

1. The primary motor cortex
 - (a) Is active in the adjustment of motor activity to current sensory input
 - (b) Is not necessary for fine motor movement
 - (c) Gives rise to the extrapyramidal tract
 - (d) Is localized only in the frontal lobe

2. The pyramidal tract:
 - (a) Is composed solely of axons from pyramidal cells
 - (b) Is a crossed pathway
 - (c) Projects solely to the thalamus
 - (d) Originates from several areas of the cortex including area 4, frontal lobe, and the parietal lobe

3. A lesion of which of the following structures may result in incoordination and reduced postural tone?
 - (a) Midbrain locomotor system
 - (b) Motor cortex
 - (c) Premotor cortex
 - (d) Cerebellum

4. Lesions that produce complete inhibition of fear responses and loss of emotion can often be seen in lesions involving the:
 - (a) Sensory cortex
 - (b) Amygdaloid nuclei
 - (c) Olfactory lobes
 - (d) Medulla oblongata

5. Premotor cortex project to brainstem is concerned with all *except*:
 - a) Posture control
 - b) Fine movement
 - c) Provides partly to corticospinal output
 - d) Partly corticobulbar output

6. Babinski's sign is produced by damage to :
 - a) Lateral corticospinal tract
 - b) Medial corticospinal tract
 - c) Anterior corticospinal tract
 - d) None of the above

a) A
b) A
c) A
d) A

7. After falling down a flight of stairs, a young woman is found to have a partial loss of voluntary movement on her right side and loss of temperature with pain on left side below midthoracic level. The lesion probably is transaction at:
- a) Lumbar spinal cord
 - b) Pons-right side
 - c) Thoracic spinal cord-left
 - d) Right half of thoracic spinal cord
8. Concerning the Cerebellum all are correct *except*
- a) Does not provides timing signals
 - b) Motor learning
 - c) Has an overall inhibitory output to the upper motor neurons
 - d) Sends error signals to the rest of the cortex
9. The following is correct concerning the Pyradmidal system EXCEPT
- a) Made up of axons whose cell bodies are in the frontal lobe
 - b) Corticospinal tract is an uncrossed pathway
 - c) Corticobulbar fibres descend to the spinal cord
 - d) Controls distal muscles
10. A corticospinal neuron in primary motor cortex can do all of the following EXCEPT
- a) Project to the limbic system to affect emotions
 - b. Participate in the initiation of movement
 - c. Code for the direction of movement
 - d. Code for the extent of the movement
11. Concerning the motor cortex. All the following are correct EXCEPT
- a. Contains cell bodies for the upper motor neurons
 - b. Is the located in the precentral gyrus
 - c. Contains the somatosensory cortex
 - d. The premotor cortex signals correct and incorrect actions
12. The correct statement concerning lateral corticospinal tract
- a) Undergoes a 50% decussation in the caudal medulla
 - b) Arises exclusively from the primary motor cortex
 - c) Is an uncrossed pathway
 - d) Plays a major role in the fine control of distal musculature

13. Regarding the premotor cortex. All of the following are correct **EXCEPT**

- a) Neurons do not signal the preparation for movement (motor planning)
- b) Neurons signal various sensory aspects associated with particular motor acts
- c) Is sensitive to the behavioural context of a particular movement
- d) Signals correct and incorrect actions

14. The following comprise the motor cortex **EXCEPT**

- a) The supplementary motor area
- b) The primary motor area
- c) Brodmann's area 4
- d) Somatosensory area 1

15. The supplementary motor area is involved in one of the following:

- a) Regulation of emotions
- b) Feeding and satiety
- c) Responds to sequences of movement and mental rehearsal of sequences of movement
- d) Transformation of dynamic to kinematic information

16. The Psychiatrist in the Emergency Department plans to initiate lithium while awaiting a b on the psychiatric unit. Which of the following suggested predictors of lithium non-response, present, would make you recommend an alternative agent?

- a. History of suicidal ideation
- b. The presence of mixed features
- c. Family history of lithium response
- d. Two episodes within a 1 -year time period

17. The patient is started on lithium and now undergoes an orthopedic consultation for an ankle fracture which is improving. Ankle fracture is ruled out with an x-ray, and now the physician asks pharmacologic option for pain control. What medication plan would be the best recommendation?

- a. Duloxetine 60 mg once daily
- b. Tramadol 50 mg 4 times daily as needed for pain
- c. Naproxen 500 mg 2 times daily until pain is resolved
- d. Acetaminophen 1,000 mg 3 times daily as needed for pain

Drug that has the least interaction with lithium. Therefore Acetaminophen(Panadol)

18. Baseline laboratory screening before starting valproate should include which of the following?

- a. Ammonia
- b. Liver function tests
- c. HLA-B*1502 variant
- d. Thyroid function tests

**IT IS
HEPATOTOXIC**

19. A 34-year-old woman with bipolar disorder has been controlled on lithium 600 mg 2 times daily for the past 18 months after failing other medication trials. She presents to her primary care physician for increased nausea and vomiting. The lithium concentration is 1.1 mEq/L, and she is found to be approximately 4 weeks pregnant. Her past psychiatric history is complicated with six hospitalizations since the age of 18 for both manic and depressive episodes, all severe with mixed features. She has attempted suicide three times. What is the best course of action in this patient?

- a. Begin a slow cross-taper to divalproex sodium
- b. Discontinue lithium and begin a clozapine titration
- c. Start a slow taper of lithium to a target concentration of 0.6 mEq/L
- d. Stop the lithium and avoid the use of psychotropic medication

20. A 26-year-old patient is being discharged today after being hospitalized for treatment of a manic episode associated with bipolar disorder. The patient is being discharged on lithium, olanzapine, and lorazepam with an outpatient clinic follow-up in 2 weeks. The patient expresses a new interest in having a healthy lifestyle, to include a regimen of dieting and exercise. What would be the most important patient education point related to medication safety over the next 2 weeks to provide?

- a. Describe the risk of excessive caffeine intake that may result in elevated lithium concentration
- b. Caution to not abruptly reduce or fully eliminate sodium from the diet, because this may result in decreased lithium concentration
- c. Describe the signs/symptoms of lithium toxicity and the importance of adequate hydration during exercise, as overexertion with dehydration may result in increased lithium concentration
- d. Support the decision to take on a healthier lifestyle, and advise that the metabolic effects of olanzapine may contribute to cardiovascular disease

21. According to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders, which is not a core feature of dementia with Lewy bodies?

- a. Impaired cognition with changes in attention and alertness
- b. Visual hallucinations

c. Spontaneous motor features similar to Parkinson's disease

Persecutory delusions

22. According to the Mini Mental State Exam, which scores demonstrate clinically significant cognitive impairment and the expected annual decline in a patient with Alzheimer's disease?

Less than 24; 3-4 points per year

b. Less than 27; 3-4 points per year

c. Less than 24; 8-10 points per year

d. Less than 27; 8-10 points per year

Please Refer to the Following scenario to Answer the Next Eight Questions.

An 85-year-old female patient reported to the geriatric clinic with family concerns of gradual memory loss. The family reports gradual decline in cognitive function. Medical history is significant for diabetes mellitus and hypertension. She has some difficulty walking and balancing due to a prior accident many years ago. Current medications include glipizide 5 mg twice daily, aspirin 81 mg daily, Lisinopril 10 mg daily, and atorvastatin 40 mg at bedtime. Current blood pressure is 143/87 mm Hg. All laboratories are within normal limits with the exception of her serum creatinine (2.3 mg/dL) and creatinine clearance (17ml/min). Her current mini mental state exam is a 21. After further testing and follow-up, she is diagnosed with probable Alzheimer's disease.

23. The psychiatrist wants to initiate the patient on an acetylcholinesterase inhibitor. Which agent would be most appropriate to recommend?

a. Donepezil

b. Galantamine

c. Memantine

Rivastigmine

24. Following the initiation of an acetylcholinesterase inhibitor, which is the most appropriate fact to educate the patient and caregiver?

a. Stops further memory loss

Slows the progression of the disease

c. Worsens agitation and aggression

d Restores memory loss permanently

e.
d. Cor
30

25. Which are common side effects associated with acetylcholinesterase inhibitors?

- a. Gastrointestinal distress, insomnia, weight loss
- b. Blood clots, weight gain, sedation
- c. Gastrointestinal distress, sedation, extrapyramidal symptoms
- d. Weight gain, insomnia, tachycardia

26. Which gene is least associated with Alzheimer's disease and dementia related disorders?

- a. Presenilin 1 and 2
- b. Methyl-CpG binding protein 2
- c. Apolipoprotein E-4
- d. Alpha and beta-synuclein gene

27. After two months, the family brings the patient to the urgent care emergency room with a notable decrease in cognitive function. The patient is diagnosed with delirium. The psychiatrist contacts you for a recommendation to treat delirium. Which agent would be most appropriate based on the request?

- a. Aripiprazole 5 mg as needed
- b. Clozapine 25 mg as needed
- c. Intravenous haloperidol 10 mg as needed
- d. Oral haloperidol 10 mg as needed

28. After starting on the antipsychotic therapy, the patient responds well and is stable. The decision is made to continue the antipsychotic as an outpatient. You are asked to educate the family regarding adverse events. Which is a black box warning specific to patients with dementia receiving antipsychotics?

- a. Increase in cerebrovascular accidents
- b. Increase in all-cause mortality
- c. Neuroleptic malignant syndrome
- d. Worsening of hyperglycemia

29. Following six months of treatment and no changes to any of the patient's medications, the family reports the patient was started on Ginkgo biloba (EGb 761 extract) and refuses to discontinue it. What most appropriate educational point would you provide?

- a. Common side effects may include dizziness, diarrhea, and bruising
- b. The maximum dose is 100 mg by mouth daily

- c. Acetylcholinesterase inhibitors should be tapered and discontinued while taking Ginkgo biloba
- d. Consider vitamin E to potentiate the effects of Ginkgo biloba

30. Three years later, the patient is diagnosed with moderate-to-severe Alzheimer's disease. There is a discussion of whether to add memantine. Which statement regarding the addition of memantine is true?

- a. Its onset of therapeutic effects is immediate
- b. It can slow the disease progression for at least 6 months
- c. It should be taken on an empty stomach
- d. It is only be used in mild AD

31. During a clinic appointment, a patient expresses concern about developing diabetes as the patient has multiple relatives who have the disease. The patient is also overweight and has hyperlipidemia. Which of the following medications might be the best option for this patient?

- a. Aripiprazole
- b. Iloperidone
- c. Paliperidone
- d. Quetiapine

32. A 31-year-old patient diagnosed with schizophrenia five years ago presents to the clinic with complaints of ongoing symptoms including paranoid delusions, auditory hallucinations, and disorganization. The patient has been prescribed risperidone 4 mg by mouth every evening since being discharged from the hospital two months ago. Although symptoms have improved, both the patient and case manager are concerned that the symptoms continue to be severe. Records indicate the patient has failed adequate trials of haloperidol, ziprasidone, and olanzapine. Upon further discussion, the patient reveals forgetting to take the prescribed medication at least two times per week. The patient lives in a rural area with limited transportation. The nearest clinic that offers psychiatric services is over 40 Km from the patient's home. The patient also states a preference for as few visits with healthcare providers as possible. Which of the following treatment recommendations would be the better choice for this patient?

- a. Increase dose of risperidone
- b. Addition of low-dose fluphenazine
- c. Switch to paliperidone
- d. Recommend transcranial magnetic stimulation

33. A 16-year old patient with no prior psychiatric history is admitted to the hospital for an acute episode of psychosis. The patient is currently experiencing auditory hallucinations, persecutory delusions and disorganized thinking. Which of the following medications would be best to initiate at this time?

- a. Paliperidone
- b. Ziprasidone
- c. Olanzapine
- d. Clozapine

34. When educating a patient on a new prescription for ziprasidone, which statement would be considered the most appropriate regarding taking the medication?

- a. Take the dose just prior to bedtime to obtain the best effect
- b. Use caution when being outdoors in hot weather for prolonged periods of time
- c. All side effects are short-lived and will resolve within 4 weeks
- d. Make sure to take dose with a meal of at least 350 calories

35. A 28-year-old with a diagnosis of schizophrenia and benign ethnic neutropenia was started on clozapine three weeks ago at the outpatient clozapine clinic. The patient's current dose of clozapine is 100 mg every morning and 300 mg every evening. The patient has experienced a reduction in positive symptoms and is less aggressive. The patient's most recent absolute neutrophil count laboratory results were 1300 $\mu\text{g}/\text{L}$. A review of the medical chart shows the following absolute neutrophil count results: 4400 $\mu\text{g}/\text{L}$ (baseline/3 weeks ago) 2800 $\mu\text{g}/\text{L}$ (2 weeks ago), and 1900 μg (1 week ago). Based upon these results, what action would you take?

- a. Decrease clozapine dose and add filgrastim
- b. Increase monitoring interval to three times weekly
- c. Continue current clozapine dose and monitoring schedule
- d. Switch to a different second-generation antipsychotic.

36. Which of the following central nervous system structures is most closely matched with the patient characteristic postulated to be associated with cravings and persistent drug use despite negative consequences?

- a. Prefrontal cortex; reward circuit
- b. Nucleus accumbens; reward circuit
- c. Hippocampus; exaggerated stress response
- d. Ventral tegmental area; exaggerated stress response

37. Which of the following medications could be used to target "positive reinforcement" which is thought to cause an individual to increase alcohol use to achieve a more pleasurable experience?

- a. Disulfiram
- b. Lorazepam
- c. Naltrexone
- d. Acamprosate

38. An elderly patient with co-occurring major depressive disorder, alcohol use disorder, hepatitis C, and hepatic steatosis was recently discharged from the hospital after a 6-day detoxification from alcohol. The patient is interested in an outpatient treatment program as well as pharmacologic therapy. Which of the following long-term maintenance medications is most appropriate to offer this patient?

- a. Naltrexone
- b. Lorazepam
- c. Acamprosate
- d. Carbamazepine

39. Which of the following is the safest medication trial for a pregnant woman desiring treatment for her substance use disorder?

- a. 6 months of naltrexone for opioid use disorder
- b. 3 months of varenicline for smoking cessation
- c. 8 months of buprenorphine for opioid use disorder
- d. 6 months of lorazepam for alcohol use disorder

40. Which of the following is a potential disadvantage of using buprenorphine compared with methadone for a patient who presents for treatment of severe opioid withdrawal?

- a. Overdose risk
- b. Ceiling effect
- c. Abuse potential
- d. Treatment access

41. Which of the following rating scales is considered to be the gold standard for assessing opiate withdrawal?

- a. Addiction Severity Index (ASI)
- b. Opiate Use Withdrawal Identification Test (OUWIT)

c. Cut down, Annoyed, Guilty, Eye opener Questionnaire (CAGE)

Clinical Opiate Withdrawal Scale (COWS)

42. You are asked to provide a medication consultation for an apparent drug intoxication event in a patient. The referring clinician is not sure which substances were ingested and states, "The patient appears extremely agitated and is behaving in a paranoid and violent manner." Based on this limited information, which type of drug was this patient most likely to have ingested?

Bath salts

b. Marijuana

c. Synthetic opioids

d. Prescription opioids

43. Which of the following is more likely to be a transient side effect of carbidopa/levodopa therapy?

a. Anorexia

Dizziness

c. Numbness

d. Dyskinesias

44. A 42-year-old with Huntington's disease is prescribed tetrabenazine for chorea. The psychiatrist asks for your assistance in prescribing an antidepressant in this patient with the least potential to interact. Which agent would be the best recommendation?

a. Sertraline

b. Citalopram

Mirtazapine

d. Paroxetine

45. Which of the following best describes how suvorexant works?

a. Histamine antagonist

b. Melatonin agonist

Orexin antagonist

d. Gamma-aminobutyric acid agonist

46. A 43-year-old man with a history of substance abuse and hypertension presents with insomnia characterized by difficulties with staying asleep. He has previously tried over-the-counter doxylamine and melatonin with little efficacy. Which of the following would be the most appropriate evidencebased treatment option for this patient?

- a. Doxepin
- b. Lorazepam
- c. Ramelteon
- d. Trazodone

47. A 23-year-old woman with a past history of seasonal allergies and asthma presents with complaints of extreme tiredness during the day, despite sleeping for 6-8 hours each night. She often falls asleep during the day when trying to study, and has been experiencing occasional frightening episodes of feeling the inability to move upon awakening.

Which of the following disorders is the patient most likely experiencing?

- a. Chronic insomnia
- b. Restless legs syndrome
- c. Non-24-hour sleep-wake disorder

d. Narcolepsy

48. A 35-year-old patient presents to you with new symptoms of mild anxiety. The patient inquires about an herbal product that has been studied "in another country" and has been shown to be effective for anxiety. You indicate there are limited data supporting use of some herbal products, but some of these have been associated with liver toxicity. The patient is aware of this concern and reassures you the doctor it was not one of those "bad herbs," but something else which has shown promising results. Which herbal product best matches the patient's request in both safety and efficacy?

- a. D-cycloserine
- b. Kava
- c. Oral lavender oil

d. Valerian

49. A 64-year-old retired teacher is taken to the emergency department with cognitive slowing, slurred speech, dizziness, and poor muscle coordination. Her son reports she had just been prescribed a new medication for "paralyzing anxiety," which she began taking some time last week. Her son cannot verify the number of pills she took or their names. Which of the following medications is most likely to have caused her symptoms?

- a. Buspirone
- b. Diazepam
- c. Fluoxetine
- d. Venlafaxine

50. Which of the following agents is listed as a first-line treatment option in the management of Generalized anxiety disorder (GAD) according to the Anxiety Disorders British Association for Psychopharmacology treatment guidelines?

- a. Asenapine
- b. Clonazepam
- c. Mirtazapine
- d. Pregabalin

51. A 41-year-old patient with severe GAD disorder has failed a 4-month trial of fluoxetine 60mg/day and a 5-month trial of citalopram 40 mg/day. Based on evidence-based guidelines, which of the following regimens should the patient be switched to and given an adequate trial?

- a. Bupropion sustained release (SR) 150 mg orally 2 times daily
- b. Olanzapine 5 mg orally daily
- c. Phenelzine 15 mg orally 3 times a day
- d. Venlafaxine extended release (XR.) 75 mg orally daily.

52. Which of the following drugs may induce parkinsonism syndromes?

- a. Dopamine receptor antagonist
- b. Monoamine oxidase inhibitors
- c. Catechol- O -Methyl Transferase Inhibitors
- d. Amantadine

53. Long term levodopa use may lead to all of the following EXCEPT:

- a. "Wearing off phenomenon"
- b. "On-off phenomenon"

1 Increase in anti-parkinsonism effects of levodopa

d. Dyskinesias and dystonias

54. Which of the following antidepressant drugs are preferred in the treatment of unipolar depressive episodes and the depressive phase of bipolar disorder in the elderly?

a. Tricyclic anti-depressants (TCAs)

1 Selective serotonin reuptake inhibitors (SSRIs)

c. Monoamine oxidase inhibitors (MAOIs)

d. Atypical anti-depressants.

55. All of the following are mechanisms by which antidepressant drugs work EXCEPT:

1 Increase cyclic AMP

b. Reduction (down-regulation) of post-synaptic beta-adrenoceptors

c. Increased responsiveness of post-synaptic serotonin 5-HT_{1A} receptors

d. Desensitization of presynaptic noradrenaline and serotonin auto-receptors

SECTION B

1) Which medication listed above is the MOST appropriate choice for each of the following examples.

Please select only ONE option, BY PLACING THE APPROPRIATE LETTER AGAINST EACH SITUATION GIVEN, BUT ANY OPTION MAY BE USED MORE THAN ONCE, IF REQUIRED.

A Buprenorphine

B Codeine

C Diazepam

D Disulfiram

E Fluoxetine

F Lorazepam

G Methadone

H Methylphenidate

J Naltrexone

K Thiamine

- i) James is in alcohol withdrawal, requires detoxification, however has significant liver failure. **LORAZEPAM**
- ii) Mumba seeks medication to support abstinence from alcohol. She requires regular opioid analgesia for pain relief. **METHADONE**
- iii) Mary seeks treatment for opioid dependence. There is a family history of sudden cardiac events and she has a prolonged QT interval. **NALTREXONE**
- iv) Bwalya is ambivalent about addressing his alcohol dependence. He lives alone and spends most of his day drinking. **NALTREXONE**
- v) Used as first-line in the treatment of Attention-Deficit Hyperactivity disorder in children. **METHYLPHENIDATE**
- vi) Is a Co-factor in glucose metabolism and key in the management of Alcohol-withdrawal. **THIAMINE**
- vii) Taking the drug for more than Three (03) weeks has been associated with habituation. **FLUOXETINE**
- viii) Mulenga has been prescribed Paroxetine to treat newly diagnosed Generalized Anxiety Disorder. In the first two weeks he experiences an increase and severity in anxiety symptoms. Which adjuvant drug would he require? **LORAZEPAM**
- ix) Is used in Alcohol use disorder patients **DISULFURAM**
- x) Well tolerated than TCA in treatment of unipolar depression. **FLUOXETINE**

2) Which intervention listed above is the MOST appropriate choice for each of the following examples

Please select only ONE option BY PLACING THE APPROPRIATE LETTER AGAINST EACH SITUATION GIVEN, BUT ANY OPTION MAY BE USED MORE THAN ONCE, IF REQUIRED.

- A Carbamazepine**
- B Electroconvulsive Therapy**
- C Intramuscular Olanzapine**
- D Lithium**

Oral Lorazepam

Tranylecypromine

Paroxetine

Psychodynamic Psychotherapy

Quetiapine

Sodium Valproate

Supportive Psychotherapy

Venlafaxine

i) Chitalu, a 25-year-old woman, presents with clear symptoms of moderate depression. She has had adequate trials of Fluoxetine and Escitalopram. **VENLAFAXINE**

ii) Michelo, a 50-year-old man with no physical co-morbidity, is admitted with severe depression. He is not eating, drinks only limited fluids, and is refusing medication. **SUPPORTIVE PSYCHOTHERAPY**

iii) Sitali, a 24-year-old man admitted with mania, becomes acutely agitated and threatening to staff. He refused his prescribed medication last night and continues to refuse medication. **ELECTRIC CONVULSIVE THERAPY**

iv) Nambeya, a 35-year-old woman with no previous history of depression, presents with low in mood in the context of a relationship break-up. **PSYCHODYNAMIC PSYCHOTHERAPY**

v) Njekwa, a 40-year-old man with bipolar disorder and known diabetes, stable on Lithium for many years, has developed renal failure. **SODIUM VALPROATE**

vi) Mercy has long standing unipolar depression, but now she has developed suicidal thoughts. **ELECTROCONVULSIVE THERAPY**

vii) Mabvuto is a known manic patient who has been taking Lithium, Olanzapine and another drug. **SODIUM VALPROATE**

viii) Mutale a known epileptic school going girl has of late been complaining of difficulties in remembering things she learns in school. **SODIUM VALPROATE**

ix) Miriam, aged 30, develops nausea, vomiting, flushing and headache after eating broad beans. **TRANSCYCLOPROMINE(MAOI)**

x) Mapenzi years, aged 30, complains of anorgasmia.

PSYCHODYNAMIC PSYCHOLOGY

E Mirtazapine

F Oral Lorazepam

G Tranylecypromine

H Paroxetine

I Psychodynamic Psychotherapy

J Quetiapine

K Sodium Valproate

L Supportive Psychotherapy

M Venlafaxine

- i) Chitalu, a 25-year-old woman, presents with clear symptoms of moderate depression. She has had adequate trials of Fluoxetine and Escitalopram.
- ii) Michelo, a 50-year-old man with no physical co-morbidity, is admitted with severe depression. He is not eating, drinks only limited fluids, and is refusing medication.
- iii) Sitali, a 24-year-old man admitted with mania, becomes acutely agitated and threatening to staff. He refused his prescribed medication last night and continues to refuse medication.
- iv) Nambeya, a 35-year-old woman with no previous history of depression, presents with low in mood in the context of a relationship break-up.
- v) Njekwa, a 40-year-old man with bipolar disorder and known diabetes, stable on Lithium for many years, has developed renal failure.
- vi) Mercy has long standing unipolar depression, but now she has developed suicidal thoughts.
- vii) Mabvuto is a known manic patient who has been taking Lithium, Olanzapine and another drug.
- viii) Mutale a known epileptic school going girl has of late been complaining of difficulties in remembering things she learns in school.
- ix) Miriam, aged 30, develops nausea, vomiting, flushing and headache after eating broad beans.
- x) Mapenzi years, aged 30, complains of anorgasmia.

SECTION C

CASE SCENARIO 25MARKS

A 52-year-old woman was evaluated for progressive weakness of her arms and legs. Three months earlier, she had noticed what she described as increasing 'clumsiness' of her right hand (She is right-handed). Shortly after that, her hand started to feel stiff and weak. The stiffness and weakness spread over a period of weeks into her legs and her other hand, and she began to notice spontaneous twitches of her finger muscles. When examined, she had moderate weakness in the distal muscles of her arms and legs; marked atrophy of her hand muscles; fasciculations in her hands; calves; and tongue; increased tone in all four extremities; hyperactive stretch reflexes; and bilateral Babinski signs. Although she was distressed about her condition, her mental status and sensory examinations were normal.

- 1) What could explain the weakness accompanied by atrophy and fasciculations? 5marks
- 2) What could explain the weakness accompanied by increased muscle tone and stretch reflexes? 5marks
- 3) Can this pattern of weakness be explained by damage at one site in the nervous system? 5marks
- 4) In two sentences briefly, explain the difference in the innervation of corticospinal tract and corticobulbar tract? 5marks
- 5) List 5 without explaining 5 Extrapyramidal Pathways.

ANSWER SPACE FOR SECTION C