**ROYAL CIVIL SERVICE COMMISSION**

**BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2014**

**EXAMINATION CATEGORY: TECHNICAL**

**PAPER III: SUBJECT SPECIALIZATION PAPER for *PHARMACY***

**Date** : 12 October 2014

**Total Marks** : 100

**Examination Time** : 150 minutes (2.5 hours)

**Reading Time** : 15 Minutes (prior to examination time)

**GENERAL INSTRUCTIONS:**

1. Write your Roll Number clearly and correctly on the Answer Booklet.
2. The first 15 minutes is being provided to check the number of pages of Question Paper, printing errors, clarify doubts and to read the instructions. You are NOT permitted to write during this time.
3. This paper consists of **TWO SECTIONS**, namely SECTION A and SECTION B:

* **SECTION A** has two parts: Part I - 30 Multiple-Choice Questions

Part II - 4 Short Answer Questions

All questions under SECTION A are COMPULSORY.

* **SECTION B** consists of two Case Studies. Choose only ONE case study and answer the questions under your choice.

1. All answers should be written with correct numbering of Section, Part and Question Number in the Answer Booklet provided to you. Note that any answer written without indicating any or correct Section, Part and Question Number will NOT be evaluated and no marks would be awarded.
2. Begin each Section and Part in a fresh page of the Answer Booklet.
3. You are not permitted to tear off any sheet(s) of the Answer Booklet as well as the Question Paper.
4. Use of any other paper including paper for rough work is not permitted.
5. You are required to hand over the Answer Booklet to the Invigilator before leaving the examination hall.
6. This paper has **07** printed pages in all, including this instruction page.

**GOOD LUCK!**

**SECTION A**

**PART I - Multiple Choice Questions (30 Marks)**

**Choose the correct answer and write down the letter of the correct answer chosen in the Answer Booklet against the question number. E.g. 31 (c). Each question carries ONE mark. Any double writing, smudgy answers or writing more than one choice shall not be evaluated.**

1. Morphine can be expected to produce which of the following pharmacological effects?

I. dilation of the pupils

II. respiratory depression

III. constipation

1. I only
2. III only
3. I and II only
4. II and III only

2. FIFO stands for

a) first in first out

b) first inside first outside

c) first into first out

d) first inside first out

3.  In a hospital pharmacy, which of the following is the most effective strategy to enhance safety and minimize the incidence of interpretation errors associated with verbal medication orders?

1. use of bar code technology on medication orders
2. requirement for a read-back to the prescriber of all verbal orders
3. use of automated dispensing technology
4. restricting the acceptance of verbal orders to oral medications only

4. Rationale for combining levodopa and carbidopa in the management of Parkinson’s disease is:

1. carbidopa prevents the breakdown of levodopa before it crosses into the brain
2. levodopa prevents the breakdown of carbidopa before it crosses into the brain
3. the combination allows lower doses of carbidopa to be used
4. all of the above

5. Say you are filling up your annual indent in December 2013. You have 20,000 capsules of amoxicillin expiring in 31/6/2014 and your Average Monthly Use (AMU) for amoxicillin is 1620. How much quantity of amoxicillin will you be mobilizing to other health centres?

1. 10280
2. 9720
3. 10300
4. nil

6. GMP stands for:

1. good manufacturing practices
2. good manufacturing policies
3. good manufacturing performances
4. none of the above

7. Which of the following drug orders is incomplete and requires follow-up with the prescriber?

1. azithromycin 250 mg, 2 tabs day 1 and 1 tab days 2-5
2. fluticasone 100 mcg spray, 1 or 2 sprays in each nostril bid x 1 bottle
3. losartan, 50 mg daily x 1 month
4. simvastatin, 1 tab hs for 3 months

8. Metoprolol is preferred over propranolol in some patients because it

a) causes less cardio depression

b) has both alpha- and beta-adrenoceptor blocking effects

c) is less likely to cause bronchoconstriction

d) is more effective as an antiarrhythmic

9. Which of the following characteristics is the most important for assessing the bioequivalence of two brands of a pharmaceutical dosage form?

a) taste

b) excipients

c) physical appearance

d) pharmacokinetic properties

10. Which one of the following statements best describes the mechanism of action of ranitidine?

1. it interferes with the synthesis of histamine in the body.
2. it forms an inactive complex with histamine.
3. it stimulates the metabolism of endogenous histamine.
4. it blocks the receptor sites on which histamine acts.

11. Which one of the following is a mechanism underlying the resistance of strains of *S. pneumoniae* to ciprofloxacin?

a) increased synthesis of PABA

b) formation of methyltransferases that change receptor structure

c) reduced topoisomerase sensitivity to inhibitors

d) formation of drug-inactivating hydrolases

12. The infusion rate of theophylline established for a neonate is 0.08mg/kg/hr. How many mg of drugs are needed for a 12-hr infusion bottle if the body weight is 16 lb?

* 1. 0.58mg
  2. 14mg
  3. 150mg
  4. 7mg

13. According to USP standards, a refrigerator can be used to store pharmaceuticals that specify storage in a

1. freezer
2. cool place
3. cold place
4. room temperature

14. Which one of the following commonly available large-volume dextrose solutions for intravenous use is isotonic?

* 1. 2.5%
  2. 5.0%
  3. 20%
  4. 50%

15. A suspension is NOT a suitable dosage form for

* 1. intradermal injections
  2. intramascular injections
  3. intravenous injections
  4. subcutaneous injections

16. Phenytoin is often implicated in drug interactions. If phenytoin is used by patient taking cimetidine for a GI ulcer, which one of the following is likely to occur?

a) decreases half-life of cimetidine

b) increases half-life of phenytoin

c) increases clearance of phenytoin

d) displacement of cimetidine from plasma proteins

17. Which one of the following compounds is NOT absorbed by activated charcoal?

* 1. acetaminophen
  2. cyanide
  3. salicylates
  4. tricyclic antidepressants

18. Benzyl alcohol is present in some parenteral solution as a (an)

* 1. antimicrobial preservative
  2. antioxidant
  3. buffering agent
  4. tonicity adjuster

19. The main reason why methylcellulose and similar agents are included in ophthalmic solutions is to

* 1. increase drop size
  2. increase ocular contact time
  3. reduce inflammation of the eye
  4. reduce tearing during instillation of the drops

20. In a person who regularly consumes greater than average quantities of ethanol daily, the potential for hepatotoxicity due to paracetamol is greater than normal. The most likely explanation for this is

a) cirrhosis of liver

b) ethanol inhibits the metabolism of paracetamol

c) nutritional deficiency

d) ethanol induces a P450 that forms a toxic metabolite

21. The parenteral administration of streptokinase

a) increases the formation of plasminogen

b) may cause bleeding reversible by aminocaproic acid

c) causes a high incidence of thrombocytopenia

d) results in clot specific thrombolysis

22. Patients about to use metronidazole should be advised

I.to avoid consumption of alcoholic beverages

II. that their urine may become discoloured

III. to take the drug on an empty stomach

* 1. I only
  2. III only
  3. II and III only
  4. I, II, and III

23. Long-term inhalation of high doses of beclometasone may predispose patients to:

I. osteoporosis

II. hoarseness

III. hypertension

1. I, II and III
2. I and II only
3. II and III only
4. I only

24. An adult patient who ingested 20 acetaminophen 500mg tablets 6 hours ago should be treated with/by

* 1. EDTA infusion
  2. ipecac syrup
  3. activated charcoal
  4. N-acetylcysteine

25. Which of the following drugs is associated with the “gray-baby syndrome” in infants?

* 1. ciprofloxacin
  2. chloramphenicol
  3. amphotericin B
  4. kanamycin

26. A patient is admitted to the casualty unit with a marked hypotension and appears to be in shock. The drug of choice to treat the condition is probably

* 1. dobutamine
  2. dopamine
  3. epinephrine
  4. nitroprusside

27. A patient for whom you dispensed a new prescription for amitriptyline 4 days ago returns to you and complains that the drug is causing drowsiness, dry mouth and that the drug has not improved symptoms of depression. You as a Pharmacist should

* 1. inform the prescribing physician that the drug is not effective in this patient
  2. inform the prescribing physician that an anticholinergic agent must be prescribed for this patient
  3. explain to the patient that these are expected effects of early treatment of the drug
  4. contact the prescribing physician and report the adverse effects experienced by the patient

28. A patient has been receiving 50mg of hydrocortisone by IV every 6 hours for an acute exacerbation of ulcerative colitis. After several days of IV therapy, the physician wishes to switch the patient to an equivalent dose of oral prednisone. The equivalent total daily dose of prednisone would be

* 1. 50mg
  2. 100mg
  3. 400mg
  4. 600mg

29. The best choice for a pregnant woman who needs to be treated for essential hypertension is

* 1. methyldopa
  2. hydrochlorothiazide
  3. propranolol
  4. nifedipine

30. Patients using allopurinol should be advised to

* 1. drink adequate fluids
  2. avoid dairy products
  3. expect urine discoloration
  4. take at least 1g of vitamin C daily

**PART – II: Short Answer Questions (20 marks)**

**Answer ALL the questions. Each question carries 5 marks.**

1. Discuss patient counseling.

2. What do you understand by rational use of medicines (RUM)? What are the criteria for RUM?

3. Define pharmaceutical care. What are the requirements for pharmaceutical care?

4. What is the purpose of quality assurance in public drug supply system? What technical and managerial activities are involved during the quality assurance?

**SECTION B**

**Case Study**

**Choose either case1 or case 2 from this Section. Each Case carries 50 marks. Mark for each sub-question is indicated in the brackets.**

**CASE 1**

**Part I**

Dema fell unconscious yesterday while taking a shower. She is 21 years old and this was the fourth time that she had lost consciousness in the past two weeks. She was hoping to start driving lessons but her condition has caused great concern and she postponed the lessons. Following questioning, it was revealed that two of Dema’s cousins also suffered from this condition and so did their grandfather, who died three years ago. The EEG recordings obtained from her scalp showed abnormal electrical activity (spikes with sharp deflections and wave abnormalities). A diagnosis was made and sodium valproate was prescribed.

**Questions**

1. Describe briefly on epilepsy and comment on the underlying pathophysiology. (7)

2. What are the two main categories of epileptic seizures? (6)

3. What are the signs and symptoms of seizures? What type of seizure is consistent with Dema’s symptoms? (7)

4. Comment on the pharmacological management of epilepsy. What is the mode of action of valproate and what side effects are associated with its use? (10)

5. Give three examples of drugs recommended for treating epileptic seizures, commenting on their mechanisms of action. (5)

**Part II**

Dema was feeling better following the valproate therapy, which successfully controlled her symptoms. However, a few months later she realized that she might be pregnant and a pregnancy test later confirmed this. Dema had previously experienced very regular menstrual periods but that had changed in the last few months and was partly responsible for her unexpected and unplanned pregnancy. She decided to continue with the pregnancy but she was not sure whether to keep taking her medication or to stop, since she was worried about the health of the developing baby.

6. Could valproate affect the regularity of her menstruation? Comment. (3)

7. Could valproate harm the developing foetus and how? (3)

8. Should Dema stop taking her medication during pregnancy? If so, what alternative medications are available for pregnant women with epilepsy and how would you start the alternative drug? (5)

9. Why is abrupt withdrawal of anti-epileptic drug discouraged and how can you we overcome the adverse effects. (2)

10. What are the counseling points that need to be given to the patient after the seizure has been controlled? (2)

**CASE 2**

Mrs. Pema has been a very successful businesswoman. She used to work long hours inher office but still managed to find time to go to the gym and swam four times aweek. Recently, she has been feeling unwell and has become increasingly tired overthe past three months. She decided to take a break from work for a couple of weeks. However, that did not help much as she was feeling sick, dehydrated and very tired. She also developed polyuria. After examination and a blood test, her doctor noted that she showed an increased plasma level of calcium (hypercalcaemia), 5 mmoll−1as compared with the normal range of 2.2–2.55 mmoll−1. Her blood glucose levelwas normal.

**Questions**

1. What is the likely diagnosis of Mrs. Pema’s symptoms? Which hormones are involved in the control of calcium balance in the body and what are their mechanisms? (7)

2. Where is the parathyroid gland located? Comment on the function of the parathyroid gland and the actions of its hormone. (5)

3. What is hyperparathyroidism and what are its consequences? (5)

4. What causes hyperparathyroidism? Which other conditions can cause hypercalcaemia? (7)

5. Describe the major symptoms of hypercalcaemia. Comment on the drug treatment of hyperparathyroidism. (7)

6. Describe the condition of hypoparathyroidism. Comment on the pathophysiology of hypoparathyroidism. (6)

7. What are the effects of hypocalcaemia? (3)

8. Outline the relationship between hypoparathyroidism and hypomagnesaemia. (7)

9. Comment on the pharmacological management of hypoparathyroidism. (3)

\*\*\***TASHI DELEK**\*\*\*