

# Registration Examination Sample Papers Autumn 2008

## Answers and Rationale

### Closed Book

Question	Answer	Comments
1	B	This patient's frontal headache may suggest sinusitis or nasal congestion. Sympathomimetic decongestants are often used to treat sinusitis, but because of their vasoconstrictor effects, they should be avoided by patients with hypertension. See a responding to symptoms text for more information.
2	C	Acute attacks of gout are usually treated with high doses of NSAIDs or colchicine. Aspirin is not indicated in gout. Allopurinol and uricosurics are not effective in treating an acute gout attack and may prolong it indefinitely if started during the acute episode. See BNF – section 10.1.4 (Acute attacks of gout) or a medical text for more information.
3	C	Sildenafil (for erectile dysfunction) is only prescribable in certain circumstances under the NHS and the prescriber must endorse the prescription with the reference 'SLS'. See BNF – section 7.4.5 – monograph for sildenafil or Drug Tariff for more information.
4	A	The pain of GORD is caused by the acid contents of the stomach leaking 'backwards' into the oesophagus. The symptoms arising are typically described as heartburn, which is pain arising in the upper abdomen passing upwards behind the breastbone. See a responding to symptoms or medical text for more information.
5	E	Alginate antacids can form a raft which floats on the surface of the stomach contents, thereby reducing symptoms of reflux. See a responding to symptoms or medical text for more information.
6	A	MEP – section 3.1.2 – Continuing professional development.
7	D	Paracetamol, a para-aminophenol derivative, has analgesic and antipyretic properties and weak anti-inflammatory activity. Paracetamol is given by mouth or as a rectal suppository for mild to moderate pain and for fever. It may also be given by intravenous infusion for the short-term treatment of moderate pain, particularly after surgery. Paracetamol is metabolised mainly in the liver and excreted in the urine mainly as the glucuronide and sulphate conjugates. Less than 5% is excreted as unchanged paracetamol. Paracetamol is generally considered to be the analgesic of choice in pregnant patients. See Martindale – The Complete Drug Reference for more information.

8	B	The body's ability to process alcohol depends on various factors, e.g. age, weight and sex. Although there is variation, the body breaks down alcohol at an average rate of one unit per hour. See a health promotion text for more information.
9	E	Methadone is a Schedule 2 Controlled Drug and a pharmacist may only supply it to a patient on the authority of a prescription in the required form issued by an appropriate practitioner. In the case of instalment prescriptions, the first instalment must be dispensed within 28 days of the appropriate date, with the remainder of instalments dispensed in accordance with the instructions. Pharmacists should also be alert to the possibility of misuse of all Controlled Drugs. See MEP – section 1.2.13 – Controlled Drugs and the RPSGB practice guidance document on substances of misuse for more information.
10	D	Emergency supplies are not legally permitted for Controlled Drugs in Schedule 1, 2 or 3 (with the exception of phenobarbital). See MEP – section 1.2.3 – Emergency supplies of prescription-only medicines.
11	E	BNF – section 6.1.2.2 – Biguanides.
12	D	The mineralocorticoid activity of hydrocortisone causes sodium and water retention which can result in hypertension. See BNF – section 6.3.2 – Glucocorticoid therapy for more information.
13	A	Nurse advisors at NHS Direct / NHS 24 use decision support software to assist them in making an assessment and in giving advice. The software consists of clinical algorithms based on symptoms. Using these algorithms the advisor can assess, advise and refer callers to the NHS service that best suits their needs. The service was developed to provide quicker, easier and faster access to advice and information for members of the public about health, illness and the NHS so that they are better able to care for themselves and their families. All calls to NHS Direct / NHS 24 are confidential. Information is only shared with other health care professionals if the information is needed for an individual's treatment and care, AND after the person has given their permission. See <a href="http://www.nhsdirect.nhs.uk">www.nhsdirect.nhs.uk</a> / <a href="http://www.nhs24.com">www.nhs24.com</a> / <a href="http://www.nhsdirect.wales.nhs.uk">www.nhsdirect.wales.nhs.uk</a> for more information.
14	E	Temazepam is a Schedule 3 Controlled Drug but is exempt from the prescription requirements for Controlled Drugs. See MEP – section 1.2.13 – Controlled Drugs.
15	A	Buprenorphine is a Schedule 3 Controlled Drug. See MEP – section 1.2.13 – Controlled Drugs.

16	A	An adequate intake of vitamin A is required during pregnancy but excessive intake is associated with an increased risk of birth defects. Foods which are particularly rich in vitamin A (e.g. liver) and vitamin A supplements should be avoided in women who are (or may become) pregnant. See 'Nutrition and Dietary Advice in the Pharmacy' by Pamela Mason or a health promotion text for more information.
17	C	Vitamin D compounds are fat-soluble sterols, sometimes considered to be hormones or hormone precursors, which are essential for the proper regulation of calcium and phosphate homeostasis and bone mineralisation. See 'Nutrition and Dietary Advice in the Pharmacy' by Pamela Mason or a health promotion text for more information.
18	E	Vitamin K is an essential cofactor in the hepatic synthesis of prothrombin (factor II) and other blood clotting factors (factors VII, IX, and X, and proteins C and S). See 'Nutrition and Dietary Advice in the Pharmacy' by Pamela Mason or a health promotion text for more information.
19	C	In humans the most significant supply of vitamin D comes from the action of ultra-violet light on sterols in the skin. Most people, including infants require little or no extra from food when regularly exposed to sunlight when the sun is high in the sky. See 'Nutrition and Dietary Advice in the Pharmacy' by Pamela Mason or a health promotion text for more information.
20	C	This patient's symptoms suggest that their dose of levothyroxine may be excessive. See BNF – section 6.2.1 – monograph for levothyroxine or a medical text for more information.
21	E	HRT causes an increased risk of thromboembolism and sudden breathlessness may indicate pulmonary embolism. See BNF – section 6.4.1.1 – Oestrogens and HRT for more information.
22	E	BNF – Appendix 9 – Cautionary and advisory labels.
23	C	BNF – Appendix 9 – Cautionary and advisory labels.
24	D	BNF – Appendix 9 – Cautionary and advisory labels.
25	A	See BNF – section 5.1.1 – Penicillins for more information.

26	E	<p>Maintenance doses of warfarin depend on the prothrombin time, reported as the INR. See BNF – section 2.8.2 – Oral anticoagulants. Carbimazole is used to treat hyperthyroidism and dosage is based on thyroid function tests. See BNF – section 6.2.2 – Antithyroid drugs.</p> <p>Lithium has a narrow therapeutic / toxic ratio and should not be prescribed unless facilities for monitoring serum-lithium concentrations are available. See BNF – section 4.2.3 (Lithium).</p>
27	B	<p>Confidential information must only be disclosed without consent in exceptional circumstances or when permitted or required by law. For examples of the circumstances where information may be disclosed without consent see MEP – Professional Standards and Guidance for Patient Confidentiality.</p>
28	D	<p>Itchiness on the surface of the eyes may indicate allergic conjunctivitis which can be treated appropriately with non-prescription medicines. Visual disturbances or pain arising from within the eye indicate possible serious pathology and require urgent referral.</p> <p>See a responding to symptoms text for more information.</p>
29	D	<p>Rifampicin is a potent liver enzyme inducing agent which increases the metabolism and clearance of warfarin from the body, which would cause the INR to decrease.</p> <p>Cimetidine and fluconazole are enzyme inhibitors.</p> <p>See 'Drug Interactions' by Stockley for more information.</p>
30	E	<p>Levobunolol is a beta-adrenoceptor blocking drug which is used topically to treat glaucoma. Systemic absorption may follow topical application to the eyes, therefore eye drops containing a beta-blocker can cause systemic side-effects e.g. bradycardia.</p> <p>See BNF – section 11.6 – Treatment of glaucoma.</p>
31	B	<p>MEP – section 1.2.3 – Emergency supplies of prescription-only medicines.</p>
32	B	<p>Misoprostol can cause diarrhoea which may occasionally be severe and require withdrawal. See BNF – section 1.3.4 – monograph for misoprostol.</p> <p>Ferrous sulphate can cause gastro-intestinal irritation including both diarrhoea and constipation. See BNF – section 9.1.1.1 – Oral iron.</p> <p>Amitriptyline has anti-muscarinic activity and therefore can cause constipation. See BNF – section 4.3.1 – monograph for amitriptyline.</p>

33	E	<p>Ramipril is an angiotensin-converting enzyme inhibitor which inhibits the conversion of angiotensin I to angiotensin II. Angiotensin II stimulates the synthesis and secretion of aldosterone (stimulating salt and water retention and potassium loss) and raises blood pressure via a potent direct vasoconstrictor effect. ACE inhibitors induce vasodilatation and enhance the renal excretion of salt and water while causing potassium to be retained. See BNF – section 2.5.5.1 – Angiotensin-converting enzyme inhibitors.</p> <p>Spironolactone is an aldosterone antagonist, therefore is potassium-sparing and can cause hyperkalaemia. See BNF – section 2.2.3 – Aldosterone antagonists.</p> <p>Furosemide is a loop diuretic which inhibits the reabsorption of electrolytes primarily in the thick ascending limb of the loop of Henle and also in the distal renal tubules. It may also have a direct effect in the proximal tubules. Excretion of sodium, potassium, calcium, and chloride ions is increased and water excretion enhanced. See BNF – section 2.2.2 – Loop diuretics.</p>
34	C	<p>Ethics has been described as the systematic study of moral choices. Ethical decision making is the process whereby one recognises that a problem needs to be overcome or a difficult choice made, identifies the possible courses of actions, chooses one, takes it &amp; then accepts responsibility. Pharmacists will face ethical dilemmas in the course of their professional practice and are expected to use their professional judgement in deciding on the most appropriate course of action.</p>
35	B	<p>GTN is a vasodilator and unwanted effects include flushing, headache and postural hypotension which may limit therapy. See BNF – section 2.6.1 – Nitrates for more information.</p>
36	B	<p>Lithium and gentamicin are excreted mainly unchanged in the urine therefore a dosage reduction is necessary in patients with renal impairment. BNF – Appendix 3 – Renal impairment.</p>
37	B	<p>See MEP – Professional Standards and Guidance for the Sale and Supply of Medicines (Supply of Prescribed Medicines). The first and second statements are not linked because the reason that the patient or their carer should be told at the outset is to give the opportunity to take the prescription to another pharmacy.</p>
38	E	<p>The use of cyclizine is not restricted in young adults. Metoclopramide is restricted in patients under 20 years due to an increased risk of dystonic reactions. See BNF – section 4.6 – Drugs used in nausea and vertigo.</p>
39	D	<p>Excess ingredients should not be returned to their stock bottles as this could contaminate the stock. Disposal of waste must comply with the provisions of environmental protection legislation. Under the Environmental Protection Act 1990, every producer of waste is under a duty to ensure safe handling and disposal of the waste. See RPSGB practice guidance on hazardous waste.</p>

40	B	<p>The use of loop diuretics can increase the risk of digoxin toxicity due to the potential for them to cause hypokalaemia, which predisposes the patient to toxicity.</p> <p>The first and second statements are not linked because although loop diuretics can cause hyponatraemia, this does not predispose to digoxin toxicity.</p> <p>See BNF – section 2.1.1 – Cardiac glycosides for more information.</p>
41	D	<p>As you are required to prepare 300 mL of Gentian Mixture, Alkaline, BP a total of 150 mL of Double-Strength Chloroform Water BP is required. Concentrated Chloroform Water BP needs to be diluted 1 in 20 to prepare Double-Strength Chloroform Water BP, therefore the volume of Concentrated Chloroform Water BP that is required is 7.5 mL.</p>
42	C	<p>Vaginal candidiasis occurs commonly in pregnancy. Any pregnant woman with vaginal candidiasis should be referred to their GP to confirm the diagnosis and exclude other potential causes.</p> <p>See a responding to symptoms text for more information.</p>
43	C	<p>The reason that it would be illegal to provide the emergency supply is that the pharmacist has not interviewed the person requesting the medicine. There is no legal age limit for emergency supplies.</p> <p>See MEP – section 1.2.3 – Prescription-only medicines (Emergency supplies of prescription-only medicines).</p>
44	C	<p>The patient should be advised to see his GP as the yellow/green sputum may indicate that he has a chest infection such as bronchitis or pneumonia. Patients should be advised to see their GP if their cough has lasted 2 weeks or more and is not improving.</p> <p>See a responding to symptoms text for more information.</p>
45	A	<p>The RPSGB Professional Standards and Guidance documents state that patients, members of the public and other healthcare professionals are entitled to expect that medicines sold or supplied within the course of professional pharmacy practice are obtained from a reputable source and fit for the intended purpose. See MEP – Professional Standards and Guidance for the Sale and Supply of Medicines (Pharmaceutical Stock). In addition it is the responsibility of pharmacists in positions of authority to ensure that systems are in place to ensure that the supplier and the quality of medicines obtained are reputable. See MEP – Professional Standards and Guidance on Accepting Positions of Authority (Policies and Procedures).</p> <p>The first and second statements are linked because the reason that the superintendent pharmacist must check the credentials of the wholesaler is primarily to ensure that the supplier and goods are reputable.</p>

## Open Book

Question	Answer	Comments
1	D	BNF – section 5.1 Table 1 – Summary of antibacterial therapy
2	A	BNF – section 3.6 Oxygen
3	C	BNF – section 2.3.1 Management of arrhythmias (Atrial fibrillation) and individual drug monographs
4	B	BNF – section 2.3.1 Management of arrhythmias (Atrial fibrillation)
5	D	BNF – section 4.3.3 Selective serotonin re-uptake inhibitors (Interactions)
6	E	BNF – section 5.1.1.2 – monograph for flucloxacillin
7	B	BNF – section 13.4 – monograph for hydrocortisone Non-prescription hydrocortisone cream is indicated for the treatment of allergic contact dermatitis. Vallergran and Piriton both contain a sedating antihistamine (BNF – section 3.4.1) and are more appropriate if systemic treatment is needed and sedation is acceptable.
8	B	BNF – Prescribing in palliative care (Nausea and vomiting)
9	D	BNF – section 9.1.2 – monograph for folic acid
10	E	BNF – section 4.7.4.3 Cluster headache
11	B	MEP – 1.2.4 Exemption from the controls on retail sale – Ambulance paramedics: administration
12	B	MEP – 1.2.4 Exemption from the controls on retail sale – Midwives: administration
13	C	Drug Tariff: <ul style="list-style-type: none"> <li>• England/Wales – Part XVI Notes on charges</li> <li>• Scotland – Part 1 Prescription charges</li> </ul> BNF – section 7.2.2 – Preparations for vaginal and vulval candidiasis
14	C	Drug Tariff: <ul style="list-style-type: none"> <li>• England/Wales – Part XVI Notes on charges</li> <li>• Scotland – Part 1 Prescription charges</li> </ul>

15	B	MEP – 1.3 Alphabetical list of medicines for human use
16	A	MEP – 1.3 Alphabetical list of medicines for human use
17	C	BNF – section 4.8.1 Control of epilepsy
18	D	BNF – see individual monographs (1.6.2 Stimulant laxatives and 1.6.1 Bulk-forming laxatives)
19	A	MEP – 1.7 Denatured alcohol
20	A	MEP – section 2.2 – Professional Standards and Guidance for the Sale and Supply of Medicines (7. Prescription Collection Service)
21	C	BNF – section 12.3.5 Treatment of dry mouth
22	A	<p>Insomnia associated with Singulair (BNF – section 3.3.2 – monograph for montelukast) should be reported to the MHRA because the patient is a child (all suspected reactions should be reported in children – see BNF – Adverse reactions to drugs).</p> <p>Cleft palate possibly caused by prednisolone should be reported as it is a congenital abnormality (see BNF – Adverse reactions to drugs).</p> <p>All suspected adverse reactions caused by Avandamet should be reported as Avandamet is still being intensively monitored by the MHRA (BNF – section 6.1.2.3 – monograph for rosiglitazone).</p>
23	A	MEP – section 2.2 – Professional Standards and Guidance for the Sale and Supply of Medicines (4. Extemporaneous Preparation or Compounding)
24	E	<p>See individual monographs in BNF:</p> <ul style="list-style-type: none"> <li>• vindesine – section 8.1.4</li> <li>• amsacrine – section 8.1.5</li> <li>• methotrexate – section 8.1.3</li> </ul>
25	A	<p>BNF – Appendix 6 – Intravenous additives</p> <p>The table states that bumetanide is compatible with glucose 5% and sodium chloride 0.9%. According to the information box printed before the table, this indicated compatibility with sodium chloride and glucose intravenous infusion.</p> <p>The first and second statements are linked because you are able to establish that bumetanide is compatible with sodium chloride and glucose intravenous infusion by checking compatibility with glucose 5% and sodium chloride 0.9%.</p>

26	B	BNF – section 4.3.4 – monograph for flupentixol The first and second statements are not linked because the reason that flupentixol should not be taken in the evening is because it has an alerting effect.
27	C	BNF – Appendix 1 – Interactions
28	D	BNF – section 12.2.1 – monograph for beclometasone nasal spray
29	A	Drug Tariff: <ul style="list-style-type: none"> <li>• England/Wales – Part VIII Basic prices of drugs</li> <li>• Scotland – Part 7 Drugs &amp; preparations with tariff prices</li> </ul> The first and second statements are linked because co-careldopa m/r tablets 50/200 are not listed the Drug Tariff Part VIII (Part 7 Scotland).
30	A	BNF – section 5.4.1 Antimalarials (Asplenia) The spleen is involved in producing protective humoral antibodies, the production and maturation of B and T cells and plasma cells, removal of unwanted particulate matter (e.g. bacteria) and it also acts as a reservoir for blood cells, especially white cells and platelets, therefore fulminant, potentially life-threatening infection is a major long-term risk of hyposplenism. The first and second statements are linked because it is due to the increased risk of severe falciparum malaria that patients with severe splenic dysfunction should be strongly advised to take all anti-malarial precautions/prophylaxis and ideally avoid holidays in malaria endemic areas.

## Calculations

Question	Answer	Comments
31(Calc)	C	Benylin Dry Coughs (Original) contains 14 mg of diphenhydramine hydrochloride in 5 mL $\therefore$ 280 mg in 100 mL $\therefore$ 2.8 g in 1 L $\therefore$ 2.8 g x 150 L = 420 g
32(Calc)	D	1 mole of potassium chloride weighs 74.5 g $\therefore$ 1 mmol = 74.5 mg The solution to be prepared contains 6 mmol potassium ions in 5 mL $\therefore$ 120 mmol in 100 mL $\therefore$ 600 mmol in 500 mL $600 \times 74.5 \text{ mg} = 44.7 \text{ g}$
33(Calc)	C	Dobutamine dose = 4.5 mcg/kg/minute & patient weighs 55 kg $\therefore$ dose = $4.5 \times 55 = 247.5 \text{ mcg/minute}$ After 1 hour the patient will have received $60 \times 247.5 \text{ mcg} = 14.85 \text{ mg}$
34(Calc)	C	Digoxin tablets have a bioavailability of 0.7 $\therefore$ 70% of the administered dose is available. Digoxin elixir has a bioavailability of 0.8 $\therefore$ 80% of the administered dose is available. The dose of digoxin elixir (y) that must be given to provide an equivalent dose to the tablets can be calculated as follows: $80\% \text{ of } y = 70\% \text{ of } 125 \text{ mcg}$ $80\% = 0.8$ $\therefore 0.8 \times y = 0.7 \times 125$ $\therefore y = (0.7/0.8) \times 125 = \text{approximately } 110 \text{ mcg}$
35(Calc)	E	A 1 in 8000 solution contains 1 g in 8000 mL $\therefore$ 125 mg in 1000 mL $\therefore$ 12.5 mg in 100 mL $\therefore$ 50 mg in 400 mL
36(Calc)	B	BNF – section 2.3.2 – monograph for amiodarone Dose = 200 mg 3 times daily for 1 week reducing to 200 mg twice daily for a further week; maintenance dose, usually 200 mg daily. 1 tablet tds for 7 days = 21 tablets 1 tablet bd for 7 days = 14 tablets 1 tablet od for 14 days = 14 tablets Total = 49 tablets
37(Calc)	C	$\text{BMI} = \text{weight (kg)} \div \text{height (m)}^2$ $\therefore \text{weight} = \text{BMI} \times \text{height (m)}^2$ To calculate the weight that will give Mrs S a BMI of 20: $= 20 \times 1.65^2 = \text{approximately } 55 \text{ kg}$ To calculate the weight that will give Mrs S a BMI of 25: $= 25 \times 1.65^2 = \text{approximately } 68 \text{ kg}$

38(Calc)	A	BNF – section 9.6.4 – monograph for alfacalcidol Dose = 50 ng/kg daily ∴ 50 ng x 4 kg = 200 ng daily = 0.2 mcg
39(Calc)	B	Remifentanil dose = 0.05 mcg/kg/minute & child weighs 16 kg ∴ dose = 0.05 x 16 = 0.8 mcg/minute After 25 minutes the child will have received 25 x 0.8 = 20 mcg = 0.02 mg
40(Calc)	E	BNF – section 9.1.1.1 Oral iron  200 mg dried ferrous sulphate contains 65 mg of ferrous iron  Fersamal syrup contains 45 mg of iron / 5 mL ∴ 85.5 mg iron in 9.5 mL  Sytron elixir contains 27.5 mg of iron / 5 mL ∴ 41.25 mg iron in 7.5mL  Niferex elixir contains 100 mg of iron / 5 mL ∴ 65 mg iron in 3.25 mL