PTS Phase 1 Mock SBA 2023

Paper 1 – [Answers]

Examiner Instructions:

- Time allocated for examination: 2 hours.
- You are **not permitted** to leave the examination hall in the first 90 minutes and last 10 minutes.
- You are permitted to use a Sheffield University approved calculator should you wish.
- The use of mobile phones or other electronic devices is **strictly prohibited** in this exam and should be handed in or switched off for the duration of the exam.
- Please complete all 90 questions
- The paper consists of 90 marks total.

Disclaimer:

The following paper has been written **for students by students** and bares no reflection on the real exam. This is a learning tool that has not been reviewed by the University of Sheffield and therefore the use of this paper for learning are at the student's discretion.

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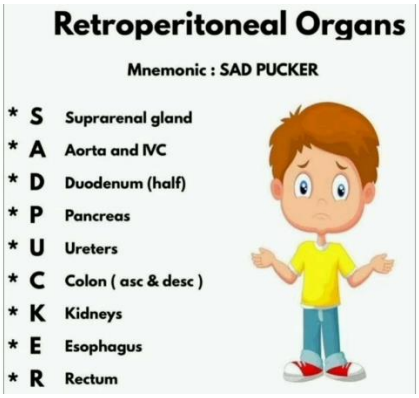
1. **Which one of these organs are NOT retroperitoneal?**
   A- Kidneys
   B- Transverse Colon: Transverse colon is intraperitoneal
   C- Oesophagus
   D- Ureters
   E- Rectum

   Retroperitoneal organs do not have a mesentery.
   Remember the retroperitoneal organs by SAD PUCKER:



2. **Which of the following cell types are not present in bone?**
   A- Macrophage
   B- Osteoclast
   C- Osteocloid - not a cell type: unmineralized organic portion of bone matrix
   D- Osteoblast
   E- Osteocyte

3. **Cardiac output is……**

   A-Mean blood pressure * systemic resistance
   B-Mean blood pressure * stroke volume
   C-Heart rate * mean blood pressure
   D-Heart rate * stroke volume
   E-Stroke volume * systemic resistance

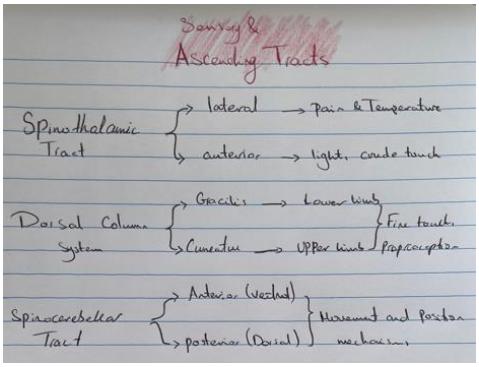
4. **Which artery most frequently supplies the AVN?**

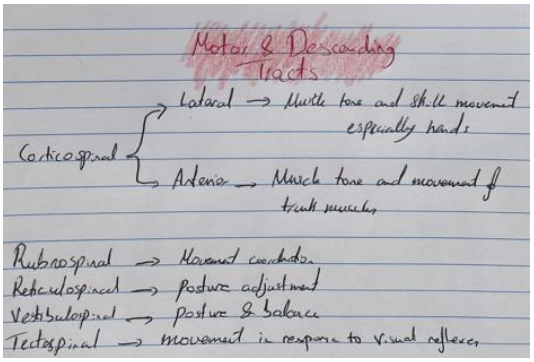
   A- L coronary artery
   B-R coronary artery
   C-L circumflex artery
   D-Posterior descending artery
   E-LAD

The AVN is always supplied by the posterior interventricular artery (PIV) In 90% of people PIV branches off the RCA. The remaining 10% have their PIV branch off ONLY the LCA.

5. **Which of the following tracts provides pain, pin prick, and temperature sensation?**
   A- Spinocerebellar
   B- Corticospinal
   C- Dorsal Column medial pathway
   D- Rubrospinal
   E- Spinothalamic

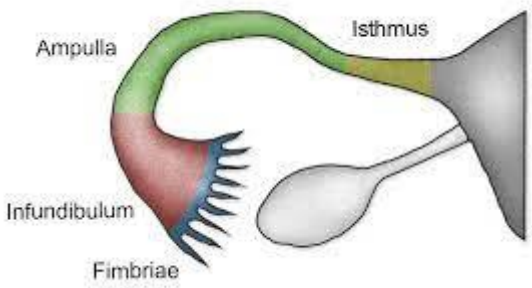
   Learn a brief overview of each tract's function





(Raneem's notes)

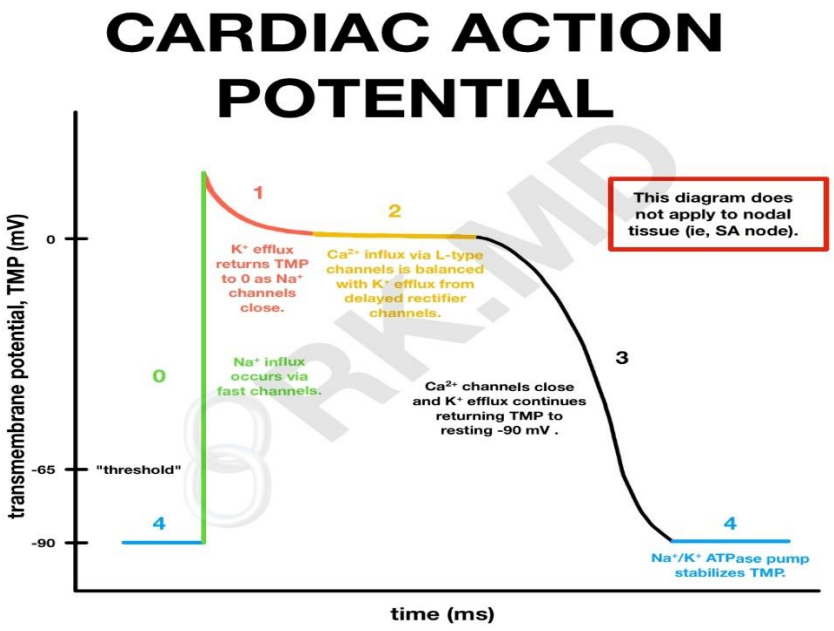
6. **Which of the following does not form part of the fallopian tubes?**
   A - Fimbriae
   B - Infundibulum
   C - Fundus
   D - Ampulla
   E - Isthmus



7. **Which layer of the skin prevents dehydration?**
   A - Dermis
   B - Stratum spinosum
   C - Stratum basale
   D - Stratum granulosum
   E - Stratum corneum

   Stratum corneum is the primary barrier between thebody and theenvireonemtn and prevents unwanted materials from entering and excessive loss of water from existing the body.

8. **During phase 3 of ventricular cardiomyocyte action potential, the cells repolarise. Which of the following best explains how this repolarisation occurs?**
   A - Influx of K+ ions
   B - Efflux of K+ ions
   C - Influx of Na+ ions
   D - Influx of Ca2+ ions
   E - Efflux of Na+ ions



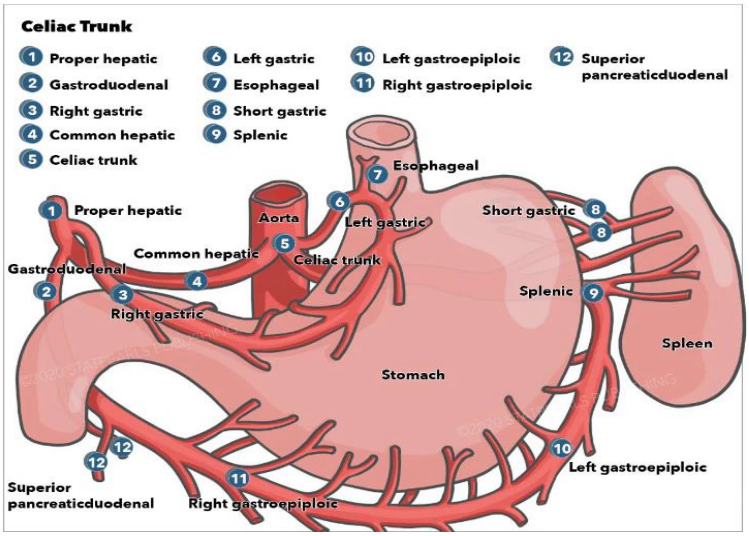
9. **Which adrenoreceptor is most sensitive to adrenaline compared to noradrenaline?**
   - **A - α1 receptor**
   - **B - α2 receptor**
   - **C - β1 receptor**
   - **D - β2 receptor**
   - **E - β3 receptor**

10. **Where does capacitation occur in spermatogenesis?**
   - **A - Seminiferous tubule**
   - **B - Epididymis**
   - **C - Rete testis**
   - **D - Female reproductive tract**
   - **E - Sertoli cells**

11. **Which coagulation factors are vitamin K dependent?**
   - **A - Factors II, VII, X and XII**
   - **B - Factors V, VIII, XI AND XII**
   - **C - Factors II, VII, IX and X**
   - **D - Factors I, IX, XI and XII**
   - **E - Factors III, IV, VIII and X**

   1972 – Factors 10, 9, 7 and 2

12. **Which artery does the right gastric artery arise from?**
   - **A - Common hepatic artery**
   - **B - Proper hepatic artery**
   - **C - Splenic artery**
   - **D - Abdominal aorta**
   - **E - Gastroduodenal artery**



This diagram is very helpful in remembering branches and further branches of abdominal aorta.

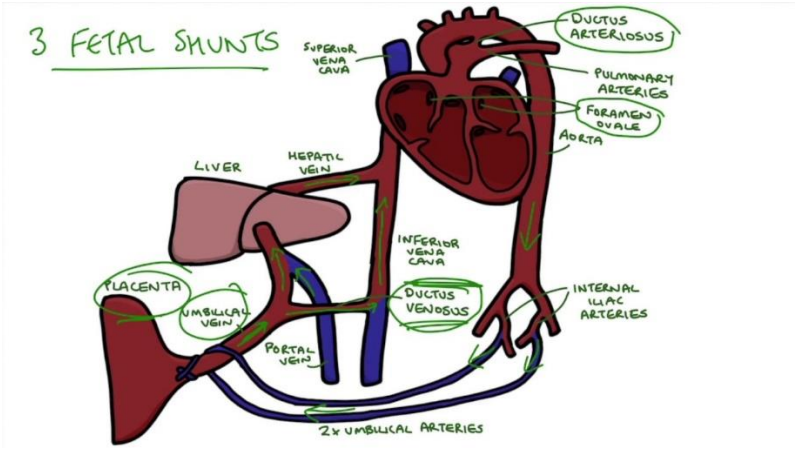
13. **Which these muscles is NOT in the rotator cuff?**
    - **A- Subscapularis**
    - **B- Infraspinatus**
    - **C- Teres major**
    - **D- Teres minor**
    - **E- Supraspinatus**

14. **Which cell in the stomach secretes pepsinogen?**
    - **A- Goblet cells**
    - **B- D cells**
    - **C- G cells**
    - **D- Parietal cells**
    - **E- Chief cells**

Cell Types	Substance Secreted
Goblet cells	Mucus (protects stomach lining)
Parietal cells	Gastric acid (e.g. hydrochloric acid)
Chief cells	Pepsinogen (protease precursor)
D cells	Somatostatin (inhibits acid secretion)
G cells	Gastrin (stimulates acid secretion)

15. **Where does fertilisation usually occur in the Fallopian tubes?**
    - **A- Isthmus**
    - **B- Infundibulum**
    - **C- Perineum**
    - **D- Fimbriae**
    - **E- Ampulla**

16. **What two structures does the ductus venosus connect in the fetus?**
    - **A. IVC and the portal vein**
    - **B. Aorta and the IVC**
    - **C. IVC and the umbilical vein**
    - **D. Umbilical vein and aorta**
    - **E. Umbilical artery and portal vein**



Important to learn the foetal circulation.

17. Within 3 weeks of birth, what does the ductus arteriosus turn into?

A. Ligamentum arteriosum
B. Fossa ovalis
C. Foramen ovale
D. Ligamentum venosum
E. Bulbus cordis

18. What activates the renin-angiotensin-aldosterone system?

A. Low blood pressure- RAAS is activated when there is low blood pressure to increase water and electrolyte reabsorption in the kidney, which compensates for the drop in blood pressure, therefore increasing the blood pressure.
B. High blood pressure
C. High sodium
D. Low glucose
E. Glucagon

19. What is not an effect of cholecystokinin?

A. It causes gallbladder contraction.
B. It inhibits gastric emptying.
C. Increases pancreatic enzyme secretion
D. Increases the rate of gastric emptying
E. Decreases pancreatic enzyme secretion

20. What type of epithelium is the ectocervix covered by?

A. Transitional epithelium
B. Stratified squamous non-keratinised epithelium
C. Stratified columnar keratinised epithelium
D. Stratified squamous keratinised epithelium
E. Simple columnar kertainised epithelium

21. In which area is a lumbar puncture performed?

A. Subarachnoid space
B. Nucleus pulposus
C. Intervertebral disc
D. Extradural space
E. Intraventricular space

The aim of lumbar puncture is to get a sample of CSF. CSF is between the arachnoid and pia layers called the subarachnoid space.

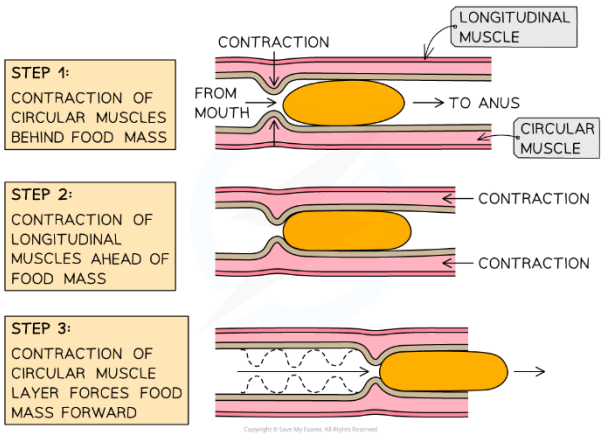
22. What nerve supplies the pericardium?

A. Trigeminal nerve
B. Phrenic nerve
C. Laryngeal nerve
D. Sacral plexus
E. Intercostal nerve

23. Which statement about peristalsis is true?

A. Peristalsis only occurs in the stomach and small intestine – also occurs in the pharynx, oesophagus, rectum and ureters
B. Peristalsis is a voluntary muscle movement – it is involuntary
C. Longitudinal muscles propel the food bolus through the oesophagus
D. Circular smooth muscle contracts in front of the food bolus – behind not in front of
E. Chyme turns into bolus

This diagram explains peristaltic action clearly.

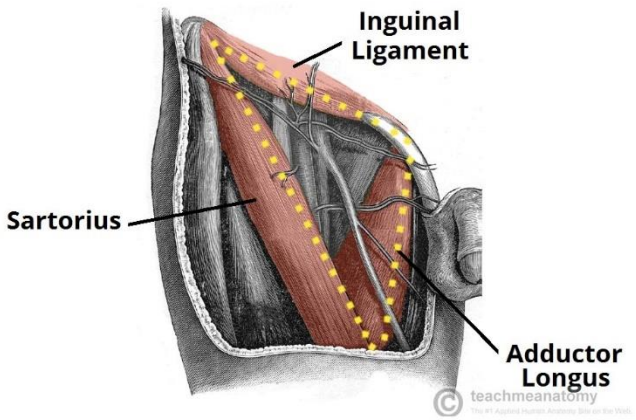


24. Which blood vessels supplies approximately 1/3rd of the blood supply to the liver?

A. **Hepatic artery proper**
B. **Hepatic portal vein**
C. **Inferior phrenic artery**
D. **Superior mesenteric artery**
E. **Inferior mesenteric artery**

25. Which structure forms the lateral border of the femoral triangle?

A. **Inguinal ligament**
B. **Adductor longus**
C. **Femoral nerve**
D. **Femoral canal**
E. **Sartorius**



26. Collagen is an abundant structural protein found in the body. Which type of collagen is found in the basement membrane?

A. **Type I – bone, skin, dentin, cornea, blood vessels and tendon**
B. **Type II – cartilaginous tissues**
C. **Type III – skin, ligaments, blood vessels and internal organs**
D. **Type IV – basement membrane**
E. **Type V – lung, bone, cartilage and skeletal muscle**

27. What is the main blood supply to the foregut?

A. Superior mesenteric artery
B. Coeliac trunk
C. Renal artery
D. Inferior mesenteric artery
E. Femoral artery

28. A 52 year old man has a suspected brain tumour. He is experiencing vision loss in his temporal visual fields. Where is the most likely site of damage?

A. Optic tract
B. Right Meyer's loop
C. Optic chiasm - Bitemporal hemianopia is most likely caused by lesions at the optic chiasm due to pituitary adenomas
D. Right Baum's loop
E. Left Baum's loop

29. A pregnant woman with a history of Osteogenesis Imperfecta Type I has just given birth. Her baby was diagnosed antenatally with the same condition which causes a reduction in the amount of type I collagen produced. Which of the following is one of the main sites of type I collagen production?

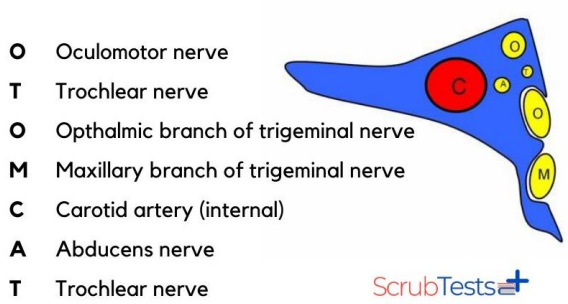
a) Tendons
b) Hyaline cartilage
c) Reticular fibres
d) Basal lamina
e) Cell surfaces

- Type I collagen is mainly produced in the tendons, bones and organ capsules. Type II collagen is mainly produced in hyaline and elastic cartilage. Type III collagen is mainly produced in reticular fibres of connective tissue. Type IV collagen is mainly produced in the basal lamina. Type V collagen is mainly produced in cell surfaces.

30. Which of the following structures does not pass through the cavernous sinus?

A. Oculomotor nerve
B. Abducens nerve
C. Trochlear nerve
D. Trigeminal nerve V3
E. Trigeminal nerve V2

Structures in cavernous sinus and their positions (O TOM CAT)



Remember the acronym O TOM CAT

31. What is the function of the medial golgi body?

A) Synthesis of proteins
B) Protein phosphorylation
C) Proteolysis of peptides and sorting molecules into vesicles
D) Modifies products by adding sugars forming oligosaccharides
E) Synthesis of lipids

32. What is a desmosome?

A) Seals neighbouring cells together in an epithelial sheet
B) Joins an actin bundles in one cell to an actin bundle in a neighbouring cell
C) Anchor intermediate filaments in a cell to the basal lamina
D) Joins intermediate filaments in one cell to those in a neighbouring cell
E) Joins the actin filaments of one cell to the intermediate filaments of another cell

33. Which step is rate limiting in glycolysis?

A) Phosphoenol pyruvate to pyruvate
B) Glucose to glucose-6-phosphate
C) Fructose-6-phosphate to fructose-1,6-bisphosphate
D) 3-phosphoglucerate to 2-phosphoglycerate
E) Fructose-1,6-bisphosphate to glyceraldehyde-3-phosphate

34. Which is the blood and nerve supply to the foregut?

A. **Coeliac trunk, greater splanchnic T5-T9**
B. Coeliac trunk, greater splanchnic T6-T10
C. Coeliac trunk, lesser splanchnic nerve T6-T11
D. SMA, lesser splanchnic nerve T10-T11
E. IMA. Least splanchnic nerve T12

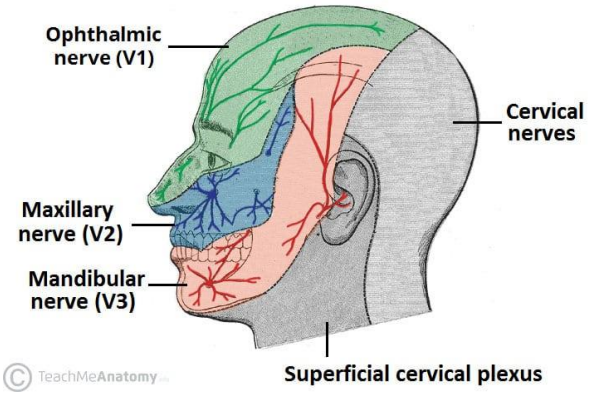
Foregut supply: coeliac trunk, greater splanchnic nerve, T5-T9
Midgut supply: SMA, less splanchnic nerve, T10-T11
Hindgut supply: IMA, least splanchnic nerve, T12

35. Which ion causes depolarisation in the pacemaker cells of the heart?

A) Na+
B) K+
C) Cl-
D) Ca2+
E) I-

36. Which nerve supplies sensation in the frontal sinuses?

A) Trigemial nerve
B) Oculomotor nerve
C) Trochlear nerve
D) Opthalmic division of the trigeminal nerve
E) Maxillary division of the trigeminal nerve



37. What is the correct definition for Vital capacity?

A) Maximum volume of air the lungs can contain
B) Volume of air in excess tidal inspiration that can be inhaled with maximum effort
C) Volume of air that can be exhaled with maximum effort after maximum inspiration
D) Volume of air that can be inhaled or exhaled in one breath
E) Volume of air that can be exhaled with maximum effort after tidal inspiration

38. Which of the following statements regarding bilirubin metabolism is false?

A) Reticuloendothelial cells metabolise haemoglobin
B) Urobilinogen is oxidised into urobilin in the kidneys, then excreted into the urine
C) Biliverdin is reduced to create unconjugated bilirubin
D) Around 20% of urobilinogen is reabsorbed into the bloodstream as part of enterohepatic circulation
E) Bilirubin is converted into urobilinogen in the liver - this happens in the colon, not the liver

39. Which of these is not part of the ureteric bud?

A) Ureter
B) Nephrons - part of metanephric tissue
C) Renal pelvis
D) Major and minor calyces
E) Collecting tubules

40. Which of the following statements regarding water distribution in an average 70kg male is true?

A) Intracellular fluid equals 14 litres
B) Interstitial fluid equals 3 litres
C) Plasma equals 11 litres

D) Extracellular fluid equals 14 litres - correct values: total body water = 42L, intracellular fluid = 28L, interstitial fluid = 11L and plasma = 3L. Therefore, extracellular fluid must equal 14L
E) Total body water equals 28 litres

41. Which of these is not a feature of the small bowel?

A) Contains plicae circulares
B) Has villi
C) Has no taenia coli
D) Has epiploic appendages - the small bowel does not contain epiploic appendages but the large bowel does
E) Has simple columnar epithelium

42. What exits through the foramen spinosum?

A) Maxillary branch of trigeminal nerve
B) Internal carotid artery
C) Mandibular branch of trigeminal nerve
D) Middle meningial artery - located in the middle cranial fossa lateral to foramen Ovale, it contains the middle meningial artery, the middle meningial vein and the meningial branch of CN V3
E) Lacrimal nerve

43. Which bone in the wrist is most commonly fractured?

A) Hamate
B) Scaphoid - the scaphoid is on the side of the wrist so often takes the impact in a fall or other trauma
C) Trapezium
D) Capitate
E) Trapezoid

44. What is Barrett's metaplasia?

A) Stratified squamous to simple columnar - Barrett's oesophageal occurs after long term epithelial irritation from GORD, the epithelium changes from normal stratified squamous to specialised intestinal simple columnar epithelium
B) Simple columnar to simple squamous
C) Simple squamous to stratified columnar
D) Stratified squamous to stratified columnar
E) Simple squamous to simple cuboidal

45. How much protein would a 70kg man need in a day?
A) 1050g
B) 560g
C) 35g
D) 56g - recommended protein intake is 0.8g/kg so 0.8 x 70 = 56g
E) 700g

46. What is the rate limiting enzyme of the Krebs cycle?
A) Citrate synthase
B) Malate dehydrogenase
C) Succinyl-CoA synthetase
D) Isocitrate dehydrogenase - the rate limiting step is isocitrate to alpha-ketoglutarate, this is a rate limiting step as isocitrate dehydrogenase controls the reaction allosterically, allowing it to undergo feedback inhibition via the products ATP and NADH
E) Succinate dehydrogenase

47. A patient comes in struggling to breath. They have an ABG done which shows a pH of 7.25, a low PaO2, a high PaCO2 and a high bicarbonate. What is wrong with this patient?
A) Partially compensated metabolic alkalosis
B) Type 1 respiratory failure
C) Fully compensated respiratory acidosis
D) Uncompensated respiratory acidosis
E) Partially compensated respiratory acidosis - there is respiratory acidosis as the pH and PaO2 are low and the PaCO2 is high, however, there is metabolic compensation, evident from the increased bicarbonate. This is only partial compensation though as the pH is still acidic.

48. What is not a function of angiotensin II?

A) Increases blood pressure
B) Increases aldosterone release
C) Increases sodium retention
D) Increases potassium retention - it increases potassium excretion directly as well as indirectly through the increased action of aldosterone
E) Increases water retention

49. What is not an action of PTH?

A) Increases osteoclast activity
B) Increases phosphate excretion
C) Increases osteoblast activity - PTH reacts to low calcium levels in order to increase them, so it increases osteoclast activity in order to increase bone lysis to increase serum calcium, increasing osteoblastic activity would decrease serum calcium as more calcium would be absorbed into the bone
D) Increases 1-alpha hydroxylation of 25-OH vitamin D
E) Increases calcium reabsorption in the small intestines

50. Which of the following cranial nerves does not contain parasympathetic fibres?

A) III
B) XII - hypoglossal nerve doesn't carry any parasympathetic fibres. Remember 1973 – 10, 9, 7 and 3 contain parasympathetic fibres
C) VII
D) X
E) IX

51. Which of these does not decreased metabolism?

A. Increasing age
B. Hyperthyroidism
C. Female compared to male
D. Hypothyroidism
E. Starvation

Hyperthyroidism increased metabolism.
Factors that decrease metabolism: increasing age, being female, starvation, low BMI and hypothyroidism
Factors that increased metabolism: high BMI, hyperthyroidism, pregnancy, infection and exercise.

52. What enzyme is inhibited by NSAIDs in the formation of peptic ulcers?

A) Cyclo-oxygenase - it is the inhibition of the COX-1 and COX-2 enzymes that result in reduced synthesis of prostaglandins which are needed for mucus production. Less mucus results in worsened protection and worse mucosal defense.
B) Pepsin
C) Mono-oxygenase
D) Endothelin converting enzyme 1
E) Phospholipase A2

53. What enzyme splits DNA strands apart in the process of DNA replication?

A) Ligase
B) Primase
C) DNA polymerase
D) Endonucleases
E) Helicase

54. What vessel does the left testicular vein drain into?

A) Inferior Vena Cava
B) Left Femoral vein
C) Pampiniform plexus
D) Left Renal Vein
E) Internal Iliac Vein

55. How many calories are there in one unit of alcohol?

A) 48 kcal
B) 52 kcal
C) 56 kcal - there are 7 kcal per gram in alcohol and in one unit there are 10 ml or 8 grams, so 7 x 8 = 56kcal in one unit of alcohol.
D) 64 kcal
E) 70 kcal

56. A 79 year woman is admitted to A & E. She is found to be severely dehydrated. Which of the below is the correct distribution of fluid in the body?

a) 28L intracellular, 10L transcellular, 1L interstitial, 3L plasma
b) 28L intracellular, 1L transcellular, 10L interstitial, 3L plasma
c) 28L intracellular, 10L transcellular, 3L interstitial, 1L plasma

d) 28L intracellular, 1L transcellular, 3L interstitial, 10L plasma
e) 10L intracellular, 3L transcellular, 28L interstitial, 1L plasma

57. Which of the following tracts would have sensory pathology contralaterally 1-2 levels below the lesion?

A. DCML – cuneatus
B. DCML – gracilis
C. Spinothalamic
D. Corticospinal
E. Corticobulbar

Spinothalamic: ascending tract for crude touch, pain and temperature. It enters the spinal cord and ascends 1-2 levels ipsilaterally before decussating.
DCML is for fine touch, proprioception and vibration. Cuneatus is for upper limbs and gracilis for lower limbs. Both of these decussate in the medulla.
Corticospinal and corticobulbar are descending tracts that have motor functions.

58. An analysis of the sensitivity and specificity of COVID-19 tests is carried out. What is the sensitivity of a test?

a) A test of the probability of a person with the disease obtaining a positive test result
b) A test of the probability of a person without the disease testing negative
c) The proportion of people with a positive test result who actually have the disease
d) The proportion of people without the disease who are correctly excluded by the test
e) Number of existing cases at a particular point in time
Answer: A - A test of the probability of a person with the disease obtaining a positive test result

- **A is describing sensitivity (= No. of true positive results / Total no. screened). B is describing specificity (= No. of true negatives / Total no. screened). C is describing the positive predictive value (= True positives / (true positives + false positives)). D is describing the negative predictive value (True positives / (false negatives + true negatives)). E is describing the prevalence of a disease.**

59. A baby boy is born prematurely at 30 weeks. His parents are worried about his lung development. At what stage of embryonic development do the primitive alveoli begin to form
a) 4-5 weeks
b) 5-16 weeks
c) 16-26 weeks

d) From 26 weeks

e) From 34 weeks

- **From 26 weeks is the terminal sac phase of lung development, when primitive alveoli begin to form. This is followed by the alveolar phase, when the alveoli continue to further develop up to the age of 5. 4-5 weeks is the embryonic phase of lung development, when the lungs begin to develop from respiratory diverticulum. 5-16 weeks is the pseudoglandular phase of lung development, when the conducting airways develop. 16-26 weeks is the canalicular phase of lung development, when respiratory bronchioles and lung vasculature begin to form. From 24-28 weeks surfactant begins to be produced by the foetal lungs, but it is not sufficiently produced until 32-34 weeks**

60. A 42 year old woman attends A&E with severe pain in her right upper quadrant. After investigation of her biliary tract and gall bladder she is diagnosed with gallstones.

What type of epithelium lines the gallbladder?

a) Simple columnar

b) Simple columnar with poorly developed brush border

c) Simple squamous

d) Pseudostratified columnar with goblet cells

e) Simple columnar with crypts

61. A 34 year old lady is being seen by her general practitioner. She complains of weight gain, increased appetite and feeling cold all the time. She has thyroid function test which reveal she has hypothyroidism.

What is the name given to the structure that unites the right and left lobes of the thyroid?

a) Follicle

b) Thyroid tree

c) Larynx

d) Isthmus

e) Parathyroid

62. A 29-year-old man and his partner have been referred to a fertility clinic. Investigations find it is most likely a male factor due to a blockage in the sperm pathway. Where do the sperm travel to after passing through the epididymis?

a) Seminiferous tubules

b) Vas deferens
c) Ejaculatory duct
d) Urethra
e) Penile urethra

- **Spermatazoa are produced in the testes and then pass through the epididymis then to the vas deferens - these are divided in vasectomy procedures for sterilisation. After the vas deferens the sperm travel to the ejaculatory duct, then to the urethra and penile urethra. Seminiferous tubules are located within the testes and are the site of spermatozoa production.**

63. A 28 year old woman is on the labour ward about to give birth to her first child, after 35 weeks in utero.
Which of the following embryonic germ layers is correctly matched up to a structure it will become?

a) **Endoderm + sweat glands**
b) **Endoderm + urogenital system**
c) **Mesoderm + the muscular walls of the bowel**
d) **Ectoderm + thyroid gland**
e) **Ectoderm + liver**

The sweat glands arise from the ectoderm.
The urogenital system is derived from the mesoderm.
The thyroid and liver are both derived from endoderm.

64. Which of the following is NOT a common determining factor of glomerular filtration rate?

1. **Size of the molecule**
2. **Pressure gradients**
3. **Rate of blood flow**
4. **Blood CO_2 levels**
5. **Binding to plasma proteins**

65. Which of the following causes an increase in insertion of aquaporin 2 in collecting duct, increasing water retention:

1. **Angiotensin 2**

2. **Vasopressin**
3. **Aldosterone**
4. **Parathyroid hormone**
5. **Atrial Natriuretic Peptide**

66. Where is ACTH released?

1. **Hypothalamus**
2. **Adrenal medulla**
3. **Thyroid gland**
4. **Adrenal cortex**
5. **Anterior pituitary**

67. What is the average volume of air breathed in normal tidal volume?

1. **0.5L**
2. **1L**
3. **1.5L**
4. **2L**
5. **2.5L**

68. What is alveolar dead space?

1. **Volume of air remaining in lungs after quiet expiration**
2. **Volume of air remaining in lungs after maximum expiration**
3. **Volume breathed in from quiet expiration to maximum inspiration**
4. **Volume of air that never reaches alveoli and so never participates in respiration - anatomical dead space**
5. **Volume of air that reaches alveoli but never participates in respiration**

69. What is respiratory epithelium?

1. **Stratified cuboidal epithelium.**
2. **Simple ciliated columnar epithelium.**
3. **Pseudostratified ciliated columnar epithelium with interspersed goblet cells.**
4. **Pseudostratified squamous epithelium with interspersed goblet cells.**
5. **Stratified ciliated columnar epithelium with interspersed goblet cells.**

Respiratory epithelium is easy to ask a question on as there are so many components to it - just need to learn the definition.

70. Thinking about the heart, which is incorrect with regards to the parasympathetic nervous system?

1. It has a positive ionotropic effect.
2. It has a negative chronotropic effect.
3. Acetylcholine acts on muscarinic receptors.
4. Less calcium enters the myocyte.
5. There is a decreased number of triggered action potentials.

It has a negatively ionotropic effect as it decreases the force of contraction.

71. Which clotting factor is not produced by the liver?

1. VII
2. X
3. V
4. II
5. VIII

All clotting factors but 8 are produced by the liver.

72. Which of these is a characteristic symptom of depression?

1. Self-worth.
2. Loss of interest.
3. Sleeping a lot.
4. Eating more.
5. Hyperactivity.

All of the others are the opposite of the characteristic symptoms. The characteristics are: lack of self worth, disturbed sleep, loss of appetite, decreased energy and loss of interest.

73. Which of the following is not associated with movement of the vertebral column?

1. **Splenius capitis.**
2. **Rotatores.**
3. **Longissimus.**
4. **Latissimus.**
5. **Spinalis.**

Latissimus is a superficial back muscle so it is associated with shoulder movement. All of the others are deep/intrinsic back muscles.

74. In which lobe of the brain is Broca's area?

1. **Parietal**
2. **Frontal**
3. **Occipital**
4. **Temporal**

75. A pregnant woman with a history of Osteogenesis Imperfecta Type I has just given birth. Her baby was diagnosed antenatally with the same condition which causes a reduction in the amount of type I collagen produced. Which of the following is one of the main sites of type I collagen production?

a) Tendons
b) Hyaline cartilage
c) Reticular fibres
d) Basal lamina
e) Cell surfaces

- **Type I collagen is mainly produced in the tendons, bones and organ capsules. Type II collagen is mainly produced in hyaline and elastic cartilage. Type III collagen is mainly produced in reticular fibres of connective tissue. Type IV collagen is mainly produced in the basal lamina. Type V collagen is mainly produced in cell surfaces.**

75. What vertebral level is the Carina found at?

1) **L1**
2) **C5**

3) T2
4) T4
5) C7

76. What is the normal structure of adult Haemoglobin (HB)?
1) 2 Alpha Chains, 2 Gamma Chains
2) 2 Alpha Chains, 2 Beta Chains
3) 2 Beta Chains, 2 Gamma Chains
4) 3 Beta Chains, 1 Alpha Chain
5) 3 Alpha Chains, 1 Beta Chain

77. Which hormone stimulates the release of LH and FSH from the anterior pituitary gland?
A) CRH
B) TSH
C) ACTH
D) GnRH
E) Progesterone

78. What is the optimal blood pressure?
A) 125/50
B) 140/70
C) 120/80
D) 110/90
E) 160/60

79. What type of inheritance is responsible in cystic fibrosis?
A) X- linked
B) Autosomal recessive
C) Mutation
D) Multi factoral
E) Autosomal dominant

80. What does McBurney's point indicate the location of?
A) Lungs
B) Kidney
C) Heart

D) Appendix - right-hand side, 1/3 of the distance from the ASIS to the umbilicus.
E) Small intestine

81. What is the function of topoisomerase enzymes?

A) Preventing damage to the DNA
B) Assisting mRNA leaving the nucleus
C) Relieving supercoiling
D) Breaking hydrogen bonds
E) Aiding ribosomes

82. What is the function of tight junctions?

A) Binds cells together to prevent leakage of molecules in between them.
B) Conduct electrical signals. (gap junction)
C) Attach cells via the intermediate filaments (desmosome)
D) Transports and stores materials. These are membrane-bound organelles. (vesicle)
E) Regulates the movement of ions

83. How much energy do lipids provide?
A) 4kcal/g (protein)
B) 9 kcal/g (lipids)
C) 7kcal/g (alcohol)
D) 3 kcal/g
E) 2 kcal/g

84. Which of these is karyotype of Turners syndrome?
A) 40, Y
B) 45, X Y
C) 45, X
D) 46, X Y
E) 46, X X

85. Where is angiotensin produced?

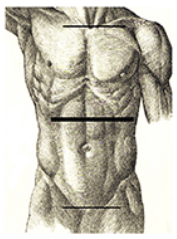
A) Kidney
B) Spleen
C) Liver
D) Stomach
E) Pancreas

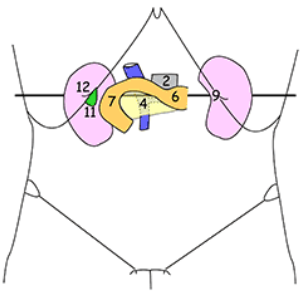
86. At what spinal level is the transpyloric plane located?

A) L1
B) T2
C) L4
D) T12
E) C7

TRANSPYLORIC PLANE

(Horizontal line half way between suprasternal notch & pubic symphysis)





Structures approximately on this line:

1 End of spinal cord
2 L1 vertebral body
3 Origin of superior mesenteric art
4 Origin of portal vein
5 Neck of pancreas
6 Pylorus of the stomach
7 Second part of duodenum
8 Sphincter of Oddi
9 Hilum of each kidney
10 Duodenojejunal flexure
11 Fundus of gall bladder
12 Tips of ninth costal cartilages

Important to remember the contents of the transpyloric place as it is an important anatomical landmark.

87. What are chondrocytes?

A) Cells that secrete extracellular matrix components of bone- these describe osteoblasts
B) Cells that secrete extracellular matrix components of cartilage
C) Cells that are star-shaped, regulate blood flow and can phagocytose synapses- these describe astrocytes
D) Cells that secrete extracellular matrix components of collagen and elastin- these describe fibroblasts

E) Cells that line the sinusoids of the liver and are involved in the breakdown of red blood cells- these describe Kupffer cells

88. What term is used to describe 'the increase in the size of a tissue due to an increase in the number of cells'

A) Atrophy- this is the decrease in tissue size
B) Hypertrophy- this is the increase in the size of cells
C) Dysplasia- this is the increase in abnormal cells
D) Hyperplasia
E) Metaplasia- this is the transformation of one cell type into another, brought on by environmental stressors

89. How many essential amino acids are there?

A) 20
B) 7
C) 12
D) 9
E) 3

90. Mr X is a 15-year-old boy who has just been diagnosed with a coagulopathy. Which of the following is the clotting factor involved in the common blood coagulation pathway that converts prothrombin into thrombin?

a) Factor I
b) Factor II
c) Factor IIa
d) Factor X
e) Factor Xa

- **These are all part of the common pathway. Factor Xa converts Factor II (prothrombin) into Factor IIa (thrombin). Factor I (fibrinogen) is converted into Factor Ia (fibrin) by Factor IIa. Factor X is converted into Factor Xa by factor VIIa in the extrinsic pathway.**