Exam II: Version B

PART 1: ANATOMY: match the words below to the number anatomical part
(1 point each; 10 points total)

Matching answers

<table>
<thead>
<tr>
<th>Matching</th>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. femur</td>
<td>5</td>
<td>bc. maxilla</td>
</tr>
<tr>
<td>b. pubis</td>
<td>6</td>
<td>bd. premaxilla = 8</td>
</tr>
<tr>
<td>c. fibula</td>
<td>7</td>
<td>be. humerus = 3</td>
</tr>
<tr>
<td>d. nares</td>
<td>8</td>
<td>ab. antorbital fenestra</td>
</tr>
<tr>
<td>e. dentary</td>
<td>9</td>
<td>abc. cervical vertebrae = 1</td>
</tr>
<tr>
<td>ab. tibia</td>
<td>10</td>
<td>abd. mandibular fenestra</td>
</tr>
<tr>
<td>ac. sacrum</td>
<td>1</td>
<td>abe. temporal fenestra = 10</td>
</tr>
<tr>
<td>ad. scapula</td>
<td>2</td>
<td>bcd. cervical vertebrae</td>
</tr>
<tr>
<td>ae. ulna</td>
<td>3</td>
<td>bce. thoracic vertebrae</td>
</tr>
<tr>
<td></td>
<td></td>
<td>bde. caudal vertebrae</td>
</tr>
</tbody>
</table>
PART 2: READING CLADOGRAMS (just like I told you) (2 pts each; 10 pts total)
Dashed lines associate names with node; they do not designate lineages.

11. What is the name of the group defined as hypothetical common ancestor A and all of its descendents?
   a. Dinosauria  
   b. Saurischia  
   c. Sauropodamorpha  
   d. Theropoda

12. Based on the cladogram, which group first appeared earlier in Earth history, Cerapoda or Thyreophora?
   a. Cerapoda  
   b. Thyreophora  
   c. same time  
   d. can't be determined

13. Based on this cladogram, which group first appeared earlier in Earth history, Ornithischia or Cerapoda?
   a. Cerapoda  
   b. Ornithischia  
   c. same time  
   d. can't be determined

14. Which group is the sister-group, or next of kin, of the clade Cerapoda?
   a. Thyreophora  
   b. Ornithopoda  
   c. Genasauria  
   d. Marginocephalia

15. For the clade Thyreophora, Cladogram II suggests a different pattern of relationships from Cladogram I.
   a. True  
   b. False

PART 3: MATCHING. Fill in the blanks using words from the list below. (2 pts each; 20 pts total).
16. The ____________ are sauropod dinosaurs with osteoderms, very long necks, broad snouts and nostrils high on their skulls that are known primarily from the southern hemisphere.

17. The neck vertebrae of many sauropods have ____________, deep cavities scooped out of the side of the centra that helped reduce the weight of the neck.

18. The ____________ is a new bone added to the front of the lower jaw that is a shared derived character of Ornithischia.

19. The ____________ are ornithischian dinosaurs with dermal armor comprised of keeled skutes.
20. The animal in the figure below is a _____________.

21. What type of preservation is characteristic of ankylosaurs found in marine deposits?

22. The ____________ are the least derived ceratopsians. They were bipedal herbivores, with short parrot-like faces and teeth that did not occlude precisely. One is figured below.

23. The ____________ come in two varieties, those with “flat-heads” and those with “fat-heads”.

24. The ____________ are among the least derived ornithopods. They have high crowned teeth with denticles, poorly organized dental batteries, and kinetic lower jaws. The skull of one if figured for question 43.

25. In K-selected species with ____________ young, offspring are fairly helpless when born and need to be cared for by their parents. As a consequence, parents have few offspring at a time.

Matching Answers

| a. premaxilla | be. titanosaurids = 16 |
| b. predentary = 18 | cd. precocial |
| c. excellent preservation | ce. bloat and float = 21 |
| d. brachiosaurids | de. nodosaurids = 20 |
| e. stegosaurids | abc. thyreophorans = 19 |
| ab. pachycephalosaurids = 23 | abd. heterodontosaurids = 24 |
| ac. psittacosaurs = 22 | abe. premaxilla |
| ad. pleurocoels = 17 | acd. iguanodontids |
| ae. protoceratopsids | ace. neural spines |
| bc. replacement | ade. altricial = 25 |

PART 4: TRUE OR FALSE: A = TRUE, B = FALSE (2 pts each; 20 pts total).
26. Prosauropod dinosaurs had very large thumb claws. A
27. Sauropods had low EQs (encephalization quotients). A
28. Stegosaurs were most diverse and abundant in the late Jurassic. A
29. Stegosaurs had small, weak teeth. A
30. Ankylosaurids had tails that were stiff distally and bore large bony clubs. A
31. Herbivores that have selective diets tend to have broad snouts. B

32. Some morphological evidence suggests that neoceratopians had a sprawling front limb posture, whereas trackway evidence suggests they had an upright front limb posture. A

33. Pachycephalosaurs had precisely occluding teeth in complex dental batteries. B

34. Ornithopod nests have been discovered with eggs and young. A

35. Ornithopods are well represented in the fossil record. A

PART 5: MULTIPLE CHOICE (only one right answer, I hope) (2 pts. each, 40 pts. total)

36. If you found a sauropod with cervical vertebrae that had bifurcate neural spines (see image below), what would you conclude?
   a. that it had a fat neck
   b. that it had a big neck ligament and held its neck horizontally, not vertically
   c. that it had a small head
   d. that it had a large head

37. Sauropods had ______________, which they used to grind up their plant food to aid digestion.
   a. strong jaw muscles
   b. gastroliths
   c. complex teeth in dental batteries
   d. all of the above

38. A line of evidence that diplodocids used their tails like bullwhips to make sounds is __________.
   a. the extreme thinness of the tail distally
   b. the reinforcement of the tail near where the tail meets the sacrum
   c. that there are "poppers" at the end to increase sound volume
   d. all of the preceding
   e. a and b

39. Which of the following are disadvantages of large size that sauropods may have experienced?
   a. overheating
   b. stress of heavy body on limbs
   c. high blood pressure in the head and neck
   d. all of the above

40. Which of the following is a potential function of stegosaur plates?
   a. defense
   b. species recognition
   c. thermoregulation
   d. all of the above

41. __________ is the most primitive thyreophoran. It was a small, bipedal herbivore.
   a. Stegoceras
   b. Scutellosaurus
   c. Pisanosaurus
   d. Scelidosaurus

42. Which factor may have made it hard for stegosaurs to move fast?
   a. They had weak knees and elbows.
   b. They had weakly developed pelvic musculature.
   c. Their hind legs were much longer than their front legs.
   d. All of the above.
43. The image below shows which shared derived character of the clade Cerapoda?
   a. large lower temporal fenestra
   b. diastema (gap between teeth on maxilla and premaxilla)
   c. canine-like tooth
   d. very low jaw joint
   e. all of the above

44. What are solutions that large dinosaurs used to deal with the fact that leg strength does not increase as fast as the stress on the legs as bodies grow larger?
   a. keep leg shape constant as size increases
   b. keep legs straight when walking
   c. live in water to support weight
   d. all of the above

45. Ankylosaurs were most abundant and diverse in the ______________.
   a. late Triassic      b. early Jurassic      c. late Jurassic      d. late Cretaceous

46. Vertebrate herbivores are not able to directly break down and digest ______________.
   a. fruit          b. protein          c. lignin and cellulose   d. fat

47. The images below shows which shared derived character of the clade Ankylosauridae?
   a. wide skulls covered by irregular osteoderms
   b. eyes shift toward the back of the skull
   c. ‘horns’ at the back of the head
   d. all of the above

48. The location of scars on the frills of ceratopsids provides evidence that ______________.
   a. they did not bleed profusely when bitten or torn
   b. they protected the animals from theropod dinosaurs
   c. they engaged in fights within species
   d. all of the above

49. Pachycephalosaurs are known from ______________.
   a. the Northern Hemisphere   b. Antarctica   c. South America   d. Australia

50. What morphological traits indicate that pachycephalosaurs strengthened their skeletons to deal with hitting things with the tops of their heads?
   a. rotation of the occiput/neck joint to line up with the dome
   b. skull bone texture with bony columns oriented for absorbing shocks
   c. tongue-groove articulation along spinal column to resist sideways flexure
   d. all of the above

51. The dinosaur figured below is a ______________.
   a. protoceratopsid
   b. psittacosaur
   c. long-frilled ceratopsid
   d. short-frilled ceratopsid
52. Which of these traits is evidence that hadrosaurids processed food extensively in their mouths?
   a. advanced dental batteries with at least 3 teeth in each position
   b. kinetic lower jaws that allow complex tooth occlusion
   c. simple triangular teeth
   d. all of the above

53. The animals figured below are ________________.
   a. lambeosaurine ornithopods
   b. psittacosaur
   c. heterodontosaurid ornithopods
   d. hadrosaurine ornithopods

54. Which of the following ornithopods occurred in the late Cretaceous?
   a. basal euornithopods
   b. basal iguanodontids
   c. hadrosaurids
   d. all of the above

55. Which of the following is evidence that some ornithopods had complex social interactions?
   a. trackways suggesting they traveled in groups
   b. evidence for vocalization
   c. nest sites with many individuals
   d. all of the above