Australian Pharmacy Council Ltd
Knowledge Assessment of Pharmaceutical Sciences (KAPS)
Paper 1 Sample 1

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All questions in this sample paper are no longer used in live or actual examinations and have been chosen to allow candidates to gain exposure to the type of content and layout of questions on the examination. Live or actual KAPS Examinations delivered contemporaneously will vary from this sample paper.

The KAPS Examination is 100-questions long and candidates have 2 hours to complete it.

Due to the frequent changes to the scope and content within the practice of pharmacy in Australia, the APC does not guarantee that the information in this paper is accurate or relevant once published publicly.

The actual KAPS Examination is delivered by computer and candidates should visit the APC website for further information, including the online tutorial.

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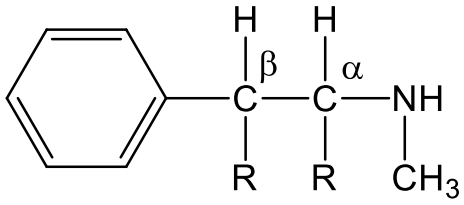


The sympathomimetic amine structure pictured above can be modified by substituting at the alpha and beta carbons. Which of the following effects will result if the R group on the alpha carbon is methyl rather than hydrogen?

A Activity following oral ingestion

B Increased pressor activity

C Less toxicity

D Less CNS stimulation

E Activity

2 Another acceptable name for isopropyl alcohol is

A methanol

B 1,2-ethanediol

C 2-propanol

D n-propanol

E propylcarbinol

3 Saponification is defined as the

A reaction of a glyceryl ester with alkali to form soaps and glycerol

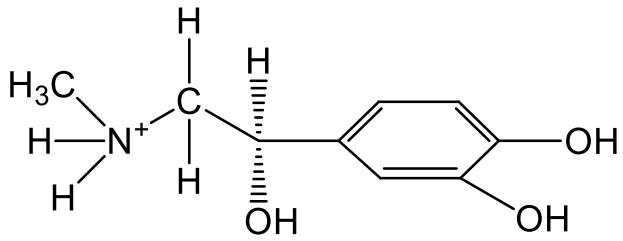
B reaction of acids with bases to form salt(s) and water

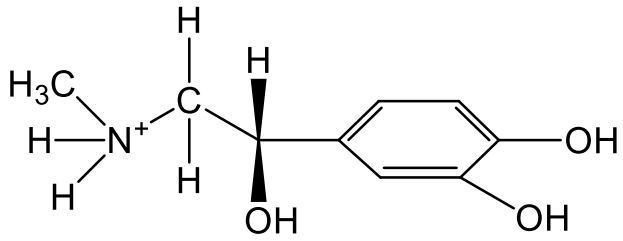
C reaction of salts or esters with water to form acids and bases or alcohols

D reaction in which the hydroxyl of an organic acid is replaced by an alkoxy group (RO)

E reaction in which hydrogen atoms are added across a double bond

4 The two compounds with the following formulae are best described as





A isosteres

B diastereoisomers

C optical enantiomorphs

D conformational isomers

E Cis-trans isomers

5 Which of the following is **NOT** true for enantiomers?

A They are stereoisomers of a chiral compound

B They have the same melting point

C They have the same boiling point

D They have the same density

E They have different physical properties

6 Petrolatum is **NOT** soluble in

A chloroform

B ethyl alcohol

C ether

D Benzene

E petroleum ether

7 Which one of the following properties **BEST** enables a drug to be detected by UV analysis?

A Aromatic ring

B Carboxyl group

C Primary amine

D Hydroxyl group

E Aliphatic hydrocarbon chain

8 Which biochemical class does gelatin belong to?

A Carbohydrate

B Protein

C Lipid

D Glycolipid

E Tannin

9 The structure of tranylcypromine consists of a rigid cyclopropane ring with two substituents in a trans-arrangement to each other. These two groups are on separate carbon atoms and

A both are above the plane of the ring

B one is in the plane of the ring and one below

C both are in the plane of the ring

D one is above the plane of the ring and one below

E both are below the plane of the ring

10 The essential dietary fatty acid that gives rise to the "omega-3" family is

A arachidonic acid

B eicosapentaenoic acid

C gamma - aminobutyric acid

D linolenic acid

E pentanoic acid

11 Which of the following is a cationic emulgent?

A Sodium lauryl sulphate

B Cetrimide

C Sodium stearate

D Calcium oleate

E Triethanolamine stearate

12 Salicylic acid shaken with chloroform (SG 1.47) and dilute aqueous nitric acid will

A be present mainly in the upper aqueous layer

B be present mainly in the lower layer

C precipitate in the upper aqueous layer

D precipitate in the lower layer

E be evenly dispersed in both layers

13 Biotransformation of phenobarbitone in the liver is catalysed

A by the oxidative phosphorylation complex

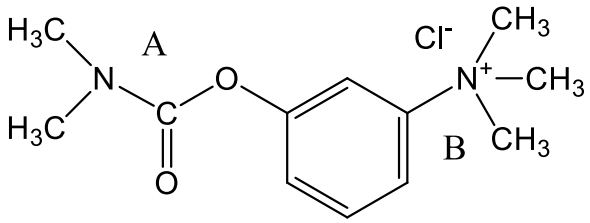
B by the microsomal mixed function oxidases

C in the hexose monophosphate shunt

D in the gluconeogenic pathway

E by the hepatic amidases

14 The anticholinesterase activity of neostigmine is due to



A the relative positions of molecular features A & B making it structurally similar to acetylcholine

B the acetyl-like carbamoyl group A which facilitates the action of the esterase enzyme

C the charged quaternary structure B which assists the release of the enzyme bound substrate

D the non-polar nature of the acetyl-like carbamoyl group A

E the bulky nature of the benzene ring adjacent to the quaternary structure B

15 Nicotinic acid (Vitamin B_3) and gemfibrozil are used to treat

A hyperlipidaemia

B hyperglycaemia

C anticoagulant hypertension

D hypersecretion

E hypovitaminosis

16 Which of the following medicinal agents does **NOT** contain a sulphur atom?

A Meloxicam

B Gliclazide

C Indapamide

D Frusemide

E Ramipril

17 The chemical reaction shown below

$C_3H_5(C_{16}H_{31}O_2)_3 + 3KOH \text{ ---> } 3KC_{16}H_{31}O_2 + C_3H_5(OH)_3$

is an example of

A esterification

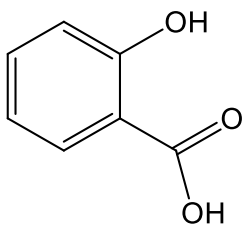
B neutralization

C hydrolysis

D saponification

E polymerization

18 The following structure is? - hydroxybenzoic acid



A meta-

B para-

C levo-

D ortho-

E pseudo-

19 The functional group which contributes to the instability of atropine is

A alcohol

B ketone

C ester

D heterocycle

E ether

20 Volatile oils contain

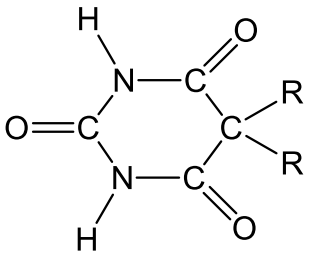
A terpenes

B steroids

C alkaloids

D aliphatic hydrocarbons

E glycosides

21 

The formula given above, which is the basic formula for barbiturates, can be chemically classified as

A acidic

B basic

C amphoteric

D neutral

E lipophilic

22 The solubility of sodium phenobarbitone is greatest in

A purified water

B aqueous buffer of pH 4

C aqueous buffer of pH 10

D dilute hydrochloric acid

E chloroform water

23 The interaction of methylcellulose and p-hydroxybenzoic acid is due to

A polymerization

B hydrolysis

C oxidation

D complexation

E esterification

24 Sodium metabisulphite is used in injections of adrenaline as

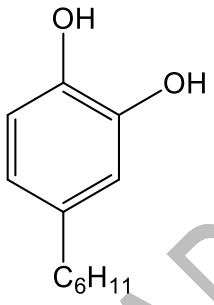
A a suspending agent

B a fungicide

C an antioxidant

D a buffering agent

E a bactericide

25 

When hexylresorcinol is exposed to light and air it

A volatilizes very readily

B loses water to form the anhydride

C reduces rapidly to form a white insoluble cake

D oxidises

E liquefies

26 A secondary alcohol on oxidation yields a(an)

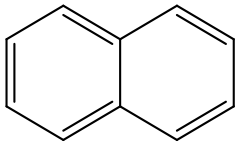
A ketone

B primary alcohol

C aldehyde

D aldehyde and subsequently an acid

E ether

27 

The chemical structure shown above depicts

A pyridine

B pyrrolidine

C quinoline

D naphthalene

E bi-phenyl

28 Which of these statements does **NOT** apply to phenol?

A Not soluble in hydrochloric acid

B Undergoes photo-oxidation

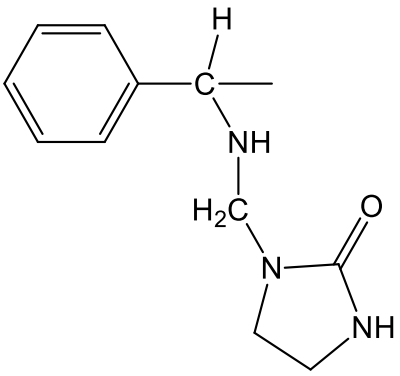
C Acidic

D Soluble in sodium hydroxide solution

E Deliquescent crystalline solid

29 Which of the following chemical structures represents the side chain for amoxycillin?

A



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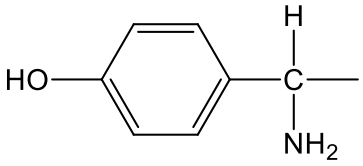
B



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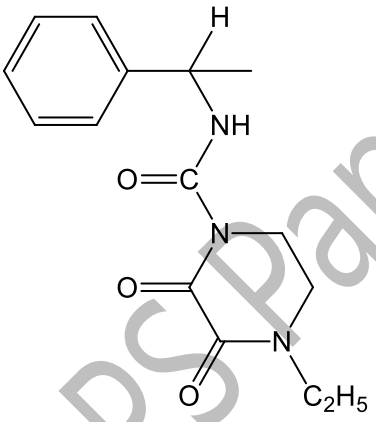
C



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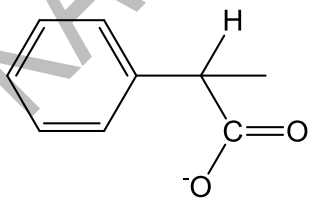
D



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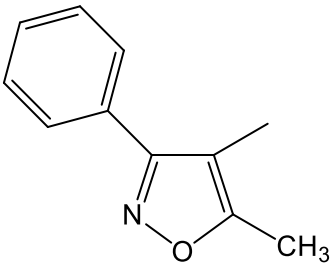
E



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30 Quinine is a (an)

A nucleic acid

B alkaloid

C enzyme

D vitamin

E protein

31 Morphine

A is a synthetic opioid

B has an active metabolite

C is a respiratory stimulant

D is more potent than fentanyl

E can be used to treat constipation

32 Which one of the following factors causes the majority of cases of hypertension?

A Aortic aneurism

B Unknown mechanisms

C Phaeochromocytoma

D Primary aldosteronism

E Renin-angiotensin imbalances

33 Damage to the posterior pituitary

A will cause senile dementia

B will result in a decrease of oxytocin and vasopressin release

C produces Cushing's syndrome

D results in retarded growth

E leads to hypothyroidism

34 All of the following are a long term complications of diabetes **EXCEPT**

A retinopathy

B microangiopathy

C macroangiopathy

D paralytic ileus

E neuropathy

35 A Type I allergic reaction is an indication

A that antibodies are not present in the blood

B of immunity

C of hypersensitivity to a given protein

D of the presence of typhoid bacilli

E of infestation by trypanosomes

36 Cystic fibrosis

A is an inherited disorder of the endocrine system

B most commonly affects the cardiovascular and nervous systems

C often leads to lung disease, predominantly caused by *Pseudomonas aeruginosa*

D is due to a viral infection

E is due to a bacterial infection

37 Angiotensin converting enzyme inhibitors

A inhibit the conversion of angiotensin I to angiotensin II

B should never be used with potassium sparing diuretics

C may decrease lithium levels through increased renal clearance

D all have similar half-lives and duration of action

E Commonly cause a dry cough and angioedema

38 Which group of symptoms is **MOST** often associated with a patient who has signs of left-sided heart failure?

A Shortness of breath, paroxysmal nocturnal dyspnea

B Jugular venous distension, shortness of breath

C Hepatojugular reflux, abdominal distension

D Paroxysmal nocturnal dyspnea, hepatojugular reflux

E Abdominal distension, hepatomegaly

39 Peptic ulcers

A are not related to the presence of *Helicobacter Pylori*

B are worsened by increased mucous secretion

C involve excessive histamine secretion from parietal cells

D involve excessive gastrin secretion from endochromaffin cells

E are associated with excessive acid secretion

40 Diabetic retinopathy

A is characterised by reversible changes in the retinal architecture

B is characterised by microaneurysms and vitreous haemorrhage

C is caused by impaired drainage of the aqueous humour

D is characterised by corneal injury

E is caused by proteolytic enzymes degrading the retina

41 Oestradiol is secreted by the

A ovarian follicle

B anterior pituitary

C adrenal cortex

D hypothalamus

E posterior pituitary

42 The cells of the distal convoluted tubule

A reabsorb approximately 50% of the water in the glomerular filtrate

B are not capable of secreting hydrogen ions

C reabsorb potassium ions

D are sensitive to aldosterone

E reabsorb approximately 75% of the glucose in the glomerular filtrate

43 Which organ in the body plays a major role in the development of the immune system?

A Pancreas

B Thyroid

C Liver

D Thymus

E Adrenal

44 Which of the following would be deemed to be within the optimal range of haematocrit value for a healthy adult male?

A 10%

B 20%

C 50%

D 80%

E 95%

45 The composition of sweat is altered in what disease state?

A Hypertension

B Hypothyroidism

C Glomerulonephritis

D Diabetes insipidus

E Cystic fibrosis

46 Blackheads result from a

A block of sebaceous glands

B block of hair follicles

C block of sweat glands

D excessive intake of oily foods

E excessive secretions from sebaceous glands

47 Cartilage

A can be transformed into bone during ossification

B binds muscle to bones

C is part of epithelial tissue

D covers muscles

E lies within muscles

48 Muscle fatigue is thought to be a consequence of

A lactic acid accumulation

B paying off the oxygen debt

C poisons in the blood stream

D lack of sufficient ATP molecules

E accumulation of carbon dioxide

49 Metformin acts via

A blocking absorption of glucose by the intestine

B tissue uptake of glucose

C increased insulin secretion

D increased metabolism of ketone precursors

50 Normal erythrocytes

A are non-nucleated, biconcave discs

B are nucleated biconcave discs

C are non nucleated convex discs

D are binucleated cells

51 The structure(s) which prevent(s) backflow of blood to the ventricles of the heart

A is the interventricular septum

B are the valves in the veins

C are the atrio-ventricular valves

D is the pericardium

E are the aortic and pulmonary valves

52 If an infection of the throat has spread to the eustachian tube, to which of these structures would the infection be most likely to spread next?

A Auditory nerve

B Inner ear

C Middle ear

D Mastoid air cells

E External auditory canal

53 Examples of monosaccharides are

A glucose and glycine

B maltose and sucrose

C fructose and glucose

D lactose and galactose

E dextrin and erythrodextrin

54 The main effect of vasopresssin is

A to increase blood pressure, increasing formation of nephric filtrate

B to cause active transport of urea and uric acid from renal blood into tubules

C to cause production of renin by kidney cells

D inhibition of aldosterone action

E to cause reabsorption of water, especially in the distal tubule and collecting ducts

55 Insulin glargine acts via

A blocking absorption of glucose by the intestine

B tissue uptake of glucose

C increased insulin secretion

D increased metabolism of ketone precursors

56 In myocardial ischaemia, β-adrenoreceptor blockade

A decreases the risk of ventricular fibrillation

B decreases the size of the infarct due to coronary occlusion

C by agents with high intrinsic sympathominetic activity decreases the risk of reinfarction

D if withdrawn leads abruptly to an increased risk of infarction

E decreases the incidence of arrhythmias associated with intubation

57 Frusemide increases the flow of urine by increasing

A filtration pressure

B renal plasma flow

C urinary pH

D sodium excretion

E sodium reabsorption

58 Which of the following drugs does **NOT** lower blood pressure?

A Hydralazine

B Diazoxide

C Minoxidil

D Flecainide

E Lercanidipine

59 Corticosteroids are effective in the treatment of acute asthma because they

A cause acute bronchodilation

B reduce mucosal oedema

C suppress precipitating infections

D prevent mediator release from mast cells

E reduce prostaglandin formation by inhibiting cyclo-oxygenase activity

60 All of the following are antineoplastic agents. Which one is **NOT** an alkylating agent?

A Chlorambucil

B Cyclophosphamide

C Melphalan

D Thiotepa

E Cytarabine

61 Incorporation of adrenaline into local anaesthetic solutions for injection will effectively

A decrease the local action of the anaesthetic

B reduce local blood flow

C increase the amount of local anaesthetic which will need to be administered

D block nerve fibres by depolarising the membrane

E decrease the systemic side effects of the anaesthetic

62 Isoprenaline

A blocks alpha adrenoceptors

B stimulates beta adrenoceptors directly

C releases noradrenaline from noradrenergic nerves

D is taken up by uptake 1

63 Organophosphate poisoning must be treated by the urgent administration of

A adrenaline

B atropine

C promethazine

D physostigmine

E methyldopa

64 Single doses of paracetamol over which of the following amounts may result in severe liver damage(which may be fatal) and referral to an emergency department is essential?

A 150 mg/kg

B 50 mg/kg

C 90 mg/kg

D 25 mg/kg

E 300 mg/kg

65 Which **ONE** of the following treatments can cause a patient to develop acute gout?

A Acetazolamide

B Colchicine

C Triamterene

D Spironolactone

E Frusemide

66 Which of the following is the treatment of choice for an infestation of scabies?

A Permethrin

B Crotamiton

C Mebendazole

D Malathion

E Tinidazole

67 Bipolar disorder is treated with all of the following **EXCEPT**

A lithium

B haloperidol

C carbamazepine

D sodium valproate

E paroxetine

68 Which one of the following drugs is used to prevent haemorrhagic cystitis in patients receiving various types of chemotherapy?

A Methotrexate

B Mercaptopurine

C Dacarbazine

D Ifosfamide

E Mesna

69 Anthracyclines can be used for the treatment of

A anaemia

B polycythemia

C vasculitis

D leukaemia

E hereditary coagulation disorders

70 Which of the following symptoms would be **LEAST** likely to be exhibited by a patient suffering from diabetes mellitus?

A Urinary retention

B Excessive thirst

C Glycosuria

D Weight loss

E Weakness

71 Which of the following is characterised by selective destruction of myelin sheath surrounding nerve axons?

A Huntington's chorea

B Multiple sclerosis

C Parkinson's disease

D Tardive dyskinesia

E Myasthenia gravis

72 Patients with diabetes have higher risks for

A renal stenosis

B macular depigmentation

C visual cortex hyperplasia

D erectile dysfunction

E ocular hyperopathy

73 All of the following statements regarding whooping cough are true **EXCEPT**

A the vaccine is at least 90% effective

B the incubation period is usually 1-2 weeks

C it is characterised by paroxysmal coughing

D it is caused by gram negative aerobic bacilli

E it is effectively treated with cephalosporin antibiotics

74 Pityriasis versicolor is **BEST** described as

A an acute inflammatory yeast infection characterised by a diffuse rash

B an asymptomatic fungal infection affecting the beard area in males

C a yeast infection characterised by multiple, usually asymptomatic, patches varying in colour from white to brown

D a viral infection characterised by patches of red and brown colour

75 A 'nosocomial' infection is one that

A is acquired in a medical facility

B is transmitted by respiratory droplets

C is notifiable

D is transmitted to the host via contaminated water

E affects mainly school aged children

76 Betaxolol should be administered with caution in patients with

A glaucoma

B Parkinson's disease

C asthma

D epilepsy

E cardiac failure

77 Atropine causes

A constriction of the pupil

B increased gastric motility

C micturition

D impairment of ejaculation

E increased heart rate

78 Which of the following compounds is an irreversible cholinesterase inhibitor?

A Physostigmine

B Edrophonium

C Pilocarpine

D Malathion

E Atropine

79 Which of the following is **NOT** among those actions of propranolol which are due to $ß_1$-adrenoceptor blockade?

A Decrease in heart rate

B Prolongation of A-V conduction time

C Reduction in cardiac contractility

D Reduced peripheral blood flow

E Antagonism of the cardiac actions of catecholamines

80 Which of the following drugs is the most useful for the chronic management of metastatic bone pain?

A Indomethacin

B Paracetamol

C Fentanyl

D Amitriptyline

E Carbamazepine

81 Benzodiazepines may be indicated for all of the following **EXCEPT**

A restless leg syndrome

B muscle spasm

C anxiety

D depression

E acute alcohol withdrawal

82 All of the following are features of simple, competitive antagonism **EXCEPT**

A in the presence of different concentrations of antagonist, log concentration-effect curves to an agonist have the same slope

B the maximal response to an agonist is not reduced

C increasing concentrations of antagonist shift the agonist log concentration-effect curve to the right

D increasing concentrations of antagonist shift the agonist log-concentration-effect curve to the left

83 Alpha-1 receptors are the main adrenoceptor located in

A arterioles

B bronchioles

C atria

D cardiac ventricles

84 Colchicine can relieve the symptoms of an acute attack of gout because it

A blocks PGE_2 formation

B blocks uric acid formation

C inhibits neutrophil infiltration

D increases uric acid excretion

85 Which of the following drugs when placed in the eye would cause the pupil to contract and the eye to be focused for near vision?

A Atropine

B Timolol

C Phenylephrine

D Pilocarpine

E Cyclopentolate

86 A 30-year-old female with partial seizures is treated with vigabatrin. What is the principal action of vigabatrin?

A Sodium channel blockade

B Increase in frequency of chloride channel opening

C Inhibit GABA transaminase enzymes

D Increased potassium channel permeability

E NMDA receptor blockade

87 Glucocorticoids are powerful anti-inflammatory agents. Which of the following is **NOT** an anti-inflammatory mechanism of action of glucocorticoids?

A Decreased secretion of proteolytic enzymes

B Reduction in the release of cytokines, such as IL-1 and IL-2

C Decreased number of circulating neutrophils

D Impairment of prostaglandin and leukotriene synthesis

88 Which of the following best describes the effect of doxycycline on therapeutically administered oestrogens? It decreases

A oestrogen metabolism

B the enterohepatic circulation of oestrogen

C the plasma protein binding of oestrogen

D the renal excretion of oestrogen

E the sensitivity of oestrogen at its site of action

89 Rickets develops from a deficiency of which of the following?

A Vitamin A

B Vitamin B_6

C Vitamin K

D Vitamin D

E Vitamin C

90 Filgrastim, a colony stimulating factor, stimulates which one of the following haematological lineages?

A Macrophages

B Granulocytes

C Thrombocytes

D Erythrocytes

E Lymphocytes

91 Which of the following is true about glutamate neurotransmission in the brain?

A Glutamate is an inhibitory neurotransmitter in the cerebral cortex

B The anaesthetic agent ketamine is an agonist at NMDA-type receptors

C Glutamate is an excitatory neurotransmitter in the cerebral cortex

D Decreases in glutamate transmission may be associated with epilepsy

92 The following statements about the use of β-blockers for treatment of congestive heart failure are true **EXCEPT**

A β-blockers increase life expectancy

B the use of β-blockers can result in cardiac depression

C β-blockers prevent ventricular remodelling

D β-blockers can increase ejection fraction

E β-blockers increase AV nodal conduction

93 Which of the following agents is a selective dopamine receptor (D_2) agonist?

A Fluphenazine

B Bromocriptine

C Promethazine

D Haloperidol

E Chlorpromazine

94 Which of the following opioid analgesics has the longest duration of action in a standard release formulation?

A Morphine

B Pethidine

C Oxycodone

D Methadone

E Tapentadol

95 Nitrous oxide

A has a high anaesthetic potency

B is not analgesic

C has a fast induction

D has a high blood/gas partition coefficient

96 The mechanism of action of salbutamol is that of a relatively selective

A $beta_2$-adrenoceptor agonist with alpha-adrenoceptor agonist activity

B $beta_1$-adrenoceptor agonist without alpha-adrenoceptor agonist activity

C $beta_2$-adrenoceptor agonist without alpha-adrenoceptor agonist activity

D $beta_1$-adrenoceptor agonist with alpha-adrenoceptor agonist activity

E $beta_2$-adrenoceptor agonist with alpha-adrenoceptor antagonist activity

PATIENT PROFILE

Patient Name:	James Gurley		
Address:	Room Number 420-2		
Age:	26	Height:	185 cm
Sex:	Male	Weight:	65 kg
Allergies:	Pollens, dust		

Diagnosis

Presenting Complaint:

Primary
1: Duodenal ulcer
Secondary
1: Epilepsy (stabilised)

Medical History:

Laboratory / Diagnostic Tests

Date	Test	Reference Range

Medication Record

Date	Medication	Quantity	Sig
2/6	Cimetidine 400 mg - oral		1 four times a day
2/4	Aluminium hydroxide - oral		15 mL every two hours
2/4	Phenytoin 100mg - oral		3 times a day
2/4	Salbutamol - inhaler		1-2 puffs every 4 hours prn

Pharmacist's Notes

Mild asthma controlled using prn salbutamol

97 The nursing staff report that Mr Gurley is experiencing dizziness and has fallen down several times. It is advisable to

A continue the drug regimen as the side effects are transient

B increase the dose of phenytoin

C decrease the dose of phenytoin

D decrease the dose of cimetidine

E take the cimetidine with food to increase its absorption and decrease stomach irritation

98 Mr Gurley's poor muscle coordination may be defined in medical terminology as

A ataxia

B atresia

C dementia

D hemiplegia

E dysarthria

99 Mr Gurley's physician calls the pharmacy for information concerning the interaction between cimetidine and some benzodiazepines. Which of the following agents is **LEAST** likely to have its concentration increased by cimetidine? **MOST** appropriate?

A Midazolam

B Diazepam

C Flunitrazepam

D Alprazolam

E Oxazepam

100 Mr Gurley brings an antibiotic prescription into the pharmacy five days after being discharged. He asks for the meaning of "nosocomial infection". This can be **BEST** described as

A communicable

B hospital-related

C drug-related

D unknown origin

E non-communicable

*** END OF PATIENT PROFILE ***

***** END OF EXAMINATION *****

Australian Pharmacy Council Ltd
Knowledge Assessment of Pharmaceutical Sciences (KAPS) Paper 1 Sample 1: Answers

Question Number	Correct Answer
1	A
2	C
3	A
4	C
5	E
6	B
7	A
8	B
9	D
10	D
11	B
12	B
13	B
14	A
15	A
16	E
17	D
18	D
19	C
20	A
21	A
22	C
23	D
24	C
25	D
26	A
27	D
28	A
29	B
30	B
31	B
32	B
33	B
34	D
35	C
36	C
37	A
38	A

39	E
40	B
41	A
42	D
43	D
44	C
45	E
46	A
47	A
48	A
49	B
50	A
51	E
52	C
53	C
54	E
55	B
56	C
57	D
58	D
59	B
60	E
61	B
62	B
63	B
64	A
65	E
66	A
67	E
68	E
69	D
70	A
71	B
72	D
73	E
74	C
75	A
76	C
77	E
78	D
79	D
80	A
81	D
82	D
83	A

84	C
85	D
86	C
87	C
88	B
89	D
90	B
91	C
92	E
93	B
94	D
95	C
96	C
97	C
98	A
99	E
100	B