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**CHRISTIAN SERVICE UNIVERSITY COLLEGEKUMASI, GHANA**  
**FACULTY OF HEALTH AND APPLIED SCIENCE**  
**DEPARTMENT OF PHYSICIAN ASSISTANTSHIP STUDIES**  
**BSc. PHYSICIAN ASSISTANTSHIP STUDIES (MEDICAL)**  
**END OF FIRST SEMESTER EXAMINATIONS - 2018/2019 ACADEMIC YEAR**  
**LEVEL 200**  
**PACS 213: LABORATORY & IMAGING TECHNIQUES**

**May, 2019**

**Time Allowed: 3 Hours**

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**SECTION 'A' - Time Allowed: One hour**

**GENERAL INSTRUCTIONS TO STUDENTS:**

- Answer all questions in both sections A and B
- Section A: Answer this section on the question paper by **circling** the correct answer.
- Section B should be answered in the answer booklet that will be provided

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1. A 7monthh old patient is brought to your consulting room with a complaint of blood stools and intermittent loud cries. Mother further complains of feeling a mass in the right flank. You suspect an intussusception; which radiologic investigation will you opt for?
  - a. Contrast enhanced CT scan
  - b. Plain abdominal x ray
  - c. Contrast enhanced ultrasound
  - d. MRI
  - e. Ultrasonography
  
2. A 28 year old ward assistant present to the consulting room with a history of sudden onset of low back pain following assisting a patient unto a bed . You suspect a slipped disc. What will be your imaging modality of choice if you have all modalities available in your institution?
  - a. MRI
  - b. Ultrasonography
  - c. Plain thoraco lumbar spine x ray
  - d. Contrast enhanced ultrasonography
  - e. Fluoroscopy
  
3. The following cancers in the body may be quite reliably ruled out on ultrasonography
  - a. early stages of cervical cancer
  - b. early prostate carcinoma
  - c. Small pancreatic carcinoma
  - d. none of the above
  - e. All of the above
  
4. A 6 year old school boy is brought to your consulting room with a complaint of sudden onset of left hemiscrotal pain during a football game. You suspect a left testicular torsion. You next appropriate line of action include;
  - a. Give antibiotics and assure mother that all will be well
  - b. Give painkillers and detain for sometime
  - c. get a booking for MRI in KATH within the week
  - d. refer to a urologist for urgent review and intervention
  - e. Request an urgent pelvic x ray
  
5. You receive an x ray from a patient in the consulting room and notice homogenous opacification if the left hemithorax. This could mean all these EXCEPT;
  - a. A large hemithoracic tumour
  - b. A massive pleural effusion
  - c. Total lung collapse
  - d. Tension pneumothorax
  - e. Massive empyema thoraces

6. A patient presents with abdominal pain, an ultrasound scan you requested reports normal finding. These inferences are all true EXCEPT,
- appendicitis is then ruled out
  - it still could be enteritis
  - it could still be pancreatitis
  - she could still have pyelonephritis
  - an infectious process could still account for the condition
7. A patient presents with a large intra-abdominal mass, your initial ultrasound diagnosis a tumour of renal origin. You want to confirm the tumour type before the appropriate referral is made. Your next line of investigation should be; Q 59
- Request for an urgent CT scan of the abdomen
  - Request for a plain abdominal x ray
  - Request for a contrast enhanced abdominal ultrasound
  - Request for an urgent image guided core biopsy for histologic diagnosis
  - Request for an urgent MRI of the abdomen
8. When a patient is suspected to have a DVT, an objective way to assess for the need of an ultrasound investigation is by the Well's score. The following are components of this score EXCEPT; Q60
- Patient with an alternative diagnosis as likely as or greater than that of DVT
  - Entire leg swelling
  - Pitting oedema
  - Active cancer with treatment ongoing or within previous six months
  - None of the above
9. A patient presents to your consulting room with cough of more than 2 weeks duration, you request a PA chest x ray, the following findings could point towards PTB on the x ray EXCEPT; Q61
- Reticulonodular opacities
  - Volume loss in affected lung
  - Evidence of cavitation
  - Findings of pleural effusion
  - Rib fractures

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10. A 32 year old teacher is rushed to your consulting room with sudden onset of left flank pain, colicky in nature; after the initial pain management you receive an ultrasound report with a diagnosis of left hydronephrosis; which of the following is the most likely cause of patient's pain? Q62
- acute appendicitis
  - intestinal obstruction
  - left ureteric calculus
  - splenic abscess
  - descending colonic diverticulitis
11. The most appropriate investigation for the patient described in the above question is;
- Acute abdominal MRI
  - low dose abdominal CT scan
  - Barium enema
  - Barium meal with follow through
  - Urgent IVU
12. Which of the following is true concerning intravenous urography;
- It requires the injection of contrast medium intramuscularly
  - It can be transformed into an MCUG
  - It uses CT as imaging
  - It requires no contrast administration
  - It is done under ultrasonographic guidance
13. You have a 7 year old patient in your consulting room with an ultrasound diagnosis of Intra-abdominal mass, you reckon he needs a biopsy for histologic diagnosis, which of the following are true concerning image guided biopsy?
- if the ultrasound could be used to assess the tumour, it may be used to guide the biopsy
  - the most appropriate tool for guidance will be MRI
  - CT scan guidance is best
  - MRI guidance should be far cheaper than other modalities
  - CT guidance must always be combined with fluoroscopy for guidance
14. You are sending a patient for MRI of the head; the following are important questions to ask the patient before you send her/him for the scan; EXCEPT
- do you have a pacemaker
  - do you have a metallic implant
  - do have a cochlear implant?
  - all of the above
  - none of the above

15. A lady with the following conditions cannot undergo a mammographic examination EXCEPT
- age below thirty years
  - breast implant
  - breast abscess
  - age above 40 years
  - swollen painful breast
16. Patient preparation for a pelvic ultrasound include all the following EXCEPT;
- Empty urinary bladder for transvaginal pelvic assessment
  - Full bladder for trans-abdominal pelvic assessment
  - Full bladder for transvaginal assessment
  - Instilling sterile saline into the bladder via an indwelling urethral catheter when scan is needed urgently
  - Explaining the procedure to the patient
17. The typical ultrasonographic description of a cyst is
- Rounded, thin walled, anechoic lesion with posterior acoustic enhancement
  - Rounded, thin walled, anechoic lesion with posterior acoustic shadowing
  - Rounded, thin walled, hyperechogenic lesion with posterior acoustic shadowing
  - Homogenously hyperechoic lesion
  - Heterogeneously isoechoic lesion with posterior acoustic shadow
18. Rounded intraluminal hyperechoic lesion with posterior acoustic shadowing; describes a;
- Cyst on ultrasound
  - Calculus on ultrasound
  - Cyst on CT scan
  - Tumour on CT scan
  - Cyst MRI
19. The following terminologies and the matching modalities are right EXCEPT
- Intensity for MRI
  - Density for CT scan
  - Opacity for fluoroscopy
  - Lucency for plain radiographs
  - Echogenicity for MRI

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20. A patient with a known radiological contrast allergy can conveniently undergo all these radiological examinations EXCEPT;
- Doppler ultrasound of the lower limb vessels
  - low dose plain abdominal CT scan
  - Chest x-ray
  - CT urography
  - Antegrade pyelography
21. Which of the following cancers can convincingly be ruled out on colour Doppler ultrasound examination;
- Carcinoma of the uterine cervix
  - Prostatic carcinoma
  - Oesophageal carcinoma
  - None of the above
  - All of the above
22. The following x ray findings on a plain chest x ray could point to a possible diagnosis of pulmonary tuberculosis EXCEPT;
- Presence of pleural effusion
  - Reticulonodular opacities
  - Elevation of the minor fissure with signs of consolidation
  - Consolidation in the upper zones with lung volume loss
  - Presence of "cannon ball opacities" in both lung fields
23. You have an 11 year old girl in your consulting room with an ultrasound diagnosis of suspected abdominal Burkitt lymphoma. The following follow up investigative decisions may not be appropriate in confirming the diagnosis EXCEPT
- Request for a contrast enhanced CT scan
  - Request for an abdominal MRI with contrast
  - Request for a plain abdominal x ray
  - Refer the patient for expert oncology review
  - None of the above
24. The recommended investigation for confirming the kind of tumour palpated or visualised on imaging is,
- Additional higher imaging technique
  - Imaging within contrast
  - Ultrasonography with duplex studies
  - Tumour biopsy for histology
  - Real time fluoroscopic imaging

25. It is generally believed that ultrasound has limited use in lung and chest pathologies, however ultrasound has found use in the diagnosis in the following conditions EXCEPT;
- Pneumothorax
  - Pleural effusion
  - Pleural bases tumours
  - Lobar pneumonia
  - Endobronchial tumours
26. The following patients with various causes of pain may benefit from plain x ray examinations EXCEPT;
- Abdominal x ray for flank pain
  - Abdominal x ray for pancreatitis
  - Knee joint x ray for joint effusion
  - Skull x ray for sinusitis
  - Pelvic x ray for suspected ectopic pregnancy
27. A patient is brought to your consulting room with a history of blunt abdominal trauma, a sonography report gives an impression of moderate ascites, cause not evident. Your treatment will not include all these EXCEPT
- Request for renal function test to rule out renal failure
  - Request for liver function test to rule out cirrhosis
  - Propose that ascitic fluid tap be done to rule out abdominal tb as cause
  - Refer for urgent surgical review after check HB and BP monitoring with IV fluids being given
  - Refer the patient for a physician to review in two weeks
28. You sent a patient to the radiology department in your hospital requesting a skull x ray to help confirm suspected sinusitis, which one of the radiology staff underlisted should you discuss the most appropriate views to be taken with?
- Sonographer
  - Radiographer
  - Technician
  - Receptionist
  - Radiologist
29. You have an 8month old baby with a suspected brain abnormality, you send the patient for a transfontanelle scan, and the most appropriate ultrasound probe to use is;
- A linear array probe
  - A linear array probe with at least 6MHz frequency
  - A convex probe 3.5MHz
  - A sector probe
  - An intra cavitory probe with high frequency

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30. Concerning Radiation protection principle; ALARA refers to;
- As Low As Radiation Allows
  - As Less As Reasonably Allowable
  - As Low As Responsibly Achievable
  - As Less As Reasonably Achievable
  - None of the Above
31. In requesting for Radiation related investigations in medical practice, the following encapsulates the overall principles
- Justification, Limitation, Optimization
  - Justification, Limitation, Organisation
  - Justification, Liberation, Optimization
  - Justification, Liberation, Organisation
  - Judicial, Limitation, Optimization
32. In the Electromagnetic spectrum, rays used in medical diagnostics and treatment have the following properties;
- Higher frequencies and long wavelengths
  - Higher frequencies and short wavelengths
  - Lower frequencies and long wavelengths
  - Higher frequencies and no wavelength
  - Lower frequencies and short wavelengths
33. A patient presents with right lower quadrant pain with fever and elevated WBC count. His ultrasound report states; "Normal abdomino-pelvic ultrasound; No evidence of Appendicitis". Your next appropriate action should not include?
- Ask for a repeat ultrasound by an experienced radiologist
  - Request for a contrast enhanced abdominal CT scan
  - Start some broad spectrum antibiotics and refer patient for surgical review
  - Give some antimalarial drugs and antibiotics and allow him to go home
  - Explain to the patient that the ultrasound report is not final appendicitis could be missed on Sonographic studies.
34. Concerning the electromagnetic spectrum, repeated exposure to some rays could increase ones chances of developing cancers. These rays do not include;
- X rays
  - Gamma rays
  - Infra-red and visible light
  - None of the above
  - All of the above



35. The following are not true concerning a good chest x ray EXCEPT
- Must be taken at full inspiration
  - Patient should be rotated
  - X rays must be directed antero-posteriorly
  - Both costophrenic angles must not be in view
  - X rays must be directed obliquely
36. A 35year old patient has been involved in a road traffic accident with significantly reduced coma score. Your facility is in the city with good and diverse radiological equipment. What will be the most appropriate examination tool if you suspect skull base fractures with brain injury and possible intracranial haemorrhage?
- X ray of the skull
  - Ultrasound of the brain
  - Fluoroscopy of the skull
  - CT scan of the head
  - MRI of the head
37. Concerning mammography the following are not true EXCEPT;
- It could be hazardous in a patient less than 30years
  - It is the best imaging tool for breast cysts.
  - It is the only imaging modality for diagnosis of breast cancers
  - Best used in women less than 35 years old
  - Uses Tungsten filament instead of Molybdenum in the ordinary X ray tube
38. Mammography is not indicated for in all the under listed EXCEPT;
- Patient with a breast abscess
  - Female with a breast in plant
  - Patient less than 35 years of age
  - Postmenopausal woman with a palpable breast lump
  - Patient with severe breast tenderness
39. Fluoroscopy guidance may be employed in all the following examinations EXCEPT
- Barium swallow
  - Angiography
  - Fistulography
  - Venography
  - Skull x ray

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40. The following matching pairs are true EXCEPT
- Fluoroscopy - X rays
  - CT scan - X rays
  - MRI - magnetic field
  - Ultrasound - Sound waves
  - MRI - Microwaves
41. The ability of MRI to generate images from body tissues is dependent on the,
- Abundant Hydrogen ions in tissues
  - Sodium ions in the body
  - Potassium ions in the body
  - Calcium ions in the body
  - Chloride ions in the body
42. A 48year old patient presents to your consulting room with a swollen tender lower limb without fever following a journey from China a couple of days prior to her visit to your facility. The following management may not apply EXCEPT;
- Give antibiotics for treatment of cellulitis and review in a week
  - Send her for an x ray of the lower limb
  - Advise her to massage the affected limb with analgesic gel and apply bandage
  - Send her for a duplex ultrasound to confirm or rule out DVT
  - Counsel her to elevate her affected lower limb during sleep and when seated
43. An objective assessment of the likelihood of a patient having a DVT is known as the,
- Wells score
  - Bells score
  - Dells score
  - Cells Score
  - Pells score
44. A seventy eight year old chief presents to your consulting room with a history of headache for 2 weeks following a durbar at which he was carried shoulder high. He has developed gradual unilateral weakness of the left side of his body. He is not diabetic or hypertensive. His blood pressure during the consultation is slightly elevated. What is your most likely working diagnosis and what radiological investigation will you request to confirm.
- Request an X ray for the affected half of the body to rule out fracture
  - Request a head CT scan to rule out brain injury
  - Request a CT scan of the brain with a suspicion of subdural haematoma in mind
  - Request a chest X ray to rule out Cardiomegaly
  - Request an MRI for the affected half of the spine for spinal cord injury

45. The frequency of sound waves employed in diagnostic ultrasound studies range from;
- 2.5Mhz – 5MHz
  - 2.5MHz > 15MHz
  - 2.5Mhz – 7.5MHz
  - 2.5Hz – 15Hz
  - 2.5Mhz – 4MH
46. Concerning diagnostic ultrasonography, the following are true,
- A mode refers to Amplitude mode and has generally been replaced by B mode
  - M mode refers to Motion mode and may be useful in cardiac studies
  - B mode refers to brightness mode is mainly used to visualize body tissues
  - Colour Doppler is able to detect both flow in a medium and the direction of flow
  - Power Doppler is able to detect both flow in a medium and the direction of flow
47. A 12MHz linear probe is expected to have all the following properties EXCEPT
- High frequency
  - Sharper and better image quality
  - Shorter penetration
  - Fan shaped beam
  - Appropriate for the study of superficial structures
48. In the assessment of a patient's pelvis to find the possible causes of infertility all the following uterine, tubal and ovarian factors may be diagnosed on ultrasound EXCEPT;
- Bilateral hydrosalpinges
  - Submucosal uterine fibroids
  - Endometrial scarring
  - Polycystic ovary disease
  - Bilateral tubal occlusion from salpingectomy
49. An ultrasound diagnosis of fluid in the Douglas pouch may be due to all the following EXCEPT;
- Ruptured ectopic gestation
  - Pelvic inflammatory disease
  - Ruptured ovarian follicle
  - Polycystic ovary disease
  - Ascites from chronic liver disease

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50. A client comes to you and complains of having missed her menses for a week and a couple of days. She had been sexually active and suspects she may be pregnant, an ultrasound report she comes along with states small uterine fibroids; largest measuring 1.4cm in diameter; no evidence of cyesis. What should be your next appropriate action
- Let her repeat the scan immediately
  - Assure her not to worry about being pregnant since the scan can be trusted
  - Do a urine pregnancy test to confirm possible cyesis
  - None of the above
  - All of the above

**SECTION 'B' - TIME ALLOWED: 2 (TWO) HOUR**

- SECTION B SHOULD BE ANSWERED IN THE ANSWER BOOKLET THAT WILL BE PROVIDED**

- A 70 year old man known alcoholic presents to your consulting room with gradual onset of headache and right sided weakness following a minor head trauma. He has no obvious swelling or injury. He has no findings to support a history of diabetes or hypertension.**
  - How will you radiologically investigate this patient
  - List two differential diagnosis
  - List two analgesics you should avoid in his treatment
- A 40year old market woman presents to your consulting room in the district with four days history of fever, right upper quadrant abdominal pain and a tinge of jaundice.**
  - List 3 radiological investigations you will request to help in your diagnosis
  - List 3 differential diagnosis
  - Write a concise request to the radiology unit for your investigation of choice
- A 42year old female presents to your consulting room with a history of vague left breast symptoms. Your physical examination revealed nothing concrete.**
  - List two radiological examinations you will request and why
  - How will you prepare this patient for the radiological investigations?
  - List three contraindications for one of your modalities

- 4. Describe briefly the principle of x ray production.**
  - a. List three views/projections that a chest x-ray can be taken
  - b. List three diagnosis that can be conclusively made on chest x ray
  - c. List 3 differentials for homogenous opacification of a hemithorax on a plain chest x-ray
  
- 5. A 5 year old girl is said to have drunk some caustic soda solution resulting in difficulty in swallowing solid foods.**
  - a. Which radiological investigation would you request
  - b. List 3 other fluoroscopic guided radiological examinations
  - c. Name one alternative examination for upper GI investigation
  
- 6. Describe briefly how you will prepare a patient for the following examinations**
  - a. Abdominal ultrasound
  - b. Trans abdominal pelvic ultrasound
  - c. Transvaginal pelvic ultrasound study
  
- 7. State the form of energy used by 5 imaging modalities of your choice, for example, fluoroscopy uses x rays.**
  
- 8. A 6 year old presents go your consulting room with severe left hemiscrotal pain of sudden during a football game in school.**
  - a. What is your most likely diagnosis
  - b. State one urgent investigation that may be of use in evaluating the hemiscrotum
  - c. Name one complication.
  
- 9. Various imaging modalities have variable sensitivity for various disease conditions**
  - a. List 3 imaging modalities sensitive for the diagnosis of bony pathologies
  - b. List 3 imaging modalities sensitive for the diagnosis of cystic pathologies
  - c. List 3 imaging modalities sensitive for the diagnosis of soft tissue pathologies
  
- 10. A 45year old business woman returns from a trip to China with sudden onset of painful left lower limb swelling. No fever or differential warmth noticed.**
  - a. List three radiological modalities useful in the evaluation and diagnosis of the above condition
  - b. What is your most likely diagnosis
  - c. Summarise the use of the Well's score.

*Examiner: Dr. Joseph A. Quansah*

**ALL THE BEST OF LUCK**

✓  
Done