

Dalkeith High School



CfE Higher Human Biology

Unit 3

Neurobiology & Communication

Past Paper Questions

Divisions of the Nervous System and Parts of the Brain

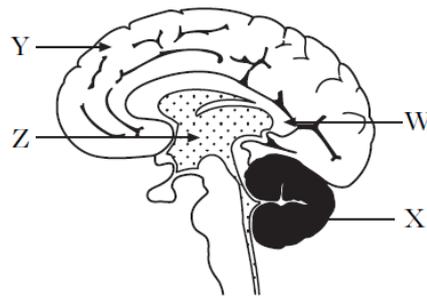
1. The table below shows the changes in brain volume that have occurred during human evolution

Time (million years ago)	Brain volume (cm ³)
3	500
2	600
1	800
0	1400

By how much has brain volume increased during the last three million years?

- a. 36%
 - b. 64%
 - c. 180%
 - d. 280%
2. The somatic nervous system control the
- a. Skeletal muscles
 - b. Heart and blood vessels
 - c. Endocrine glands
 - d. Muscular wall of the gut
3. Which parts of the body are controlled by the largest motor area of the cerebrum
- a. Hands and lips
 - b. Feet and hands
 - c. Arms and hands
 - d. Legs and arms
4. Which of the following statements in correct?
- a. The somatic nervous system controls mainly involuntary actions using sensory nerves.
 - b. The somatic nervous system controls mainly voluntary actions using sympathetic nerves.
 - c. The autonomic nervous system controls some involuntary actions using parasympathetic nerves
 - d. The autonomic nervous system controls some voluntary actions using motor nerves.

5. The diagram below shows the main parts of the brain as seen in vertical section.



Which line in the table below correctly identifies the functions of two areas of the brain?

	Communication between hemispheres	Reasoning
A	W	X
B	X	Y
C	W	Y
D	Z	W

6. Which of the following parts of the brain is important in transferring information between the two cerebral hemispheres?

- Hypothalamus
- Corpus callosum
- Cerebellum
- Medulla oblongata

7. In which of the following is part of the autonomic nervous system correctly linked to the response it causes?

	Part of the autonomic nervous system	Response
A	Sympathetic	Acceleration of heart beat
B	Sympathetic	Vasodilation of skin arterioles
C	parasympathetic	Secretion of sweat
D	parasympathetic	Vasodilation of coronary blood vessels

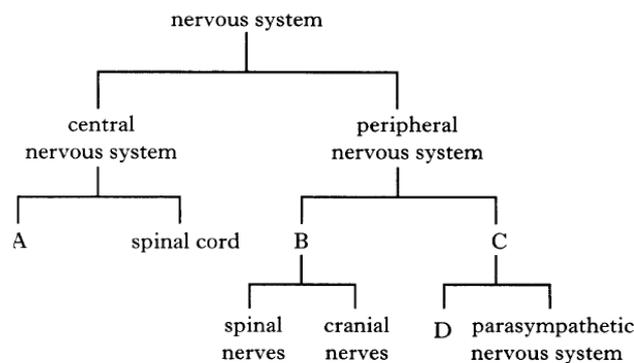
8. The human cerebrum has a highly convoluted surface. This increased surface area allows an

- Increase in the types of neurons present
- Increased blood supply to the brain
- Increased number of interconnections between neurons
- Increase in the amount of white matter on the surface.

9. Which parts of the body are controlled by the largest motor area of the cerebrum?

- Hands and lips
- Feet and hands
- Legs and feet
- Legs and arms

10. The somatic nervous system controls the
- Skeletal muscles
 - Heart and blood vessels
 - Endocrine glands
 - Muscular wall of the gut.
11. Stimulation of the sympathetic nerves causes
- Vasoconstriction of arterioles in the skin
 - Vasoconstriction of the coronary arterioles
 - Vasodilation of arterioles of the gut
 - Vasodilation of arterioles in the salivary glands.
12. The flow chart shows the sub-divisions of the human nervous system. Which letters represents the autonomic nervous system?

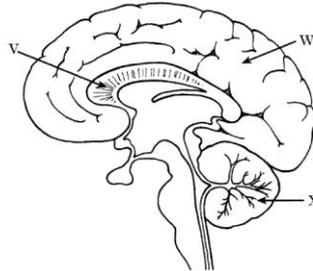


13. In which part of the brain are the control centres for both speech and hearing located?
- Limbic system
 - Hypothalamus
 - Medulla oblongata
 - Cerebrum
14. The function of the corpus callosum is to
- transfer information from a sensory nerve to a motor nerve
 - control balance and coordination
 - transfer information from one hemisphere to the other
 - control all sensory activities
15. The peripheral nervous system contains the
- Brain and spinal cord
 - Brain and somatic system
 - Spinal cord and autonomic system
 - Somatic system and autonomic system

16. Which of the following responses is caused by stimulation of the sympathetic nervous system?

- a. Increase in insulin production
- b. Increase in heart rate
- c. Increase in the flow of saliva
- d. Increase in peristalsis

17. A vertical section of the brain is shown in the diagram below.



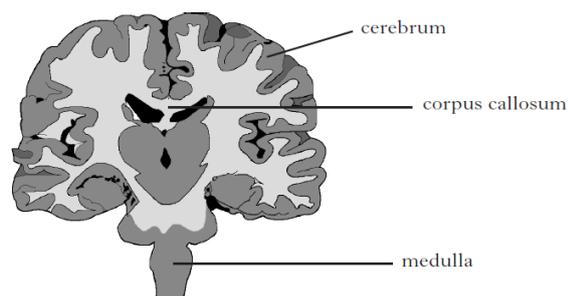
Which line of the table correctly labels the parts of the brain shown?

	V	W	X
A	Corpus callosum	Cerebellum	Cerebrum
B	Cerebellum	Cerebrum	Corpus callosum
C	Corpus callosum	Cerebrum	Cerebellum
D	Cerebrum	Corpus callosum	Cerebellum

18. Information is transferred between the two cerebral hemispheres by the

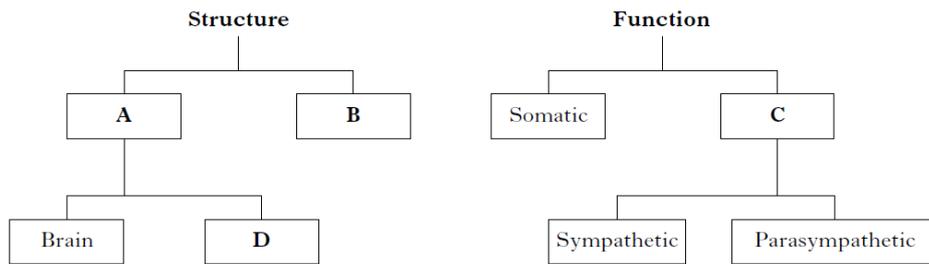
- a. Corpus callosum
- b. Medulla oblongata
- c. Cerebellum
- d. Hypothalamus

19. The image below shows a vertical section through a human brain

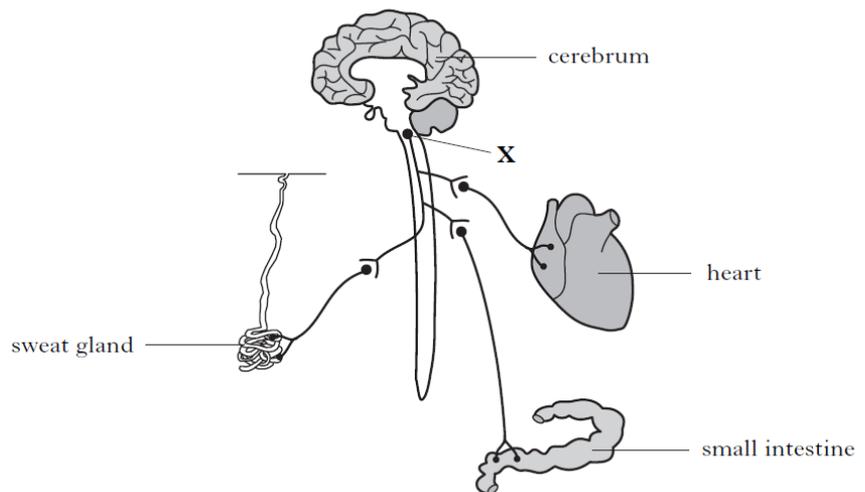


- a. Explain how the maximum number of interconnections between neurons is achieved within the cerebrum. 2
- b. What is the function of the corpus callosum? 1
- c.
 - i. Which division of the nervous system is linked to the Medulla? 1
 - ii. Describe how this division of the nervous system controls heart rate? 1

20. The diagrams below show two possible ways of classifying the nervous system.



- a. i) Identify A to D 2
 ii) Describe one function of the somatic nervous system. 1
- b. The brain contains two cerebral hemispheres. 1
 i) Name the structure which links these two hemispheres. 1
 ii) The surfaces of the hemisphere are heavily folded to provide a large surface area. 1
 Explain the significance of this feature. 1
- c. The diagram below shows some of the nerve connections between the brain and three parts of the body.

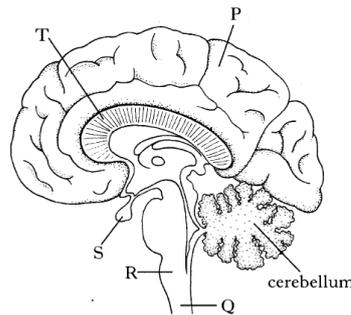


- i) Identify the part of the brain labelled X. 1
 ii) The sympathetic and parasympathetic systems are often described as antagonistic to one another. 1
 Explain the meaning of antagonistic? 1
 iii) Complete the table to show the effect of sympathetic stimulation on the heart, sweat glands and small intestine.

Part of the body	Sympathetic effect
Heart	
Sweat glands	
Small intestine	

2

21. The diagram shows a section through part of the central nervous system.



- a. The table contains information about three parts of the central nervous system. Complete the table to identify the parts and their functions.

Label	Name	Function
		Controls voluntary actions
T		Links left and right side of brain
	Spinal cord	

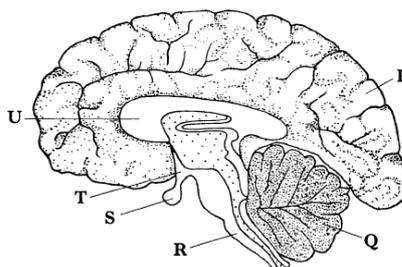
- b. Complete the following sentences by selecting one option from each pair of options shown in bold.

The parasympathetic nervous system is part of the **autonomic/somatic** nervous system which originates in the **medulla/cerebellum**.

Parasympathetic nerves **speed up/slow down** heart rate.

- c. What structural feature of the motor and sensory neurones speeds up the transmission of nerve impulses?

22. The diagram below shows the main parts of the human brain as seen in a vertical section.



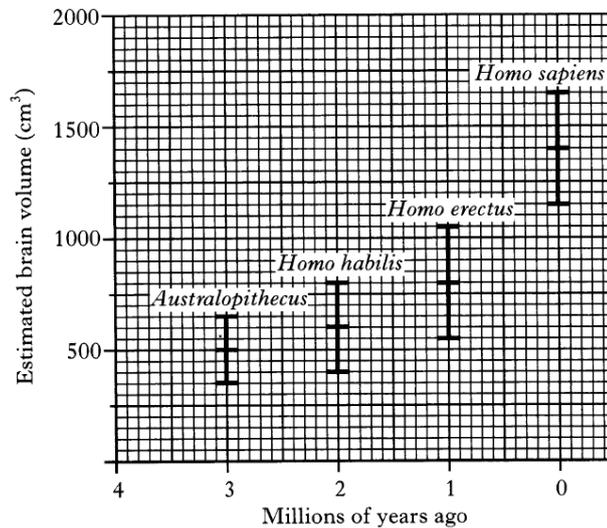
- a. Complete the table by adding the correct letters, names and functions of the parts.

Label	Name	Function
P		
	Pituitary gland	
		Temperature regulation

- b. Describe the feature of part P which improves its function.
- c. What is meant by the term "localisation of function"?
- d. Why is the part of the brain which controls the right hand much larger than the part which controls the right foot?

23. The graph shows increases in brain volume at four stages of human evolution over the last four million years.

The bars indicate the range of volumes and the mid (median) volume.



a. State the range of brain volume for *Homo habilis*.

_____ to _____ cm³

1

b. Complete the table below for *Homo sapiens*.

2

Species	Median volume (cm ³)	Percentage increase
Australopithecus	500	-
Homo habilis	600	20%
Homo erectus	800	33%
Homo sapiens		

c. Name the part of the brain which

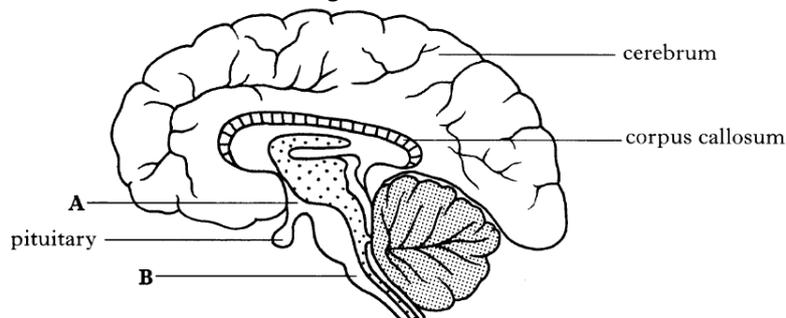
i. Contributes most to brain matter

1

ii. Links the two hemispheres

1

24. The diagram shows a section through the brain.



a. Name parts A and B shown of the diagram.

2

b. i) Name two areas of the cerebrum in which functions are localised

1

ii) Explain how the convoluted surface of the cerebrum contributes to its function.

1

iii) What is the function of the corpus callosum?

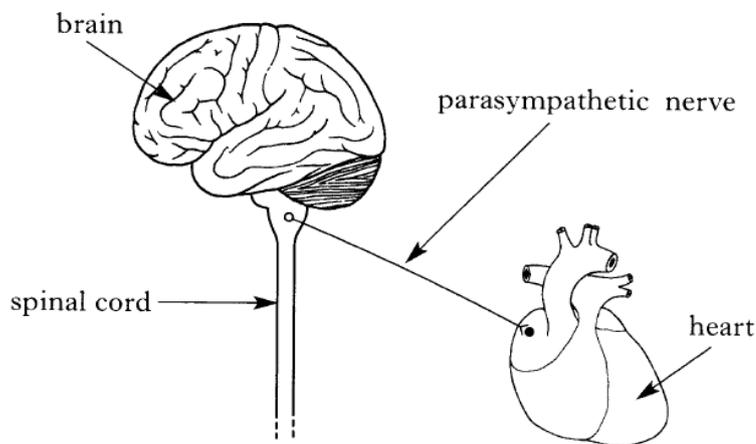
1

- c. Parts of the brain are involved in memory storage. Complete the following sentences which relate to memory loss, using words from the list below.

Alzheimer's Noradrenaline limbic Huntingdon's Acetylcholine Lymphatic

A disorder particularly associated with memory loss is _____ disease.
 This disorder is due to the disappearance of cells which produce the
 neurotransmitter _____ in the _____ system of
 the brain. 2

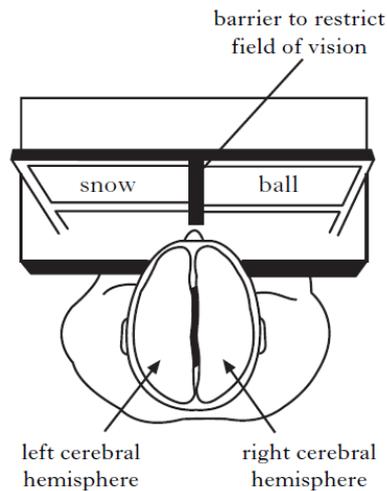
25. The diagram below shows the parasympathetic nerve which runs between the central nervous system and the heart.



- a. i) Which subdivision of the peripheral nervous system contains parasympathetic nerves? 1
 ii) In which part of the brain does this parasympathetic nerve originate? 1
- b. i) Name the part of the right atrium which is stimulated by the parasympathetic nerve. 1
 ii) State the effect of parasympathetic stimulation on the heart? 1
- c. Describe another effect which the parasympathetic nervous system has on the body. 1

Perception and Memory

26. The serial position effect shows that words in the middle of a list are usually poorly recalled because many of these words
- Have been displaced from short-term memory
 - Have not been encoded into short-term memory
 - Have been transferred into long-term memory
 - Have been stored in the long-term memory.
27. The diagram below shows a test on a man who had a damaged corpus callosum.



This meant that he could no longer transfer information between his right and left cerebral hemispheres.

Some of the functions of each hemisphere are described in the table below.

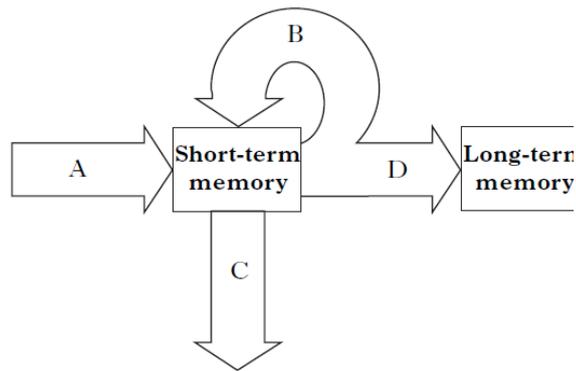
Left cerebral hemisphere	Right cerebral hemisphere
Processes information from right eye	Processes information from left eye
Controls language production	Controls spatial task co-ordination

The man was asked to look straight ahead and then the words "snow" and "ball" were flashed briefly on the screen as shown.

What would the man say that he had just seen?

- Ball
 - Snow
 - Snowball
 - Nothing
28. Which of the following best describes memory span?
- The total memory capacity of the brain
 - The time taken to learn a piece of information
 - The storage capacity of the short-term memory
 - The capacity to store information in long-term memory.

29. The diagram below illustrates the relationship between short and long-term memory.



Which arrow represents the process of rehearsal?

30. The retrieval of information from long term memory is often aided by remembering the situation in which the information was encoded. This is described as using

- a. Contextual cues
- b. Chunking techniques
- c. Rehearsal methods
- d. Memory span

31. The transformation of information into a form that memory can accept is called

- a. Shaping
- b. Retrieval
- c. Encoding
- d. Storage

32. Split brain patients cannot transfer information between their left and right cerebral hemispheres because the band of nerve fibres connecting these areas of the brain has been cut.

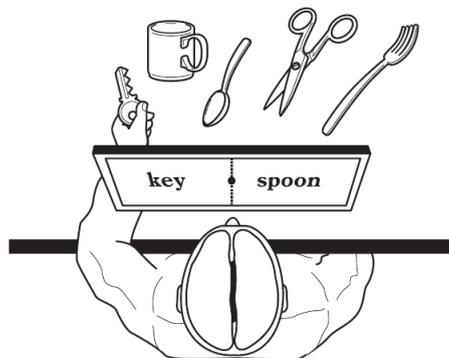
- a. Name the band of fibres which connects the two hemispheres.
- b. Some of the functions of each hemisphere are described in the table below. These functions are unaffected in split brain patients.

1

Left cerebral hemisphere	Right cerebral hemisphere
Processes information from right eye	Processes information from left eye
Controls language production	Controls movements of left hand

The diagram below shows an experiment on a split brain patient.

The patient was asked to stare at a spot in the centre of the screen and the words "key" and "spoon" were flashed briefly onto the screen in the positions shown.

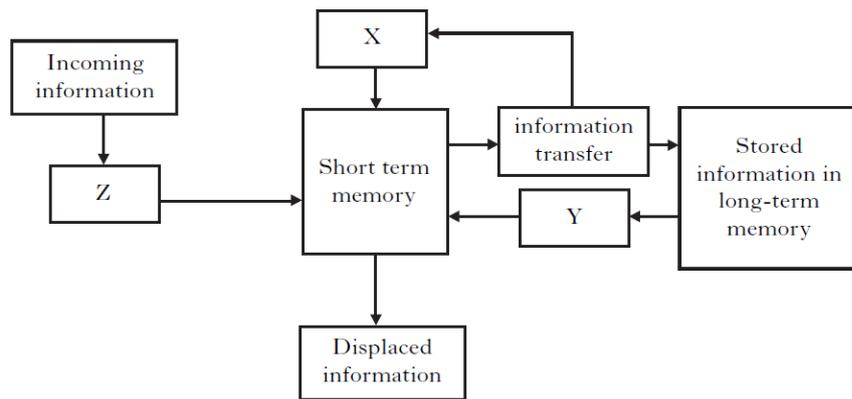


- i) The patient was then told to use his left hand to pick up the objects he saw named on the screen.
Explain why the patient picked up the key but not the spoon.
- ii) The patient was then asked to say what he saw written on the screen.
Predict what he would have said and give a reason for your answer.

2

2

33. The diagram below represents the passage of information through memory.



- a. i) Identify processes X, Y and Z. 2
- ii) State two forms of information that can enter the short term memory. 1
- iii) Describe how contextual cues help recall from long-term memory. 1
- b. A student had to learn her SQA candidate number which contained 9 digits. She was advised to use chunking to memorise it. 1
 Explain why the process of chunking would help her memorise this number. 1
- c. i) Patients with Alzheimer's disease find it difficult to form new memories. 1
 Which part of the brain is affected by Alzheimer's disease? 1

34. An investigation was carried out to study the serial position effect. Twelve pictures were shown, one by one, to five children. The children were then asked to recall the pictures they saw. The results of the investigation are shown below.

		<i>Position of picture in list shown to children</i>											
<i>Child</i>	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	
1	✓	✓	✓	✓	×	×	✓	×	✓	✓	✓	✓	
2	✓	✓	✓	×	×	✓	×	×	✓	×	✓	✓	
3	✓	×	✓	✓	×	×	×	×	×	✓	✓	×	
4	✓	✓	×	×	×	×	✓	✓	✓	✓	✓	✓	
5	✓	✓	✓	×	✓	×	×	✓	×	✓	✓	✓	
Recall (%)	100	80	80	40	20	20	40	40	60	80	100	80	

✓ = picture recalled

× = picture forgotten

The table shows the recall success for each picture.

- a. i) Describe the trend shown by these results. 1
- ii) Explain these results in terms of the serial position effect. 3
- b. To make sure that the children tried their best, the investigation was designed as a competition and the child with the best recall was rewarded. 1
 What behavioural term describes improved performance in competitive situations? 1

35. Discuss memory under the following headings:
- i) Short-term memory 5
 - ii) The transfer of information between short and long-term memory. 5
36. Give an account of memory under the following headings:
- i) Encoding into short-term memory; 2
 - ii) Transfer from short-term to long-term memory; 6
 - iii) Retrieval from long-term memory. 2

The Cells of the Nervous System and Neurotransmitters at Synapse

37. Vision in dim light is improved by the rods connecting to
- a. Diverging neural pathways
 - b. Converging neural pathways
 - c. Reflex neural pathways
 - d. Peripheral neural pathways
38. The speed of impulse transmission along an axon is promoted by
- a. Diffusion of neurotransmitters
 - b. Converging neural pathways
 - c. Diverging neural pathways
 - d. Myelination of fibres.
39. Which of the following statements about diverging neural pathways is correct?
- a. They accelerate the transmission of sensory impulses.
 - b. They suppress the transmission of sensory impulses.
 - c. They increase the degree of fine motor control
 - d. They decrease the degree of fine motor control.
40. Which of the following statements about diverging neural pathways is correct?
- a. They accelerate the transmission of sensory impulses.
 - b. They suppress the transmission of sensory impulses.
 - c. They decrease the degree of fine motor control
 - d. They increase the degree of fine motor control
41. Which of the following carries an impulse towards a nerve cell body?
- a. Dendrite
 - b. Axon
 - c. Myelin
 - d. Myosin

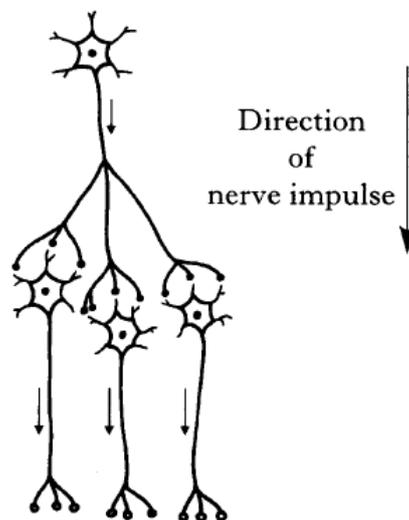
42. Which of the following statements describes a neurotransmitter and its method of removal?

- a. Adrenaline is removed by reabsorption
- b. Adrenaline is removed by enzyme degradation.
- c. Noradrenaline is removed by enzyme degradation.
- d. Noradrenaline is removed by reabsorption.

43. Which of the following shows the direction of a nerve impulse in a neurone?

- a. Axon - cell body - dendrite
- b. Cell body - dendrite - axon
- c. Cell body - axon - dendrite
- d. Dendrite - cell body - axon

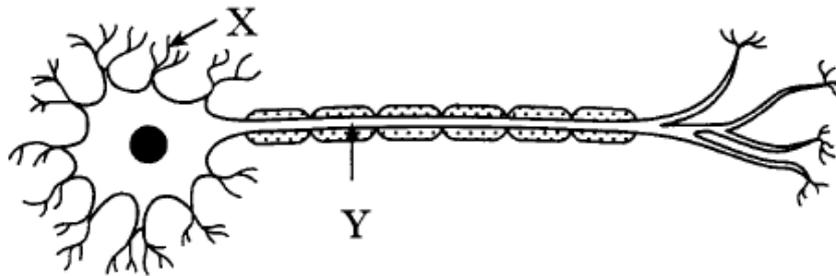
44. The following diagram represents four neurones in a nervous pathway.



Which line of the table describes correctly the pathway?

	Type of pathway	
A	Sensory	convergent
B	motor	convergent
C	Sensory	divergent
D	motor	divergent

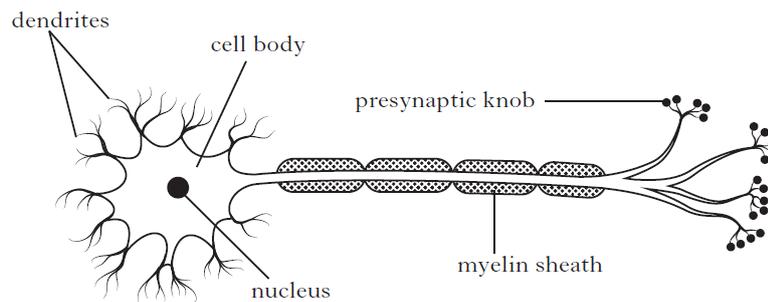
45. The diagram shows a motor neurone.



Which line of the table identifies correctly the labelled parts and the direction of impulse?

	X	Y	Direction
A	dendrite	axon	X - Y
B	dendrite	axon	Y - X
C	axon	dendrite	X - Y
D	axon	dendrite	Y - X

46. The diagram below shows a neuron from an adult.

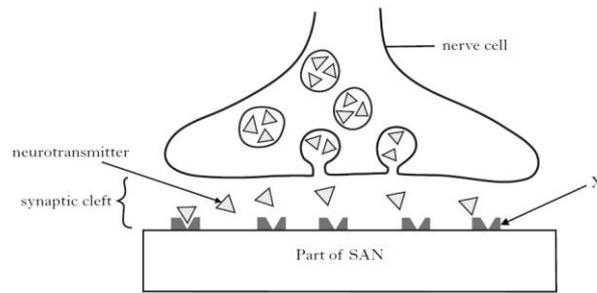


- Copy the diagram above and draw an arrow to show the direction in which an impulse would travel. 1
- Suggest a possible role of the nucleus in the transfer of information across a synapse. 1
- Copy and complete the table below which contains information about organelles found in the presynaptic knob. 1

Organelle	Function
	Provides ATP for synthesis reactions
Vesicle	

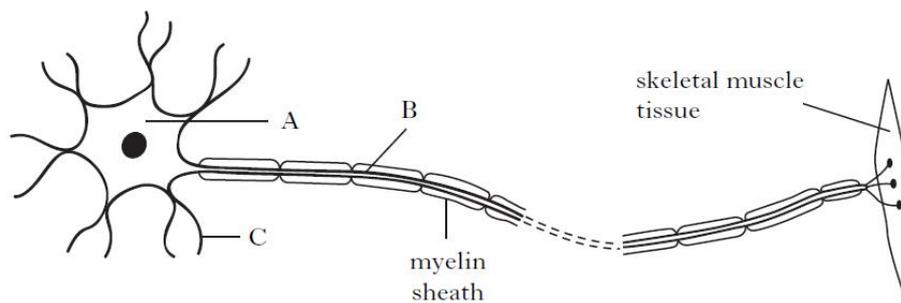
- How might a neurone in a newly-born child differ from the one in the diagram? 1
 - In what way would this affect how the neuron functions? 1

47. The diagram below shows a synapse which links a nerve cell with the sinoatrial node (SAN) in the heart.



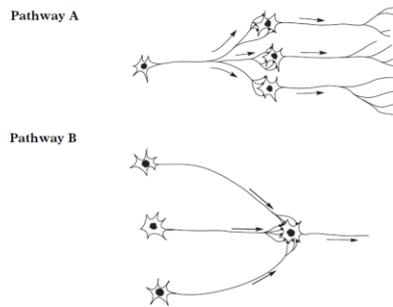
- a. i) Where in the heart is the SAN located? 1
- ii) Describe the function of molecule X? 1
- b. One example of a neurotransmitter is acetylcholine.
How is acetylcholine removed from the synapse? 1
- c. i) In which area of the brain does the sympathetic nervous system originate? 1
- ii) Describe a situation which would lead to stimulation of the sympathetic nervous system. 1

48. The diagram below shows a motor neuron and its junction with the skeletal muscle tissue.



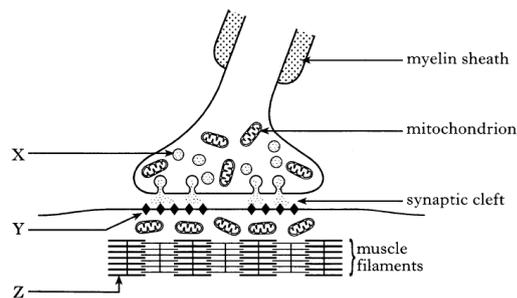
- a. Name the parts of the neurone labelled A, B and C on the diagram. 2
- b. Neurotransmitters bind to receptors on skeletal muscle tissue triggering contraction.
 - i) Name two neurotransmitters. 1
 - ii) Explain why the release of neurotransmitter into a synaptic cleft may sometimes fail to trigger muscle contraction. 1
 - iii) Name the structural proteins in skeletal muscle tissue and describe how they interact to bring about muscle contraction, 2
- c. i) State the importance of the myelin sheath in the transmission of impulses. 1
- ii) Postnatal myelination is necessary for a child to go through the sequence of developmental stages leading to walking.
What term describes this sequence of developmental stages? 1

49. The diagram below shows two different neural pathways,
Nerve impulses are travelling from left to right in both pathways.



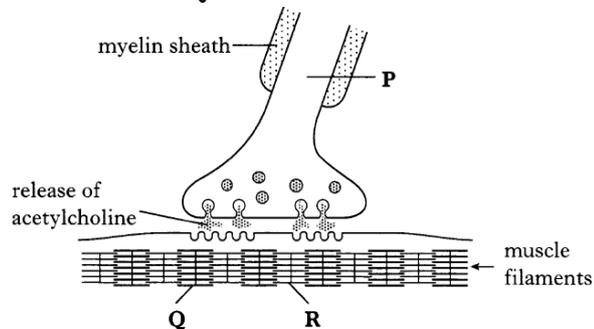
- a. i) Name the types of pathway represented by A and B. 1
 ii) Pathway A helps the hand to function.
 Explain how it does this? 2
- b. Blinking is a reflex action. 1
 i) What is a reflex action? 1
 ii) The blinking reflex can sometimes be suppressed.
 What term refers to the ability of the nervous system to suppress reflexes? 1

50. The diagram shows a neuromuscular synapse.



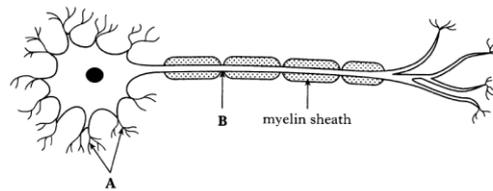
- a. Name cell structure X. 1
 b. What is the function of molecule Y? 1
 c. The areas on both sides of the synaptic cleft are rich in mitochondria. Explain why mitochondria are needed in each area. 2

51. The diagram shows a neuromuscular junction.



- a. Name the part of the nerve cells labelled P. 1
 b. i) What kind of substance is acetylcholine 1
 ii) What triggers the release of acetylcholine? 1
 iii) State what happens to acetylcholine after it has acted on the muscle. 1

52. The diagram represents a motor neurone.

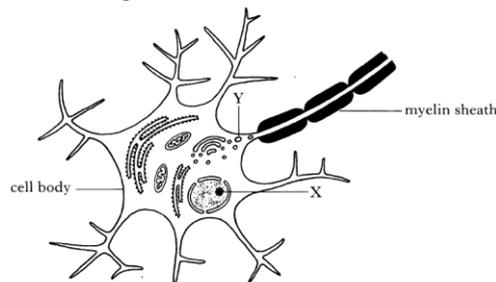


- a. Name the nerve fibres A and B 2
- b. The table below describes features of somatic and autonomic motor neurone function. Copy and complete the table 2

Feature	Somatic	Autonomic
Type of control (conscious/unconscious)		
Example of target muscle		Uterine muscle
Example of neurotransmitter		noradrenaline

- c. State the effect of sympathetic stimulation on the 3
- i) Heart rate
 - ii) Digestive system
 - iii) Skin arterioles
- d. The sympathetic and parasympathetic nervous systems often influence organs in opposite ways. What term describes this opposing effect? 1

53. Part of a neurone is shown in the diagram below.



- a. State whether the neurone shown is a sensory or motor neurone and give a reason for your answer. 1
- b. Name structure X and state its function 2
- c. i) Name structure Y. 1
- ii) Similar structures are found in the synaptic knob. What do they contain? 1
- d. In the disorder Muscular Sclerosis, the myelin sheath is damaged by the body's own defence system. 1
- i. What effect does this have on the function of the nerve fibre? 1
 - ii. What term is used to describe a disorder where the body's defence system destroys its own cells? 1
- e. Copy the diagram above and draw an arrow to show the direction of an impulse in a dendrite. 1
- f. Describe neural pathways always contain the type of neurone shown opposite. Explain how diverging pathways allow humans to perform a task such as threading a needle. 1

54. Give an account of the nervous system under the following headings:
- i) The role of neurotransmitters at the synapse 6
 - ii) Converging and diverging neural pathways. 4
55. Give an account of the function of a synapse under the following headings:
- i. Release of neurotransmitters 3
 - ii. Action of neurotransmitter 3
 - iii. Removal of neurotransmitter 4

Communication and Social Behaviour

56. A young person does not smoke because she has seen an advertising campaign showing pictures of famous sports stars who do not smoke.
This is an example of a behaviour called
- a. Identification
 - b. Discrimination
 - c. Generalisation
 - d. Deindividuation.
57. Which of the following best describes shaping behaviour?
The reward of behaviour which
- a. Improves performance in competitive situations
 - b. Approximates to the desired behaviour
 - c. Results in the learning of motor skills
 - d. Results in deindividuation taking place.
58. Which of the following describes the change in an individual's behaviour where the presence of others causes the individual's to show less restraint and become more impulsive?
- a. Social facilitation
 - b. Shaping
 - c. Generalisation
 - d. Deindividuation

59. Four groups of students were asked to make paper aeroplanes. Each student had to make five aeroplanes. The table below shows the conditions under which each group worked.

	Demonstration on how to fold the paper	Written set of instructions supplied	Prise for the first students finished
Group 1	No	Yes	No
Group 2	Yes	No	No
Group 3	Yes	No	Yes
Group 4	yes	yes	Yes

Which two groups are likely to be affected by social facilitation?

- a. Groups 1 and 4
- b. Groups 2 and 3
- c. Groups 2 and 4
- d. Groups 3 and 4

60. The following is a list of body parts:

1. Tongue
2. Eyebrows
3. Hands
4. Eyes.

Which of these body parts can be used in non-verbal communication?

- a. 3 only
- b. 2 and 4 only
- c. 2,3 and 4 only
- d. 1,2,3 and 4

61. An athlete has a much better chance of achieving a "personal best" time in a race rather than in training because of

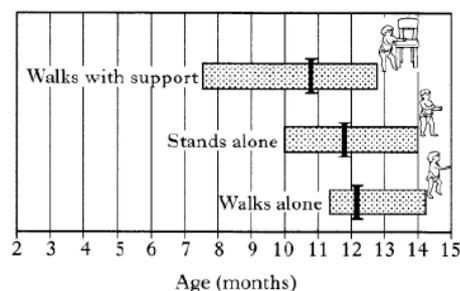
- a. Internalisation
- b. Deindividuation
- c. Identification
- d. Social facilitation.

62. The rewarding of patterns of behaviour which approximate to desired behaviour is called

- a. Generalisation
- b. Discrimination
- c. Extinction
- d. Shaping

63. Which of the following terms describes the process by which a person learns to distinguish between different but related stimuli?
- Generalisation
 - Imitation
 - Discrimination
 - Identification

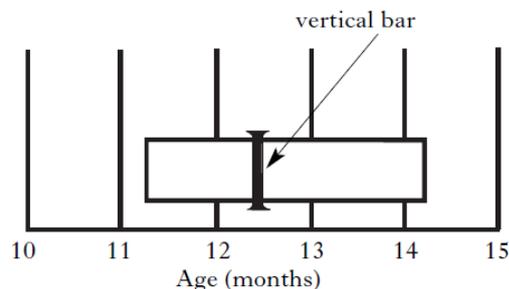
64. The diagram below shows the ages (in months) at which children reach various stages in their development. The left end of each bar indicates the age by which 25% of infants have reached the stated performance. The right end of each bar indicates the age by which 90% of infants have reached the stated performance. The vertical bar indicated the age by which 50% of infants have reached the stated performance.



An eight-month old infant can walk with support but cannot stand alone.

In what percentage of the population is this child found?

- Less than 25%
 - Between 25% and 50%
 - Around 50%
 - Between 50% and 90%
65. The diagram shows the ages in months at which children are able to walk unaided. The left end of the bar shows the age at which 25% of infants can walk unaided. The right end of the bar shows the age at which 90% of infants can walk unaided. The vertical bar shows the age at which 50% of infants can walk unaided.



If sixteen infants, aged twelve months, were tested, how many would be expected to walk unaided?

- 4
- 7
- 9
- 12

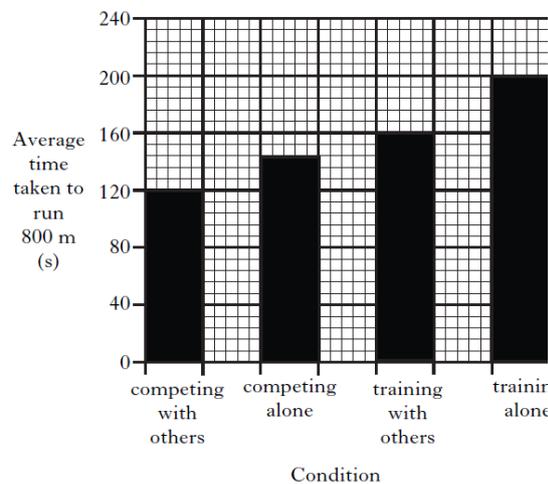
66. An investigation was carried out to determine how long it takes students to learn to run a finger maze. A blindfolded student was allowed to run the maze on ten occasions. The results are given in the table below.

Trial	Time (s)
1	23
2	20
3	26
4	12
5	18
6	10
7	6
8	7
9	6
10	6

How could the investigation be improved to make the results more reliable?

- Allow other students to try to run the maze ten times, whilst blindfolded
- Allow the same student some additional trials on the same maze
- Change the shape of the maze and allow the same student to repeat ten trials
- Record the times to one decimal place.

67. The graph below shows the results of a survey arrived out on members of an athletic club who ran an 800m course under different conditions.



What is the percentage improvement in the time taken to run 800m between those athletes training on their own and those training with others?

- 40%
- 25%
- 24%
- 20%

68. The following question relates to aspects of learning associated with guitar playing.



- a. What effect does practising a motor skill, such as repeatedly playing chords, have on the nervous system? 1
- b. Suggest how "shaping" might be used by a teacher to help students improve their guitar playing over the course of a year. 2
- c. i. A teenager decides that she dislikes all of the band's music after hearing just one song. What type of learning is this? 1
 ii. As she grows older this teenager's opinion about the band's music could be altered by internalisation. Explain how this may happen? 1
- d. Anti-social behaviour can occur when people are together in a group such as at a music festival. What is the name of this effect and why does it occur? 2

69. The information in the table below refers to the development of walking by infant boys.

Stage of development	Description of behaviour	Age (weeks) at which behaviour develops	
		Earliest	Latest
1	Rolls over	9	23
2	Sits up without support	16.5	32.5
3	Crawls	21	38
4	Pulls up and stands holding on to furniture	23	43
5	Walks holding on to furniture	28.5	49
6	Stands unsupported	35.5	54
7	Walks alone	44.5	57.5

- a. Assuming a normal pattern of distribution, predict by what age 50% of boys would be expected to walk alone. 1
- b. Identify all the stages in the development of walking that boys could be at when they are 36 weeks old. 1
- c. Suggest two reasons why a boy might still only be crawling when, at the same age. His elder brother could stand unsupported. 1
- d. i. What term describes the development of a behaviour which follows a set sequence of stages? 1
 ii. Describe the change which occurs in the nervous system that allows children to go through the stages of development leading to walking? 1

70. An investigation was carried out into the effect that the meaning of words has on the ability to recall them from short and long-term memory.

Two groups of people were each shown lists of five words for 30 seconds.

Group 1 was shown words with related meanings while group 2 was shown words with unrelated meanings.

List of words with related meanings - large, big, great, huge, wide.

List of words with unrelated meanings - late, cheap, rare, bright, rough

Immediately after 30 seconds, the people in both groups were asked to write down, in the correct order, the words that they had been shown.

Everyone was the asked to read a book for one hour and told that they would be asked questions about it afterwards.

Instead, after the hour has passed, everyone was asked to write down, in the correct order, the words they have been shown in their original list.

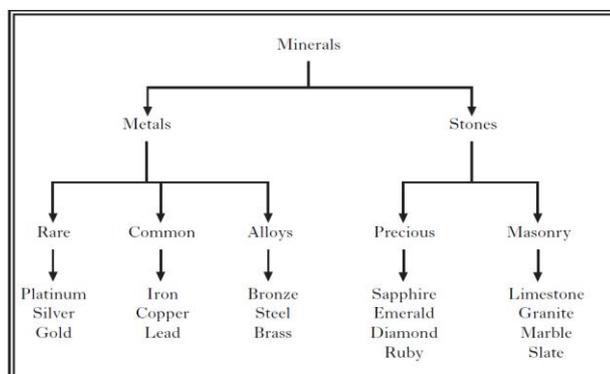
The results are shown in the table below.

Group	Meaning of words shown	Correct responses immediately after reading the words (%)	Correct responses after reading the book for one hour (%)
1	Related	96	54
2	Unrelated	96	78

- a. List two ways in which the investigators could minimise variation between the two groups of people. 1
- b. What aspect of memory explains the high percentage of correct responses immediately after reading the words? 1
- c. Suggest why the groups were asked to read a book during the investigation. 1
- d. State two conclusions that can be drawn from the results of this investigation. 2

71. An investigation was carried out into the effects of organisation on improving the recall of information.

Four students were each asked to look at a card containing 25 words organised into a branching diagram. The card is shown below.



The card was removed after three minutes and each student had to write down as many words as he or she could recall. A score out of 25 was recorded for each student and these were added together to give a total score out of 100 for the group. The procedure was repeated twice. Each time the students were given cards containing 25 different words also organised into branching diagrams. Another group of four students took part in the control for this investigation. The words on their cards were not organised. The results are shown in the table below.

Student group	Total number of words recalled (out of 100)			
	1 st card	2 nd card	3 rd card	average
Experimental	75	78	72	
Control	53	57	55	

- Complete the table by calculating the average number of words recalled by each student group. 1
- In what way would the content of the control cards be similar to the experimental cards and different from the experimental cards? 1
- Suggest two variables, not already mentioned in the description of this investigation, which would have to be kept constant to ensure that a valid comparison could be made between the two groups? 2
- State a conclusion that can be drawn from the results. 1
- How could the reliability of the results of this investigation be improved? 1
- At the start of the investigation that students were told that the person in each group who recalled the most words would be given a prize? Why did the design of this investigation include a prize? 1
- In a further investigation into recall, students were given the same card to memorise on three successive occasions. Predict what would happen to the number of words recalled on each successive attempt. Explain your prediction. 1

72. An investigation was carried out into the influence of adult on the behaviour of young children.

Some groups of children watched a recording of either a man or woman being physically and verbally aggressive to a large plastic clown.

Other groups of children watched either a man or a woman behaving in a non-aggressive manner towards the clown.

Each child was then placed in a room on their own with the clown. The number of aggressive acts they committed over a five minute period was counted.

The figures in the table below show the average number of aggressive acts that the children committed while in the room.

Gender of the child	Average number of aggressive acts committed by the children			
	Aggressive man observed	Aggressive woman observed	Non-aggressive man observed	Non-aggressive woman observed
Boys	18.7	7.9	1.0	0.6
Girls	4.4	9.2	0.2	0.8

- a) i) Which adult/child combination resulted in the least aggression? 1
 ii) Calculate the percentage increase in aggressive acts committed by boys when they observe an aggressive man rather than a non-aggressive man. 1
 iii) State a conclusion that can be drawn from these results regarding the gender of the aggressive adult. 1
 b) The children are observing and then repeating the acts of adults. What form of learning are they using? 1
 c) Suggest a control that could have also been used in this investigation. 1

73. Give an account of communication under the following headings: 4
 i. The use of language 4
 ii. Non-verbal communication 6

74. Discuss how other people can affect an individual's behaviour under the following headings: 6
 i. The influence of groups 6
 ii. Influences that change beliefs 4

75. Describe the factors which influence the development of behaviour. 10