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科目名稱	普通生物學	科目碼	A04		
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八 平 坝 考 I. 選擇題 (單	選,每題2分)請於答案卡上作答,否則				
			rokarvote?		
1. A cell lacl A) Nuclear n	king which of the following structures is most lik	to be a p	J		
B) Cell mem					
C) Cytoplasm					
D) Nucleic a					
2. A salama would have A) slightly d	nder relies on hydrogen bonding to stick to various the greatest difficulty clinging to a amp surface	ous surfaces.	Therefore, a s	alam	ander
B) surface o	f hydrocarbons				
C) surface o	f mostly carbon-oxygen bonds				
	f mostly carbon-nitrogen bonds				
oxygen. (A) have great B) have a great C) have a hi	in the same column of the periodic table as oxyg Compared to water molecules, how will the H ₂ S rater cohesion to other H ₂ S molecules reater tendency to form hydrogen bonds with each of gher capacity to absorb heat for the same change in alle to form hydrogen bonds with each other	other	ss electronega nave?	tive t	han
4 Which of	f the following identifies the chemical relationshi	ip between gl	ucose and fru	ctoses	•
A) They are					
B) They are enantiomers.					
C) They are	C) They are cis-trans isomers.				
	structural isomers.				
5. During a	12-hour fast in a human, the first macromolecu	le to get dep	leted is typical	ly	
A) glucose					
B) protein			1,9		
C) glycogen					
D) starch					
6. Zinc is a	n essential trace element for most organisms. Zi carboxypeptidase where it most likely functions	nc is require in which of t	d in the active he following w	site o ays?	f the
A) as a noncompetitive inhibitor of the enzyme					
B) as an allosteric activator of the enzyme					
C) as a cofactor necessary for enzyme activity					
D) as a coe	nzyme derived from a vitamin				
structur	r is involved in the detoxification of many poisones is abundant in liver cells and primarily respo	ns and drugs nsible for de	. Which of the toxification pr	follo ocess	wing es?
A) rough en	ndoplasmic reticulum				
B) smooth	B) smooth endoplasmic reticulum C) Golgi apparatus				
C) Golgi aj					

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membran	ells, there are many different ion electrochemica e even though there are usually only one or two e. The gradients of the other ions are most likely	types of prote	on pumps present:	in the		
A) co-transpo B) ion channe	ort proteins els					
	ne plasma membrane ffusion across the plasma membrane					
	the following responses is stimulated by cell sign of mating complexes on of bacteria	aling the for	mation of biofilms	?		
C) secretion	of substances that inhibit the growth of foreign bac of quorum sensing	teria				
1		of the CO ₂ re	leased by the comp	olete		
1 '	of pyruvate to acetyl-CoA					
11. Carotene human n serve in	oids are often found in foods that are considered autrition. Which of the following statements best plants?	to have anti- describes a	oxidant properties related function th	in ey		
A) They serv B) They prot C) They shie	re as accessory pigments to increase light absorption ect against oxidative damage from excessive light of the sensitive chromosomes of the plant from har ect orange light and enhance red light absorption by	energy. mful ultraviol	et radiation.			
A) are unable B) are arreste C) continue t	erence between cancer cells and normal cells is to synthesize DNA ed at the S phase of the cell cycle to divide even when they are tightly packed together notion properly because they are affected by density	er				
A) sister chro B) DNA repl C) the daugh	omatids separate during anaphase licates before the division ter cells are diploid ous chromosomes synapse					

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14. Glucose-6-phosphate dehydrogenase deficiency (G6PD) is inherited as an X-linked recessive allele in humans. A woman whose father had G6PD is planning a family with a man who has no history of the disease. What proportion of their sons are expected to have the disease?					
A) 100% B) 1/4 C) 1/2					
D) 0					
15. DNA strands are antiparallel. Which of the following statements defines "antiparallel"? A) The double helix structure of DNA creates nonparallel strands. B) A 5' to 3' DNA strand is paired with the 3' to 5' DNA strand.					
C) Hydrogen bonds between base pairs cause DNA strands to cross. D) One DNA strand contains bases that complement the bases in the opposite strand.					
16. Transcription in eukaryotes requires which of the following molecules in addition to RNA polymerase?					
A) anticodor	as				
B) ribosomes C) transcript					
1 /	el-tRNA synthetase				
	cells differ from nerve cells mainly because they	·			
	A) express different genes B) contain different genes				
C) use differ	C) use different genetic codes				
	que ribosomes				
18. When attempting to introduce a particular fragment of DNA into the genome of an animal cell which of the following methods would be most successful? A) CRISPR/Cas9 recombination					
B) in vitro h	ybridization of the DNA with the cell's genome				
C) infecting the mouse cell with a Ti plasmid					
D) RNA-seq	D) RNA-seq followed by genetic profiling				
19. Bioinformatics includes all of the following except					
A) using computer programs to align DNA sequences B) using mathematical tools to make sense of biological systems					
C) developing computer-based tools for genome analysis					
D) using DN	NA technology to combine DNA from two different	t sources in a	test tube		
20. Darwin used the phrase "descent with modification" to explain which of the following ideas? A) descent of all organisms from a single, ancient ancestor B) the unity of life					
C) the diversity of life D) both the unity and diversity of life					
boin the	unity and diversity of the				

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21. Based on	the tree below, which statement is correct?				
	Salamander				
	Lizard				
	Goat				
	Human				
A) Lizards a	nd goats form a sister group.	المسمدة مسطا			
B) Salamand	lers are a sister group to the group containing lizarders are more closely related to lizards than to huma	is, goais, and i	lumans.		
D) Goats and	I humans are the only sister group shown in this tree	e.			
 22. One population of a species has 25 individuals, all with genotype AA; a second population of this species has 40 individuals, all with genotype aa. Assume that these populations live far apart but in similar environmental conditions. Based on this information, the observed genetic variation most likely resulted from A) genetic drift 					
B) gene flow C) nonrando					
D) directiona					
23. Which o when ap A) geograph B) niche diff C) gene flow	Perences	or determinii	ng species boundaries		
	D) morphological similarity				
24. The half	F-life of carbon-14 is about 5,730 years. A fossil ton-14 to carbon-12 should be about how many ye		of the normal proportion		
A) It uses vis B) It convert C) It translat	the function of reverse transcriptase in retrovir ral RNA as a template for DNA synthesis. ts host cell RNA into viral DNA. tes viral RNA into proteins. ral RNA as a template for making more viral RNA				

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- 26. Some bacteria possess antibiotic resistance, as well as the ability to survive through adverse conditions. Where in this type of bacteria is the DNA located?
- A) nucleoid, fimbriae, and plasmids
- B) endospore, fimbriae, and plasmids
- C) fimbriae, nucleoid, and endospore
- D) plasmids, nucleoid, and endospore
- 27. After studying a particular species of protist, you suspect that it has obtained a chloroplast via secondary endosymbiosis. Which of the following information would confirm your hypothesis?
- A) have nuclear and cyanobacterial genes
- B) are exceptionally small
- C) have three or four membranes
- D) have only a single pigment
- 28. What evidence do paleobotanists look for that indicates the movement of plants from water to land?
- A) waxy cuticle to decrease evaporation from leaves
- B) loss of structures that produce spores
- C) sporopollenin to inhibit evaporation from leaves
- D) remnants of chloroplasts from photosynthesizing cells
- 29. Many mammals have skins and mucous membranes that are sensitive to secretions of plants like poison oak. These secondary compounds are primarily adaptations that function in which of the following ways?
- A) to favor pollination
- B) to foster seed dispersal
- C) to decrease competition
- D) to inhibit herbivory
- 30. Fungi produce many compounds that humans use medicinally. Which of the following statements best describes the evolution of these compounds in fungi?
- A) Humans used artificial selection to develop fungi that produced specific compounds.
- B) The presence of compounds in the fungi was accidentally produced and has no function.
- C) The compounds probably provide a benefit to the fungi.
- D) The compounds are produced as a result of sexual reproduction and recombination.
- 31. Which of the following is an advantage of using molecular data rather than morphological data for phylogenetic analysis?
- A) Molecular data can be gathered in the lab, while morphological data must be gathered in the field.
- B) Molecular data is based on genetic relationships rather than morphological similarities.
- C) Morphological changes usually do not result from molecular changes.
- D) Some phyla vary too widely in morphological characteristics to be classified accurately.

類組代碼 A04.B04.C07.C08.D06 普通生物學 科目名稱 科目碼 A0401 ※本項考試依簡章規定所有考科均「不可」使用計算機。 本科試題共計 6/8 32. Our understanding of many of the evolutionary relationships among animals changed after those phylogenies were based on morphological and molecular data (as opposed to only using morphological data). What do these changes indicate? A) molecular and morphological studies rarely agree B) molecular studies add additional information to morphological studies and improve our understanding of evolutionary history C) molecular studies are less reliable than morphological studies D) molecular studies are extremely time consuming and expensive and really don't add additional information to our understanding of evolutionary history 33. Primate evolution and behavior, such as hunting skills, have been directed in part by the development of depth perception. What anatomical change made depth perception possible? A) a smaller brain B) the development of compound eyes C) location of the eyes at the front of the head D) diurnal activity 34. The biological molecule specific to woody sclerenchyma cells is A) cellulose B) starch C) lignin D) chlorophyll 35. A plant developed a mineral deficiency after being treated with a fungicide. What is the most probable cause of the deficiency? A) Mineral receptor proteins in the plant membrane were not functioning. B) The genes for the synthesis of transport proteins were destroyed. C) Active transport of minerals was inhibited. D) Mycorrhizal fungi were killed. 36. Which answer best describes how roots acidify the soil solution? A) Roots release CO_2 and pump K^+ into the soil. B) Roots release CO₂ and pump H⁺ into the soil. C) Roots release NaCl and pump Na⁺ into the soil. D) Roots release NaCl and pump Cl⁻ into the soil. 37. The part of a flower that can develop into the pulp of a fleshy fruit is A) stigma B) style C) ovule D) ovary 38. The primary sites of auxin (IAA) production in plants are _____. A) shoot apical meristem and young leaves B) roots C) seeds D) ripening fruits

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39. The hypothat trigg ACTH trigglands. It happen was A) CRH and B) CRH level C) CRH level D) CRH and 1	thalamus in the brain releases the hormone corgers the release of adrenocorticotropic hormone avels through the blood to cause the release of a cortisol acts with negative feedback on CRH at when cortisol is released? ACTH levels will decrease is will increase, but ACTH levels will decrease is will decrease, but ACTH levels will increase is will decrease, but ACTH levels will increase in action action of prostaglandins is derived from the correct of the cor	ticotropin-re (ACTH) from cortisol from nd ACTH, w	leasing hormone (CRH) m the pituitary gland. the cortex of the adrenal
D) amino acid 41. It is important the fetus is	ortant for pregnant women to consume folic acies not able to acquire oxygen by breathing on its ow	d supplement vn	ts because
C) folic acid D) folic acid	tores folic acid in high quantities deprivation is associated with neural tube defects i deprivation is a cause of heart abnormalities in a n	ewborn	
was decr CO ₂ + H ₂ A) the amour B) the bicarb C) the amour	the following reaction. Which of the following eased? ${}_{2}O \Leftrightarrow H_{2}CO_{3} \Leftrightarrow HCO_{3}^{-} + H^{+}$ at of carbon dioxide would increase onate concentration in the blood would increase at of oxygen in the blood will decrease at of protons in the blood will increase	would happe	n if the pH of the blood
A) starch and B) triglycerid C) proteins a:	ls, the catabolism of which molecules contributous wastes? I cellulose les and steroids and nucleic acids pids and glycolipids	es most to the	e production of
A) have alter B) have plast C) are unicel		ilgae	•

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- 45. Retinoic acid, a metabolite of vitamin A, plays a key role in vertebrate development, differentiation, and organogenesis. Retinoic acid normally binds to the RAR receptor to initiate changes in gene expression. Researchers have determined that one type of RAR receptor is found at high levels in muscles, but is not found at all in neurons. How can you explain these findings?
- A) Muscle cells, but not neurons, contain the gene for the RAR receptor.
- B) The RAR receptor gene is expressed in muscle cells but not neurons.
- C) Neurons can produce retinoic acid, so they do not need RARs for development.
- D) RAR transcripts are hydrolyzed by lysosomes in neurons but not in muscle cells.
- 46. Vertebrate immune cells, which are phagocytic, include which of the following?

 I) neutrophils; II) macrophages; III) dendritic cells; IV) natural killer cells
- A) I and III only
- B) II and IV only
- C) I and IV only
- D) I, II, and III
- 47. Stem cell transplants may someday be used to treat Parkinson's disease. How could stem cell transplants alleviate the symptoms of Parkinson's disease?
- A) by preventing temporal lobe seizures
- B) by repairing sites of traumatic brain injury
- C) by replenishing missing ion channels
- D) by secreting the neurotransmitter dopamine
- 48. Most of the ATP supplies for a skeletal muscle undergoing prolonged exercise come from
- A) glucose metabolized by aerobic respiration
- B) glycolysis
- C) tropomyosin binding to calcium
- D) the transfer of a phosphate group from creatine phosphate
- 49. Coral reefs occur on the southeast coast of the United States, near Florida, but not at similar latitudes on the southwest coast near Los Angeles. Differences in which of the following most likely account for this?
- A) air temperatures driven by precipitation
- B) day length
- C) water temperatures driven by ocean currents
- D) marine salinity differences
- 50. The feeding relationships among the species in a community determine the community's
- A) secondary succession
- B) ecological niche
- C) species richness
- D) trophic structure