ACEM PRIMARY VIVA D **Thursday Morning Session 1** ***Candidate Number*:** **AGREED MARK:**

Stem: A patient presents with a penetrating eye injury. He has been given oxycodone. Commencing with pharmacology			
TOPIC	QUESTIONS	KNOWLEDGE **(essential in bold)**	NOTES
Question 1 Oxycodone (p 558) **Subject:** Pharm LOA: 1-2	Describe the pharmacokinetics of oxycodone? Prompt: Describe the pharmacokinetics of opiates. What adverse effects might you anticipate? When prescribing oxycodone what prescribing strategies may help in reducing the development of, dependence.	**Oral commonly** Good oral absorption High Vd **Low first pass metabolism CW others** 10 morphine = 4.5mg oxycodone duration 3-4h, longer if CR formulation. Hepatic met Sedation/Respiratory depression/N+V/hypotension/dysphoria/biliary colic/pruritis/caution in renal failure **Smaller doses at longer intervals**/establish goals at start of Rx/**limit doses/use of other analgesics**/frequent evaluation of ongoing need/**use of modified CR formulations**	Bold plus one more N+V a particular concern in context of penetrating eye injury 3 to pass 2 to pass
Stem: Moving on to physiology You assess his visual acuity as 6/24.			
Question 2 Eye / Acuity / Vision (pp 178 -183) **Subject:** Phys LOA: 2	How is visual acuity measured? What does the fractions of a VA of 6/24 represent? What factors influence visual acuity? Why is the fovea important for visual acquity	Measurement from **Snellen chart** viewed at a distance of **6m** or 20 feet; **6/24 indicates reduced VA** **Optical factors** The state of the image forming mechanisms/sharpness of focus **Retinal factors** the state of the cones **Stimulus factors (**illumination, brightness of the stimulus, contrast between stimulus and background, length time exposed to stimulus); sensitivity and interpretative ability of the brain Resolving power of the eye, property of the cones fovea is the point where **VA is greatest**; fovea is the centre of the macula, a thinned out rod free portion of the retina where the **cones** are densely packed & each synapses on a single bipolar cell	numerator is the distance at which the chart is read; the denominator is the **smallest line** that can be read; 6/6 indicates normal vision; 2/3 to pass One of bold

Stem: Moving on to anatomy. He has abnormal eye movement			
Question 3 Eye (Model) – (model no. F 13) **Subject:** Anat LOA: 2	Identify the muscles responsible of eye movement. Describe their actions. What nerves supply these muscles? How are the actions of these muscles tested clinically? *Prompt: Why is the "H" pattern used?*	**Recti: Superior** (**elev**, add, med rot); **Inferior** (**dep**, add, lat rot); **Medial** (**add**); **Lateral** (**abd**) **Obliques: Superior** (**dep**, abd); **Inferior** (**elev,** abd) **Oculomotor (III) N** to all, except Abducent (VI) N to Lateral R, and Trochlear (IV) N to Sup Obl In **Abd** (LR): Elev (SR) and Dep (IR) In **Add** (MR): Elev (IO) and Dep (SO)	All Bold to pass Bold plus one to pass abd and add isolates recti and obliques to pass
Stem: Moving on to pathology: Six weeks later ne develops sympathetic ophthalmia, which is a **Type IV** hypersensitivity reaction			
Question 4 Type 4 hypersensitivity reaction (pp 205-208; 1356) **Subject:** Path LOA: 1	1. Describe the sequence of events that lead to this reaction. Prompt: what cells are involved? 2. What tissue changes would occur 3. Name other examples of Type IV hypersensitivity reactions.	Injury **Initiated by antigen** sensitised CD4+ or CD8+ **T cells** Retinal antigens may be transported in the lymphatics of the damaged eye Reaction may occur in both eyes causing a Pan Uveitis. CD4+ predominate in autoimmune disease CD8+ in post infectious (esp viral) reactions **Can be cytokine** (CD4+ Th1 or TH17 cells involved) **or direct cellular** (Cyotoxic lymphocyte) **mediated** tissue injury (either satisfactory). Perivascular cellular infiltrates, tissue oedema, granuloma formation, cell destruction. Type I diabetes Multiple sclerosis Rh arthritis Inflammatory bowel disease Guillain Barre Contact sensitivity dermatitis Tuberculin reaction Granulomatous diseases Viral hepatitis	Requires antigen and either cytokine or direct cellular mechanisms to pass **(2/4 to pass)** **(2 examples to pass)**

ACEM PRIMARY VIVA D Thursday Afternoon Session 2 ***Candidate Number:*** **AGREED MARK:**

TOPIC	QUESTIONS	KNOWLEDGE **(essential in bold)**	NOTES
Stem: An elderly woman is brought to your ED hypothermic and unconscious. She is intubated. Commencing with pharmacology			
Question 1 Biotransformation – Phase 1 and 2 reactions with an emphasis on Suxamethonium (Chp 4) **Subject:** Pharm LOA: 1	What is drug biotransformation? Describe phase 1 and phase 2 reactions? How is Suxamethonium metabolised? Why may a patient have a prolonged paralysis following Sux	Drug metabolism to allow drugs to become **inactive or by increasing excretion** by making them more hydrophilic, or by metabolising them to less active agent**.** Phase 1 – **unmasking functional group** (-OH, -NH2, -SH) to become more polar metabolite. Includes oxidation, deamination, hydrolysis, reductions Phase 2**- conjugation with endogenous substrate** to become highly polar conjugate **Rapid phase 1 hydrolysis** by **butyrycholinesterase and pseudocholinesterase** in liver and plasma Genetically deficient in BCHE so slowed metabolism	Bold Bold One of the bold
Stem:Moving on to physiology			
Question 2 Hypothermia / thermoregulation (pp 316-320) **Subject:** Phys LOA: 1	By what processes does the body lose heat? How does the body produce heat? What temperature-regulating mechanisms are activated by the cold? What part of the brain controls the reflex responses activated by cold?	**Radiation & Conduction** (70% of loss at 21 °C) **Vaporization of sweat** (27%) Respiration (2%) Urination & defecation (1%) **Basal metabolic processes** Food intake **Muscular activity** Shivering Hunger Increased voluntary activity Increased secretion of Adr + NorAdr Decreased heat loss mechanism Cutaneous vasoconstriction Curling up Horripilation The posterior **hypothalamus**	Bold to pass Bold to pass 4 to pass bold
Stem: Moving on to pathology.			

Question 3 Cerebrovascular Disease (pp 1290-1295) **Subject:** Path LOA: 1	What are the types of cerebral ischemic injury? Prompt: Describe the patterns cerebral ischemic injury What are the causes of focal cerebral infarction? Prompt: Give examples What are the pathological effects of hypertension on the brain?	**Global cerebral ischemia** (ischemic/ hypoxic encephalopathy) when there is a **generalised reduction** of cerebral perfusion **Focal cerebral ischemia** follows reduction of blood flow to a **localised** area of the brain **Embolic** (from cardiac mural thrombi; thromboemboli from arteries, esp. carotid; paradoxical assoc with cardiac anomalies; tumour, fat or air), **thrombotic arterial occlusion/** in situ thrombosis (large vessel disease); **Vasculitis** (small vessel disease) infectious (immunosuppression and aspergillus, CMV encephalitis, syphilis, TB); non-infectious eg PAN, primary angiitis; **Others** eg amphetamines, cocaine, heroin; dissecting aneurysm extracranial arteries; hypercoaguable states Lacumar infarcts (in lenticular nucleus, thalamus, internal capsule, deep white matter, caudate nucleus, pons); slit haemorrhages; hypertensive encephalopathy; massive intracerebral haemorrhage)	Both types and description 3 causes plus 1 example of each 4 out of 4
Stem: Moving on to anatomy She has a swollen right elbow.			
Question 4 Elbow X-ray **Subject:** Anat LOA: 1	Identify the bony features on this Xray What factors determine the stability of the elbow joint? Prompt – What are the ligaments of the elbow	Medial / Lateral epicondyles, capitulum, olecranon, radius – head/neck, olecranon fossa, coronoid fossa, trochlea, proximal radio-ulnar joint, coronoid process of ulna **Bony factors – shape of trochlea / olecranon fossa** Joint capsule – fibrous joint capsule weak **Ligaments** **– radial collateral ligament** – lateral epicondyle and blends with the **annular ligament** of the radius (which holds the radial head in the radial notch of the ulna). - medial **ulnar collateral ligament** from medial epicondyle to the coronoid process and olecranon of the ulna - 3 bands 1. Anterior – strongest 2. Posterior – weakest 3. oblique – deepens trochlear notch Muscles – biceps, brachialis,(BR), triceps RCL & UCL & annular ligament	6 to pass Bone and ligaments 3 of 4 bolded

ACEM PRIMARY VIVA D **Friday Morning Session 3** ***Candidate Number:*** **AGREED MARK:**

Stem: A 50 year old woman is brought to the ED with an amitriptyline overdose. Commencing with Pharmacology.			
TOPIC	QUESTIONS	KNOWLEDGE **(essential in bold)**	NOTES
Question 1 Tricyclics including Volume of distribution (Chp 30) **Subject:** Pharm LOA: 1	Which factors determine the volume of distribution of a drug? Describe the volume of distribution of tricyclic antidepressants How does this influence their toxicity? What therapies for tricyclic toxicity might reduce their tissue distribution?	**Drug factors**; lipid solubility (high in TCA), pKa, pH, protein binding (high in TCA). **Patient factors**; age, gender, comorbid disease (eg. Oedema or ascites), body fat, blood flow to tissues. TCAs have a **large Vd** (5-30L/kg), tissue **concentrations are high** especially in well perfused organs such as **the brain and heart.** **Alkalinisation** (Bicarbonate or hyperventilation) increases **plasma protein binding of the free drug** removing it from the tissues reducing its tox	At least 2 from each group bold bold
Stem: Move onto Anatomy. You insert a femoral venous line.			
Question 2 Femoral Triangle (photo) **Subject:** Anat LOA: 1	Demonstrate the boundaries of the femoral triangle. What are the contents of the femoral triangle. What surface markings help would you look for when trying to locate the femoral vein? Which veins drain into the common femoral vein	**Inguinal ligament** (11), medial border of **Sartorius** (23) and lateral border of **adductor longus** (1) form the triangle, **pectineus** (med) and **iliopsoas** (lat) form the floor. Contents = **femoral vein** (6), **artery** (4) **and nerve** (5) (med to lat) and deep inguinal lymph nodes. **Artery is found below inguinal ligament, midway between ASIS and pubic tubercle, vein is just medial to artery** Continuation of the femoral vein, popliteal vein, receives **profunda femoris** and **great saphenous vein** (7), ends posterior to the inguinal ligament where it becomes the external iliac vein. Also receives superficial epigastric vein (27), superficial circumflex iliac vein (25) and superficial external pudendal vein (28).	3/5 to pass all content 3/3 to pass bold
Stem: Moving on to Pathology. She has a history of chronic alcohol abuse.			
Question 3	1. Describe the pathological effects on the liver long-term alcohol ingestion.	1. **Steatosis**: fatty change, perivenular fibrosis	Bold with 3 morphologic features of each to pass.

Alcoholic Liver Disease (pp 857-860) **Subject:** Path LOA: 1	PROMPT: please describe the morphological features 2. Which of these conditions reversible? 3. What are the possible sequelae of cirrhosis? Prompt: Complications?	2. **Hepatitis**: liver cell necrosis, inflammation, Mallory bodies, fatty change, fibrosis 3. **Cirrhosis**: extensive fibrosis, hyperplastic nodules 4. (Hepatocellular carcinoma) **Steatosis and Hepatitis are reversible**. Cirrhosis irreversible. **Portal Hypertension**, GIT Bleeding, Hepatic Failure, Coagulopathy, Hepatocellular Ca, Hepatorenal Syndrome, Hepatopulmonary Syndrome, Encephalopathy, Infection	 Bold to pass Bold plus 3
Stem: Moving on to Physiology			
Question 4 Dead Space (pp 19-21) **Subject:** Phys LOA: 1	What is DEAD SPACE? 2. What types of DEAD SPACE are there?" Prompt explain difference between the two types 3. How is it measured? (bonus)	Portion of the tidal volume that **does not participate in gas exchange** $V_T = V_D + V_A$ **1. ANATOMICAL** • Volume of **conducting airways** – trachea, bronchi, terminal bronchi (16 gen) • About 150mls of 500ml V_T • Measured by Fowler's method • Determined by: ○ Increased diameter of airways during inspiration ○ Size & posture of individual **2. PHYSIOLOGICAL** • Volume of gas that **does not eliminate CO_2** • Same as anatomical DS in normal individuals • **Increased in lung disease** because of inequality of blood flow and ventilation within the lung Measured by Bohr method	Demonstrate principle of bold to pass Two types dead space and describe what it is