifact in ultrasound is caused by :
   A- Reflection
   B- Revibration

74- The strongest orbital wall is : (repeated)
   A- Medial wall
   B- Lateral wall
   C- Superior wall
   D- Inferior wall

75- Lacrimal gland is located in : (repeated)
   A- Superior orbital wall
   B- Inferior orbital wall

76- Pregnant in 2 weeks was exposed to radiation, the likely effect on fetus is:
   A- Retardation
   B- Anomalies
   C- Cancer
   D- Death of fetus

77- In x ray the maximum skin dose is:
   A- 5.7 m Gy
   B- 21 mGy

78- Patient with aids presented with TB, CD4 100, the most likely findings on x ray;
   A- Perihilar lymphadenopathy
   B- Cavities
   C- Multiple masses

79- The most common solitary lung nodule is:
   A- Granuloma

80- When you want to biopsy liver and reach the hepatic artrey you go through which vessel:
   A- SMA
   B- Gastroduodenal
   C- Pancreaticoduodenal
81- 20 years old female presented with hemoptysis on ct you found hypervascular mass in right bronchus, she is not a smoker and not exposed to smokers, the most likely diagnosis:
A- SCC
B- Adenocarcinoma
C- Cystic adenoid carcinoma
D- Carcinoid

82- Young athlete presented with para plagia , what to do ? : (repeated)
A- Ct spine
B- Brain CTA
C- MRI brain and carotic MRA ?
D- Echo carotid

83- Patient underwent colonoscopy , presented with severe pain not releaved by bascuban , what to do next: : (repeated)
A- Double contrast enema
B- Single water soluble contrast

84- Patient with lung nodule, to evaluate it will , which window:
A- Lung window
B- Soft tissue window
C- Sharp algorithm?  B(C(HRCT))

85- Regarding lingual segment : : (repeated)
A- Superior inferior
B- Medial superior
C- Medial lateral

86- Which of the following is anterior relation to esophagous : (repeated)
A- left atrium

87- On lateral x-ray, what appears posterior/or inferior (not sure) to right pulmonary artery:
A- Right main bronchus
B- Left main bronchus

88- Pediatric patient with acute abdominal pain and in x ray showed dilated loops ( picture of intussesseption , what to do next: : (repeated)
A- Ultrasound
89- Scenario of patient with picture of horner syndrome, echomosis, where is the mass: : (repeated)
   A- Cavernous sinus

90- How to increase contrast and decrease radiation dose:
   A- Increase Kev
   B- Decrease Kev
   C- Increase mAs
   D- Decrease mAs

91- Advantage of Film radiograph over digital
   A- Less dose
   B- Better environment

92- Chamberline line used to assess: : (repeated)
   A- Basilar invagination

93- In left SVC, where it drains: : (repeated)
   A- Coronary sinus

94- To see the splenic and hepatic flexure : (repeated)
   A- LAO and RAO

95- Diabetic patient with mediastinal mass on non contrasted CT , he has renal dysfunction, How to evaluate:
   A- MRI without contrast
   B- CT with contrast
   C- Repeat CT
   D- Do it with contrast if GFR>30

96- Patient with echogenic mass on ultrasound measuring 3 cm, whats the next step:
   A- CT with contrast
   B- CT without
   C- MRI

97- Radiation can cause death to cell if it cause:
   A- Based breakadge
   B- Proteolase damage
   C- Single DNA strand breakage
   D- Double DNA strand breakage
98- Case of a pregnant women came to clinic and the nurse asked her to take her blood pressure she extended her arm: what is true:
A- The nurse should ask her for written consent
B- Pregnant women don’t give consent
C- Extending her arm is a sign for consent

99- Which of the following is a medical error:
A- Mistaken diagnosis or prescription
B- Neglectance
C- Intentionally causing damage to patient

100- Case of two groups of cardiac patients given treatment and placebo, (they gave a table with the numbers of improvement and death which was 60 and 40 for one group and the opposite to the other, 40 and 60) you will find it in the Ha2a booklet:
A- 0.4
B- 0.6
C- 1.5
D- 2.5

101- Psychiatric patient depressed not complying on medication, the doctor want to do a trial for a medication that can decrease suicidal attempts:
A- It is acceptable because it will decrease suicide
B- Unacceptable because they are incompetent
C- Not acceptable because we don’t know the efficiency

102- Study to compare between hypertension and smoking, the type of study:
A. T test
B. Chi square – sure (from Hay2a book)
C. ANOVA

103- Study of two groups of 5000 exposed to radiation and the other group of 1500 was not. We follow the two groups and follow the complication. The type of study:
A. Cohort
B. Cross sectional
C. Case control
104-The numbering code was established after:
A. Tuskegee syphilis trial
B. Nazi trial

105-Different weights: 12, 13, 14, 14, 14, 21, this distribution:
A. Unimodal?
B. Non modal
C. Multimodal
D. Bimodal

106-75, 89, 82, 83, 85, 86, 90 what is the mode:
A. 89
B. 75
C. 90
D. none

107-patient autonomy example:
A. taking patients consent