Name: _____ **ID#:** _____ **ID: A**

Psych 333 Spring 2008, Instructor Boynton, Final Exam

Multiple Choice (50 questions, 1 point each)
Identify the letter of the choice that best completes the statement or answers the question.

____ 1. A grapheme-color synesthete is likely to be better than 'normal' subjects at which task?
a. naming the color of ink that the number '3' is printed with
b. detecting a triangle of 3's amongst a background of 5's
c. determining the amount of salt to add to soup
d. discriminating auditory frequencies

____ 2. Making a saccade across a stationary scene produces
a. a motion aftereffect.
b. retinal motion.
c. perceived motion.
d. inverse motion.

____ 3. The _____ is primarily responsible for the perception fine details.
a. Pacianian corpuscle (RA2)
b. Meissner corpuscle (RA1)
c. Ruffini cylinder (SA2)
d. Merkle receptor (SA1)

____ 4. Which has been associated with empathy, autism, and motor development?
a. the organ of corti
b. mirror neurons
c. the PPA
d. the homunculus

____ 5. For which sense is it hardest for researchers to present controlled stimuli?
a. smell
b. hearing
c. sight
d. touch

____ 6. About how many types of human olfactory receptors are there?
a. 350
b. 12,000
c. 2,000,000
d. 6

____ 7. The primary visual cortex in the left hemisphere receives input from
a. both eyes
b. the right eye only
c. the left eye only
d. the right LGN

____ 8. Carpal tunnel syndrome is an example of
a. neuropathic pain
b. inflammatory pain
c. nociceptive pain
d. ordinary pain

____ 9. The smallest difference between two stimuli that can be reliably be detected is called the
a. difference threshold
b. absolute threshold
c. recognition threshold
d. level of analysis

____ 10. The Hermann grid illusion and Mach bands are both explained by
a. simultaneous contrast
b. contrast thresholds
c. selective adaptation
d. center-surround lateral inhibition

____ 11. Which sense has neurons that code spatial position by their pattern of firing?
a. touch
b. vision
c. smell
d. hearing

____ 12. Which sense seems to have the most amount of plasticity in its primary cortical representation?
a. hearing
b. touch
c. sight
d. smell

____ 13. The McGurk effect demonstrates that visual information influences speech perception. This is an example of:
a. categorical perception
b. multimodal perception
c. shadowing
d. crossmodal neural plasticity

____ 14. The difficulty of reading under dim light conditions can be explained by
a. the fact that rod functioning predominates during dark adaptation, therefore poor acuity.
b. the increased acuity of cones under low light conditions.
c. the fact that cone functioning predominates during dark adaptation, therefore poor acuity.
d. the increased sensitivity of cones under low light conditions.

____ 15. Animals that have a keen sense of smell that is important to their survival are called:
a. anosmic
b. smellomatic
c. macrosmatic
d. microsmatic

____ 16. Infants/children lose the ability to distinguish between all speech sounds after about:
a. 3 years
b. 1 month
c. 6 years
d. 1 year

____ 17. Ramachandran used a behavioral experiment in patients missing a _____ to suggest that Penfield's somatosensory map had the head representation upside-down.
a. foot
b. homunculus
c. head
d. hand

____ 18. In the movie Spiderman, there's a scene where Mary Jane is being mugged by four men. Spider-Man throws two of the men into two windows behind Mary Jane. Then the camera goes back to Spider-Man beating up the other two guys. When the camera goes back to Mary Jane the two windows are intact. This is an example of what is called in the movie business as 'bad continuity'. The fact that we typically don't notice this sort of mistake is what perceptual researchers call _____.
a. the aperture problem
b. change blindness
c. the binding problem
d. anosagnosia

____ 19. The phonemes /ta/ and /da/ are distinguished by differences in:
a. coarticulation
b. formant transition
c. voice onset time
d. formants

____ 20. Auditory space is typically defined by which coordinate system:
a. azimuth, elevation and distance
b. pitch, yaw and roll
c. azimuth, horizontal, and vertical
d. distance, frequency, and elevation

____ 21. A patient who has difficulty understanding speech most likely has suffered damage to:
a. Wernicke's area
b. Brodman's area
c. Broca's area
d. the occipital lobe

____ 22. _____ can affect behavior even though they are typically not consciously perceived.
a. paradelia
b. phonemes
c. pheromones
d. parents

____ 23. Simons and Chabris showed a video of students passing a basketball and asked viewers to count how many passes were made. What event did around half of the viewers fail to notice?
a. the basketball disappearing and then reappearing.
b. a person in a gorilla suit walking in and out of the scene
c. the color of the doorway in the hallway changing
d. pants falling down on one of the students.

____ 24. As you vary the delay between a click coming from a lead speaker and a lag speaker, different percepts are experienced. These include:
(1) The sound comes from the lead speaker, but your hear an echo from the lag speaker.
(2) The sound comes from a point in the middle between the lead and lag speaker.
(3) The sound comes from a point that is biased toward the lead speaker.
(4) The sound comes from the lead speaker only.
Which is the order that you experience if you gradually increase the delay from zero to longer than 5 milliseconds?
a. 3, 4, 1, 2
b. 4, 3, 2, 1
c. 2, 3, 4, 1
d. 1, 2, 3, 4

____ 25. Which of the following is most difficult to program a computer to do?
a. calculate pi out to 10,000 decimal places
b. play competitive chess
c. write bad poetry
d. recognize a face

____ 26. The waterfall illusion and face after-effects are both explained by
a. neural adaptation
b. the cortical magnification factor
c. neural plasticity
d. selective rearing

____ 27. If Mike Tyson bites off your pinna, you might find it more difficult to:
a. judge the location on the azimuth of a sound source.
b. judge the elevation of a sound source.
c. hear high frequency tones.
d. discriminate fine differences in pitch

____ 28. During the refractory period, a neuron
a. fires at its baseline rate
b. fires at above its baseline rate
c. cannot fire.
d. fires just below its baseline rate

____ 29. The _____ is primarily responsible for the perception of vibration.
a. Merkle receptor (SA1)
b. Ruffini cylinder (SA2)
c. Pacianian corpuscle (RA2)
d. Meissner corpuscle (RA1)

____ 30. In theatrical lighting, red green and blue overhead lights are often used in combination to produce a variety of colors for illuminating a stage. This is an example of
a. color blindness
b. additive color mixing
c. magic
d. subtractive color mixing

____ 31. Which sense has the most direct connection to memory and emotion?
a. smell
b. touch
c. sight
d. hearing

____ 32. The phonemic restoration effect refers to:
a. the ability to perceive meaningful phonemes in noise
b. learning to distinguish new phonemes when learning a foreign language
c. creating a meaningful word by adding a new phoneme to a non-word
d. the unconscious replacement of missing phonemes in a sentence

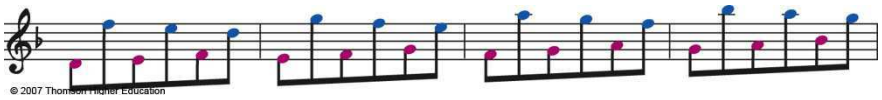
____ 33. Which of the following is NOT basic quality of taste?
a. umami
b. sour
c. bitter
d. unagi

____ 34. The most useful visual input is typically _____ light, while the most useful auditory input is typically _____ sound.
a. ambient, high frequency
b. ultraviolet, annoying
c. direct, reflected
d. reflected, direct

____ 35. If you place a gray square on a red background, the gray square will tend to look
a. gray
b. blue
c. green
d. red

____ 36. When judging the roughness of a surface, your somatosensory system makes use of _____ cues by running your fingers over it, and _____ cues by laying your hand on it.
a. spatial, temporal
b. haptic, physical
c. physical, haptic
d. temporal, spatial

____ 37. When played on a piano, the measures shown below from J. S. Bach's Chorale Prelude on *Jesus Christus unser Heiland* tend to sound like two separate musical streams. This is an example of grouping by:



a. similarity of location
b. similarity of timbre
c. proximity in time
d. similarity of pitch

____ 38. Crossed and uncrossed disparity points are divided by the
a. olfactometer
b. occluder
c. horopter
d. helicopter

____ 39. Humans have _____ olfactory receptors compared to dogs, and a single human olfactory receptor is _____ sensitive to/than a dog olfactory receptor.

a. fewer, equally
b. more, less
c. fewer, less
d. more equally

____ 40. After suffering damage to area MST, patient R.W. sees the whole world move every time he moves his eyes. R.W. is suffering from an inability to generate

a. corollary discharge signals
b. turn signals
c. image movement signals
d. motor signals

____ 41. The homunculus map shows that some body parts have a disproportionately large area of S1 devoted to them. This is most analogous to _____ in vision.

a. distributed coding
b. cortical magnification
c. ocular dominance
d. specificity coding

____ 42. Pain caused by immersing your hand in cold water is an example of

a. inflammatory pain
b. nociceptive pain
c. neuropathic pain
d. ordinary pain

____ 43. In humans, which pair of senses have different receptors that aer excited by different spatial locations?

a. hearing and sight
b. touch and hearing
c. sight and touch
d. taste and sight

____ 44. The moon just obscures the sun during a solar eclipse because the moon and the sun have roughly the same

a. horopter.
b. visual angle.
c. brightness.
d. illusion.

____ 45. The 'cone of confusion' refers to ambiguity of sound localization with respect to which cue?

a. motion parallax
b. head-related transfer function
c. binocular disparity
d. ITD

____ 46. Smells and color are both represented in the brain through _____ coding.

a. multimodal
b. specificity
c. somatosensory
d. distributed

____ 47. Which visual depth cue tells you the absolute distance of an object, rather just its distance relative to other objects in the scene?

a. accommodation
b. relative size
c. atmospheric perspective
d. occlusion

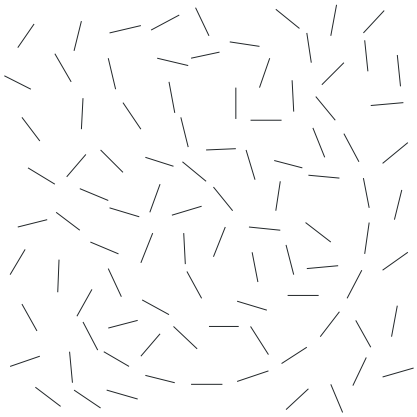
____ 48. Visual attention can modulate neural responses in all of the following areas EXCEPT:

a. area MST
b. retinal ganglia
c. area MT
d. primary visual cortex (V1)

____ 49. The fovea is to vision as the _____ is to touch.

a. ring finger (D3)
b. pinky finger (D4)
c. middle finger (D2)
d. index finger (D1)

____ 50. The easily detected curved contour in the figure below illustrates which Gestalt law?



a. common fate
b. good continuation
c. proximity
d. familiarity

Short Answer (5 questions, 3 points each)

51. Why does it make more sense to call cone classes ‘S, M and L’ rather than their orignal names ‘blue, green and ‘red’?

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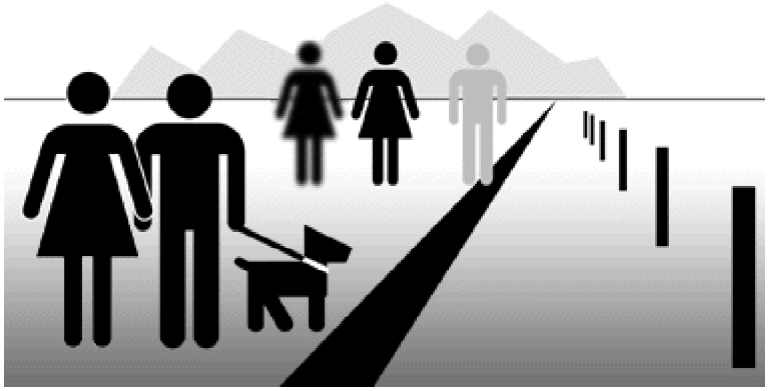
52. Name four depth cues illustrated in the scene below and one cue that can't be used.



53. Familiar size is a cue for visual depth perception. Name an example of how familiarity could also help determine the distance of an auditory sound.

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54. Explain why it is difficult to read the screen on your laptop while viewing it outside on one of the 71 sunny days that Seattle receives during the average year?

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55. Some somatosensory neurons have an excitatory center with an inhibitory surround receptive field. Use what you know about the visual system to describe how this affects the way these somatosensory neurons respond as a function of the size of the stimulated area.

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Psych 333 Spring 2008, Instructor Boynton, Final Exam
Answer Section

MULTIPLE CHOICE

1. ANS: B
2. ANS: B
3. ANS: D
4. ANS: B
5. ANS: A
6. ANS: A
7. ANS: A
8. ANS: A
9. ANS: A
10. ANS: D
11. ANS: D
12. ANS: B
13. ANS: B
14. ANS: A
15. ANS: C
16. ANS: D
17. ANS: D
18. ANS: B
19. ANS: C
20. ANS: A
21. ANS: A
22. ANS: C
23. ANS: B
24. ANS: C
25. ANS: D
26. ANS: A
27. ANS: B
28. ANS: C
29. ANS: C
30. ANS: B
31. ANS: A
32. ANS: D
33. ANS: D
34. ANS: D
35. ANS: C
36. ANS: D
37. ANS: D
38. ANS: C
39. ANS: A

40. ANS: A
41. ANS: B
42. ANS: B
43. ANS: C
44. ANS: B
45. ANS: D
46. ANS: D
47. ANS: A
48. ANS: B
49. ANS: D
50. ANS: B

SHORT ANSWER

51. ANS:
The perception of a given hue, such as red, is not determined only by the response of a single cone class, such as the L cone class. Instead, the perception of hue occurs through a distributed representation of these cone classes - specifically through the excitatory and inhibitory connections described by opponent processing theory. So although the wavelengths for maximum sensitivity for the S, M and L cones fall on the spectrum that appear blue, green and red, it is misleading to call these 'blue', 'green' and 'red' cones because these cone classes do not lead directly to these three sensations.
52. ANS:
Valid cues:
perspective convergence
relative size
familiar size
atmospheric perspective
relative height
occlusion

Borderline cues:
Texture gradient
Shadows

Cues you can't use
motion parallax
deletion and accretion (by motion)
binocular disparity
convergence
accomodation
53. ANS:
For a sound source that is familiar and doesn't typically vary in intensity, the intensity of the sound at the ear can determine how far away it is. For example, since car alarms are always very loud, if you hear a very quiet car alarm you can assume that it's far away rather than a nearby nearly silent car alarm right next to you. Another example is if you hear a the loud sound of a mosquito, you can assume it's very near your ear, rather than the more unlikely event of a very loud mosquito far away.

54. ANS:
Weber's law states that the detection threshold for light increases in proportion to the backround light level. A laptop screen gives off a relatively small amount of light which when viewed indoors is easily visible. But on a bright sunny day, the background light is several orders of magnitude brighter, leaving the fixed increment in lightness of your laptop below the detection threshold.

55. ANS:
LGN neurons in the visual cortex also have a center-surround organization. These neurons respond maximally to a disc of light that just covers the excitatory center. Similarly, we'd expect a center-surround somatosensory neuron to be 'tuned' to the size of the stimulated area of skin, with a maximum response when the stimulated area just covers the excitatory center.