

UNIVERSITI SAINS MALAYSIA

PROGRAM SARJANA FARMASI
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FCP 554 : PRAKTIS FARMASI KLINIKAL

(3 HOURS)

This examination consists of two sections.

Section A consists of 100 multiple choice questions.

Section B consists of two(2) long questions.

Answer ALL question.

Answers to section A must be entered into the scripts provided.

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Section A

Mark (/) the answers on the opposite space corresponding to a correct or most appropriate answer for each question. Each question has only one correct or most appropriate answer or statement.

1. Which of the following statements is/are true?

- (i) The administration of single daily doses of gentamicin obviates the need to monitor its plasma concentration.
- (ii) Digoxin potentiates the nephrotoxicity of gentamicin.
- (iii) The dose of gentamicin should be reduced in patients with nephrotic syndrome.
- (iv) High performance liquid chromatography (HPLC) is the instrument of choice in the analysis of plasma gentamicin concentration.

- (a) All of the above statements are true.
- (b) None of the above statements is true.
- (c) Only statements (i) and (ii) are true.
- (d) Only statements (i) and (iii) are true.

2. Which of the following statements is true?

- (a) The methods commonly used to determine serum digoxin concentrations may be interfered with by metabolites in patients with chronic renal failure.
- (b) The loading dose for digoxin, does not need to be adjusted in patients with chronic renal failure.
- (c) Digoxin toxicity is potentiated by concurrent hyperkalemia.
- (d) Digoxin elixir is less bioavailable than digoxin tablet.

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3. Which of the following statements is/are true?

- i. An advantage of the TDx instrument is that it can simultaneously run assays of multiple drugs in the same sample.
- ii. The TDx instrument usually measures free drug concentrations only.
- iii. The shelf-life of a TDx reagent is usually about 6 weeks.
- iv. A disadvantage of a TDx instrument is that it is non-specific.

- (a) All of the above statements are true.
- (b) None of the above statements is true.
- (c) Only statements (i) and (ii) are true.
- (d) Only statements (i) and (iii) are true.

4. Which of the following information is/are not essential in interpreting plasma drug concentrations?

- i. Age, weight, sex of the patient.
- ii. Parameter estimates of the drug monitored for the patient.
- iii. Parameter estimates of the drug monitored for the population of similar patients.
- iv. Clinical response of the patient.

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- (a) All of the above information are not essential.
- (b) None of the above information are is essential.
- (c) Information contained in (ii) and (iii) are not essential.
- (d) Information contained in (ii), (iii) and (iv) are not essential.

5. Which of the following statements is true about the therapeutic drug monitoring of theophylline in the neonatal patient?

- (a) Plasma concentration obtained on the second day after beginning theophylline therapy usually represents a steady state.
- (b) An over estimate of the plasma concentration may be obtained from interference by theophylline metabolites.
- (c) Two (2) grams of the intravenous formulation contains more theophylline than 1 gram of the oral formulation.
- (d) None of the above statements is true.

6. Which of the following statements is/are not true about the use and monitoring of gentamicin?

- i. In patients with renal failure, the monitoring of plasma concentration will avoid nephrotoxicity.
- ii. Monitoring of input and output is useful to monitor for the occurrence of nephrotoxicity.
- iii. The rise in serum creatinine usually occur even before any changes is seen in the elimination of gentamicin when the patient develops nephrotoxicity.
- iv. A peak of 8 ug/l is associated with nephrotoxicity.

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- (a) All of the above statements are true.
- (b) None of the above statements is true.
- (c) Only statements (ii) and (iii) are not true.
- (d) Only statements (ii), (iii) and (iv) are not true.

7. Which of the following statements is true?

- (a) A rapid bolus injection of gentamicin is associated with an increased risk of toxicity.
- (b) Phenytoin is not suitable for use in status epilepticus.
- (c) Absorption of carbamazepine is slow and erratic.
- (d) Plasma levels must be obtained for all patients given methotrexate.

8. Which of the following statements is true?

- (a) Metabolism of theophylline is reduced in patients with chronic renal failure.
- (b) Chloramphenicol exhibits a useful post-antibiotic effect.
- (c) Aspirin exhibits a saturable elimination process.
- (d) Intravenous chloramphenicol usually gives a more reliable plasma chloramphenicol concentrations in patients with typhoid.

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9. Which of the following statements is true?

- (a) In-vitro inactivation occurs when gentamicin is mixed with erythromycin.
- (b) The desired peak is higher for gentamicin than it is for amikacin.
- (c) Vancomycin can potentiate the ototoxicity of amikacin.
- (d) The therapeutic range for phenytoin is increased in patients with nephrotic syndrome.

10. Which of the following statements is true?

- (a) Free plasma phenytoin concentration can only be measured on the HPLC.
- (b) It is not necessary to wait six hours to obtain blood for plasma digoxin if the digoxin is given parenterally.
- (c) Carbamazepine therapy should be started at a lower dose in patients who are naive to carbamazepine.
- (d) The dose of sodium valproate must be reduced in patients with chronic renal failure.

11. Which of the following is not a barrier to compliance?

- (a) Cost.
- (b) Miscommunication.
- (c) Unresolved concern.
- (d) Marital status.

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12. Which of the following statements concerning noncompliance is not true ?

- (a) Noncompliance is sometimes inappropriately viewed as abnormal patient behaviour.
- (b) Noncompliance is overt when patients experience barriers to compliance.
- (c) Elderly males are more noncompliant than elderly females.
- (d) A person's personality may be associated with noncompliance.

13. Which of the following is/are compliance program issues for the future?

- (a) The value of compliance devices needs to be verified.
- (b) Future compliance technologies should link patient, physician and pharmacist.
- (c) Drug packaging, labeling, and information can be developed to enhance patient compliance.
- (d) All of the above are correct.

14. Which of the following is/are prerequisite(s) for pharmacist to improve compliance?

- (a) Incentives for pharmacists cognitive services must be included as part of the drug value.
- (b) Patients' unresolved concerns must be identified and resolved.
- (c) Industry support of the drug-use process through education and compliance-promoting programs and products must be evident.
- (d) All of the above are correct.

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15. Which of the following does not constitute a patient's drug-taking problems?
- (a) Modification of the dosage schedule.
 - (b) Self-medication with OTC drugs.
 - (c) Exacerbation of asthma.
 - (d) Inadequate knowledge on drug's side-effects.
16. Which of the following content of pharmacist communications with the prescriber to clarify a prescription is considered unprofessional?
- (a) Provide a clear, brief description of the potential problem.
 - (b) Cite a literature reference indicating the clinical significance of the identified problem.
 - (c) Provides an alternative plan to solve the prescription problem.
 - (d) None of the above.
17. Which of the following activities is most important to assist pharmacists to improve counselling skills?
- (a) Reading books on related subject.
 - (b) Practising and obtaining feedback.
 - (c) Attending counselling workshops.
 - (d) None of the above.

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18. Which of the following is a long-term solution that can be used to improve patient compliance?
- (a) Pharmaceutical companies to develop product-related compliance programs.
 - (b) Get pharmaceutical companies to sponsor continuing education programs on compliance.
 - (c) Colleges of pharmacy should develop curriculum to train graduates in counselling.
 - (d) None of the above is a long-term solution.
19. Which of the following is part of patient's drug-taking behaviour leading to noncompliance?
- (a) Belief that the therapy will not work.
 - (b) Disagree with the diagnosis.
 - (c) Fear of side-effects.
 - (d) All of the above.
20. Which of the following issues related to patient's unresolved concerns about their disease and drug therapy is false?
- (a) Patients have questions about their diagnosis and treatment.
 - (b) Patients' perception of their own health does not influence compliance.
 - (c) The patient's first opportunity to ask questions is usually in the physician's office.
 - (d) Data from one study suggest that only one out of every four physicians discusses a patient's medications with the patient.

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21. Which of the following would not be considered as a compliance-promoting dosing formulation?
- (a) Transdermal patch.
 - (b) Extended release.
 - (c) Once daily dosage.
 - (d) Depot injection.
22. Which of the following is/are advantage(s) of a pharmacist's participation in counselling activities?
- (a) Identify patient's drug-taking problems.
 - (b) Reduce the cost of outpatient drug therapy.
 - (c) (a) and (b) only
 - (d) None of the above.
23. Which of the following statements regarding communication is false?
- (a) A verbal communication sends a stronger message than a nonverbal communication.
 - (b) Pharmacists must learn to be creative to communicate effectively.
 - (c) Communication skills can be improved by participation in communication workshop.
 - (d) It is a dynamic process between people.

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24. Which of the following is a major contributor to medication noncompliance?
- (a) Low socioeconomic status.
 - (b) Occurrence of drug's side-effects.
 - (c) (a) and (b) only.
 - (d) None of the above.
25. Which of the following pharmacists' actions will increase patient compliance?
- (a) Referring patient to the physician for all questions.
 - (b) Appearance of interest in the patient's well being.
 - (c) (a) and (b) only.
 - (d) None of the above.
26. Which of the following is/are a consequence of partial compliance in a patient treated for chronic bacterial infection?
- (a) The need to perform additional tests to evaluate renal function.
 - (b) The need to switch to a more complicated regimen.
 - (c) The need for a more toxic agent.
 - (d) All of the above.

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27. Which of the following variables significantly correlates with patient's compliance to drug therapy?
- (a) Age.
 - (b) Sex.
 - (c) Social status.
 - (d) Educational level.
28. Which of the following contributes to the optimal, teachable moment in a pharmacist's counselling session?
- (a) Conducted in a private consultation area.
 - (b) The unhurried pace of the pharmacist.
 - (c) Calling the patient by his/her name.
 - (d) All of the above.
29. Which of the following reasons concerning the pharmacists reluctance to participate in the counselling activities is/are true?
- (a) The lack of ability to effectively communicate with the patients.
 - (b) The lack of time.
 - (c) (a) and (b) only
 - (d) None of the above.

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30. The direct method of compliance measurement includes.....
- (a) pill counts.
 - (b) refill record.
 - (c) electronic monitoring device.
 - (d) monitoring of serum drug concentration.
31. Which of the following methods of compliance assessment may underestimate true patient compliance?
- (a) Pill counts.
 - (b) Measurement of therapeutic outcome.
 - (c) Patient's self-report.
 - (d) Refill record.
32. Which of the following methods of compliance assessment is the most practical means of monitoring compliance in clinical practice?
- (a) Patient's self-report.
 - (b) Medication history-taking.
 - (c) Electronic monitoring device.
 - (d) Monitoring of serum drug concentration.
33. What is the main issue on patient's noncompliance behavior?
- (a) Impact on the health-care cost.
 - (b) Impact on the health outcome.
 - (c) Increase in hospital re-admission.
 - (d) Increase in the incidence of drug's adverse effects.

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34. Which of the following activities of the outpatient pharmacist is considered inappropriate?
- (a) Detects and diagnoses adverse drug reactions and drug interactions.
 - (b) Detects and overcomes incompatibilities in drug mixtures.
 - (c) Performs drug utilization review and drug use evaluations.
 - (d) None of the above.
35. The followings are examples of prescribing errors that should be identified during prescription screening process, except....
- (a) prescribe two drugs to obtain the benefit of their additive effects.
 - (b) prescribe a drug for the unproved indication.
 - (c) prescribe a drug to treat another drug's side-effects.
 - (d) prescribe two drugs that act antagonistically at the receptor site.
36. Which of the following is the most important reason for preferring a plasma drug level as a measurement for patient compliance ?
- (a) No other method of measuring compliance is sufficiently accurate.
 - (b) The plasma level can easily be obtained at the time of the clinic appointment.
 - (c) To allow us to determine if the regimen is therapeutic.
 - (d) The level cannot be faked by the patient.

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37. Which of the following is/are the reason for individualised patient counselling process?
- (a) To explore what the patients want to know.
 - (b) To determine what the patients need to know.
 - (c) To determine the scope of discussion with patients.
 - (d) All of the above.
38. The pharmacists can have a positive impact on clients by.....
- (a) using written material to supplement counselling activities.
 - (b) selecting patients most in needs of compliance oriented counselling.
 - (c) notifying patients of their refills dates.
 - (d) all of the above.
39. A patient's perceptions about the desirability of health care delivery are shaped by all of the following attitudes except.....
- (a) cultural attitudes.
 - (b) religious attitudes.
 - (c) political attitudes.
 - (d) social attitudes.

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40. During the initial patient-practitioner encounter, which of the following aspects of interaction contributes most to increasing compliance?
- (a) Questioning the practitioner.
 - (b) Environmental considerations.
 - (c) Testing and trusting the practitioner.
 - (d) Economic arrangement.
41. A pharmacist who selectively retrieves drug information, evaluate, interpret the literature and then provide an answer to the question can be calledof drug information.
- (a) a retriever
 - (b) an informant
 - (c) an evaluator
 - (d) a consultant
42. Which of the following statements regarding drug formulary is/are true?
- (i) The only factor that should be considered for drugs to be listed in the formulary is its effectiveness and its pharmacokinetics.
 - (ii) It is a listing of pharmaceuticals and their applications.
 - (iii) Its development should be guided by the objectives to provide the best drug at any expense .
 - (iv) The listings usually reflects the current clinical judgement of the medical staffs.

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- (a) (i) and (iii) only.
- (b) (ii) and (iv) only.
- (c) (i), (ii) and (iii) only.
- (d) (ii), (iii) and (iv) only.

43. When searching for information on drug, the reference that the pharmacist should consider first is.....

- (a) the general references.
- (b) the primary references.
- (c) Current Contents.
- (d) Iowa Drug Information System (IDIS)

44. Which of the following are considered as tertiary reference?

- (i) Drugdex.
- (ii) Current Contents.
- (iii) American Hospital Formulary Service - Drug Information.
- (iv) Medline.

- (a) (i) and (iii) only.
- (b) (ii) and (iv) only.
- (c) (i), (ii) and (iii) only.
- (d) (ii), (iii) and (iv) only.

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45. Which of the following are objectives of clinical drug monitoring?

- (i) To maximise benefits.
- (ii) To minimise risks.
- (iii) To tailor therapy to individual patient.
- (iv) To use the least expensive drug in all circumstances.

- (a) (i) and (iii) only.
- (b) (ii) and (iv) only.
- (c) (i), (ii) and (iii) only.
- (d) (ii), (iii) and (iv) only.

46. Adverse drug reactions due to allergic mechanism rarely occur before of drug therapy.

- (a) 1 week.
- (b) 2 weeks.
- (c) 3 weeks.
- (d) 4 weeks.

47. Which of the following could be observed in adverse drug reactions due to hypersensitivity reactions?

- (a) Leucocytosis.
- (b) Eosinophilia.
- (c) Thrombocytopenia.
- (d) Erythrocytosis.

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48. Which of the following step is not always carried out in an attempt to evaluate the cause - effect relationship of an adverse drug event?
- (a) Identifying other etiologies.
 - (b) Determining chronologic sequence of event.
 - (c) Preview of patients previous medication history.
 - (d) Rechallenge the suspected drug.
49. During clinical drug monitoring, the pharmacist need to know the therapeutic end point in order to.....
- (i) find faults with the doctor's prescription.
 - (ii) determine the clinical significance of the problems identified.
 - (iii) complete the patient's data.
 - (iv) assess the therapy.
- (a) (i) and (iii) only.
 - (b) (ii) and (iv) only.
 - (c) (i), (ii) and (iii) only.
 - (d) (ii), (iii) and (iv) only.
50. Which of the following is not a method to initiate correction of problems found from the Drug Utilization Evaluation (DUE) activity?
- (a) Educational programs.
 - (b) Limitations of prescribing.
 - (c) Formulary modifications.
 - (d) Warning letters.

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51. Which of the following statements regarding DUE is true?
- (a) DUE only involves the pharmacy department staffs.
 - (b) The final stage of a DUE is the initiation of corrective actions.
 - (c) The evaluation can be disease or drugs or patients specific.
 - (d) The criteria developed to measure quality should only consists of objective criteria.
52. Which of the following background information is the least important when handling adverse drug reaction questions?
- (a) Patients drug history.
 - (b) Indications for which the drug is being prescribed.
 - (c) Suspected drug.
 - (d) The time course, dose and route of administration of suspected drug.
53. Written response of drug information questions is done.....
- (a) for all questions.
 - (b) when the answer is of sufficient value to keep for future reference.
 - (c) when the pharmacists has the time to write it.
 - (d) when the question is from a patient.

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54. Which of the following references actually contain information from the pharmaceutical manufacturers?

- (i) Facts and Comparisons.
- (ii) Drug Index of Malaysia and Singapore (DIMS).
- (iii) American Hospital Formulary Service - Drug Information (AHFS).
- (iv) Physician Desk Reference (PDR).

- (a) (i) and (iii) only.
- (b) (ii) and (iv) only.
- (c) (i), (ii) and (iii) only.
- (d) (ii), (iii) and (iv) only.

55. Which of the following references are best suited for pharmacists to keep tract with the latest development in pharmacy and medicine.

- (i) Drugdex.
- (ii) Current Contents Clinical Practice.
- (iii) Applied Therapeutics.
- (iv) Inpharma.

- (a) (i) and (iii) only.
- (b) (ii) and (iv) only.
- (c) (i), (ii) and (iii) only.
- (d) (ii), (iii) and (iv) only.

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56. Which of the following are causes of hypokalemia in a patient given parenteral nutrition?

- (i) High fistulae output.
- (ii) Fluid overload.
- (iii) Post-acidosis state after treatment with sodium bicarbonate.
- (iv) Polyuria.

- (a) (i) and (ii) only.
- (b) (i), (ii) and (iii) only.
- (c) (i), (ii), (iii) and (iv).
- (d) (ii) and (iv) only.

57. Which of the following steps are appropriate for the management of catheter-related infection in a patient given central parenteral nutrition?

- (i) Immediate institution of empiric antibiotic therapy.
- (ii) Replacement of parenteral nutrition with dextrose 10% solution.
- (iii) Immediate withdrawal of the central catheter.
- (iv) Addition of heparin into parenteral nutrition solution.

- (a) (i) and (ii) only.
- (b) (i), (ii) and (iii) only.
- (c) (i), (ii), (iii) and (iv).
- (d) (ii) and (iv) only.

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58. Which of the following is/are common source(s) of central catheter related infections during infusion?

- (i) Hands of nursing staff.
- (ii) Volumetric chambers containing extemporaneously added drug.
- (iii) Breath of the patient.
- (iv) The use of a "Y" connector to administer drug.

- (a) (i) and (ii) only.
- (b) (i), (ii) and (iii) only.
- (c) (i), (ii), (iii) and (iv).
- (d) (ii) and (iv) only.

59. Which of the following statements are true regarding septicemia in a patient receiving parenteral nutrition?

- (i) It occurs commonly in immunocompromised patient.
- (ii) It is always associated with other foci of infection.
- (iii) It occurs secondary to poor catheter care.
- (iv) It is always fatal.

- (a) (i) and (ii) only.
- (b) (i), (ii) and (iii) only.
- (c) (i), (ii), (iii) and (iv).
- (d) (ii) and (iv) only.

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60. Which of the following complications are associated with central line catheter?
- (i) Air embolism.
 - (ii) Hemothorax.
 - (iii) Thrombophlebitis.
 - (iv) Hemolysis.
- (a) (i) and (ii) only.
- (b) (i), (ii) and (iii) only.
- (c) (i), (ii), (iii) and (iv).
- (d) (ii) and (iv) only.
61. Which of the following statements are true regarding hyperglycemia in a patient receiving parenteral nutrition?
- (i) It is associated with hypoinsulinemia.
 - (ii) It occurs as a result of rapid infusion of hypertonic solution.
 - (iii) Heparin decreases the rate of elimination of glucose.
 - (iv) It is best managed initially by reducing the rate of infusion.
- (a) (i) and (ii) only.
- (b) (i), (ii) and (iii) only.
- (c) (i), (ii), (iii) and (iv).
- (d) (ii) and (iv) only.

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62. Which of the following statements are true regarding hyperlipidemia in patients receiving parenteral nutrition?

- (i) It is associated with familial hyperlipidemia.
 - (ii) It is best avoided by adding heparin into the parenteral nutrition solution.
 - (iii) It is best managed initially by reducing the rate of infusion.
 - (iv) It results in atherosclerosis.
- (a) (i) and (ii) only.
- (b) (i), (ii) and (iii) only.
- (c) (i), (ii), (iii) and (iv).
- (d) (ii) and (iv) only.

63. Which of the following problems are associated with the use of drugs in patients receiving parenteral nutrition?

- (i) Interference with laboratory analysis.
 - (ii) Alteration of metabolic profile.
 - (iii) Alteration of acid-base balance.
 - (iv) Precipitation of the parenteral nutrition solution.
- (a) (i) and (ii) only.
- (b) (i), (ii) and (iii) only.
- (c) (i), (ii), (iii) and (iv)
- (d) (ii) and (iv) only.

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64. Which of the following statements regarding the management of hyponatremia is true ?
- (a) Replacement should be given in patients with hypotonic hyponatremia.
 - (b) Diuretic should be given in patients with hypotonic hyponatremia.
 - (c) Fluid therapy should be instituted in patients with hypotonic hypernatremia.
 - (d) Colloid should be given in patients with hypotonic hyponatremia.
65. Which of the following statements regarding hyperkalemia is true ?
- (a) Potassium level of 5 mEq/l in acidotic patients requires immediate attention.
 - (b) Hyperkalemia in alkalotic patients requires immediate treatment.
 - (c) Hyperkalemia in normal person indicates excessive potassium intake.
 - (d) Hyperkalemia in hemolysed samples indicate water toxicity.
66. Zinc deficiency may occur in the following condition.....
- (a) high fistula output.
 - (b) post-burn case.
 - (c) severe diarrhea.
 - (d) prolonged infusion of zinc free total parenteral nutrition.

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67. Which of the following statements regarding the handling of cytotoxic drugs is/are true ?

- (i) Latex glove is safer than surgical glove.
- (ii) Compliance to the right procedures is more important than wearing protective garments.
- (iii) Large powder spillage should be cleaned using special vacuum cleaner.
- (iv) The formation of aerosol during the transferring processes can be avoided by maintaining positive pressure in the vial.

- (a) i and ii only.
- (b) i, ii and iii only.
- (c) i, ii, iii and iv.
- (d) iv only.

68. Which of the following baseline parameters should be monitored in all personnel working in a cytotoxic laboratory?

- (a) Blood pressure.
- (b) Urinary mutagen.
- (c) Lung function tests.
- (d) All of the above.

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69. Which of the following parameters should be monitored prior to the initiation of total parenteral nutrition (TPN) ?

- (i) Type and volume of fluid intake.
- (ii) Serum biochemistry values.
- (iii) Renal and liver function tests.
- (iv) Nitrogen balance.

- (a) i and ii only.
- (b) i, ii and iii only.
- (c) i, ii, iii and iv.
- (d) iv only.

70. Which of the following statements regarding hyperglycemia in TPN patients is/are true ?

- (i) It occurs as a result of hypoinsulinism.
- (ii) It indicate the failure of pancreas to respond to excessive glucose load.
- (iii) It can be managed by reducing the rate of infusion.
- (iv) It is usually followed by hyponatremia.

- (a) i and ii only.
- (b) i, ii and iii only.
- (c) i, ii, iii and iv.
- (d) iv only.

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71. Which of the following statements regarding effective pharmacist-patient communication process is true ?

- (a) Be sensitive to and keep to an acceptable distance apart
- (b) The quality of the communication depends more on duration than on interaction
- (c) Non-verbal clues are almost insignificant during professional communication
- (d) Good communication is easy to provide in a hospital pharmacy environment.

72. Which of the following questions is open-ended?

- (a) "You are taking two of these tablet a day, right?"
- (b) "How many do you take each day?"
- (c) "This new medication hasn't caused you any problems, has it?"
- (d) "Did the doctor tell you how to use the medication?"

73. Which of the following questions is close-ended ?

- (a) " Did you take your medicine at home ?"
- (b) " What do you think of this new medication ?"
- (c) " I'll bet you're feeling much better, aren't you ?"
- (d) " What problems has the medication caused ?"

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74. Which of the following statements regarding communication technique is true ?
- (a) Pharmacist should start using an open-ended question at the initial interview.
 - (b) Use open-ended question to get more information when communicating with a talkative patient.
 - (c) Use close-ended question to get more information when communicating with a quite patient.
 - (d) Pharmacist should end an interview with an open-ended question.
75. Which of the following techniques is useful to maximize patients' understanding and memory during drug counselling?
- (a) Speaking rapidly to provide all the necessary information.
 - (b) Use of complete sentences to elaborate facts regarding the drugs.
 - (c) Minimising the number of facts given by providing more general information.
 - (d) Providing a written back-up for the verbal information.
76. Which of the following corrective actions is not suitable to overcome communication barriers arising from pharmacist ?
- (a) Standing within 5 feet of patient.
 - (b) Controlling distractions, such as nervous habits.
 - (c) Leaning toward patient.
 - (d) Making eye contact at least 50-70 percent of the time.

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77. Which of the following combinations of communication barrier-corrective action is true ?
- (a) Distraction from lack of privacy - maintaining appropriate interpersonal space.
 - (b) Obstruction by fixed objects such as glass partition - ensuring no interruption from supportive staff.
 - (c) Exhibition of inappropriate body movement - adoption of open body posture, uncrossing of arms and legs.
 - (d) Inappropriate use of interpersonal space - standing within 0.5 feet from patient.
78. Which of the following statements regarding pharmacist-patient communication process is true?
- (a) Communication is a one -way process.
 - (b) Communication demands effort, thought, time, and often times, money.
 - (c) The information and skills required for communication is the same for every patient.
 - (d) Communication must be seen by patients to point out their behaviour, mistake and bad effect of noncompliance.

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79. Which of the following can be considered a prescribing error ?
- (a) Incorrect selection of drug, dose, dosage form, quantity for use of a drug product by illegible prescription.
 - (b) Administration of a medication not authorized by a legitimate prescriber.
 - (c) Administration of a drug product in a different dosage form than ordered by the prescriber.
 - (d) Administration of medication outside a predefined time interval from its scheduled administration time.
80. Which of the following is classified as a dispensing error?
- (a) Prescribing error.
 - (b) Monitoring error.
 - (c) Compliance error.
 - (d) Omission error.
81. Which of the following personnel is not committed to hospital medication error?
- (a) Drug sale representatives.
 - (b) Experienced physician.
 - (c) Patients.
 - (d) (a), (b) and (c) are all committed to medication error.

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82. Treatment with another drug or an increased length of stay is
- (a) a level 0 error.
 - (b) a level 1 error.
 - (c) a level 2 error.
 - (d) a level 4 error.
83. Which of the following medication distribution systems has the highest incidence of medication error?
- (a) Floor stock + individual prescriptions.
 - (b) Individual prescriptions.
 - (c) Unit-dose distribution.
 - (d) Floor stock + partial bulk supply of individual prescriptions.
84. Which of the following is an advantage of a decentralized unit dose distribution system ?
- (a) Greater drug control and accountability.
 - (b) More communication within the pharmacy department.
 - (c) More space and equipment is required.
 - (d) A more staffing flexibility within the pharmacy department.

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85. Which of the following is a disadvantage of a centralized unit dose distribution system?
- (a) More effective communication within the department of pharmacy.
 - (b) More demand for drug information questions from the doctor.
 - (c) Pharmacist's clinical services are minimal and not efficient.
 - (d) Current patient information is readily available for dispensing pharmacist.
86. Which of the following statements regarding decentralized pharmacy service is true ?
- (a) The two components of decentralized services are drug inventory and dispensing.
 - (b) The drug distribution component is directed at minimizing medication system error.
 - (c) It efficiency is determined by the implementation of a complete computerized medication order.
 - (d) It is not cost-effective compared to a centralized unit dose.

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87. Which of the following statements regarding the role of cost justification in selling clinical pharmacy programs is/are true?

- (i) Initially, clinical pharmacy was primarily involved in the provision of drug-related information.
 - (ii) Bootman and Zaske demonstrated reduced mortality in burn patients with Gram-negative septicemia after gentamicin pharmacokinetic monitoring.
 - (iii) Most pharmacy organizations actively support the concept of pharmaceutical care.
 - (iv) The development of pharmacy as a clinical profession has been well planned and directed even from the beginning.
- (a) If (i) and (ii) only is true.
- (b) If (i) and (iii) only is true.
- (c) If (i), (ii) and (iii) only is true.
- (d) If (iv) only is true.

88. Which of the following strategies are useful to make pharmacy a truly clinical profession?

- (a) Accepting the responsibility for providing pharmaceutical care.
- (b) Accepting the responsibility for the provision of drug-related information.
- (c) Accepting the responsibility for the provision of a unit dose distribution system.
- (d) Accepting the responsibility for the provision of prescription screening in the outpatient counter.

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89. Which of the following statements regarding the establishment of pharmaceutical care is true?
- (a) The most important part of the program development is cost justification
 - (b) Standards of practice are important to ensure success and recognition.
 - (c) The most important part of the program development is the attitude of physician toward pharmacist.
 - (d) The most important part of the program development is the attitude of nurses toward pharmacist.
90. Which of the following components differentiate the unit of use distribution system from unit dose medication delivery system?
- (a) Patient profile.
 - (b) Medication trolley.
 - (c) Amount of dose supplied.
 - (d) Medication order form.
91. Which of the following is considered a support service in delivering pharmaceutical care?
- (a) Unit dose distribution.
 - (b) Drug information service.
 - (c) Pharmacokinetic laboratory service.
 - (d) All of the above.

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92. Which of the following is a major component of clinical drug monitoring?
- (a) Identification of actual or potential drug-related problems.
 - (b) Management of drug-related problems.
 - (c) Detection of drug interactions.
 - (d) (a) and (b).
93. Which of the following is the most important variable that places a drug on the list of feasible alternatives?
- (a) Efficacy and safety.
 - (b) Cost of the alternative.
 - (c) Dosage practicality.
 - (d) Drug-disease interaction.
94. Which of the following components is included in the pharmacist's workup of drug therapy care plan?
- (a) Any identified drug-related problem.
 - (b) Goals identified for managing those identified problems.
 - (c) A listing of therapeutic alternative and intervention made by the pharmacist to achieve the goals.
 - (d) (a), (b) and (c)

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95. Which of the following causes patient to take unnecessary drug therapy?
- (a) Duplicated therapy.
 - (b) Incorrect dose.
 - (c) Drug-drug interaction.
 - (d) Drug not available.
96. Which of the following causes the patient to take a wrong drug?
- (a) Drug-food interaction.
 - (b) Presence of a contraindication.
 - (c) Noncompliance.
 - (d) Inability to swallow or administer the drug.
97. Which of the following causes the patient not to take his/her drug?
- (a) Drug-disease interaction.
 - (b) More effective therapy available.
 - (c) Inability to afford therapy.
 - (d) Incorrect dose.

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98. Which of the following causes the patient to take too low a dose of a drug?
- (a) Untreated indication.
 - (b) Drug abuse.
 - (c) Unauthorized drug.
 - (d) Inappropriate dosing interval.
99. Which of the following statements is true regarding the rate of medication error in a unit dose medication system?
- (a) It is higher than unit of use distribution system.
 - (b) It is mainly due to inexperienced personels in dispensing.
 - (c) It does not justify the conversion of the whole distribution system into this system.
 - (d) It is lower than errors in the traditional system.
100. Which of the following steps is the most difficult in quality assurance of distribution services?
- (a) Initiating unit dose.
 - (b) Acceptance of Pharmacy and Therapeutic Committe.
 - (c) Analysing data.
 - (d) Designing criteria or standard of quality.

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Section B

1.

- A. SM, a 43 year old lady was diagnosed as having chronic intestinal obstruction since the last 2 years. She refused oral feeding for the last 3 months and was maintained with 2.5 liters of D₅ NS daily. The doctor requested the clinical pharmacist's opinion on the requirement for total parenteral nutrition in this patient.

After reviewing the case, the clinical pharmacists agreed to start TPN. This decision was made based on the patient's current clinical and nutritional status.

- (a) If the patient's weight is 40 kg. and is 5 ft. 6 in. tall, estimate SM daily energy requirements.

(5 marks)

A 3-in-one TPN solution was suggested to the doctor. 5 days after TPN was initiated, the patient developed cynosis although the air entry was normal.

- (b) Explain the possible reason for the cynosis in SM?.

(4 marks)

- (c) Suggest appropriate steps to be taken to overcome SM cynosis.

(3 marks)

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B.

- (a) What are the services provided by a good drug information center? Based on your experience, discuss whether these services could be developed in a drug information unit of the pharmacy department in a general hospital.

(6 Marks)

- (b) You had just received a question " Can nitrofurantoin cause leukocytosis and fever? " Using Watanabe's approach to handling drug information question, discuss how you would tackle the above question.

(7 Marks).

2. KYB is a 23 year old 40 kg. Malay lady admitted to ward 8S of Hospital USM for chronic rheumatic heart disease and atrial fibrillation. On admission, the patient was also noted to have a mild renal impairment with blood urea of 37.6 mmol/L and serum creatinine 256 mMol/L. Digoxin 0.5mg stat was given to control the atrial fibrillation. It was also planned that the patient be given digoxin 0.25mg daily orally for maintenance.

- A. Comment on the dosage regimen of digoxin for KYB.

(2.5 Marks)

- B. Discuss the strategy for monitoring digoxin therapy KYB.

(10 Marks)

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24 hours after the administration of the 0.5 mg dose plasma digoxin concentration was measured and found to be 3.0 ng/ml.

C. What is your assessment of the above digoxin concentration?

(2.5 Marks)

D. Discuss your plan of action for the above patient.

(10 Marks)

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Appendix

Normal Laboratory Values

1.	Ammonia	80-110 mcg/dl	or	47-65 umol/L
2.	Amilase	4-25 IU/ml		
3.	Billirubin			
	- Direct	0-0.2 mg/gl		0-3 umol/L
	- Indirect	0.2-0.8 mg/dl		30-14 umol/L
	- Total	0.2-1 mg/dl		30-17 umol/L
4.	CO ₂	20-30 mEq/L		24-30 mMol/L
5.	pCO ₂	35-45 mmHg		
6.	CI	100-106 mEq/L		100-106 mMol/L
7.	Cpk	50-170 U/L		
8.	Creatinine (SCr)	0.6-1.5 mg/dl		60-130 umol/L
9.	Random blood sugar	70-110 mg/dl		3-10 umol/L
10.	Iron	50-150 mcg/dl		9.0-26.9 umol/L
11.	Lactic dehydrogenase	70-210 IU/L		
12.	Magnessium	1.5-2.0 mEq/L		0.8-1.3 mMol/L
13.	pO ₂	75-100 mmHg		
14.	pH	7.35-7.45		
15.	Acid phosphatase			
	Male	0.13-0.63 IU/ml		36-176 nmol s ⁻¹ /L
	Femāle	0.101-0.65 IU/ml		2.8-156 nmol s ⁻¹ /L
16.	Alkaline phosphatase	39-117 IU/L		
17.	Phosphorous	3.0-4.5 mg/dl		1.0-1.5 mMol/L
18.	Potassium (K ⁺)	3.5-5.0 mEq/L		3.5-5.0 mMol/L
19.	Calcium (Ca ²⁺)	8.5-10.5 mg/dl		2.1-2.6 mMol/L
20.	Sodium (Na ⁺)	135-145 mEq/L		135-145 mMol/L
21.	Bicarbonate (HCO ₃ ⁻)	24-38 mEq/L		24-28 mMol/L

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22.	Protein		
-	Total	6.0-8.5 g/dl	60-85 g/L
-	Albumin	3.5-5.0 g/dl	35-50 g/L
-	Globulin	2.3-3.5 g/dl	23-35 g/L
-	Transferrin	200-400 mg/dl	2.0-9.0 g/L
23.	Transaminase (SGOT)	0-40 IU/L	0-0.32 $\mu\text{mol s}^{-1}/\text{L}$
24.	BUN	8-25 mg/dl	2.9-8.9 mMol/L
25.	Uric Acid	3-7 mg/dl	0.18-0.42 mMol/L
26.	Blood Pictures		
	Red blood cell (RBC)		
	Male	4.8-6.4 x 10 ⁶ /mm ³	
	Female	4.2-5.4 x 10 ⁶ /mm ³	
	White blood cell (WBC)	4.0-11.0 x 10 ³ /mm ³	
	P	60-75%	
	L	20-40%	
	M	4-8%	
	B	0-1%	
	E	1-3%	
	Platelate (Plt)	200-400 x 10 ³ /mm ³	
27.	ESR Male	0-10 mm/jam (Wintrobe)	
	Female	0-15 mm/jam (Wintrobe)	
28.	Hematocrit		
	Male	45-52%	
	Female	37-48%	
29.	Hemoglobine (Hgb)		
	Male	13-18 g/dl	
	Female	12-16 g/dl	
30.	Prothrombin time (PT)	75-100% nilai asas	
31.	APTT	25-37 saat	
32.	Creatinine Clearance (CrCl)	105-150 ml/min/1.73 m ²	
33.	TT ₄	3.0-7.5 mcg/dl	
34.	RT ₃ U	25-35%	
35.	FTI	1.3-4.2	

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NORMAL HEMODYNAMIC VALUES AND DERIVED INDICES

Normal Value Units

BP S/D/M	Blood Pressure Systolic/Diastolic/Mean	120/80/93	mm Hg
CO	Cardiac Output	4-6	Liters/min.
RAP	Right Atrial Pressure (Mean)	2-6	mm Hg
PAP S/D/M	Pulmonary Artery Pressure Systolic/Diastolic/Mean	25/12/16	mm Hg
PCWP	Pulmonary Capillary Wedge Pressure (mean)	5-12	mm Hg
CI	Cardiac Index	2.5-3.5	Liters/min/m ²
	$CI = \frac{CO}{\text{Body Surface Area}}$		
SV	Stroke Volume	60 - 80	ml/beat
	$SV = \frac{CO}{\text{Heart Rate}}$		
SVI	Stroke Volume Index	30 - 50	ml/beat/m ²
	$SVI = \frac{SV}{\text{Body Surface Area}}$		
PVR	Pulmonary Vascular Resistance	< 200	dynes.sec.cm ⁻⁵
	$PVR = \frac{MPAP - PCWP}{CO} \times 80$		
TPVR	Total Peripheral Vascular Resistance	900-1400	dynes.sec.cm ⁻⁵
	$TPVR = \frac{MBP - RAP}{CO} \times 80$		
LVSWI	Left Ventricular Stroke Work Index	35-80	gm-m/m ² /beat
	$LVSWI = (MBP-PCWP) (SVI) (.0136)$		