

# Registration Examination Sample Papers Autumn 2009

## Answers and Rationale

### Closed Book

Question	Answer	Comments
1	E	Shingles is caused by reactivation of the herpes zoster virus which has lain dormant in a sensory root ganglion. Skin lesions follow the course of sensory nerves producing a rash which is macular at first, then vesicular and eventually it forms crusts. It can occur on the scalp, extending unilaterally over the forehead and eye, or run from the back across the chest, or around the abdomen. See a responding to symptoms text or medical text for more information.
2	D	The storage, carriage, processing and supply of waste are subject to stringent controls designed to minimise the negative effects of waste on the environment and promote public safety. The Hazardous Waste Regulations, which came into effect in July 2005, control the storage and disposal of unwanted medicines. See RPSGB 'The Hazardous Waste Regulations 2005' available on the RPSGB website ( <a href="http://www.rpsgb.org">www.rpsgb.org</a> ) or the waste guidance on the PSNC website ( <a href="http://www.psn.org.uk">www.psn.org.uk</a> ).
3	E	The plasma elimination half-life of a medicine is the time it takes for 50% of medicine present in the plasma to be eliminated, therefore after 2 half-lives 75% of a medicine will have been eliminated.
4	D	Nitrates are potent vasodilators and common side-effects include throbbing headache, flushing and postural hypotension. See BNF – section 2.6.1 – Nitrates.
5	C	Diabetic ketoacidosis is a medical emergency characterised by high blood glucose, dehydration, electrolyte imbalances and the production of ketones. It is caused by a lack of insulin therefore treatment involves the administration of insulin together with fluids and potassium. See a medical text for more information.
6	B	Erythromycin can reduce the metabolism of warfarin thereby enhancing its anticoagulant effect, resulting in a potentially hazardous interaction. See 'Drug Interactions' by Stockley for more information.
7	C	Pyridoxine deficiency can occur during treatment with isoniazid & is characterised by peripheral neuritis. In patients with pre-existing risk factors pyridoxine is given prophylactically from the start of treatment. See BNF – section 5.1.9 – Antituberculous drugs.

8	C	Sudden cessation of beta-blockers may cause a rebound worsening of myocardial ischaemia & may cause exacerbation of angina. See BNF – section 2.4 – Beta-adrenoceptor blocking drugs.
9	A	Medicines returned to a pharmacy from a patient's home must not be supplied to any other patient. A pharmacist may destroy Controlled Drugs returned to him by a patient without the presence of an authorised person. Such Controlled Drugs should not be returned to stock. It is good practice to document the destruction, the record should be made somewhere other than the CD register. See MEP for more information.
10	E	NSAIDs can reduce the excretion of lithium resulting in an increased risk of toxicity. See 'Drug Interactions' by Stockley for more information.
11	D	Aminosalicylates can cause blood disorders, therefore patients who experience any unexplained bleeding, bruising, purpura, sore throat, fever or malaise should report this to their doctor. See BNF – section 1.5 – aminosalicylates.
12	A	See BNF – section 2.2.1 – monograph for bendroflumethiazide.
13	B	Ringworm is a fungal infection of the skin, scalp or nails. See a responding to symptoms text or medical text for more information.
14	E	Neonates are relatively deficient in vitamin K & those who do not receive supplements of vitamin K are at risk of severe bleeds. It is recommended that all newborn babies should receive vitamin K to prevent vitamin K deficiency bleeding (haemorrhagic disease of the newborn). See BNF – section 9.6.6 – Vitamin K.
15	D	Vitamin D plays an essential role in the regulation of plasma calcium & in high dosage may lead to the development of hypercalcaemia. See 'Nutrition and Dietary Advice in the Pharmacy' by Pamela Mason or BNF section 9.6.4 for more information.
16	D	Nifedipine relaxes vascular smooth muscle & dilates coronary & peripheral arteries. Side-effects associated with vasodilation include flushing & headache. See BNF – section 2.6.2 – Calcium-channel blockers.
17	E	Statins can cause rhabdomyolysis & if myopathy is suspected treatment should be discontinued. See BNF – section 2.12 – Statins.

18	C	<p>Carbimazole is used in the treatment of hyperthyroidism. Over-treatment will result in hypothyroidism which is characterised by a slowing down of all the body processes. Symptoms include weight gain, constipation, dislike of the cold and lack of energy.</p> <p>As this patient is complaining of symptoms of hypothyroidism they should be advised to see their GP as the dose of carbimazole may need to be reduced.</p> <p>See a general medical textbook for more information.</p>
19	D	See BNF – section 4.3.3 – Selective serotonin reuptake inhibitors
20	A	See BNF – section 10.1.1 – NSAIDs.
21	A	See BNF – section 5.1.1.2 – monograph for flucloxacillin.
22	B	<p>Deposition of tetracycline in growing bones &amp; teeth can cause staining; therefore tetracyclines should not be given to children under 12 years or to pregnant or breast-feeding women.</p> <p>See BNF – section 5.1.3 – Tetracyclines.</p>
23	D	See BNF – section 5.1.12 – monograph for ciprofloxacin.
24	C	See BNF – section 5.1.11 – Metronidazole & tinidazole.
25	B	<p>If a man or woman has spina bifida, or there is history of neural tube defect in a previous child, the risk of neural tube defects is increased. Women who take antiepileptic medicines are also at increased risk.</p> <p>See BNF – section 9.1.2 (Prevention of neural tube defects) &amp; 4.8.1 (Control of epilepsy – pregnancy &amp; breast-feeding).</p>
26	D	<p>Phenytoin has a narrow therapeutic index &amp; the relationship between dose &amp; plasma concentration is non-linear, therefore monitoring of plasma concentration greatly assists dosage adjustment.</p> <p>Thyroid Function Tests are used to optimise therapy with levothyroxine. Response to gliclazide is monitored by measuring blood glucose levels and glycosylated haemoglobin.</p> <p>See BNF – section 4.8.1 – monograph for phenytoin &amp; general medical textbook for more information.</p>
27	E	<p>When making an emergency supply at the request of a doctor, the doctor must undertake to furnish the prescription within 72 hours &amp; the patient does not need to have been prescribed the medicine previously.</p> <p>See MEP for more information.</p>
28	A	See BNF – Appendix 3: Renal impairment.

29	C	Some medicines predispose to the development of thrush. Broad-spectrum antibiotics can wipe out the normal bacterial flora, allowing the overgrowth of fungal infection. Inhaled corticosteroids can predispose to oral thrush due to deposition at the back of the throat during inhalation. Corticosteroids suppress the immune system and reduce resistance to infection. See a general medical textbook for more information.
30	C	See MEP – section 3.1.1 Clinical governance.
31	B	Weight loss is a significant sign in anyone with abdominal symptoms as it could signify sinister pathology, such as carcinoma, & should always be referred. The pain of angina or a myocardial infarction can mimic oesophagitis therefore pain aggravated by exercise or effort requires immediate referral to a doctor. See a responding to symptoms text or medical text for more information.
32	B	Upper gastrointestinal bleeding can result in melaena, which is the presence of partly digested blood in the stool. This causes the stool to be black & tarry. Ferrous sulphate tablets can also discolour stools. See BNF – section 9.1.1.1 – Oral iron.
33	C	See MEP – section 2 – Code of Ethics for Pharmacists & Pharmacy Technicians for more information.
34	D	See individual monographs in BNF.
35	B	Lithium preparations vary widely in bioavailability therefore changing preparations requires the same precautions as initiating therapy. See BNF – section 4.2.3 – monograph for lithium. The Council of the RPSGB advises that patients taking modified release theophylline should be maintained on the same brand. This is because theophylline has a narrow therapeutic index & brands vary in their bioavailability. See BNF – section 3.1.3 – monograph for theophylline.
36	C	For advice on protection against mosquito bites see BNF – section 5.4.1 – Protection against malaria.
37	D	While pharmacists may object to supplying treatments on the grounds of conscience (see MEP – section 2 – Code of Ethics for Pharmacists & Pharmacy Technicians) the guidance issued by the RPSGB on non-prescription emergency hormonal contraception (EHC) states that pharmacists must deal with all requests for EHC personally.
38	D	See BNF – section 5.1 – Antibacterial drugs – Choice of a suitable drug.

39	B	See BNF – section 5.1 – Table 1 – Summary of antibacterial therapy. The first and second statements are not linked because the prevalence of UTIs does not explain why a short course of antibiotics would be suitable.
40	A	See MEP – section 3.1.1 Clinical governance. The first and second statements are linked because clinical governance is a framework through which NHS organisations are accountable for continuously improving the quality of their services and safeguarding high standards of care.
41	E	NHS Direct / NHS 24 (Scotland) are nurse-led services that provide confidential healthcare information to the general public. See the relevant websites for more information.
42	C	See BNF – Prescribing for Children.
43	B	Loratadine is a non-sedating antihistamine, which is the reason why it would be appropriate to recommend it in this case (see BNF – section 3.4.1 – Antihistamines). The first and second statements are not linked because although loratadine does have a long duration of action, this does not explain why it would be a suitable choice for this patient.
44	E	Audit is a continuous cyclical process that measures the level of attainment with agreed objectives. See the RPSGB website for more information. Available at <a href="http://www.rpsgb.org/registrationandsupport/audit/">www.rpsgb.org/registrationandsupport/audit/</a>
45	E	Inclusion of age is a legal requirement in the case of POMs for children under 12 years. See MEP for more information.

## Open Book

Question	Answer	Comments
1	B	Drug Tariff – Notes on prescription charges & appropriate monographs in the BNF
2	E	BNF – section 9.2.1.1 – monograph for Calcium Resonium, 2.2.3 – monograph for spironolactone
3	A	MEP – 1.2.14 Controlled Drugs – Supply of Controlled Drugs to misusers
4	C	BNF – section 9.8.2 – Drugs unsafe for use in acute porphyrias
5	D	MEP – 1.3 Alphabetical list of medicines for human use Monomil XL 60 is a POM
6	C	BNF – Appendix 3 (Renal impairment)
7	A	BNF – section 5.5.1 – Drugs for threadworms Pripsen oral powder should not be recommended as it is cautioned in patients with epilepsy
8	D	BNF – section 7.3.1 – Reasons to stop immediately
9	C	Drug Tariff – Drugs for which discount is not deducted / Zero Discount List
10	B	BNF – section 2.4 – Beta-adrenoceptor blocking drugs
11	B	BNF – section 5.4.1 – Prophylaxis against malaria
12	A	BNF – section 5.4.1 – Prophylaxis against malaria
13	E	BNF – section 5.4.1 – Prophylaxis against malaria
14	B	MEP – 1.3 Alphabetical list of medicines for human use MEP – 1.2.13 Controlled Drugs
15	D	MEP – 1.3 Alphabetical list of medicines for human use MEP – 1.2.13 Controlled Drugs
16	C	MEP – 1.3 Alphabetical list of medicines for human use MEP – 1.2.13 Controlled Drugs

17	A	MEP – section 2.2 – Professional Standards & Guidance Documents. Professional standards & guidance for internet pharmacy services
18	C	BNF – section 6.3.2 – Pregnancy & breast-feeding – Glucocorticoid therapy
19	A	BNF – Appendix 7 (Borderline substances)
20	E	For normal plasma electrolyte values see BNF – section 9.2 Fluids and electrolytes BNF – section 1.1.1 – Antacids and simeticone (Asilone is the only preparation which is 'low sodium')
21	A	MEP – section 2.2 – Professional Standards & Guidance Documents. Professional standards & guidance for patient confidentiality, 2.6 – Standard operating procedures
22	B	BNF – section 10.1.3 – monograph for penicillamine, 4.8.1 – monograph for phenytoin, 2.12 – monograph for bezafibrate
23	C	BNF – section 3.1.3 – monograph for aminophylline, 4.2.3 – monograph for lithium, 2.3.2 – monograph for amiodarone
24	D	BNF – section 5.1 – Table 1 Summary of antibacterial therapy
25	D	BNF – section 2.8.2 Oral anticoagulants The first statement is false because in order to reduce the patient's INR the dose of warfarin needs to be reduced
26	C	BNF – Appendix 1 (Interactions) The first statement is true as the simvastatin may have caused the increase in the patient's INR
27	A	BNF – Appendix 1 (Interactions) The first and second statements are linked because a reduction in vegetable intake reduces the intake of vitamin K (which antagonises the effect of warfarin) thereby increasing the INR
28	E	BNF – section 11.8.1 – monograph for hypromellose eye drops Both statements are false because the RPSGB advise that where it is not possible to ascertain the strength of hypromellose prescribed the prescriber should be contacted to clarify the strength intended
29	E	BNF – Emergency treatment of poisoning Both statements are false because intravenous sodium bicarbonate is only indicated in adults if the plasma-salicylate concentration is greater than 500 mg/litre, & it is used to enhance urinary salicylate excretion

30	A	MEP – section 2.2 – Professional Standards & Guidance Documents. Professional standards & guidance for the sale & supply of medicines, 8 – Complementary therapies and medicines The first and second statements are linked because pharmacists have a professional responsibility only to offer advice on homeopathic medicines if they have undertaken suitable training or have specialised knowledge
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## Calculations

Question	Answer	Comments
31(Calc)	E	Haelan cream contains fludrocortide cream 0.0125% $\therefore$ 0.0125 g in 100 g $\therefore$ 12.5 mg in 100 g $\therefore$ 12.5 mg $\div$ 5 = 2.5 mg in 20 g
32(Calc)	B	Oily Phenol Injection BP contains 5% phenol $\therefore$ 5 g in 100 mL The patient is given 3 injections of 3 mL $\therefore$ total given = 9 mL $\therefore$ 5 g in 100 mL $\therefore$ 5000 mg in 100 mL $\therefore$ 500 mg in 10 mL $\therefore$ 450 mg in 9 mL
33(Calc)	A	FluoriGard Daily dental rinse contains 0.05% sodium fluoride $\therefore$ 0.05 g in 100 mL $\therefore$ 50 mg in 100 mL $\therefore$ 5 mg sodium fluoride in 10 mL Sodium fluoride 2.2 mg = 1 mg fluoride ion $\therefore$ 5 mg $\div$ 2.2 = 2.27 mg fluoride ion
34(Calc)	E	You are required to prepare a total of 15 powders, each containing 6 mg propranolol $\therefore$ the total weight of propranolol required is 90 mg (15 x 6) The final weight of each powder is 250 mg, $\therefore$ the weight of lactose required for each powder is 244 mg (250 – 6) The total weight of lactose required is 3660 mg (244 x 15) = 3.66 g
35(Calc)	D	Mr B's creatinine clearance = $(1.23 \times (140 - 80) \times 60) \div 300$ $\therefore$ = $(1.23 \times 3600) \div 300 = 1.23 \times 12 = 14.76$ mL/minute The BNF (appendix 3) states that if the creatinine clearance is less than 30 mL/minute the maximum dose of levetiracetam is 1 g daily
36(Calc)	C	The maximum recommended dose is 6 mg/kg/day in 3 divided doses $\therefore$ the maximum daily dose for a of 22 kg child = 132 mg (6 x 22) = 44 mg tds The gentamicin injection contains 80 mg in 2 mL $\therefore$ 40 mg in 1 mL $\therefore$ 44 mg in 1.1 mL
37(Calc)	D	The oxygen cylinder contains 1360 litres $\therefore$ if used at 2 litres/minute the cylinder will last for 680 minutes (1360 $\div$ 2) 680 minutes = 11 hours 20 minutes
38(Calc)	E	15% solution contains 15 g in 100 mL $\therefore$ 90 g in 600 mL
39(Calc)	B	The original solution prior to dilution will be 45 mL of a 0.2% solution $\therefore$ when diluted with an equal volume of water will give 90 mL of a 0.1% solution $\therefore$ 0.1% solution contains 0.1 g in 100 mL $\therefore$ 0.09 g in 90 mL

40(Calc)	A	<p><b>1</b> 1 mole of sodium bicarbonate weighs 84 g  <math>\therefore</math> 1 mmol = 84 mg  <math>\therefore</math> 150 mmol = 12600 mg (84 x 150) = 12.6 g</p> <p><b>2</b> 1 mole of sodium chloride weighs 58.5 g  <math>\therefore</math> 1 mmol = 58.5 mg  <math>\therefore</math> 100 mmol = 5850 mg (58.5 x 100) = 5.85 g</p> <p><b>3</b> 1 mole of potassium chloride weighs 74.5 g  <math>\therefore</math> 1 mmol = 74.5 mg  <math>\therefore</math> 40 mmol = 2980 mg (74.5 x 40) = 2.98 g</p>
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