UNIVERSITY OF TEXAS AT ARLINGTON

DEPARTMENT OF BIOLOGY

HUMAN PHYSIOLOGY (Biol 3345)

Dr. David G. Bernard

THIRD INTRASESSIONAL EXAMINATION

April 19, 2007

4

First Name SMITA Last Name: SHARMA UTAID# 1000389323

There are 50 items in this booklet; 45 are multiple choice questions and the remainder are either short essay questions or diagrams to be labeled. Be careful not to overlook any pages in the examination booklet. You have 80 minutes to complete these questions.

During the course of the examination students will remain in their assigned seats. If assistance is needed, the student should raise his/her hand and a proctor will attend the individual needs of that student.

Upon completion of the exam, each student is to remain seated, raise her/his hand, and the exam materials will be collected by a proctor. At no time is the student to leave his/her seat and carry the exam materials to the proctors or other areas of the room.

After collection of exam materials, the student is to immediately, quietly, and promptly leave the Examination Room.

NO EXTRA TIME WILL BE ALLOWED AT THE END OF THE EXAMINING PERIOD FOR ANSWERS TO BE TRANSFERRED.



DIRECTIONS:

Each of the numbered items or incomplete statements in this section is followed by answers or completions of the statement. Select the ONE lettered answer or completion that is BEST in each case and write your selection in the left margin beside the question. Each multiple choice question is worth 2 points.

1.	The ciliary muscle helps to:
	A. control the amount of light reaching the retina
	B control the shape of the lens C control the production of aqueous humor
	C. control the production of aqueous humor
	D. move the eyeball
	E. None of the above is correct.
2.	The vitreous chamber of the eye:
	A. contains the lens
	B helps to stabilize it and gives physical support to the retina is located between the lens and the iris
	D. contains blood vessels that nourish the retina.
	E. All of the above
3.	Which of the following is NOT a function of smooth muscle tissue?
	A. altering the diameter of the respiratory passageways
	B. elevating hairs on the arm
	(C.) forcing blood from the heart into the major arteries
	D. moving food materials along the digestive tract
	E. forcing urine out of the urinary tract
4.	The lacrimal apparatus:
	A. is a system of glands and ducts
	B. keeps the cornea moist with continuous tear flow
	C. is innervated by sympathetic neurons from cranial nerve VII
	D A and B
	E. All of the above are correct.
5.	Information about sound must through each of these areas of the brain. Put them in the correct order.
	1. thalamus 2. medulla 3. auditory cortex of cerebrum 4. midbrain
	A. 1, 2, 3, 4 B. 2, 1, 4, 3
	D. 3, 2, 1, 4 E. 3, 4, 1, 2
6.	Tonic receptors:
	A. are slowly adapting receptors V
	B. fire rapidly when first activated, then slow and stop firing even with a continuing stimulus X
	C. are activated by parameters that must be continuously monitored by the body.
	D. are proprioreceptors, for example (E) A, C, and D
	(E) A, C, and D
7.	During the cardiac cycle,
	\triangle . the p wave of the ECG occurs between the first and second heart sounds \checkmark
	B the QRS complex of the EKG precedes the increase in ventricular pressure
	C. the third heart sound occurs during atrial systole
	D. the second heart sound coincides with the QRS complex of the ECG
	E. the greatest increase in ventricular pressure occurs during the ejection phase
8.	Vibrations received the ear are amplified by the action of the:
	A. cochlea (B.) bones of the middle ear (C.) oval window
	D. round window E. tympanic membrane

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9.	The	purpose of transverse tubules is					
	A.	ensure a supply of Ca2+ ion	s through	the mus	cle fiber		
	(B)	rapidly conduct the action	otentials	to the in	terior of the muscle	fiber	
	C.	ensure a supply of glycoger	through	out the n	nuscle sarcoplasm		
	D.	conduct the ATP molecules				he sarcoplasm	1
	E.	All of these statements are			8	--	i.
	_						
10.		ardiac muscle:					
15	Α.	calcium ions are not release					
	В.	calcium ions do not bind to					
	C.	calcium ions play no role in	the proc	ess of co	ntraction		
	\bigcirc	some of the calcium ion req	uired for	contract	ion comes from out:	side of the cel	1,
	E.	calcium ion plays an import	ant role i	in repolar	izing the membrane	e after the dep	olarization phase
7.1	In ai	raulatina fuare tha busin to the		C1-1-	- J 11 N/O///1		. 1 . 1 . 1 . 0 . 1
11.		rculating from the brain to the a	ırın, a arc	op 01 0100	od would <u>IVOI</u> have	to pass throu	gh which of the
		wing structures?	ъ				
	A.	left atrium	В.	aorta		(C.)	inferior vena cav
	D.	pulmonary vein	E.	super	rior vena cava		
10	fm -						
12.		I band contains:					
	A.	thick filaments		(B)	thin filaments		
	C.	an area of overlapping filam		D.	All of the above	are correct.	7
	E.	None of the above is correct				1,7	
							Marie Marie Company . I was to make the same
13.		plateau phase of the cardiac mu					for
	A.	the movement of fewer sodi	um ions a	across the	e cell membrane		
	(B)	the calcium channels remain	ing open	longer tl	nan the sodium char	nnels	
	C.	the increased membrane pen	meability	to potas	sium	•	
	D.	a decrease in the amount of	calcium o	diffusing	across the membrar	ne	
	E.	an increased membrane pem					
14.	Co2÷ :		C .1	1	3771 1 67 611		
14.		s important in the contraction of	or smooth	i muscie.	which of the follo	owing is NO1	true about smooth
		le contraction?					
	. (A.	Ca ²⁺ enters the cytosol from	the sarco	plasmic i	reticulum.		
	B.	Ca ²⁺ binds to calmodulin.			,		
	(C.)	Contraction is immediately t					
	D	MLCK (myosin light chain k					
	E.	When MLCK activates myos	sin, ATPa	ase activi	ty is high and cross	bridge format	ion is active.\
15.	An in	portant difference between sin	ole-unit s	and multi	unit smooth muscle	is:	
	Α.	the ability of single-unit fiber					າາຕ
	В.	longer actin and myosin filar					
	<i>D</i> .	contraction	nemes m i	Humungg	Simoum muscie, wi	iteli aliow coo	Tullation of
	$\langle C \rangle$		1	1	1 ' 1 11	11 /1.	
	(C.)	numerous gap junctions in si	ngie-unit	muscle,	which allow many (cells to work t	ogether as a sheet
	D.	closely controlled individual	fibers in	single-ui	nit smooth muscle to	o allow fine c	ontrol and graded
		contractions by selective acti		<i>G</i>			J. 1
	E.	All of the above are correct.					
1.6	The .	valalan anno t- t1					
16.		ssicles connect the:					
	A.	cochlea to the oval window	1 ,	1			
	В.	tympanic membrane to the ro		IOW			
	C.	oval window to the round win					
	D. (E)	cochlea to the tympanic mem		•			
	作上!	tympanic membrane to the ov	al windo	w			

1 /.	A viral infection involving the v A. loss of hearing D. local paralysis	B. E.	loss of sight high blood pressure	(c.)	a sense of dizziness
18.	The structure that separates the			he:	5-
	A. tectorial membraneC. membranous labyrinthE. stapedius		B basilar membrar D. bony labyrinth		
19.	During the isovolumic phase of A. the atria contract the atrioventricular valv blood is ejected into the D. the ventricles are relaxin E. the ventricles are filling	es and semiluna great vessels			
<i>2</i> 0.	The loudness or intensity of a so amplitude D. decibels	und wave is rela B. E.	nted to its: frequency pitch	C.	duration
21.	Which description is NOT corred. A. skeletal muscle – controd. B. cardiac muscle – classification of the cardiac muscle – found of the cardiac muscle – always. E. smooth muscle – the prince.	Is voluntary bod ed as striated m DNLY in the hea attached to bon	y movements / uscle / art / es /		
22.	As ATP binds to the myosin head the myosin head detache B. the myosin head initiates C. the myosin head tightens D. ATP does not bind to the E. None of these complete to	s from actin binding with ac its bond to acti myosin head	etin n	a cycle,	
23.	The first heart sound is heard wh A. the AV valves open C. the semilunar valves clos E. blood enters the aorta	C	the AV valves cl D. the atria contract		
24.	Which event happens at the start A. Blood is ejected from the B. The SA node fires. C. Ventricular systole occur The P wave develops. E. Atrial systole occurs.	atrium.	le?		
25.	If the EDV is 140 mL, which other A. The ESV could be 70 mL B. The ESV could be 190 m C. The ESV could be 50 mL D. A and B A and C	and the SV cou L and the SV, co	ld be 70 mL.	lthy, normal p	erson?

26.	A. B. (C.) D. E.	these phases of the cardiac cycle 1. opening of the semilunary 2. isovolumetric contraction 3. atrial systole begins 4. closure of the AV valves 5. ventricular filling is comp 6. ventricular systole begins 7. ventricular relaxation 8. ventricular ejection 4, 5, 1, 2, 7, 8, 3, 6 3, 2, 6, 1, 4, 5, 8, 7 3, 5, 6, 4, 2, 1, 8, 7 3, 5, 6, 1, 8, 4, 2, 7 3, 2, 6, 4, 5, 8, 7, 1	valves	3,2,6,4,5,7	, 1		
27.	The i	ntensity of a stimulus can be dete	ermined	hv.			
	Α.	population coding	B.)	labeled line coding	C.	freat	ency coding
	(D)	A and C	E.	All of the above.		1	
28.	Excit A. B. C. D. E.	ation-contraction coupling refers the arrival of acetylcholine at acetylcholine opening ion cha the chemical and electrical ev the enzymatic removal of acet B and D	the neur nnels ents that	omuscular junction due to i	nts in a musc	ele fiber	
29.	Which A B C C D E	n of the following are involved d superior vena cava, right atriu- right ventricle, pulmonary arter left ventricle, pulmonary arter right atrium, right ventricle, ar inferior vena cava, pulmonary	m, and lery, and in y, and in ad left ve	eft ventricle. left atrium. ıferior vena cava entricle	70.A	1.	A
30.	The th	ick, gel-like fluid that helps sup	ort the	structure of the eveball is th	ne:		
	(A)	vitreous humor	В.	aqueous humor		C.	ora serrata
	Ď.	perilymph	E.	ortholymph			
31.	At the A. B. C. D. E.	conclusion of the power stroke, inorganic phosphate has been actin has been moved toward to ADP is released from the myosthe myosin head is tightly bour All of the above are correct.	he M lin sin head	ie /			
32.	Displa	cement of stereocilia toward the	kinocili	um of a hair cell:			
		produces a depolarization of th					
	(A) B.	produces a hyperpolarization o					
	C.	decreases the membrane perme					
	D.	increases the membrane perme					
	E.	does not affect the transmembra	ane pote	ential of the cell			
33.	The rec	ceptors in the inner ear are the:					
•	A.	utricles	В.	saccules		(C.)	hair cells
	D.	supporting cells	È.	ampullae			

34.	Tran	isduction involves							
	A.	a stimulus altering the pe	rmeability o	f a recep	tor membrar	ie			
	B.	changes in the transmeml							
	C.	production of a receptor	ootential		-	•			
	D.	generation of an action pe	otential that	can be p	rocessed and	l interpreted	by the	CNS	
	Œ.	All of the above				•	•	~	
35.	The	two point discrimination to at							
55.	A.	two-point discrimination test is used to determine clari							
	В.				_				
	<u>(C)</u>	provides information abo			o i				
	D.	provides a detailed map for is used to test for hearing		ceptors					
	E.	monitors the activity of ta							
	±5.	monitors the activity of ta	ste buas						
36.		ch of the following statement							
	Α.	Titin returns stretched mu	scle to their	resting l	ength.				
	В.	Titin stabilizes the positio	n of the con	tractile f	ilaments.				
	C.	Titin is helped by actin.							
	(D)	A and B are correct.							
	E.	All of the above are correct	ct. ·						
37.	The f	lattening of the action potent	ials of myoc	ardial co	ontractile cel	ls, called th	e platea	υ phase, is due	to a
		ination of K ⁺ permeab					F	, ,	
	A.	increasing, increasing	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	<u>В</u> .		g, decreasin	g	•	
	C.	increasing, decreasing		(D.)	_	g, increasing	_		
	E	cannot be determined							
38.	Facto	ain, usually described as sha	m and local	igad is a	arriad by	18		1	
50.	A.	large, unmyelinated C fibe		1260, 18 0	arried by:	<i>1</i> }.		1	
	(B)	small, myelinated A-delta				<i>:</i>			
	(B). C.	small, unmyelinated C fibe							
	D.	large myelinated A-beta fil				<i>j</i>			
	E.	None of the above.		•		V		•	
2.0	a 3	1.0.3							
39.		ıl fatigue							
		include feeling tired	1 0 1						
	В.	may precede physiological			,			•	
		may be related to changes i	n the brain	related to	changes in	the pH of t	he blood	1	
	E.	A and B A, B and C							
	E.	A, B and C			, I so call of principals ()				
40.	Sensat	ions of gravity and linear acc	eleration ar	e registe	red in the:		\sim		
	Α.	semicircular canals	В.	cochle	1		(C.)	saccule and	utricl
	D.	ossicles	E.	organ (of Corti				
11.	The	of a sensory receptor may	be irregula	r in shap	e and overla	p with thos	e of nei	ghboring recep	tors.
	The siz	e of this area determines the	sensitivity 1	to a stim	alus.	1	•	5 5 1	
	A.	discriminatory area	B.	spatial	field		C.	somatic esth	etic
	(D.)	receptive field	E	None o	f the above				
2.	The for	ce generated by a single mus	scle fiber				,		
	Α.	is always the same							
	B	can be increased by increasi	ng the frea	iency of	action poter	ıtials			
	C.	can be increased due to sum							
	(D)	B and C			E.	All of	the abo	ve are correct	
	\sim								

43. Which statement best describes arteries? A. All carry oxygenated blood to the heart. All contain valves to prevent the back-flow of blood. All carry blood away from the heart. Only large arteries are lined with endothelium. All are larger than veins. 44. What structures monitor vertical movements? cristae and the semicircular canals 7B) maculae of the saccule Ć. maculae of the utricle B and C D. E. All of the above 45. Light passes through the following structures in which order? vitreous humor, cornea, lens, aqueous humor ~B) cornea, aqueous humor, lens, vitreous humor C. cornea, vitreous humor, lens, aqueous humor D. aqueous humor, cornea, lens, vitreous humor E. vitreous humor, lens, aqueous humor, cornea **Short Answer Questions** Please answer these questions briefly. Label diagrams correctly, with lines pointing to the proper structures. Partial credit will be given where appropriate. Write legibly!! You can use the back of the last page to continue any question. Number them, please!! 46. Trace the path of light from the time it is converted to an action potential until it is perceived. (5 points) OPTIC Chausin -visual cootex optic (besieved in theil) thalanus (contraction of Discuss pain modulation as it relates to the gate control theory. (5 points) Mon-painful stimulus like touch increase the inhibition reusion in spiral cord by which the sensory reusion from painful stimulus is modulated and there is decrement in pain in the brain B, inhi Lidory thalanus due to pain modulation stimulle Painful

Spiral cord

* (A-B fibre & C-fibre & interneuron) Fig[10-12]

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40. Debottoe the different syptem of the control of
1) Resipiratory - in air passages 2) Urinary - in wroter, wrinary bladder
a Orinary - un wroter, wrinary bladder
J) @ Vascular
Beproductory in reproductive parts
3 Ocular - in eyes
(E) Grastrointestinal
49. A certain drug is known to block monovalent cation channels. This drug is used as a "muscle relaxer." Would it affect both smooth and skeletal muscle, or only skeletal muscles? Defend your answer. (5 points) The affects only Skeletal Muscles Because Skeletal Muscle uses Morovalent cation i.e. Not in depolariting
the action of a which have the second of the
The action potential which helps in the Influx of cart
Dy opening ca2+ channel while contraction but its opposite in relaxation - ca2+ channel is closed, Nat
/ opposite un relaxation - cart charriel us closed, Nat
charrel is blocked.
Smooth muscle doesnot use monovalent cation for
Ca2+ entry to ECF in relaxation.
THORMAN , nouroharmane - smooth murcle!
Please answer only ONE of the following (A OR B). Circle the one you are
answering (5 noints)
A. Your physiology professor has 5 liters of blood distributed between his pulmonary and systemic circuits. Assume 20% of the blood is in his lungs at any moment. If his cardiac output is 5 L/min,
how long will it take a drop of blood to flow from his right ventricle to his left ventricle? Show your
calculations for full points.
OR 3
B. Explain how Ca ²⁺ levels inside myocardial cells are altered. (Fig (4-11).
A coordiac output = 5 L/ rien.
blood in lungs = 20% of 51
= 20 x x = 1 L Finin - 5 L
Remaining = 9L
C.O = Strove Volume x Heast rate (5x 60) See = 1230
Heastrate = C.O = SL/Nins Stroke volume 4L
Heart rate = C.O = \$L/Nus
Stroke vollence
= 5/nin = 1.25/nin
T1 1125 - Incin
Ti 1/125 - [Nuis]
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Describe the different types of smooth muscle. (5 points)

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DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or completions of the statement. Select the ONE lettered answer or completion that is BEST in each case and write your selection in the left margin beside the question. Each multiple choice question is worth 2 points. 1. The lacrimal apparatus: is a system of glands and ducts → B. keeps the cornea moist with continuous tear flow is innervated by sympathetic neurons from cranial nerve VII A and B All of the above are correct. 2. The flattening of the action potentials of myocardial contractile cells, called the plateau phase, is due to a combination of K- permeability and hat Ca2- permeability. increasing, increasing decreasing, decreasing increasing, decreasing decreasing, increasing E. cannot be determined 3. What structures monitor vertical movements? cristae and the semicircular canals maculae of the saccule C. maculae of the utricle D B and C E. All of the above 4. Which of the following is NOT a function of smooth muscle tissue? altering the diameter of the respiratory passageways A. В. elevating hairs on the arm Ĉ. forcing blood from the heart into the major arteries D. moving food materials along the digestive tract E. forcing urine out of the urinary tract 5. The force generated by a single muscle fiber: is always the same can be increased by increasing the frequency of action potentials can be increased due to summation B and C All of the above are correct During the isovolumic phase of ventricular systole, contraction the atria contract The atrioventricular valves and semilunar valves are closed blood is ejected into the great vessels D. the ventricles are relaxing ar Birm the ventricles are filling with blood

7. Ca²⁻ is important in the contraction of smooth muscle. Which of the following is **NOT** true about smooth muscle contraction?

A. Ca²⁺ enters the cytosol from the sarcoplasmic reticulum.

Ca²⁺ binds to calmodulin.

C.

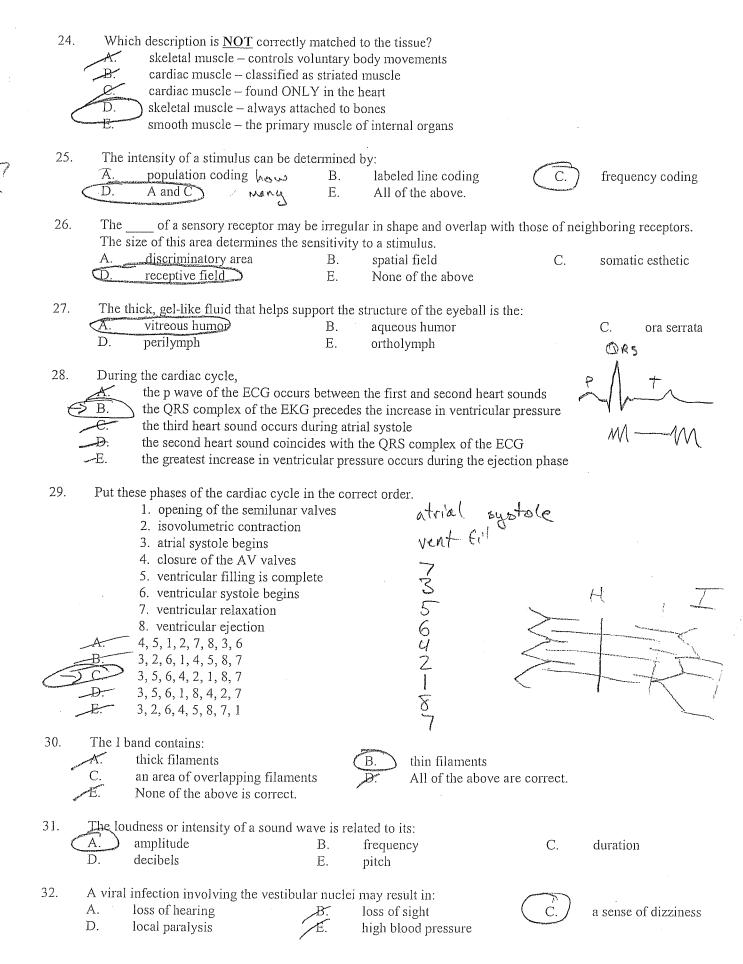
Contraction is immediately triggered by calmodulin binding.

D. MLCK (myosin light chain kinase) forms a complex to activate myosin.

E. When MLCK activates myosin, ATPase activity is high and crossbridge formation is active.

8.	Disp A. B. C. D. E.	placement of stereocilia toward the produces a depolarization of the produces a hyperpolarization of decreases the membrane permeter increases the membrane permeter does not affect the transmembrane	ne member the meability cability	brane embrane to sodium ions to potassium ions		
9.	Excir A. B. C. D. E.	tation-contraction coupling refers the arrival of acetylcholine at t acetylcholine opening ion char the chemical and electrical eve the enzymatic removal of acety B and D	he neur mels nts that	omuscular junction due trigger the mechanical	events in a musc	le fiber
10.	Centry → A. → B. C. D. E.	ral fatigue include feeling tired may precede physiological mus may be related to changes in th A and B A, B and C	scle fati e brain	gue related to changes in th	e pH of the blood	d
11.	Which A. B. C. D. E.	ch statement best describes arteries All carry oxygenated blood to t All contain valves to prevent th All carry blood away from the l Only large arteries are lined wit All are larger than veins.	he hear e back- neart.	flow of blood.		
12.	The property A. B. C. D. E.	conduct the ATP molecules out the All of these statements are true.	ntials to oughout	e muscle fiber S/S the interior of the musc t the muscle sarcoplasm	l.	
13.	The pl B. C. D.	lateau phase of the cardiac muscle the movement of fewer sodium the calcium channels remaining the increased membrane permea a decrease in the amount of calc an increased membrane permeal	ions acr open lo bility to ium dif	oss the cell membrane onger than the sodium of potassium fusing across the memb	- 1	
14.	Fast pa A. B. C. D. E.	ain, usually described as sharp and large, unmyelinated C fibers small, myelinated A-delta fibers small, unmyelinated C fibers large myelinated A-beta fibers None of the above.	l localiz	zed, is carried by:	#O	
15.	Sensati A. D.		tion are B. E.	registered in the: cochlea organ of Corti	(C.)	saccule and utricle

16.	As A	ATP binds to the myosin head a	t the begi	inning of a mu	scle contrac	tion cycle,		
	(A.) the myosin head detaches fi	om actin	1				
	B.	the myosin head initiates bi	nding wi	th actin				
	C.	the myosin head tightens its	bond to	actin				
	D.	ATP does not bind to the m						
	E.	None of these complete the						
		1						
.17.	Tran	sduction involves						
	A.	a stimulus altering the perm	eability (of a receptor n	nembrane			
-	→> B.	changes in the transmembra	-	•		r		
·	→ C.	production of a receptor pot						
د	→ D.	generation of an action pote		can be proces	sed and inte	emreted by	the CNS	
	E.	All of the above		. com de proces	ood alla illic	Aprotod by	1110 01 12	
		The state of the s						
18.	The c	iliary muscle helps to:						
	-A.	control the amount of light r	eaching	the retina				
<i>(</i>	5 B.)	control the shape of the lens						
`	C.	control the production of aqu	ueous hu	mor				
	D.	move the eyeball						
	E.	None of the above is correct.						
								ŕ
19.	Whie	of the following are involved	directly	in the systemi	c circulation	ı?		
للمستسمح	'A.'	superior vena cava, right atri	um, and	left ventricle.	mak.			/
_	B.	right ventricle, pulmonary ar					LV -	> A-onta
,	e.	left ventricle, pulmonary arte			ava			· ·
	D.	right atrium, right ventricle,						8
	B. e. D. E.	inferior vena cava, pulmonar			TV .		۸ دست	200
		, F			-)		KA	> Aorta Bod Vera C.
20.	The os	ssicles connect the:	1	3 Doves				· croj c.
	A.	cochlea to the oval window	1	/d. C.J				
	B.	tympanic membrane to the ro	und win	dow			Λ <i>I</i>	
	C.	oval window to the round win		4077	lymp	\rightarrow	Oval	
	D.	cochlea to the tympanic mem			0 '			
	Œ.	tympanic membrane to the ov	AND DESCRIPTION OF THE PARTY OF	ow 7				
			more of the same of					
21.	The re-	ceptors in the inner ear are the:						
	A.	utricles	B.	saccules			$\left(C_{i}^{c}\right)$	hair cells
	D.	supporting cells	E.	ampullae			The second second	11011
					····, equinos		PROPERTY I	
22.	Tonic 1	receptors:		•	j			
4	A.	are slowly adapting receptors						
	B.	fire rapidly when first activate	ed, then s	slow and stop	firing even y	with a cont	inning stimul	115
	₹ C.	are activated by parameters th						
	D	are proprioreceptors, for exam			, , ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	. 0) 1110 00	۵	
	E.	A, C, and D	17520					
`		The state of the s						
23.	If the E	DV is 140 mL, which other val	ues are i	most likely to	occur in a b	ealthy nor	mal person?	
	A.	The ESV could be 70 mL and						
_	B.	The ESV could be 190 mL and				<\/>/ "	- MC 1311 -	FKI
	C.	The ESV could be 50 mL and				00	down Ku. A	<u> </u>
	D	A and B		odia oo oo mi	J	\ ~~		
	The state of the same	A and C				70 =	140 -	フィ
						0 >		لحسيا م



				A.	at 1'm	5 +14	-K. W.	Lose
33.	A. Titin returns stretched muse	cle to thei	ir resting l		<		Control of the Contro	Contractor, management of the tenter
	→ B. Titin stabilizes the position	of the co	ntractile fi	laments.		\rangle		(
	C. Titin is helped by actin. D. A and B are correct.				(\	(
	E. All of the above are correct				_	7	1	
34.	Which event happens at the start of		cycle?				ł	
	A. Blood is ejected from the at The SA node fires.	rium.						
	C. Ventricular systole occurs.							
	D. The P wave develops.							
	Atrial systole occurs.							
35.	In circulating from the brain to the a following structures?	ım, a dro	p of blood	would <u>NOT</u>	have to	pass throu	gh which	of the
	A. left atrium	B.	aorta			(C.)	inferior	vena cava
	D. pulmonary vein	E.	superio	or vena cava				. • •
36.	The structure that separates the coch	lear duct	from the t	ympanic duc	ct is the:		V	
	A. tectorial membrane	(CB.	basilar mer	nbrane		\subset	,
	C. membranous labyrinth E. stapedius		D.	bony labyr	inth	Arriv	T	
37.	The first heart sound is heard when:		-		-		·	
	A. the AV valves openC. the semilunar valves close	(В. D.	the AV value the atria co	PROGRAMO PROGRAM - TOTAL)		
	E. blood enters the aorta		D.	the atria co.	шиась	_		
38.	In cardiac muscle:							
<i>J</i> 0.	calcium ions are not released	from the	sarconlas	mic reticulu	m			
مام سر	B. calcium ions do not bind to tr	oponin m	nolecules					
2	calcium ions play no role in t	he proces	s of contra		·	State South of the		
	D. some of the calcium ion requirements of the calcium ion plays an important	ired for control	ontraction repolarizi	comes from ng the memb	outside orane afte	of the cell r the depo	larization	phase
9.	Information about sound must through							
	1. thalamus 2. medulla	i cacii oi	3. audit	ory cortex o	n. Fut in f cerebru	m	4. midbi	
,	A. 1, 2, 3, 4 D. 3, 2, 1, 4	В.	2, 1, 4, 3	3	,		2, 4, 1, 3	
/	5, 2, 1, 4	<u> </u>	3, 4, 1, 2)			The same of the sa	
0.	The two-point discrimination test:							
	A. is used to determine clarity of provides information about of							
	B. provides information about of C. provides a detailed map for se							
	D. is used to test for hearing disc.		орсога					
-	E. monitors the activity of taste b	uds		(6)				
1.	The vitreous chamber of the eye:				/			
	A. contains the lens	ਰ 'ਹੜ			.4	Pluid		
	B. helps to stabilize it and gives p	hysical s	upport to	the retina	VIT (Thid		
5	is located between the lens and contains blood vessels that not		etino					
	E. All of the above	mish me r	сина					

	42.	An important difference between single-unit and multiunit smooth muscle is: the ability of single-unit fibers to change into multiunit fibers when advantage	ous.
		B. longer actin and myosin filaments in multiunit smooth muscle, which allow co contraction	ordination of
	e de la composition della comp	C. numerous gap junctions in single-unit muscle, which allow many cells to work	together as a sheet
		closely controlled individual fibers in single-unit smooth muscle to allow fine contractions by selective activation	control and graded
		E. All of the above are correct.	
	43.	Vibrations received the ear are amplified by the action of the:	
		A. cochlea B. bones of the middle ear D. round window E. tympanic membrane	C. oval window
	44.	At the conclusion of the power stroke,	
	in the second se	 A. inorganic phosphate has been released from the myosin B. actin has been moved toward the M line 	Antonia (Blacement)
		> C. ADP is released from the myosin head	
	***	D. the myosin head is tightly bound to actin E. All of the above are correct.	
	كمعر	THE CONTRACTOR OF THE CONTRACT	
	45.	Light passes through the following structures in which order? A. vitreous humor, cornea, lens, aqueous humor	
	Ć	B. cornea, aqueous humor, lens, vitreous humor	
		C. cornea, vitreous humor, lens, aqueous humor	
		aqueous humor, cornea, lens, vitreous humor vitreous humor, lens, aqueous humor cornea	
		vitreous humor, lens, aqueous humor, cornea	90 ,15
			25
		Short Answer Questions	
	Pleas	e answer these questions briefly. Label diagrams correctly, with	lines pointing to
	the p	roper structures. Partial credit will be given where appropriate. In use the back of the last page to continue any question. Number them, please!!	Write legibly!!
A	4 6.	Trace the path of light from the time it is converted to an action potential until it is perc	eived. (5 points)
16) L.	ght becomes on action potential inside the photo	
From the	ere ba		
		an Optic nerve	conus) Geniculate Nucleus
K	e ye	Optic Chiasm -	visual contex (percep
photor	explor	Trial Critique	
1 e	4 C	-> Optic nerve Midbrain	
	O .	> Optic nerve	(perception)
	46/	> Optic nerve / Middlink / Lieft LGN	(perception)
\mathcal{I}	47.	Discuss pain modulation as it relates to the gate control theory. (5 points)	Cperception > Left visual corfer
Inals	47. The	Discuss pain modulation as it relates to the gate control theory. (5 points) The are inhibitory neurous that block the transmission	> Left visual corfer
inals signals	47. The tot	Discuss pain modulation as it relates to the gate control theory. (5 points) re are inhibitory neurons that block the transmission he higher CNS. When a painful stimulus is experienced b via a C fiber to inhibit the inhibitory neurons in the	> Left visual corfer
inals signals	47. The tot	Discuss pain modulation as it relates to the gate control theory. (5 points) re are inhibitory neurons that block the transmission the higher CNS. When a painful stimulus is experienced b via a C fiber to inhibit the inhibitory neurons in the se	> Left visual corfer

48. Describe the different types of smooth muscle. (5 points) Vascular -> found by Blood vessels Constrointestinal & found in GT traction Orchang - Hound in without fract Reproductive > found in female reproductive system

Respiratory > (ung, alreali

Occular > cilliary nucles

A certain drug is known to block monovalent cation channels. This drug is used as a "muscle relaxer."

Would it affect both arresth and dialeted monovalent cation channels. 49. Would it affect both smooth and skeletal muscle, or only skeletal muscles? Defend your answer. (5 points) -Blocking monoudent cotion channels would lead to decreased levels of Nat and Cat in the sarcoplasm. Both skeletal and smooth muscle depend on Catt

for movement (Skeletal -> troponia to stop tropomy osin from blockely

of actin Smooth -> to bind to Call to myosia bindiks sites

and myosin increase PLCK activity and inturn

feats

both skeletal + smooth myosin ATPase. ges it affects Please answer only ONE of the following (A OR B). Circle the one you are 50. answering. (5 points) Your physiology professor has 5 liters of blood distributed between his pulmonary and systemic circuits. Assume 20% of the blood is in his lungs at any moment. If his cardiac output is 5 L/min, how long will it take a drop of blood to flow from his right ventricle to his left ventricle? Show your calculations for full points. Answered on extra sheet OR В. Explain how Ca2- levels inside myocardial cells are altered.

Gate control theory states that these painful signals can be modified by activating AB Eibers in the same topographical area. (For example, subbing your knee after you bong it into a desk). The subbing is transmitted via AB fibers which inturn stimulate the inhibitory neurons in the spinal cord which work to block the nociceptive signal from the injury. The modulation is a graded summation of the activity of the Cfiber and the AB fiber on the inhibitory neuron in the spinal cord.

50 A _)
on reverse

50	A
	Market Sant Street
•	

5 L distributed between

Pulmonary

20%

20% x 52 = (12)

Systemic

80% x 5 L= (4L

Cardiac output = 51/min

Pathway: Right V > Pulmonary Circ >> Left V.

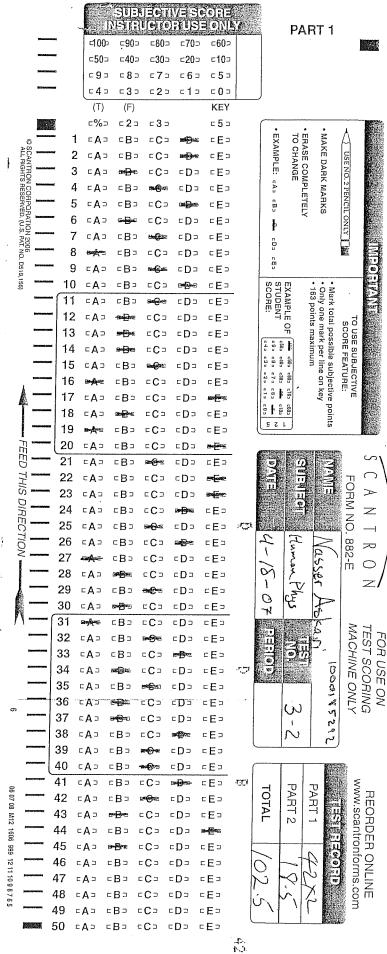
Pulmonario direculation is IL of blood

Cordiac output is 5L/min



IL x Imin =

it takes approx 20 sec for that drop of blood to travel from RV to LV



UNIVERSITY OF TEXAS AT ARLINGTON

DEPARTMENT OF BIOLOGY

HUMAN PHYSIOLOGY (Biol 3345)

Dr. David G. Bernard

THIRD INTRASESSIONAL EXAMINATION

April 17, 2008

2

First Name Nicole	Last Name: Khahbi	UTAD# 1000546162
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There are 60 items in this booklet; 55 are multiple choice questions and the remainder are either short essay questions or diagrams to be labeled. Be careful not to overlook any pages in the examination booklet. You have 80 minutes to complete these questions.

During the course of the examination students will remain in their assigned seats. If assistance is needed, the student should raise his/her hand and a proctor will attend the individual needs of that student.

Upon completion of the exam, each student is to remain seated, raise her/his hand, and the exam materials will be collected by a proctor. At no time is the student to leave his/her seat and carry the exam materials to the proctors or other areas of the room.

After collection of exam materials, the student is to immediately, quietly, and promptly leave the Examination Room.

NO EXTRA TIME WILL BE ALLOWED AT THE END OF THE EXAMINING PERIOD FOR ANSWERS TO BE TRANSFERRED.

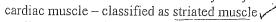


DIRECTIONS:

Each of the numbered items or incomplete statements in this section is followed by answers or completions of the statement. Select the ONE lettered answer or completion that is BEST in each case and write your selection in the left margin beside the question. Each multiple choice question is worth 1.6 points.

- 1. Which statement best describes arteries?
 - All carry oxygenated blood to the heart.
 - All contain valves to prevent the back-flow of blood.
 - All carry blood away from the heart.
 - Only large arteries are lined with endothelium.
 - E. All are larger than veins.
- 2. Which description is correctly matched to the tissue?

skeletal muscle - controls involuntary body movements



cardiac muscle - found ONLY near the heart skeletal muscle – always attached to bones

smooth muscle - the muscle of internal organs ONLY

3. Excitation-contraction coupling refers to

the arrival of acetylcholine at the neuromuscular junction due to its exocytosis from the axon terminal

acetylcholine opening ion channels

- the chemical and electrical events that trigger the mechanical events in a muscle fiber
- the enzymatic removal of acetylcholine from the synapse which can then allow relaxation to occur
- B and D
- 4. Restoring lost fluid from the capillaries back to the circulatory system is one of the major functions of the

Α. urinary

D.

В. thirst quenching digestive

lymphatic

Asynchronous recruitment:

immune

- helps avoid fatigue during sustained muscle contractions
- refers to different motor units taking turns maintaining muscle tension

E.

C. makes an entire muscle seem to contract smoothly

D. A and B

(E) A, B, and C



817-983-9260

- 6. Each of the following statements concerning the movement of fluid between capillaries and interstitial space is true EXCEPT one. Identify the exception.
 - Blood hydraulic pressure forces fluid from the capillary to the interstitial space. Α.
 - В. Blood osmotic pressure moves fluid from the interstitial space to the capillary
 - C. The osmotic pressure of the interstitial fluid is less than the blood osmotic pressure.

① The blood hydraulic pressure and the blood osmotic pressure are equal in magnitude but opposite in action.

- E. The hydraulic pressure of the interstitial fluid does not oppose the movement of fluid from the capillary.
- 7. The depolarization phase of the conducting system muscle action potential is the result of:
 - increased membrane permeability to sodium ions
 - increased membrane permeability to potassium ions increased membrane permeability to calcium ions
 - decreased membrane permeability to sodium ions
 - increased membrane permeability to chloride ions

8.	If the A. B.	EESV is 60 mL, which other va The EDV could be 70 mL a The EDV could be 140 mL The EDV could be 150 mL	nd the SN and the S	V could be 70 SV could be 90	mL.) mL.	, normal j	person?
	D. E.	The EDV could be 120 mL B and D	and the S	SV could be 70	TIMEN ESV :	SV	
9.		etal muscles at rest receive abou	\\$0^		ardiac output. Du	ring exerc	cise, they receive as
	much						•
	(A.)	20%, 85%					
	B.	20%, 20%					
	C. D.	85%, 20% 85%, 85%					
	Б. Е.	none of the above					
_	L.	none of the above					
(0.)		lattening of the action potential ination of K ⁻ permeabili				he platea	u phase, is due to a
	A.	increasing, increasing		APP.	creasing, decreasi	_	7
	C.	increasing, decreasing		(D) de	creasing, increasing	ig)	
	E.	cannot be determined		,			
11.	Contr	actions of the papillary muscles	· .				
11.	A.	close the atrioventricular val				~	
	В.	close the semilunar valves	, 05				
	C.	eject blood from the ventricle	es				
	D E.	prevent the atrioventricular v		om projecting	into the atria		
	Ē.	eject blood from the atria into	o the ven	ntricles			
1.0	0.1.						
12.		nnces transported by the cardiov		•	e:		
	А. В.	nutrients transported to the exmaterials that move from cell					
	C.	waste that the cells eliminate		wittiiii tiie ood	У		
	D.	A and C					
	(E)	B and C					
13.		ulating from the brain to the arring structures?	m, a drop	p of blood wor	ald <u>NOT</u> have to p	ass throu	
	A.	left atrium	В.	aorta		\mathbb{C}	inferior vena cava
	D.	pulmonary vein	E.	superior ve	na cava		
14.		nount of blood flowing to skele nto muscles is accomplished by	y:		ncreased during e	xercise.	This redirection of
		contraction of muscle in the v					
	B.	relaxation of muscle in walls	of arterio	oles			
	C.	opening of valves in veins					
	D.	opening of valves in arteries	11 C	•			
	E.	relaxation of muscle in the wa	alls of ve	eins			
15.	Central	fatigue					
	Α.	include feeling tired					
	В.	may precede physiological mu					
	C.	may be related to changes in the			nges in the pH of	the blood	I
	(D,)	A and B			•		
	E.	A, B and C					

16		the arm, the biceps brachii act as flexor whereas triceps brachii act as extensor. Which of the following tements is true?
	(A)	The biceps brachii would be the primary muscle responsible for movement of the hand and forearm
	В.	towards the shoulder.
	В.	The triceps brachii would be the primary muscle responsible for movement of the hand and forearm towards the shoulder.
	\bigcirc	Theses muscles are an example of antagonistic muscle groups.
	D.	A and C
	E.	B and C
17.	۸ + +	ha conclusion of the normar studies
17.	A	he conclusion of the power stroke: inorganic phosphate has been released from the myosin
	В.	actin has been moved toward the M line
	C.	ADP is released from the myosin head
	D.	the myosin head is tightly bound to actin
	E	All of the above are correct.
(18)	Inm	nuscles used for fine actions, such as controlling eye movement or use of the hand, a motor unit will hav
	. 111 111	muscle fibers when compared to a motor unit in muscles used for power and strength.
	Ā.	hundreds more
	B) C.	very few
		approximately the same numbers of
	D. E.	Any of these answers could be correct, as this is impossible to predict
	E.	None of the above is correct.
(19.)	The	purpose of <u>transverse</u> tubules is to:
	Α.	ensure a supply of Ca ² ions through the muscle fiber
	(B) C.	rapidly conduct the action potentials to the interior of the muscle fiber
		ensure a supply of glycogen throughout the muscle sarcoplasm
	D. E.	conduct the ATP molecules out of the mitochondria throughout the sarcoplasm X All of these statements are true.
	L.	An of these statements are title.
20.	Put th	nese events in the correct chronological sequence.
V		1. end plate potentials trigger action potentials 3
_/\		2. transverse tubules convey potentials into the interior of the cell
	•	 3. acetylcholine binds to receptors on the motor end plate () 4. binding sites on actin are uncovered, allowing myosin to bind and carry out power strokes (7)
		5. Ca ²⁻ is released from the sarcoplasmic reticulum (5)
		6. chemically regulated ion channels open, causing depolarization (2)
		7. Ca ²⁻ ions bind to troponin-C, pulling on tropomyosin (6)
	A.	5, 3, 2, 1, 4, 7, 6
	В.	3, 6, 1, 2, 5, 7, 4
	C. D.	4, 1, 3, 7, 2, 6, 5 2, 4, 7, 6, 3, 1, 5
	E.	3, 6, 1, 5, 7, 2, 4
		· · · · · · · · · · · · · · · · · · ·
21.)	Ca²⁺ is	s important in the contraction of smooth muscle. Which of the following is true about smooth muscle
	contra	
		Ca ²⁺ only enters the cytosol from the sarcoplasmic reticulum.
	XXX D.	Ca ²⁻ binds to troponin. Contraction is immediately triggered by calmodulin binding.
	D.	MLCK (myosin light chain kinase) forms a complex to activate myosin.
	(Ē)	When MLCK activates myosin, ATPase activity is low and crossbridge formation is inactive.
	\vee	

22.	Blood flow to a tissue will increase if the: A. level of oxygen at the tissue increases level of carbon dioxide at the tissue increases C. pH rises D. vessel constricts E. all of the above
23.	In living muscle at rest, which situation is most common? The myosin head is not attached to any molecule. B. The myosin head is weakly attached to G-actin. C. The myosin head is attached to ADP and inorganic phosphate. D. B and C E. None of the above
(24,)	Stretching a myocardial cell: A. decreases the force of a contraction allows more Ca ²⁻ to enter increases the force of contraction D. A and B B and C
25.	The plateau phase of the cardiac muscle action potential is due to: the movement of fewer sodium ions across the cell membrane the calcium channels remaining open longer than the sodium channels the increased membrane permeability to potassium D. a decrease in the amount of calcium diffusing across the membrane an increased membrane permeability to sodium ions
26.	The cardiovascular control center in the brain can directly cause: A. arterioles to dilate or constrict. B. the heart rate to increase or decrease. C. the elasticity of the heart to increase or decrease. A and B E. A, B, and C
27.	 Which of the following statements is true about titin? A. Titin returns stretched muscle to their resting length. B. Titin stabilizes the position of the contractile filaments. C. Titin is helped by actin. D. A and B are correct. E. All of the above are correct.
28.	Type I alveolar cells: A allow rapid diffusion of gases through their thin membranes secrete a chemical known as surfactant C. are phagocytic D. All of the above E. None of the above
29.	Stroke volume would be expected to decrease when: there is an increase in contractility there is a sudden increase in aortic pressure

the end-diastolic volume increases

when blood flow returning to the heart is increased

there is a slow heart rate

30.		, whereas one that generates
	force without movement is known as	,
	isotropic, isometric B. isometric eccentric	
	isotonic, isometrie	
	D. isometric, isotonic	
	Eisotonie, eccentrie-	
31.	Which of the following is a function of smooth muscle tissue?	,
	A. altering the diameter of skeletal muscles	
	B. elevating the arm	
	C. forcing blood from the heart into the major arteries	
	D. moving food materials around the mouth	
	(E) forcing urine out of the urinary tract	
32.	In muscle contraction, calcium apparently acts to:	
	A. increase the action potential transmitted along the sarcolemma	
	B. release the inhibition on the Z lines	
	remove the blocking action of tropomyosin	
	D. cause ATP binding to actin	
(33)	During the cardiac cycle:	•
	the P wave of the ECG occurs before the first and second heart sounds	
•	B. the QRS complex of the EKG follows the increase in ventricular press	
	the third heart sound occurs during atrial systole	ure.
	D. the second heart sound coincides with the QRS complex of the ECG \(\rightarrow \)	/
	(
	E. the greatest increase in ventricular pressure occurs during the ejection	pnase
34.	During the isovolumic phase of ventricular systole:	
	A. the atria contract	
	B. blood is ejected into the great vessels	
	C. the ventricles are relaxing	
	D. the ventricles are filling with blood	,)
	(E.) All the valves of the heart are closed	<u> </u>
35.	During the cardiac cycle:	
	the P wave of the ECG occurs before the first and second heart sounds	
	B. the QRS complex of the EKG follows the increase in ventricular pressu	ıre
	C. the third heart sound occurs during atrial systole	
	D. the second heart sound coincides with the QRS complex of the ECG	
•	E. the greatest increase in ventricular pressure occurs during the ejection I	ohase
36.	When the diaphragm and external intercostal muscles contract:	
	the volume of the thorax increases	
	the volume of the thorax decreases	
	C. the volume of the lungs decreases	
	D. the lungs collapse	
	<i>O</i>	
	E. expiration occurs	
37.	Within a single fiber, the tension developed during a twitch depends on:	
	A. the magnitude of the stimulus	
	B the length of the sarcomeres prior to contraction	
	C. the force required to move the relevant joint	
	D. the amount of neurotransmitter in the synapse	•
	(E) the duration of the stimulus	
	"Pagent"	

(38.)	Whic A	h statement is true? Myosin is a motor pro of motion.	tein that conve	rts the ch	emical bond energy of A	ATP into	the mechanical ene	rg
	B. C. D.	Each myosin molecule			ch both binds ATP and a ver stroke by swiveling			
39.	_	is made of multin	ole globular mo	ecules no	olymerized to form long	chains o	r filaments.	
	D.	actin myosin	В. Е.		nyosin	C.	troponin	
40.	An im A. B.	longer actin and myosicontraction	it fibers to char in filaments in	nge into i nultiunit	nultiunit fibers when ac smooth muscle, which	allow coo	ordination of	
	D. E.		vidual fibers in ve activation		which allow many cells nit smooth muscle to all			
41.	The AA.C.	band contains: thick filaments an area of overlapping None of the above is co		B.	thin filaments All of the above are o	orrect.		7
42.	Contra A. B. C. D.	ction of vascular smooth Ca ²⁺ hormones paracrines neurotransmitters All of the above.	muscle is regu	lated by:				
43.)		way between the larynx -pharynx alveolar-duct	Transmission of the Contract o	bronch			trachea	
44.	As ATI B. C. D. E.	binds to the myosin he the myosin head detach the myosin head initiate the myosin head tighter ATP does not bind to the None of these complete	es from actines binding with as its bond to acted myosin head	actin etin		le:	,	
45.	A. C.	t heart sound is heard w blood enters the aorta the AV valves open the AV valves close	hen:	В. D.	the semilunar valves of the atria contract	lose		
46.		nmon passageway shared larynx	d by the respira	tory and glottis		»: С.	vestibule	

47.	A. is always the same
	 B. can be increased by increasing the frequency of action potentials C. can be increased due to summation B and C
	B and C E. All of the above are correct
48.	The power stroke begins when: A. the actin is released by the myosin head
	B. the ATP is hydrolyzed by the myosin head
	the inorganic phosphate and ADP are released from the myosin D. the actin is attached to the myosin head
	D. the actin is attached to the myosin headE. A and B
49.	Tom suffers from hypertension (high blood pressure). Which of the following might help deal with his problem? A drug that:
	A. stimulates alpha receptors in cardiac muscle tissue
	B. blocks alpha receptors in cardiac muscle tissue
	C. stimulates cAMP formation in cardiac muscle tissue
	Stimulates cAMP formation in cardiac muscle tissue blocks beta receptors in cardiac muscle tissue blocks muscarinic receptors in cardiac muscle tissue
	E. blocks muscarinic receptors in cardiac muscle tissue
50.	If the HR is 72 bpm and the SV is 72 mL, the cardiac output would be approximately equal to: A. 5184 mL/minute
	B. 5.2 liters/minute $72 \times 72 = 144$ $Co = WR \times SV$
	A and B E. none of the above 5040 5134 = 5.2
51.	At an intercolated direct
51.	At an intercalated disc. A. the cell membranes of two cardiac muscle fibers are completely separated by a synapse
	B. the myofibrils are loosely attached to the membrane of the disc
	two cardiac muscle cells are connected by gap junctions
	D. t-tubules unite the membranes of the adjoining cells
	E. all of the above
52.	As ATP binds to the myosin head at the beginning of a muscle contraction cycle:
	A) the myosin head detaches from actin
	B. the myosin head initiates binding with actin
	C. the myosin head tightens its bond to actin
	D. ATP does not bind to the myosin headE. None of these complete the statement correctly.
	E. None of these complete the statement correctly.
53.	When comparing complete tetanus with unfused tetanus, which is true?
	A. In complete tetanus, no relaxation occurs between stimuli.
	B. In complete tetanus, maximum tension is developed.
	C. In complete tetanus, the muscle fiber is stimulated at a higher frequency.D. A and B
	D. A and B A, B, and C **
	Dear Dear
	(min)

Which of the following are involved directly in the systemic circulation? superior vena cava, right atrium, and left ventricle right ventricle, pulmonary artery, and left-atrium.

C. left-ventricle, pulmonary artery, and inferior vena cava-

D. right atrium, right ventricle, and left ventricle

E. inferior vena cava, pulmonary vein, pulmonary artery

55. In smooth muscle:

A) calcium ions do not(bind to troponin molecules

B. calcium ions are not released from the sarcoplasmic reticulum X

C. calcium ions play no role in the process of contraction χ

D. none of the calcium ion required for contraction comes from outside of the cell χ

E. calcium ion plays an important role in repolarizing the membrane after the depolarization phase

All vake Obsie

Short Answer Questions

Please answer these questions briefly. Label diagrams correctly, with lines pointing to the proper structures. Partial credit will be given where appropriate. Write legibly!! You can use the back of the last page to continue any question. Number them, please!!

56. List the mechanical events of the eardiac cycle in sequence, beginning with atrial systole. (Hint: include the positions of the valves and serially number each event) (5 points)

when the action potential at SA node is delivered to VA node and the two atrium are contracted the initial part of p vave of EKG happens the AU value closed and the first sound put the heart heard by the sending the ation potential down the bordle of his the p wave completed and atriums Contract at the Same time.

H 64

C- VILIN

occun

57. What effect will a <u>calcium channel blocker</u> have on the heart, the blood pressure, and cardiac output? Why? (5 points)

the effect of calcium channel blocker is to block the channels

that release catt in the expression of mycardium cells in order

to bind to toponin and take the proponyosin away from

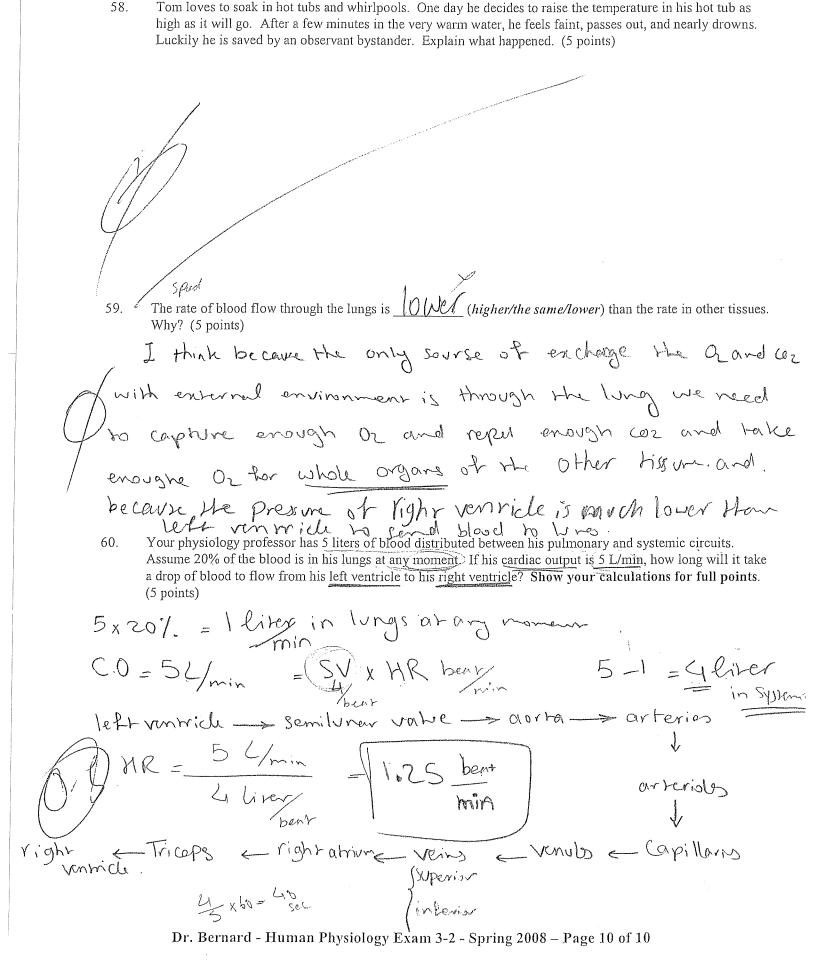
the binding site of achin- myssin so the excitibility doen't

occur and blood pressure decrease and cardiae output

decrease and the mansfer of Oz and in whole

body decrease and lack of Oxygen for cells and

Dr. Bernard-Human Physiology Exam 3-2-Spring 2008-Page 9 of 10



DIRECTIONS:

Each of the numbered items or incomplete statements in this section is followed by answers or completions of the statement. Select the ONE lettered answer or completion that is BEST in each case and <u>write your selection in the left margin beside the question</u>. Each multiple choice question is worth 1.5 points. YOU DO NOT HAVE TO ATTEMPT ALL THE QUESTIONS TO EARN 100 POINTS

			NOI HA	VEIQA	A I I E IVII	'I ALL	THE QUES	110N5 I	ULA	KIN IUU POIINI S.
E	1.	The GA.	cytoplasm of a skeleta sarcolemma sarcoplasmic reticu		ber is call	led the: sarcome sarcopla			C.	sarcosome
P	2.,	The o	the repolarization of the attachment of A the hydrolysis of A calcium ions	of T tubule ATP to my	S		riggered by:	en de La companya de la comp La companya de la co		
P	3.	Musc A. D.	le fibers differ from " lack a cell membra lack mitochondria	Company of the country of	ls" in that		ıny nuclei		C.	are very small
\mathcal{C}	4.	At res	st, the active sites on t myosin molecules tropomyosin molec ATP molecules	•	e blocked B. D.		n molecules ions		· A	
	N.C. (.1	1	ith its function (Quest	iona 5 to 7	۸.			1 1	+1	
Proceedings of the second	Match	A. B. C. D. E.	I band H zone A band both A and B none of the above a		<i>)</i> •	Madandara ayang and A. 19 989 P				
\mathcal{D}	5.		ncrease in size or leng					at your		de de la secono
I	6.	Marks	the boundary betwee	n adjacent	sarcomer	es. Z	F 1	50 to 1		Silver the Commercial
A	7.	The ce	entral portion of each	thick filam — H	ent is cor	nected to	its neighbors	in this re	gion.	us
	8.	In the gas is:	Peruvian Andes where	き the atmos	spheric pi	essure is	the state of the s	al sea leve	ei, the I	O ₂ of tracheal inspired
C_{s_0}	B	A. C.	60 80		B. D.	70 90		•	E.	100
A	9.	Which B. C. D. E.	of the following is No Smooth muscle come Neurons that innervo Smooth muscles are Smooth muscles do The thin filaments of	nective tiss nte smeeth uninucleat not contair	ue forms muscles te. sarcome	tendons. are under res.	involuntary o) ·	
R	10.		ntement "in a mixture nixture" is called: Henry's law	of gases, the		4	the sum of the	e individu	ial part D.	ial pressures of gases Charles law

11. According to the length-tension relationship: longer muscles can generate more tension than shorter muscles the greater the zone of overlap in the sarcomere the greater the tension the muscle can develop the greatest tension is achieved in sarcomeres where the actin and myosin initially do not overlap there is an optimum range of actin and myosin overlap that will produce the greatest amount of tension both B and D The function of the atrium is to: 12. pump blood to the lungs collect blood pump blood to the heart pump blood into the systemic circuit both A and D The heart is innervated by 13. parasympathetic sympathetic both sympathetic and parasympathetic neither sympathetic nor parasympathetic The plateau phase of the cardiac muscle action potential is due to: 14. the movement of fewer sodium ions across the cell membrane the calcium channels remaining open longer than the sodium channels the increased membrane permeability to potassium ion a decrease in the amount of calcium diffusing across the membrane D. an increased membrane permeability to sodium ions The T wave on an ECG tracing represents: 15. atrial repolarization atrial depolarization A. ventricular repolarization C. ventricular depolarization ventricular contraction E. The first heart sound is heard when the: 16. AV valves close AV valves open A. €. atria contract semilunar valves close blood enters the aorta E. During the cardiac cycle, the: P wave of the ECG occurs between the first and second heart sounds ORS complex of the ECG precedes the increase in ventricular pressure second heart sounds coincides with the ORS complex both B and C The volume of blood ejected from each ventricle during a contraction is called: 18. end-diastolic volume end-systolic volume A. cardiac output stroke volume 🦠 🐫 V C. E. cardiac reserve Which of the following is greater? 19. the number of action potentials per minute spontaneously generated by the SA node A. the number of action potentials per minute spontaneously generated by the AV node B. neither is greater

	11.	According to the length-tension relationship.	with an abortor muscles
		A. longer muscles can generate more tension	in than shorter muscles
	+	B. the greater the zone of overlap in the sar	comere the greater the tension the muscle can develop
	\vdash	C. the greatest tension is achieved in sarcon	meres where the actin and myosin initially do not overlap
		D. there is an optimum range of actin and n	nyosin overlap that will produce the greatest amount of
		tension	
		both B and D	
		Oom B and D	
	12.	The function of the atrium is to:	n :
Λ		A collect blood	B. pump blood to the lungs
4	Α		D. pump blood to the heart
/ '	2 \	E. both A and D	
		· '	·
	13.	The heart is innervated by nerves	1. 0 1 (1)
	15.	A. parasympathetic	(1) + (4+)
		B. sympathetic	
(both sympathetic and parasympathetic	
		D. neither sympathetic nor parasympathetic	. V
			atautial in dua to:
	14.	The plateau phase of the cardiac muscle action p	otential is due to:
		A. the movement of fewer sodium ions acro	ess the cell memorane
	Þ	the calcium channels remaining open lor	iger than the sodium channels
	- D-	the increased membrane permeability to	potassium ion AS VE
		D. a decrease in the amount of calcium diff	using across the membrane
		E. an increased membrane permeability to s	sodium ions AD / V ?
	15.	The T wave on an ECG tracing represents:	P
	_	A. atrial depolarization	B. atrial repolarization
	\cap	C. ventricular depolarization	D) ventricular repolarization
		E. ventricular contraction	
		D. Your Carm Conditions	. •
	16.	The first heart sound is heard when the:	
	10.		B. AV valves close
	Λ	(.)	D. atria contract
	F	0.	4 1)
		E. blood enters the aorta	1, AV valors clay that AV value the
1			2, St unlary clase
بحث	_17.	During the cardiac cycle, the:	
• •	^	A. P wave of the ECG occurs between the f	
٠	\cap	B. QRS complex of the ECG precedes the in	
	\mathcal{L}	C. second heart sounds coincides with the C	QRS complex
		both B and C	/
	(18.)	The volume of blood ejected from each ventricle	during a contraction is called:
	(3.		B. end-systolic volume
(D. cardiac output
<u>\</u> .			o, value or pro
		E. cardiac reserve	
	_		
	19.	Which of the following is greater?	te spontaneously generated by the SA node coership at the spontaneously generated by the AV node
		A. the number of action potentials per minut	e spontaneously generated by the SA node
/		B. the number of action potentials per minut	e spontaneously generated by the AV node
<u>(.</u> .		(C.) neither is greater	
		_	

20.		blood vessels tha	t play the mo	ost importa	nt role in	the regulation of blo	od flow to a	tissue an	d blood
T	A. D.	ssure are the: arteries venules			В.	arterioles		C.	veins
21. A	. !	erials can move addiffusion and secretion and all of the above	osmosis absorption	y walls by	E.)) :	capillaries active transport an A and B	nd bulk flow		
22.	B. B.	because of cor with the aid of because valves with the aid of	essure in the traction-relation the thoracoa in the veins contractions	veins is lo exation punabdominal prevent the s of skeleta	wer than nping of pump e backflo l muscle	the smooth muscle in Build's pressure ow of blood s	in hear	4	
23.	The a he/sh A. C.	alveolar ventilatio e breathes at a fre 3500 4000	n in a young quency of 10	healthy pe breaths po D.	rson who er minut 5220 2800	ose lean body weight e with a tidal volume	is 120 pound of 400 ml is E.	ds $(V_D = 1)$: 3200	i 20 ml) when
24.	Blood A. B. C.	I pressure within the volume with the volume with the pressure with all of the above	nin the heart nin the blood thin the heart	changes I vessels ch		ates because	t.	100 - 1	201280 XIC
25.	The ra A. D.	apid depolarization Ca ²⁺ - A and B	n phase of the	e action po	otentials B. E.	of myocardial contrac K ⁺ A and C	ctile cells is	due to wh	nich ion(s)?
26.	Which B E.	The atria are fill The AV valves a The Iast 20% of A and C A, B and C	ing. are open.		complis	hed.	1 145		
27.	At a Po	0 ₂ of 70 mm Hg an 10% 75%	id normal te	•	and pH, -B. E.	hemoglobin is 25% over 90%		C. 5	en. 50% 1975 pp. 14 g
28.	A. B. C	ding filament mode the Z lines sliding the shortening of actin and myosing actin and myosing	g over the m thick filame shortening b	yofilament nts so that out not slid	s thin fila ing past	each other	·		- 1
, ,	B. C.	Is of the alveoli a to secrete surfacta to trap dust and or to replace mucus to protect the lung	int ther debris in the alveol	i		lls, type I and type II.	The functi	on of type	e II is:

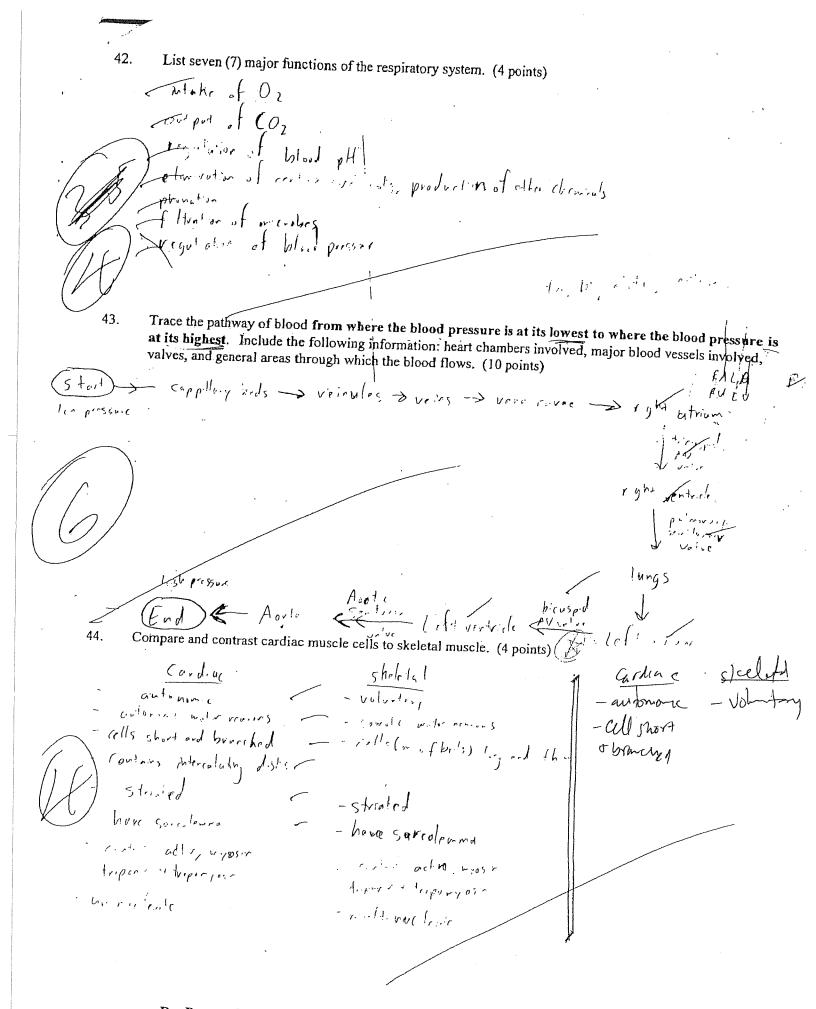
20.	The blood vessels that pl	ay the most importar	nt role in	the regulation of b	lood flow to a	tissue a	nd blood
Þ	pressure are the:		$\langle \hat{\mathbf{p}} \rangle$	artorio log		C.	• .
D .	A. apteries D. venules		(B) E.	capillaries		C.	veins
21	Materials can move acros A. diffusion and osn C. secretion and abs E. all of the above	nosis	B.	active transport a	and bulk flow		
(22.) B	B because of contra C. with the aid of the D. because valves in	ough veins by all of to ure in the veins is low ction-relaxation pume thoracoabdominal paths the veins prevent the intractions of skeletal	wer than ping of oump backfl	in the arteries the smooth muscle ow of blood	in the wall of	the vein	
D 23.	The alveolar ventilation in he/she breathes at a frequency. A. 3500		er minut 5220	e with a tidal volum	e of 400 ml is	:	120 ml) whe
	C. 4000 <	(D.)	2800	K	E.	3200	
24.			anges -				
25.	The rapid depolarization p A. Ca ²⁺ A and B	hase of the action po	tentials B. E.	of myocardial contr K ⁺ A and C	ractile cells is C.	due to v Na ⁺	which ion(s)?
26. B	Which occur(s) during ven A. The atria are filling The AV valves are C. The last 20% of ve D. A and C E. A, B and C	g. ,	complis	hed.	. · · · • • • • • • • • • • • • • • • •		
27. ()	At a PO ₂ of 70 mm Hg and A. 10% D. 75%	normal temperature	and pH, B. E.	hemoglobin is 25% over 90%	saturated v	vith oxy	gen. 50%
28.	B. the shortening of th C. actin and myosin sh	of contraction involver the myofilament ick filaments so that ortening but not slid iding past each other	s thin file ing pas	each other			
29. A	The walls of the alveoli are to secrete surfactant B. to trap dust and othe C. to replace mucus in	er debris		ells, type I and type	II. The funct	ion of ty	pe II is:

	A.	Muscle length and to	ension remain co	onstant during isoto	nic contractio	on.	
<u></u>	В.	Myofilaments are sl	liding during isot	onic contraction.			
$-\mathcal{V}$	Q.	The A band does no	ot shorten during	isotonic contraction	n /		,
	ı D.	The Z disc shorteps				e constant	•
	. D.	Both Band C are cor		contraction.	-110., 0	* (t + 5 (+ 4)	•
	(E.)	Dout Dand C are cor	песі.		-		•
	9		•••				
31.	if the	e period of ventricular fi	_				
_	A.	less blood would flo	w into the ventri	cles for any given t	ime interval		
13	(B)	the amount of blood	in the ventricles	at the end of diasto	ole would be	greater	
\cup	E.	the amount of blood	in the ventricles	at the end of systol	le would be g	reater	•
	D.	the stroke volume we		-	_		•
32.	When	n the heart is beating at a	a rate of 75 times	s per minute, the du	ration of one	cardiac o	evole is
		nd(s):		•			7 - 10 10
7	(A)	60/75	В.	75/60		C.	1
1		3600/75	E.	cannot be deter	minad	C.	1
	D.	3000/73	E.	cannot be deten	mmed		
R	He fir	dore decides to make an xes a mouthpiece to a lo pool with the top of the his alveolar ventilation he is breathing faster	ong plastic tube, on plastic pipe 3 incomments on rate has increased and deeper	weights himself dov ches above the water	wn, and sits a	t the botte w minute	om of an eight foot
В	He fir	xes a mouthpiece to a log pool with the top of the his alveolar ventilatio	ong plastic tube, or plastic pipe 3 income on rate has increat and deeper arger decreased	weights himself dov ches above the water	wn, and sits a	t the botte w minute	om of an eight foot
True	He fix deep p	xes a mouthpiece to a log pool with the top of the his alveolar ventilation he is breathing faster his vital capacity is lathis tidal volume has d	ong plastic tube, of plastic pipe 3 incomments and deeper arger decreased as increased	weights himself dov ches above the wate ase	wn, and sits a er. After a fe	t the botte	om of an eight foot
	He findeep A. B. C. D. E.	xes a mouthpiece to a lost pool with the top of the his alveolar ventilation he is breathing faster his vital capacity is lathis tidal volume has dead his residual volume has	ong plastic tube, of plastic pipe 3 independent of the plastic pipe 3 independent of the plastic pipe in t	weights himself dove the water above the water ase	wn, and sits a er. After a fe movement.	w minute	om of an eight foot s, he finds that:
34. 35.	He findeep C. D. E. //False T/F	xes a mouthpiece to a logod with the top of the his alveolar ventilation he is breathing faster his vital capacity is lathis tidal volume has distributed his residual volume has During isometric contact The dicrotic notch referenticular systole.	ong plastic tube, of plastic pipe 3 income rate has increased as increased are increas	weights himself dove the water above the water ase	wn, and sits a er. After a fe movement.	w minute	om of an eight foot s, he finds that:
34. 35.	He findeep (A) C. D. E. //False T/F	xes a mouthpiece to a logod with the top of the his alveolar ventilation he is breathing faster his vital capacity is lathis tidal volume has distributed his residual volume has During isometric contact The dicrotic notch referenticular systole.	ong plastic tube, of plastic pipe 3 income rate has increased as increased are increas	weights himself dove the water above the water ase	wn, and sits a er. After a fe movement.	w minute	om of an eight foot s, he finds that:
34. 35.	He findeep A B C. D. E. //False T/F // each with A.	xes a mouthpiece to a lose pool with the top of the his alveolar ventilation he is breathing faster his vital capacity is lathis tidal volume has distributed his residual volume has During isometric contact The dicrotic notch referent ventricular systole. th its function (Question larynx	ong plastic tube, of plastic pipe 3 income rate has increased as increased are increas	weights himself dove the water above the water ase	wn, and sits a er. After a fe movement.	w minute	om of an eight foot s, he finds that:
34. 35.	He findeep (A) C. D. E. //False T/F n each with A. B.	xes a mouthpiece to a lose pool with the top of the his alveolar ventilation he is breathing faster his vital capacity is lathis tidal volume has distributed his residual volume has During isometric contact The dicrotic notch referent ventricular systole. th its function (Question larynx glottis	ong plastic tube, of plastic pipe 3 income rate has increased as increased are increas	weights himself dove the water above the water ase	wn, and sits a er. After a fe movement.	w minute	om of an eight foot s, he finds that:
34. 35.	He findeep C. D. E. //False T/F a each with A. B. C.	xes a mouthpiece to a logod with the top of the his alveolar ventilation he is breathing faster his vital capacity is lathis tidal volume has distributed his residual volume has distributed buring isometric contour The dicrotic notch referent ventricular systole. the its function (Question larynx glottis pharynx	ong plastic tube, of plastic pipe 3 income rate has increased as increased are increas	weights himself dove the water above the water ase	wn, and sits a er. After a fe movement.	w minute	om of an eight foot s, he finds that:
34. 35.	He findeep C. D. E. //False T/F a each wir A. B. C. D.	xes a mouthpiece to a logod with the top of the his alveolar ventilation he is breathing faster his vital capacity is lathis tidal volume has distributed his residual volume has distributed buring isometric contour The dicrotic notch referent ventricular systole. the its function (Question larynx glottis pharynx trachea	ong plastic tube, of plastic pipe 3 income rate has increased as increased are increas	weights himself dove the water above the water ase	wn, and sits a er. After a fe movement.	w minute	om of an eight foot s, he finds that:
34. 35.	He findeep C. D. E. //False T/F a each with A. B. C.	xes a mouthpiece to a logod with the top of the his alveolar ventilation he is breathing faster his vital capacity is lathis tidal volume has distributed his residual volume has distributed buring isometric contour The dicrotic notch referent ventricular systole. the its function (Question larynx glottis pharynx	ong plastic tube, of plastic pipe 3 income rate has increased as increased are increas	weights himself dove the water above the water ase	wn, and sits a er. After a fe movement.	w minute	om of an eight foot s, he finds that:
34. 35.	He findeep C. D. E. //False T/F a each winder A. B. C. D. E.	xes a mouthpiece to a logod with the top of the his alveolar ventilation he is breathing faster his vital capacity is lathis tidal volume has distributed his residual volume has distributed buring isometric contour The dicrotic notch referent ventricular systole. the its function (Question larynx glottis pharynx trachea	ong plastic tube, of plastic pipe 3 independent of the plastic pipe 3 independent of the plastic pipe in t	weights himself dove the sabove the water above the water asses as a second appears as a second appear appears as a second appear appear as a second appear appear as a second appear appear appear appear as a second appear	wn, and sits a er. After a fe movement.	sure of th	om of an eight foot s, he finds that:
34. 35. Match	He findeep (A) C. D. E. (False T) (F) A. B. C. D. E. Commo	xes a mouthpiece to a logod with the top of the his alveolar ventilation he is breathing faster his vital capacity is lathis tidal volume has distributed his residual volume has distributed buring isometric contour The dicrotic notch referent ventricular systole. the its function (Question larynx glottis pharynx trachea nasal cavity	ong plastic tube, of plastic pipe 3 income rate has increased and deeper arger decreased as increased as increased as increased as increased as 36 to 38):	weights himself don ches above the water ase gy used appears as ise in pressure caus and digestive syste	wn, and sits a er. After a fe movement.	sure of th	om of an eight foot s, he finds that:

Please answer these questions briefly. Label diagrams correctly, with lines pointing to the proper structures. Partial credit will be given where appropriate. Write legibly!! You can use the back of the last page to continue any question. Number them, please!!

	10	i e e e e e e e e e e e e e e e e e e e
	39.	List the events of the cardiac cycle in sequence, beginning with atrial diastole and ventricular systole. Note
	J.F.	where the valves open and close. (10 points)
		0 C
(i)	Λι	10 det bigger d'and de la late de late de la late de la late de la late de late
	/ dv:4	al Diusible - bicusped and terrupped valves are closed, and blook enters for the war come and pulmorety vem
(2)	٠. ا	1 5 15 - C to contract for lat to fake our track pulse.
	Vec 1x	according systole - Candid muscle controlly lovery store out of the corr pulmers.
//		Senterer volet respectively.
16)	-6	cicular Systole - Condine muscle controls, foreing blood out of the portraid pular. arrenge through the open outer som lover unler and the open pulmers. Sen lover unler respectively.
X		1 Double - 1 1 comment rolling an chosed ventucles are filled
3	√ € • ° · · [•	all for the transfer of the state of the sta
		blied from the atrium that enters through the bousped and to
		The state of the s
U,	1.1	
}	- trio	Exside - AV values on open, and the atom continues, firmy but the age 11
		AV volves.
	40.	Can a skeletal muscle contract without shortening? Explain. (5 points)
•	, , ,	I so welve wester contraction. A sercourse removes rigid but does not recta
		Tours + Slow-twitch wissles maintan posture to may
) once it stone wasters borones book as a second
/		
	9),	
	ff	
	41.	List the factors that will shift the oxygen-hemoglobin saturation curve to the left. (2 points)
•	-	
		twerensed pH
	•	Decreed temporature
. ,	\sim	

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Each of the numbered items or incomplete statements in this section is followed by answers or completions of the statement. Select the ONE lettered answer are completion that is BEST in each case and write your selection in the life margin beside the question. Each multiple choice question is worth 2 points.

	beside the question. Each multiple choice question is worth 2 possess	
	Contration involves	
1. •	The sliding filament of contraction involves: Actin and myosin sliding past each other but not shortening Actin and myosin sliding past each other but not shortening	*:
	Actin and myosin stiding past each other to the filaments slide pasts. The shortening of thick filaments so that the thin filaments slide pasts. The shortening of thick filaments so that the thin filaments slide pasts.	
	B. The shortening of thick mameries so that the min manufacture and the shortening of thick mameries so that the min manufacture and the shortening of thick mameries so that the min manufacture and the shortening of thick mameries so that the min manufacture and the shortening of thick mameries so that the shortening of the shorte	+1
	B. The shortening of thick training but not sliding past each other. C. Actin and myosin shortening but not sliding past each other.	
	D. The Z discs sliding over the myofilaments.	•
	Cata movillary muscles	•
2.	Contractions of the papillary muscles:	
	A. close the atrioventricular valves	
	B. close the semilunar valves	•
	C. eject blood from the ventricles prevent the atrioventricular valves from projecting into the atria	
	(D) prevent the atrioventricular valves from pro-	
	E. eject blood from the atria into the ventricles	
	If you feel like you heart is beating rapidly while you sit here taking this exam, you are probably	
3.		
		4g
	B. right because the parasympathetic system is responding to the stress of the test situation right because the sympathetic system is responding to the stress of the test situation.	
	right because the sympathetic system is responding to the stress of motors and rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even under the pacemaker tends to keep your heart beating at a steady rate even the pacemaker to be a steady rate even the pacemaker to be a steady	r strem
	D. wrong because the pacemaker tends to keep your near treating at a street of response of your body to stress is to shift energy to the skeletal smeal. E. wrong because the response of your body to stress is to shift energy to the skeletal smeal.	es from the
	E. wrong because the response of your body to suess is to said the subsection of the	
	7 to 1000	•
4.	Plead within the pulmonary veins is returned directly to the:	·
4.	A brage	um.
	D. right ventricle E. left ventricle	
		The same of the sa
5.	Each of the following statements concerning the movement of fluid between capillaries and men	STEERS SPORTS
٦.		
	to the form of the control of the co	n
	the interest of the interest o	
	C. The osmotic pressure of the interstitual find is associated and the blood osmotic pressure are equal in magnitude but (D) The blood hydraulic pressure and the blood osmotic pressure are equal in magnitude but	Oldstrate, and
	action. E. The hydraulic pressure of the interstitial fluid does not oppose the movement of fluidifference of the interstitial fluid does not oppose the movement of fluidifference of the interstitial fluid does not oppose the movement of fluidifference of the interstitial fluid does not oppose the movement of fluidifference of the interstitial fluid does not oppose the movement of fluidifference of the interstitial fluid does not oppose the movement of fluidifference of the interstitial fluid does not oppose the movement of fluidifference of the interstitial fluid does not oppose the movement of fluidifference of the interstitial fluid does not oppose the movement of fluidifference of the interstitial fluid does not oppose the movement of fluidifference of the interstitial fluid does not oppose the movement of fluidifference of the interstitial fluid does not oppose the movement of fluidifference of the interstitial fluid does not oppose the movement of fluidifference of the interstitial fluid does not oppose the movement of fluidifference of the interstitial fluid does not oppose the movement of the interstitial fluid does not oppose the movement of the interstitial fluid does not oppose the movement of the interstitial fluid does not oppose the movement of the interstitial fluid does not oppose the movement of the interstitial fluid does not oppose the movement of the interstitial fluid does not oppose the movement of the interstitial fluid does not oppose the movement of the interstitial fluid does not oppose the movement of the interstitial fluid does not oppose the movement of the interstitial fluid does not oppose the movement of the interstitial fluid does not oppose the movement of the interstitial fluid does not oppose the movement of the interstitial fluid does not oppose the movement of the interstitial fluid does not oppose the movement of the interstitial fluid does not oppose the movement of the interstitial fluid does not oppose the movement of the interstitial fluid does not oppose the movement	TIT! ANDY
	capillary.	
6.	During the period of ventricular filling:	
υ,	A. pressure in the heart is at its peak	
	b the atria remain in diastole:	
	blood flows passively through the atria and the open AV valves	•
	1. 4 - man nulmonary Valve	
	and the state of t	
、		C - 470 51
	A 25 year old Human Physiology student has a total lung capacity of 6000 ml, residual variance.	of Mant north
7.	A 25 year old Human Physiology student has a total lung capacity of tidal volume of 500 ml and inspiratory capacity of 3000 ml. Her functional residual capacity (F	RC)is:
1	tidal volume of 500 ml and inspiratory capacity of 5000 ml	ml .
1	(A) 2,000 ml B. 2,500 ml	

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3,000 - 1000

8.	8. Site where the velocity of blood flow is least.	
	A. large arteries B. arterioles (C.) cappil	aries
	D. large veins E. inferior vena cava	•
ř	A STATE OF THE STA	
9.	9. Stroke volume would be expected to decrease when: A. there is an increase in contractility There is a sudden increase in portion pressure.	la
	A. there is an increase in contractility	ie .
	there is a sudden increase in aortic pressure	
•	C. the end-diastolic volume increases	
	there is a slow heart rate	
	E. when blood flow returning to the heart is increased	
10.	10. The lung volume which represents the total volume of exchangeable air is the:	
10.		atory capped
	D. expiratory reserve volume	awiy cappani
	b. expiratory reserve volume (L) total range capacity	
11.	1. Which of the following are involved directly in pulmonary circulation?	avron
1-4	A. superior vena cava, right atrium, and left ventricle	
The last	∫ B right ventricle, pulmonary artery, and left atrium √ P∪	monary (
	C. left ventricle, aorta, and inferior vena cava	lunar , les
	A. superior vena cava, right attrum, and left ventricle right ventricle, pulmonary artery, and left atrium C. left ventricle, aorta, and inferior vena cava D. right atrium, aorta, left ventricle	all
12.		1
12.	The sarcomere shortens, the two Z disks at each end move closer together, and the 1 bar	nd and Ell room
•	virtually disappear.	IU AIRI MIL MIEI
	The thin actin filaments slide along the thick myosin filaments as they move toward the	M line in the
	center of the sarcomere.	
	C. When a muscle contracts, mryosin molecules coil up like springs to shorten the length	
• .	A and B are true	
	E. A, B and C are true	
13.		
•	A. the heart would stop, since the vagal nerves trigger the heart to contract	
•	B. parasympathetic stimulation would increase, causing a decrease in heart rate the AV node would become the pacemaker of the heart	•
	The first transfer of about 25 boats per minute of	
	1. Stone of the above is correct.	-
14.	I. Isovolumetric contraction: - all volves closed, we tolered executed	
	(A) refers to the short period during ventricular systole when the ventricles are completely c	
	chambers	
•	B. occurs while the AV valves are open	
	C. occurs immediately after the semilunar valves close	
		à
	E. occurs immediately after the atria relax	ent
	E. occurs immediately after the atria relax	ertan
15.	The deflection waves in an ECG tracing include:	
	the T wave, which indicates ventricular repolarization	
	B. the Q-T interval, which indicates the time of atrial contraction \(\bigcirc \qquad \qquad \qquad \qquad \qquad \qquad \qqqqq \qqqqqqqqqqqqqqqqqqqqqqqqqqqqq	
	C. the PQRS complex, which follows ventricular contraction	
	D. the P wave, which is only present in patients who have had a heart attack	

16.	smooth musc B. neurons that C. smooth musc D. smooth musc E. the thin filam The tricuspid valve is A. while the ven B. while the atri C. by movement	ng is NOT characteristic connective tissue for innervate smooth muscles are unmucleate less do not contain sarcents of smooth muscle closed: tricle is in diastole contain is contracting of blood from atrium tricle is in systole	omeres are ind	s) Fer involuntary attached to dense A		alt A
100 roads	Which of the following PO ₂ - 120, C. PO ₂ - 60,	ng is most likely to rep PCO ₂ - 60 PCO ₂ - 40	resent norm B.	PO ₂ - 70, PO ₂ - 90,	PCO ₂ - 35 PCO ₂ - 35	um H
19.	A. humidifying to B. warming the a interfering wind fluid D. protecting the	event the alveoli from he air before it enters it before it enters that the cohesiveness of surface of alveoli from	× water mole	cules, thereby		
20 .	The depolarization phosphatic increased men increased men increased men decreased men decreased men	ase of the conducting subrane permeability to obtain permeability to	potassium io calcium io sodium io	ions ions ins	ntial is the esulu	en E
not reeder	A subject has a tidal version of the horizontal A. 1,000	olume of 800 mal, an an areas alveolar ventilation (natomical d (V _A) is (in in B. D.	ead space of 20 nl/minute): 3,000 12,000	900-20	
not related	In mouth-to-mouth artion of the victim, thus: Expansion of the during inflation of the contrapulmonary All of the above	ne victim's lungs is bron of the lungs, the intro pressure exceeds intr	ought about apleural pre	t by blowing ai	or her ownresspir	intoryyysican into
not reeded	Which of the following A. Alveolar presso C. Alveolar presso All of the abov	ure is less than atmosp ure is greater than atmo ure equals atmospheric	heric press ospheric pr	ure during a no essure during a	ormal negative po a forced expiration	TO THE STATE OF TH
	In the Peruvian Andes vinspired gas is: A. 60 mm Hg D. 90 mm Hg	where the atmospheric	70 mm	Hg	al sea levelvallu	,than B, oxfirache

"The quantity of a slightly soluble gas that will dissolve in a given mass of liquid at an saled imperature directly proportional to the partial pressure of that gas". This statement refers to Daulon's how Graham's law Charles law Henry's law-Avogadro's law Which of the following would act as a stimulus to initiate a muscle contraction? 26. neurotransmitters hormonal activity A. All of the above a change in the pH of a muscle. C. The plateau phase of the cardiac muscle action potential is due to: 27. the movement of fewer sodium ions across the cell membrane the calcium channels remaining open longer than the sodium channels the increased membrane permeability to potassium a decrease in the amount of calcium diffusing across the membrane D. an increased membrane permeability to sodium ions E. The walls of the alveoli are composed of two types of cells, type I and type II. The fraction of type II is to secrete surfactant to trap dust and other debris to replace mucus in the alveoli to protect the lungs from bacterial invasion to increase the diffusion distance reace the following st bronchioles 2. bronch Provehiales 2, 4, 1, 5, 3, 6

Telm roll Bronchiales 2, 4, 1, 5, 3, 6

Telm roll Bronchiales 5, 1, 3, 2, 6, 4

Respectively In muse!

The contract of the following st bronchioles 2. bronch 2, 4, 1, 5, 3, 6

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Telm roll Bronchiales 2, 4, 1, 5, 3, 6

Telm roll Bronchiales 2, 4, 1, 5, 3, 6

Telm roll Bronchiales 2, 4, 1, 5, 3, 6

Telm roll Bronchiales 2, 4, 1, 5, 3 Place the following structures of the respiratory tree in order, considering how air enters three enters the terms bronchioles 2. bronchioles 3. respiratory bronchioles 4. alveolar duct 5. bronchioles 6. alreoitansaces 33,424,5,4,6 1, 5, 2, 3, 6, 4 2, 5, 1, 3, 4, 6 In muscle contraction, calcium apparently acts to: Avedli Jus A. increase the action potential transmitted along the sarcolemma release the inhibition on the Z lines remove the blocking action of tropomyosin cause ATP binding to actin The amount of blood flowing to skeletal muscles is greatly increased during exercisee. This saddings ticrostic more 31. blood into muscles is accomplished by: contraction of muscle in the walls of arterioles relaxation of muscle in walls of arterioles В. opening of valves in veins C. opening of valves in arteries D. relaxation of muscle in the walls of veins E. If the period of ventricular filling were increased in duration: 32. less blood would flow into the ventricle for any given time interval the amount of blood in the ventricles at the end of diastole would be greatest the amount of blood in the ventricles at the end of systole would be greater the stroke volume would decrease D. The respiratory membrane is a combination of: 33. respiratory bronchioles and alveolar ducts alveolar and capillary walls and their fused basal lamina atria and alveolar sacsy None of the above

3

Please answer these questions briefly. Label diagrams correctly, with lines pointing to the proper structures. Partial credit will be given where appropriate. Write legibly!! You can use the back of the last page to continue any question. Number them, please!!

Imagine grasping an object with a handle and lifting it 20 centimeters. What is different about the muscle 51. behavior lifting a coffee mug, a full half gallon of milk, or a 10 kilogram suitcase? (Ignore positional differences of the arm; address the effort required.) Do sarcomeres behave differently? (5 points)

Lifting a coffee mugnis devel by isotonic Coffee mug: contraction where the nursele tension stays constant and the muscle length shorkers (salomen Shortening)

effort than the coffee mug but the movement Milk is still iso tonic meaning the tunsion will shorten sarconieres shorten.

Suitcase'
Lifting the suitcase regulies substantially more effort
than the rang or milk. It it is too heavy and countrat
than the rang or milk. It it is somethic contraction in
belifted the nucles will experience isomethic contraction in
Selifted the nucles will experience isomethic contraction in
selifted the puscles will experience isomethic grades on the last example of
the Your physiology professor has suffered a myocardial infarction (after seeing the grades on the last example of
the contraction of the contraction Although his heart rate is 60 beats per minute, his ejection fraction (SV divided by EDV) is only 25%, with a stroke volume of 40 mL. What is his EDV, ESV, and CO? Show your calculations. (5 points)

CO = HRXSV HR=60 点 CO = 60 mix 40 mi SV=40ML Co = 2400 min EF= 25% = 40 EDV

ESV = 25 = 40 100 = EDV CO = ESV + EDV 25EW = 4000 2400 = ESV+160 EDV = 160 ML 2240 - ESV

will not shorten meaning Sourcomer will not ghorten. If the suitcas can be lifted tse tonic contra will occur maning tension wi be constant and

Dr. Bernard - Human Physiology Exam 3 - Spring 2005 - Page 7 of 7 Muscle length

(Sasconvere os.

Please answer these questions briefly. Label diagrams correctly, with lines pointing to the proper structures. Partial credit will be given where appropriate. Write legibly!! You can use the back of the last page to continue any question. Number them, please!!

Neurons are treated with a drug that instantly and permanently stops the Na,K-ATPase pumps. The neuron is then repeatedly stimulated, and recordings are made of the response. What happens to the resting membrane potential immediately and over time? (4 points)

During any one action potential generated, only a few molecules of Na+ and K+ actually. move, so the concentration gradients are not significantly altered. The norting membrane potente is not riguificantly changed according to the) textbook, mother action potential could be generate

without rectoring the ions. But over a long perior stimulation (millions of time), the RMP would

How is the action of neurotransmitters terminated? (3 points) probably stary depol

nemotionsmitters can be terminated in 3 ways 1. diffure away from the sugnaptive cleft, deal ing from the receptors

2. inactivated by engines in the deft (cx: acetylcholinesterase)

3. transpored back into presignaptic neuron or a Trace the path of cerebrospinal fluid from its point of production until it is reabsorbed into the blood. (6 CH.9 53.

From the point of production, there are 2 path which CSF can flow:

- I out the opening in the medulla, more up to the subarachuoid space, more around the brain dorsally, more to the anchroid ve where it is absorbed
- 2. down the spinal cord by your through the center canal, exit the system, more aroun doesally, more up the spenal and + brane Dr. Bernard - Human Physiology Exam 2 - Spring 2005 - Page 7 of 7 Willi

4 . T , T , 20 mg

Each of the numbered items or incomplete statements in this section is followed by answers or completions of the statement. Select the ONE lettered answer or completion that is BEST in each case and write your selection in the left margin beside the question. Each multiple choice question is worth 2 points.

Use	e the diagrar	m to the right to an	swer the next thre	ee (3) questions.	errene e errene Herrene e errene	
1.	A B. E. D.	the structure labele thalamus cerebral cortex primary motor corte primary sensory cor autonomic ganglion	ex rtex			
2. A	Which s receptor A D.	tructure receives im B. E.	$\frac{1}{2}$	m a sensory C. 3		5
3.	labeled "A. I. B. I. C. I. D. I.	the type of informate '2." motor commands to proprioception to the fine touch to the cerepain and crude touch visceral motor comm	skeletal muscles e cerebral cortex ebral cortex a sensations			spinother Pain Ten Corse
4.	B. 7 C. A	ng filament of contra Actin and myosin sli The shortening of the Actin and myosin shall The Z discs sliding of	ding past each other ck filaments so the ortening but not sli	at the thin filament ding past each oth	ts slide past.	DCML Fine Vibration Propriouple
5.	A. c B. c P. e D. p	ons of the papillary lose the atrioventric lose the semilunar viect blood from the revent the atriovent ject blood from the a	ular valves alves ventricles ricular valves from	projecting into th	ne atria	
6. D	hearing.	_ ear collects sound	s waves and transr B.	nits them to the	ear, which contai	ns sensory organs for
7.	Site where A. la	e the velocity of blooringe arteries	E.	none of these arterioles inferior yena car	<u>C</u>	

0.	in you need the you heart is beauting raphtry while you sit here taking this exam, you are probably.
	A. right because the somatic nervous system is in control
	B. right because the parasympathetic systemic responds to stress situations
	E. wrong because the response of your body to stress is to shift energy to the skeletal muscles from the
	heart muscle
9,	Pamage to the fovea of the eye would interfere with the ability to:
	A. focus on an image
	B. regulate the amount of light striking the retina
. /	C. bleach visual pigments
R	D. see black and white
	E. see color
10.	The lens focuses light on the photoreceptor cells by:
	A. moving up and down
	B. moving in and out
•	Changing shape
	D. opening and closing
	E. dilating and constricting
	the districting
11.	Blood within the pulmonary (ein) is returned directly to the:
	A. lungs B. right atrium C. left atrium
	D. right ventricle E. left ventricle
	+ inglit volutions 12. Note volutions
12.	Each of the following statements concerning the movement of fluid between capillaries and interstitual space is
* .	true EXCEPT one. Identify the exception.
	y to the fitter.
	1
	C. The osmotic pressure of the interstitial fluid is less than the blood esmotic pressure.
	D. The blood hydraulic pressure and the blood osmotic pressure are equal in magnitude but opposite in
	action.
	E. The hydraulic pressure of the interstitial fluid does not oppose the movement of fluid from the capillar
13.	During the period of ventricular filling:
	A. pressure in the heart is at its peak
	B. the atria remain in diastole
	D. blood is flowing through the open pulmonary valve
	E. the mitral valve remains closed
14.	Stroke volume would be expected to decrease when:
	A. there is an increase in contractility
	「「「「「「「「」」」「「」」「「」」「「」「「」「「」「「」「「」「「」「「
	D. there is a slow heart rate
	E. when blood flow returning to the heart is increased
15.	The cartilaginous structure that surrounds the external auditory meatus si the:
	Λ 1
	A. saccule B. utricle C. labyunth Dipima E. ossicle
	C. OSSICIE

16.	Which statement is true?
	The sarcomere shortens, the two Z disks at each end move closer together, and the I band and H zome
	virtually disappear.
	B. The thin actin filaments slide along the thick myosin filaments as they move toward the M line in the
	center of the sarcomere.
	When a muscle contracts, myosin molecules coil up like springs to shorten the length.
	A and B are true
	E. A, B and C are true
	A, B and C are title
17.	If the years I nervise to the beaut years out the result reveald be
17.	If the vagal nerves to the heart were cut, the result would be:
	A: the heart would stop, since the vagal nerves trigger the heart to contract
	A: the heart would stop, since the vagal nerves trigger the heart to contract B: parasympathetic stimulation would increase, causing a decrease in heart rate C: the AV node would become the pacemaker of the heart
	C. the AV node would become the pacemaker of the heart
	the heart rate would increase by about 25 beats per minute. None of the above is correct.
	E. None of the above is correct.
18.	Isovolumetric contraction:
	(A) refers to the short period during ventricular systole when the ventricles are completely closed chambe
	B. occurs while the AV valves are open
	C: occurs immediately after the semilunar valves close
	only occurs in people with heart valve defects
	refers to the short period during ventricular systole when the ventricles are completely closed chamber occurs while the AV valves are open occurs immediately after the semilunar valves close only occurs in people with heart valve defects E. occurs immediately after the atria relax
19.	The shape of the lens is controlled by the:
	A. papillary constrictor muscles B. papillary dilator muscles
	C. iris D. ciliary muscles
	E. aqueous body
20.	The deflection waves in an ECG tracing include:
	A) the T wave, which indicates ventricular repolarization the Q-T interval, which indicates the time of atrial contraction
	B. the Q-T interval, which indicates the time of atrial contraction
	C. the PQRS complex, which follows ventricular contraction
	D. the P wave, which is only present in patients who have had a heart attack
21.	Which of the following is NOT characteristic of smooth muscle?
	smooth muscle connective tissue forms tendons
	B. neurons that innervate smooth muscles are under involuntary control
	C. smooth muscles are uninucleate
	D. smooth muscles do not contain sarcomeres
	E. the thin filaments of smooth muscle fibers are attached to dense bodies
00	
22.	The tricuspid valve is closed:
	A. while the ventricle is in diastole
	B. while the atrium is contracting
	by movement of blood from atrium to ventricle
	(D) when the ventricle is in systole
3 2	
23.	The depolarization phase of the conducting system muscle action potential is the result of:
	increased membrane permeability to sodium ions
<u>~</u>	B. increased membrane permeability to potassium ions
,	increased membrane permeability to calcium ions
	D. decreased membrane permeability to sodium ions
	E. increased membrane permeability to chloride ions

24.	Which of the following would act as a stimulus to initiate a muscle contraction?
	A. hormonal activity B. neurotransmitters
	C. a change in the pH of a muscle All of the above
25	The platear where of the combine provide estion motortial is due to:
25.	The plateau phase of the cardiac muscle action potential is due to:
	A. the movement of fewer sodium ions across the cell membrane
	B the calcium channels remaining open longer than the sodium channels *
	C. the increased membrane permeability to potassium
	D. a decrease in the amount of calcium diffusing across the membrane
	an increased membrane permeability to sodium ions
26.	In muscle contraction, calcium apparently acts to:
	A. increase the action potential transmitted along the sarcolemma
	B. release the inhibition on the Z lines
	C remove the blocking action of tropomyosin
	D. cause ATP binding to actin
27	The ossicles connect the: A tympanic membrane to the oval window O551 Cles - Dove S
27.	The ossicles connect the:
	B. tympanic membrane to the round window
	C. oval window to the round window
	D. cochlea to the tympanic membrane
	E. cochlea to the oval window
28.	The amount of blood flowing to skeletal muscles is greatly increased during exercise. This redirection of blood
20.	
	into muscles is accomplished by:
	A. contraction of muscle in the walls of arterioles B. relaxation of muscle in walls of arterioles
M_{λ}	
1	opening of valves in veins
	D. opening of valves in arteries
	E. relaxation of muscle in the walls of veins
29.	If the period of ventricular filling were increased in duration:
	A. less blood would flow into the ventricle for any given time interval
	B. the amount of blood in the ventricles at the end of diastole would be greater
	C. the amount of blood in the ventricles at the end of systole would be greater
	D. the stroke volume would decrease
mary and	,
30.	In circulating from the brain to the arm, a drop of blood would <u>NOT</u> have to pass through which of the
	following?
: 1	A. left atrium B. aorta
	C. superior vena cava D. pulmonary vein
	E. inferior vena cava
	YYT ' 1 O 1 O 1 O 1 O 2 O 1 O 2 O 1 O 1 O 1 O
31.	Which of the following is NOT a function of smooth muscle tissue?
	A. altering the diameter of the respiratory passageways
	B. elevating hairs on the arm
\wedge	forcing blood from the heart into the major arteries
	D. moving food materials along the digestive tract
	E. forcing urine out of the urinary tract
32.	Vibrations received th the ear are amplified by the action of the:
J.J.	A. auditory ossicles by B. cochlea C. oval window
	D. round window E. tympanic membrane
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33.	The pu	pulmonary circulation differs from the systemic circulation	on because.
	Α.	Dulmonary blood flow is only half that of the cardiac	coutput
	В	There are no arterioles in the milmonary circulation.	· [1] [1] [2] [2] [2] [3] [4] [4] [4] [4] [4] [4] [4] [4] [4] [4
		It is a low pressure system while the systemic circula	ution is a high pressure system.
	D.	It is less distensible than the systemic circulation.	
	D.	It is ioss distorbiole than the cycle	
~ .	**n * .1.	1 -C+L C-11	
34.		th of the following has a <u>pulsatile flow</u> into capillaries?	pulmonary circulation
	A.	nic systemic circulation	ther
	C.	both	шс
35.	Which	ch statement best describes arteries?	
	A.	All carry oxygenated blood to the heart.	
	B	All contain valves to prevent the back-flow of blood.	
	(C)	All carry blood away from the heart.	•
	Ď.	Only large arteries are lined with endothelium.	and the second s
	,,,,,,,, -	·	•
36.	The ha	bacterium that causes tetanus produces a toxin that affect	cts the central nervous system and skelettellmuscl
50.	produc	ucing powerful tetanic contractions of the skeletal muscl	es. The toxin probably actsby:
		increasing the amount of acetylcholinesterase in the	synapse
	Α.	increasing the amount of activitional states and and the second in the s	·J
	В.	making the cells less permeable to sodium ions	ellular fluid
	C	increasing the amount of potassium ions in the interc	om iona
		making the cell membranes more permeable to calciu	III IOAS
	Ē.	competing with acetylcholine for receptors at the mo	tor end plate
37 .	Central	ral fatigue	
	\mathbf{A}_{\cdot}	include feeling tired	
	В. "	may precede physiological muscle fatigue	_
	C '	may be related to changes in the brain related to chan	nges in the pH of the blood
		A and B	
	F	A, B and C	A A Section
			•
38.	Which	ch of the following are involved directly in the systemic of	circulation?
50.		superior vena cava, right atrium, and left ventricle.	
		right ventricle, pulmonary artery, and left atrium.	
	D.	left ventricle, pulmonary artery, and inferior vena ca	va
	C.	left ventricle, pullifoliary artery, and interior ventricle	
	P.	right atrium, right ventricle, and left ventricle	
	***	NOTE IN LABORATE THE MINISTER OF	
39.	Which	th description is <u>NOT</u> correctly matched to the tissue?	
	A.,	skeletal muscle - controls voluntary body movement	3
	(B)	skeletal muscle - always attached to bones	
	Č.	cardiac muscle - found only in the heart	
	D.	cardiac muscle - classified as striated muscle	
	E.	smooth muscle – the primary muscle of internal orga	ns
	L.	Smooth musele the primary masters of annual grant	
40	Manufact.	ation and traction any pline refers to	
40.		ation-contraction coupling refers to	
	Α.	acetylcholine opening ion channels	time due to its average from the average Time
	B.	the arrival of acetylcholine at the neuromuscular junc	THOU ONE TO HE EXOCATORIS STORY THE SYCHOLOGICAL LIMEST
		the chemical and electrical events that trigger the med	chanical events in a musck liber
	Ď.	the enzymatic removal of acetylcholine from the syna	ipse which can then allow relaxation to mecur
	E.	B and D	
		are more about the	

33.	The pulmonary circulation differs from the systemic circulation because:
	A. Pulmonary blood flow is only half that of the cardiac output.
	B. There are no arterioles in the pulmonary circulation.
	C. It is a low pressure system while the systemic circulation is a high pressure system. D. It is less distensible than the systemic circulation.
	D. It is less distensible than the systemic circulation.
34.	Which of the following has a pulsatile flow into capillaries?
	A. the systemic circulation B. the pulmonary circulation
Y	C. both D. neither
35.	Which statement best describes arteries?
	All carry oxygenated blood to the heart.
	B. All contain valves to prevent the back-flow of blood.
	C. All carry blood away from the heart.
	D. Only large arteries are lined with endothelium.
36.	The bacterium that causes tetanus produces a toxin that affects the central nervous system and skeletal muscles
	producing powerful tetanic contractions of the skeletal muscles. The toxin probably acts by:
	A. increasing the amount of acetylcholinesterase in the synapse
	B. making the cells less permeable to sodium ions
	C. increasing the amount of potassium ions in the intercellular fluid
/	D. making the cell membranes more permeable to calcium ions
	E. competing with acetylcholine for receptors at the motor end plate
37.	Central fatigue
	A. include feeling tired
()	B. may precede physiological muscle fatigue
y	C. may be related to changes in the brain related to changes in the pH of the blood D. A and B
	(E. A, B and C)
38.	Which of the following are involved directly in the systemic circulation?
,	A. superior vena cava, right atrium, and left ventricle.
4.50	B. right ventricle, pulmonary artery, and left atrium.
•	left ventricle, pulmonary artery, and inferior vena cava
	ight atrium, right ventricle, and left ventricle
39	Which description is NOT correctly matched to the tissue?
	A. skeletal muscle – controls voluntary body movements
7	B. skeletal muscle – always attached to bones
り	C. cardiac muscle – found only in the heart
	D. cardiac muscle – classified as striated muscle
	E. smooth muscle – the primary muscle of internal organs
40.	Excitation-contraction coupling refers to
	A. acetylcholine opening ion channels
	B. the arrival of acetylcholine at the neuromuscular junction due to its exocytosis from the axon terminal
	C. the chemical and electrical events that trigger the mechanical events in a muscle fiber
	D. the enzymatic removal of acetylcholine from the synapse which can then allow relaxation to occur
	E B and D

	1. 1	End plate potentials trigger	action potential	s		
	2. 7.	Transverse tubules convey	action potentials	s into the interior of the muscl	le fiber	
		Acetylcholine binds to rece				
	4. I	Binding sites on actin are u	ncovered, allow	ing myosin to bind and carry	out power st	rokes.
		Ca ²⁺ is released from the sa			•	
		Chemically regulated ion cl				
	7. (Ca2+ ions bind to troponin-				
	A.	5. 3. 2. 1. 4 7 6	-,,,	F J		
	$\hat{\mathbf{B}}$	3 6 1 2 5 7 4				
	C	4 1 3 7 2 6 5				
	D.	2. 4. 7. 6. 3. 1. 5				
	E.	3. 6. 1. 5. 7. 2. 4				
		5, 3, 2, 1, 4, 7, 6 3, 6, 1, 2, 5, 7, 4 4, 1, 3, 7, 2, 6, 5 2, 4, 7, 6, 3, 1, 5 3, 6, 1, 5, 7, 2, 4				
42.	An ir	nportant difference betwee	n single-unit and	d multi-unit smooth muscle is		
	A.			mooth muscle, which allow m		work together as a
	·	sheet 8		and the second of the second of the second		<i></i>
	B.	longer actin and myosir	filaments in m	ulti-unit smooth muscle, which	h allow coor	dination of contraction
	C.	the ability of single-uni	t fibers to chang	e into multi-unit fibers when	advantageou	S
	D.			ingle-unit smooth muscle to a		
		contractions by selectiv				_
	E.	All of these			Stala	Vestibuli'
					Scal	Vestibuli' la Medi' la Tympan'
43.	The s	tructure that separates the	cochlea duct fro	om the tympanic duct is the:	500	la Tympan'
	A.	tectorial membrane	₹ B.	basilar membrane	-e. ·	membrane labyrinth
	D.	bony labyrinth	E.	stapedius	٠.	indicated and jumpi
				,		
44.	The t	hick, gel-like fluid that help	os support the st	tructure of the eyeball is the:		
<	(A.)	vitreous humor	B.	aqueous humor	C.	ora serrata
	D.	perilymph	E.	otolymph		
45.		passes through the following				
	A.	vitreous humor, lens, aq	ueous humor, c	ornea		
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	<u>С.</u>	cornea, aqueous humor,	lens, vitreous h	umor)		
37		cornea, vitreous humor,				
	D.	aqueous humor, cornea,	lens, vitreous h	umor		
46.	In the	sympathetic nervous syste	m progonaliani	a fibora ara		*** ***
	A.	white; gray		c fibers are and post g		
	D.	thick; skinny	B. E.	long; short	C.	square; round
	D.	duck, skilliy	<u>.</u>	short; long		
47.	A cert	ain drug decreases heart ra	ite by producing	s hyperpolarization at the men	when a of th	
	the he	art. This drug probably bi	nds to rec	entore	norane or in	e pacemaker cens or
	A.	nicotinic	B.	muscarinic	6	1.1 1 1
	D.	alpha -2 adrenergic	E	beta	. .	alpha-l adrenergic
		aipia 2 adionoigio	J.	UGIA		
				C.		
48.	A(B)('	\Gamma/F) White blood cell	ls form a plug th	nat seals a break in a blood ve	essel	
	~ A		1 8	7		
49	(A)B	Γ/F) All muscle cells	are elongated a	nd are therefore called muscle	e fibers.	
·	Sero	med wells M. S				
50.	The _	h is a map of the motor	cortex of the ce	erebrum. Write in your	answer.	
	/ 4	Tobor humunculu	<u> </u>			
1	\uparrow	1.011.01.46	المتنبع			
1	/'	Dr. Bernard - Huma	n Physiology	Exam 3 - Spring 2006 – I	Page 6 of 7	

41.

Put these events in the correct order of occurrence.

Each of the numbered items or incomplete statements in this section is followed by answers or completions of the statement. Select the ONE lettered answer or completion that is BEST in each case and write your selection in the left margin beside the question. Each multiple choice question is worth 2 points.

	beside the question. Each multiple choice question is worth 2 points.	
1.	The sliding filament of contraction involves:	
1.	A SATION AND A SAT	
	Actin and myosin sliding past each other but not shortening. The shortening of thick filaments so that the thin filaments slide past.	
		•
•	C. Actin and myosin shortening but not sliding past each other	
	D. The Z discs sliding over the myofilaments.	
2.	Contractions of the papillary muscles:	
	A. close the atrioventricular valves	
	B. close the semilunar valves	
	C eject blood from the ventricles	
	prevent the atrioventricular valves from projecting into the atria	2
	E. eject blood from the atria into the ventricles	
3.	If you feel like you heart is beating rapidly while you sit here taking this exam, you are probably:	
	A. right because the somatic nervous system is in control	
	B. right because the parasympathetic systemic responds to stress situations	1
	right because the sympathetic system is responding to the stress of the test situation	
	A. right because the somatic nervous system is in control B. right because the parasympathetic systemic responds to stress situations right because the sympathetic system is responding to the stress of the test situation wrong because the pacemaker tends to keep your heart beating at a steady rate even under stres	s
•	E. wrong because the response of your body to stress is to shift energy to the skeletal muscles from	a the 🗀
•	heart muscle	
	Blood within the pulmonary veins is returned directly to the:	•
4.		
		,
	D. right ventricle E. left ventricle	·
·	Each of the following statements concerning the movement of fluid between capillaries and interstitial true except one. Identify the exception. A. Blood hydraulic pressure forces fluid from the capillary to the interstitial space. B. Blood osmotic pressure moves fluid from the interstitial space to the capillary C. The osmotic pressure of the interstitial fluid is less than the blood osmotic pressure. The blood hydraulic pressure and the blood osmotic pressure are equal in magnitude but opposition. E. The hydraulic pressure of the interstitial fluid does not oppose the movement of fluid from the capillary.	
6.	During the period of ventricular filling:	
0.	A. pressure in the heart is at its peak	•
	B. the atria remain in diastole	
	blood flows passively through the atria and the open AV valves	
. '	The state of the s	
	D. blood is flowing through the open pulmonary valve	
	E. the mitral valve remains closed	
	01000	. 1
7.	A 25 year old Human Physiology student has a total lung capacity of 6000 ml, residual volume of 1000 tidal volume of 500 ml and inspiratory capacity of 3000 ml. Her functional residual capacity (FRC) is: 2,000 ml B. 2,500 ml 3,000 ml E. 5,000 ml	ni,
	RC= RV+ EPV 3,000 - 1800	
F	PC = RV + EPV 1000 7000 3,000 - 1000 Page 1 of 7 C = TV + 1	LRV
	Dr. Ramard Human Physiology From 3 - Spring 2005 - Page 1 of 7	IRV
	Dr. Bernard - Human Physiology Exam 3 - Spring 2005 - Page 1 of $7C = 7V + 7V$	=RX

3

8.	Site where the velocity of blood flow is least.
0.	A. large arteries B. arterioles (C) capillaries
•	D. large veins E. inferior vena cava
9.	Stroke volume would be expected to decrease when: At there is an increase in contractility There is a sudden increase in aortic pressure C. the end-diastolic volume increases SV = EDV - ESU
	A there is an increase in contractility Strove of yentricle
٠.	there is a sudden increase in aortic pressure
	C. the end-diastolic volume increases \times
	there is a sudden increase in aortic pressure C. the end-diastolic volume increases There is a slow heart rate There is a slow heart rate
	E. when blood flow returning to the heart is increased
•	
10.	The lung volume which represents the total volume of exchangeable air is the:
	A. tidal volume By vital capacity C. inspiratory capacity
	D. expiratory reserve volume total lung capacity
11.	
•	A superior vena cava, right atrium, and left ventricle
	B aright ventricle, pulmonary artery, and left atrium
•	C. left ventricle, aorta, and inferior vena cava
	D. right atrium, aorta, left ventricle
12.	Which statement is two 2
12.	Which statement is true?
•	The sarcomere shortens, the two Z disks at each end move closer together, and the I band and H zone virtually disappear.
	The thin actin filaments slide along the thick myosin filaments as they move toward the M line in the
•	center of the sarcomere.
	C. When a muscle contracts, myosin molecules coil up like springs to shorten the length.
•	A and B are true
	E. A, B and C are true
13.	If the vagal nerves to the heart were cut, the result would be:
	A. the heart would stop, since the vagal nerves trigger the heart to contract
	B. parasympathetic stimulation would increase, causing a decrease in heart rate
	the AV node would become the pacemaker of the heart SA is PW
	(D) the heart rate would increase by about 25 beats per minute
	E. None of the above is correct.
	Isovolumetric contraction: - all volves closed, no blood ejected
14.	Isovolumetric contraction:
Ą	A refers to the short period during ventricular systole when the ventricles are completely closed
	chambers
	B. occurs while the AV valves are open. C. occurs immediately after the semilunar valves close.
•	E. occurs immediately after the atria relax
•	D. only occurs in people with heart valve defects. E. occurs immediately after the atria relax of the state
15.	The deflection waves in an ECG tracing include:
***	the T wave, which indicates ventricular repolarization
	B. the Q-T interval, which indicates the time of atrial contraction (
•	C. the PQRS complex, which follows ventricular contraction \(\)
	D. the P wave, which is only present in patients who have had a heart attack

10.		
	smooth muscle connective tissue forms tendons/	
• .	B. neurons that innervate smooth muscles are under involuntary control	•
	C. smooth muscles are uninucleate	:
	D. smooth muscles do not contain sarcomeres.	
• }	E. the thin filaments of smooth muscle fibers are attached to dense bodies	
	The tricuspid valve is closed:	
17.	The middle plant to the management of the middle plant to the midd	
	A. while the ventricle is in diastole \(\times \)	
	B. while the atrium is contracting	•
	C. by movement of blood from atrium to ventricle	
	when the ventricle is in systole //	1.
	V ·	1
. ALQ	Which of the following is most likely to represent normal arterial blood gas value	s, in mm Hg?
Ac.	PO ₂ - 120, PCO ₂ - 60 B. PO ₂ - 70, PCO ₂ - 3	32
. 📲	1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	38
•	C. $PO_2 - 60$, $PCO_2 - 40$ $PO_2 - 90$, $PCO_2 - 30$	
1		
19.	Surfactant helps to prevent the alveoli from collapsing by:	•
	A. humidifying the air before it enters ×	•
•	warming the air before it enters	
	interfering with the cohesiveness of water molecules, thereby reducing the	e surface tension of alveol
	fluid	•
	والمستقد والمراجع والم والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراج	al variations
	D. protecting the surface of alveoli from dehydration and other environment	,
	Nativ	regult of
20.	The depolarization phase of the conducting system muscle action potential is the	result of.
	ancreased membrane permeability to sodium ions	•
•	B. increased membrane permeability to potassium ions	•
· 1	1 to make the policy of the same	
	D. decreased membrane permeability to sodium ions	· · · · · · · · · · · · · · · · · · ·
• •	E. increased membrane permeability to chloride ions	. 1_
•	L. morousou monostra por julio de la company	•
1	A subject has a tidal volume of 800 ml, an anatomical dead space of 200 ml and a	respiratory rate of 15
N/I	A Subject has a fidal volume of 800 ini, an amaziment deduce passes of 200 ini, and	more technical
W_	breaths per minute. His alveolar ventilation (V _A) is (in ml/minute):	200 1000
	A. 1,000 B. 3,000	was a second
•	9,000 D. 12,000 6.00	700 # 600 ML
	•	•
22.	In mouth-to-mouth artificial respiration, the rescuer blows air from his or her own	respiratory system into in
	of the victim, thus:	•
	expansion of the victim's lungs is brought about by blowing air in at high	er than atmospheric pressu
•	B. during inflation of the lungs, the intrapleural pressure increases	
	C. intrapulmonary pressure exceeds intrapleural pressure	
•		
	All of the above are correct.	
٧.		
V/23.	Which of the following statements concerning alveolar pressure is/are correct?	
80	A. Alveolar pressure is less than atmospheric pressure during a normal negat	ive pressure inspiration.
	Alveolar pressure is greater than atmospheric pressure during a forced exp	piration
	C. Alveolar pressure equals atmospheric pressure at the end of a normal tidal	l expiration.
	All of the above.	-
	Wit of the grove.	
	- 1 1611 lass lavel	value, the PO, of tracheal
24.	In the Peruvian Andes where the atmospheric pressure is half the normal sea level	rumo, mo i O2 vi manani
	inspired gas is:	· · · · · · · · · · · · · · · · · · ·
	A. 60 mm Hg 70 mm Hg	80 mm Hg
	D. 90 mm Hg E. 100 mm Hg	

2.	The state of the s
	directly proportional to the partial pressure of that gas". This statement refers to:
	Charles law B. Graham's law Dalton's law
	D. Avogadro's law $PV_{z} = P_{z}V_{z}$
. 26	
	A. hormonal activity B. neurotransmitters
	C. a change in the pH of a muscle All of the above
•	And the second s
.27	1 The state of the
	A. the movement of fewer sodium ions across the cell membrane
•	the calcium channels remaining open longer than the sodium channels
	C. the increased membrane permeability to potassium
	D. a decrease in the amount of calcium diffusing across the membrane
	E. an increased membrane permeability to sodium ions
28.	of the same of the same type it. The fairetient of type it is.
	A) to secrete surfactant
	B. to trap dust and other debris
	C. to replace mucus in the alveoli
	D. to protect the lungs from bacterial invasion
	E. to increase the diffusion distance
29.,	Place the following structures of the respiratory tree in order, considering how air enters the tree: 1. terminal
	bronchioles 2. bronchius 3. respiratory bronchioles 4. alveolar duct 5. bronchioles 6. alveolar sacs
	A. 2, 4, 1, 5, 3, 6 B. 1, 5, 2, 3, 6, 4 C. 3, 1, 2, 5, 4, 6
•	D. 5, 1, 3, 2, 6, 4 (E) 2, 5, 1, 3, 4, 6
20	7 46
30.	In muscle contraction, calcium apparently acts to:
	A. increase the action potential transmitted along the sarcolemma
_	B. release the inhibition on the Z lines
•	remove the blocking action of tropomyosin/
•	D. cause ATP binding to actin
31.	The amount of blood flowing to skeletal muscles is greatly increased during exercise. This redirection of
~	blood into muscles is accomplished by:
	A contraction of muscle in the walls of arterioles
	B. relaxation of muscle in walls of arterioles X
	C. opening of valves in veins
	D. opening of valves in arteries x
	E. relaxation of muscle in the walls of veins x
32.	If the period of ventricular filling were increased in duration:
32.	A loss blood would flow it the three times and direction:
	less blood would flow into the ventricle for any given time interval
(the amount of blood in the ventricles at the end of diastole would be greater
	C. the amount of blood in the ventricles at the end of systole would be greater
	D. the stroke volume would decrease
 33.	The required on a manufacture of the second
25.	The respiratory membrane is a combination of:
/1	A. respiratory bronchioles and alveolar ducts
· R	alveolar and capillary walls and their fused basal lamina
-	C. atria and alveolar sacs
	D. None of the above

34.	When	you exhale, the diaphragm:	- A. J.		1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 /	
	(A)	relaxes and arches	100	В.	relaxes and flattens	
	Č.	contracts and arches		D.	contracts and flattens	•
1	E.	contracts and arches, but o	nly when yo	u are e	exercising vigorously	
· i .		•				the
35.	In cir	culating from the brain to the	arm, a drop	of bloc	od would <u>NOT</u> have to pass through which of	ЩС
'1 .	follov	wing? .	•			•
	Α.	left atrium	•	В.	aorta	
	C . '	superior vena cava		\mathbf{D}_{\cdot}	pulmonary vein	-
		inferior vena cava	•			1
			•			
36.	Which	h of the following is NOT a fo	inction of st	nooth 1	muscle tissue?	•
50.	A	altering the diameter of the	resniratory	nassag	reways	
•	В.	elevating hairs on the arm				. 1
•		forcing blood from the hear	t into the m	aior art	teries Cordiac	-
•	D. E.	moving food materials alon	a the direct	ive trar	rt!	
,	ψ. E			VC HILL		•
	E.	forcing urine out of the urin	iary iraci			1
			41	imia a	simulation because	
37.	The p	ulmonary circulation differs fi	om the syst	enne e	cardiac output \ Pul = 11 fer card = 61.	ter
	A.	Pulmonary blood flow is on	ly half that	or me	Card - Card - Card	
		There are no arterioles in th	e pulmonar	y circu	HAHOH.	•
:		It is a low pressure system v	vhile the sy:	stemic	circulation is a high pressure system.	
	Ď.	It is less distensible than the	systemic c	irculati	ion.	
	-		A			
38.	Which	of the following has a pulsati	le flow into	capill	aries?	
	Α	the systemic circulation	<i>(</i>	D)	the pulmonary circulation	
	C	both	`	(D)	neither	•
	,		***	~	a 1 b	
39.	Which	statement best describes arter	ies?	avoc	, ,	ŕ
•	Α.	All carry oxygenated blood t	to the heart.	×		•
	В.	All contain valves to prevent	t the back-fi	low of	blood,×	•
		All carry blood away from the	ne heart.			
	Ď.	Only large arteries are lined		elium.		
Match	each wi	th its function (Questions 40 a	nd 41):			•
14161101	A.	If the items vary directly				•
	В.	If the items vary inversely	¥			
	Б. С.	If changes in the first item an	e not ordina	arily ac	ccompanied by changes in the second	
		Both A and B	O HOL OF	## T		•
	D. :	Neither A nor B		f.V	more A = m	~ NE 095
	E.	Neimer A nor b		N.	more H= "	۵۰ J ۱۰-
10	A 4	Co		nge dif	ffusing through that membrane.	
40.	Area or	a memorane AND the total at	nountor a	gaşun	ffusing through that membrane.	•
		, , , , , , , , , , , , , , , , , , , ,		_ 41	what warmbrone to all the those	~104° ·
41.	Thickne	ess of a membrane AND diffus	sion of a ga	is throu	nigh that membrane. Thicker these	7-3
	· 7)				
		•				+a1
42.	The bac	terium that causes tetanus pro-	duces a tox	in that	t affects the central nervous system and skele	ran
	muscles	producing powerful tetanic co	ontractions	of the	skeletal muscles. The toxili probably acts of	y:
		increasing the amount of acety	ylcholinest	erase i	in the synapse 🗡	
.1	А. В.	making the cells less permeab	le to sockiu	m ions	Σ.	
•	c.	increasing the amount of potas	ssium io ms	in the	intercellular fluid	
. 1	An .	making the cell membranes me	OTH MATTER	ble to	calcium ions \	
1		competing with acetylcholine	för recemate	rs at th	he motor end plate	
5		compening with accidicatine	IOI ICOURTIC	, v ut U	en and the transfer of the tra	٠.

	43.	Central fatigue	, , , , , , , , , , , , , , , , , , ,
		A. include feeling tired \$	w #
		B. may precede physiological muscle fatigue	"妈妈 我们们说说,我
	. 6	may be related to changes in the brain related to changes in t	he nH of the blood
		A and B	ne pri or the blood 4
		E. A, B and C	
•			
4	14.	Which of the following are involved directly in the systemic circulati	والمالية
		superior vena cava, right atrium, and left ventricle.	on?
			refr ventricle
		o, 71 J vvij, and lot, ad tall.	1 Market
. ' '		The state of the s	aorra
		D. right atrium, right ventricle, and left ventricle	I right abrium
A	c 10	TREAT 1 2 A TOWN	7 Occurred
. 4	5 V	Which description is <u>NOT</u> correctly matched to the tissue?	•
		skeletal muscle - controls voluntary body movements	
_			
	C	and the nome	
	D	The state of the s	
	E	smooth muscle – the primary muscle of internal organs	
•			
46	6. E	xcitation-contraction coupling refers to	
	A	acetylcholine opening ion channels	
	B :	the arrival of acetylcholine at the neuromuscular junction due	to its executosis from the avon terminal
•	- (C	the chemical and electrical events that trigger the mechanical e	events in a muscle fiber
	D:	the enzymatic removal of acetylcholine from the synapse which	h can then allow relevation to com-
	E.	B and D	a can then allow letaxation to occur
<i>!</i>		•	
· 47.	. Pu	t these events in the correct order of occurrence.	
•	· 1.	End plate potentials trigger action potentials	
	2.	Transverse tubules convey action potentials into the interior of the r	
	. 3	Acetylcholine binds to receptors on the motor end plate.	nuscle fiber
	4	Rinding sites on actin are uncovered allowing sites on acting are uncovered.	
	5	Binding sites on actin are uncovered, allowing myosin to bind and c Ca^{2+} is released from the correction of the second site.	arry out power strokes.
	6	Ca ²⁺ is released from the sarcoplasmic reticulum.	'
	7	Chemically regulated ion channels open, causing depolarization.	3,6,1,2,5,7,4
	Α.	Ca ²⁺ ions bind to troponin-C, pulling on tropomyosin	19492979 194
	A:	5, 3, 2, 1, 4, 7, 6	
	410	3, 6, 1, 2, 5, 7, 4	1
	U.	$\frac{3,6,1,2,5,7,4}{4,1,3,7,2,6,5}$ $\frac{3,6,1,2,5,7,1}{3,6,1,2,5,7,1}$	
•	D	2, 4, 7, 0, 3, 1, 3	•
•	E.	3, 6, 1, 5, 7, 2, 4	
48	An i	mportant difference between single-unit and multi-unit smooth musc	ele is
	(A.)	numerous gap junctions in single-unit smooth muscle, which allo	ow many cells to work together as a
•		sheet	To home to gotton to t
	В.	longer actin and myosin filaments in multi-unit smooth muscle, v	which allow coordination of
		contraction	, mon ano w coordination of
	C.	the ability of single-unit fibers to change into multi-unit fibers wh	ien adventageore
•	D.	Closely controlled individual fibers in single-unit smooth muscle	to allow fine a series to a series to allow fine a series to a ser
		contractions by selective activation	to allow rine control and graded
	E.	All of these	·
•	٠.	THE OF MICSE	·
49.	TF	All muscle calls and the	
ተ ጛ、	TIE)	All muscle cells are elongated and are therefore called muscle fibe	ers. F
	m#1		
<i>5</i> 0. ·	T(F)	Intrapleural pressure is always negative and stable.	

Please answer these questions briefly. Label diagrams correctly, with lines pointing to the proper structures. Partial credit will be given where appropriate. Write legibly!! You can use the back of the last page to continue any question. Number them, please!!

51. What are the four types of sensory receptors for the general senses? What is the nature of the stimuli that excite each type? (4 points)

Europeuphers - Pressure They was vaciple >1 - Temporation Chemoreonters - H Nocimposis Pair

Photo

52. Imagine grasping an object with a handle and lifting it 20 centimeters. What is different about the muscle behavior lifting a coffee mug, a full half gallon of milk, or a 10 kilogram suitcase? (Ignore positional differences of the arm; address the effort required.) Do sarcomeres behave differently? Explain! (5 points)

reconstment no sarcomers behave in the same way be movement

53. Your physiology professor has suffered a myocardial infarction (after seeing the grades on the last exam). Although his heart rate is 60 beats per minute, his ejection fraction (SV divided by EDV) is only 25%, with a stroke volume of 40 mL. What is his EDV, ESV, and CO? Show your calculations for full points. (5 points)

000

Co = Condias Pody a EDV = End - Dissible Volume 05% = 14 CO = HR X CV 2 97 × 046 5V = /2(EDV) HRXSV = CO HOME X BED) SV = EDV - ESV TO = EDV = 2,4 L

ESTA Conde Contalie Volum LIDV - TARREST 1600 -400 = 177 mil

F17 120 1 10 1 Helimb = EDH

-16L

Each of the numbered items or incomplete statements in this section is followed by answers or completions of the statement. Select the ONE lettered answer of a completion that is BEST in each case and write your selection in the left margin beside the question. Each multiple choice question is worth 2 points.

Wigo 4	the diame.			1	en 2 points.	
Use t	the magram to the right	to answer the ne	xt three (3) questions.	~	e de la companya de l	
1. 	Identify the structure land thalamus B. cerebral cortex C. primary motor D. primary sensor E. autonomic gang Which structure receives	abeled "5." cortex y cortex glion				-7(1° something sentory cortex) -6(3°
. (B. 2	C. 3	/_ \		
	D. 5 Identify the type of infor labeled "2." A. motor command:	s to skeletal mucc	s along the structure			Lulla)
1	C. fine touch to the pain and crude to visceral motor co	o the cerebral cort cerebral cortex ouch sensations ommands to smoot	h muscle	Proc	2 (paint	rever. rever. ul reation)
B C D	Actin and myosin and The Z discs sliding	sliding past each thick filaments so shortening but not gover the myofila	other but not shortening that the thin filaments s		inal cord	
5. Co A. B. C. D. E.	close the semilunar	icular valves valves ventricles tricular valves for	om projecting into the atr	м та	A STAN	Failure Unknown Feyechise
A.	uner, middle	ds waves and tran	smits them to the		as sensory organs for	655 dearh
	middle; inner	E.	none of these	C.	outer; inner	
Site A. D.	where the velocity of blox large arteries large veins		arterioles inferior vena cava	C	capillaries	

	If you feel like you heart	is beating rapidly w	hile you sit here taking	g this exam, you are probably.
(المرابع الم المرابع المرابع المراب	- Est occause un	, SULBAUU HELVOHN SV	SICID IS IN CONTROL	and the second of the second s
1 (Pric occuracy fill	varasvindainenc sv	Siemic recoonde to at-	annih at .
		e pacemaker tends t	o keep your heart beat	ting at a steady rate even under stress
	heart muscle	E response of your c	ody to stress is to shif	ing at a steady rate even under stress from the
9,	Damage to the fovea of th	e eye would interfer	e with the ability to	
Ą	 iocus on an image 	9		•
}	3. regulate the amou 5. bleach visual pign	nt of light striking th	ne retina	
		nents		
	 see black and white 			
Œ	see color		And the second of the second o	A PROPERTY OF THE SECOND SECON
). Ţ	he lens focuses light on the	ne photorecentor cell	le hv	
Å	moving up and dov	wn	<i>u</i> y.	x = x + S
В	moving in and out			
Œ				
D	1	3		
E	dilating and constri	cting		
Bl	و و المائنية الموم			
Д.	ood within the pulmonary	veins is returned di		
D.	lungs right ventricle	B .	right atrium	C. left atrium
	right ventricle	E.	left ventricle	
Ea	ch of the following statem	onto com a di		
Ea tru	EXCEPT one. Identify	the expension	movement of fluid bet	ween capillaries and interstitial space is
Α.	Blood hydraulic pres	State forces fluid for	om the capillary to the	•
₿.				
C	Serifolio picasuli	COLUCTION PROPERTY	inner and an array of the second	(887年) 12 (1997年) 1997年 1997
(\mathbf{D})	The blood hydraulic	pressure and the blo	od osmotic pressure e	ood osmotic pressure re equal in magnitude but opposite in
	action.		rod osmode pressure a	re equal in magnitude but opposite in
E.	The hydraulic pressu	and the second second		
	and my draudic pressu	re of the interstitial	fluid does not oppose t	the movement of fluid fam.
5 D	in the state of th	re of the interstitial	fluid does not oppose t	the movement of fluid from the capillary.
3 Dur	ing the period of ventricul	re of the interstitial	fluid does not oppose t	the movement of fluid from the capillary.
Α.	ing the period of ventricul pressure in the heart i	re of the interstitial ar filling:	fluid does not oppose t	the movement of fluid from the capillary.
B.	ing the period of ventricul pressure in the heart in the atria remain in dia	re of the interstitial ar filling: s at its peak		
A. B. C	ing the period of ventricul pressure in the heart in the atria remain in dia blood flows passively	re of the interstitial ar filling: s at its peak astole through the atria ar	ed the open AV1	
A. B. C. D.	ing the period of ventricul pressure in the heart in the atria remain in dia blood flows passively blood is flowing throu	re of the interstitial ar filling: s at its peak estole through the atria are	ed the open AV1	
A. B.	ing the period of ventricul pressure in the heart in the atria remain in dia blood flows passively	re of the interstitial ar filling: s at its peak estole through the atria are	ed the open AV1	
A. B. C. D. E.	ing the period of ventricul pressure in the heart in the atria remain in dia blood flows passively blood is flowing throu the mitral valve remain	ar filling: s at its peak estole through the atria an gh the open pulmon is closed	nd the open AV valves nary valve	
A. B. C. D. E.	ing the period of ventricul pressure in the heart in the atria remain in dia blood flows passively blood is flowing throu the mitral valve remain the volume would be expect	ar filling sat its peak astole through the atria and gh the open pulmon as closed ted to decrease when	nd the open AV valves nary valve	
A. B. C. D. E.	ing the period of ventricul pressure in the heart in the atria remain in dia blood flows passively blood is flowing through the mitral valve remains the volume would be expectable to an increase in the control of the prior of	ar filling: s at its peak estole through the atria an igh the open pulmon ins closed ted to decrease where	nd the open AV valves nary valve n:	
A. B. C. D. E. // Strok	ing the period of ventricul pressure in the heart in the atria remain in dia blood flows passively blood is flowing through the mitral valve remains the volume would be expectable is an increase in there is a sudden increase.	ar filling: s at its peak estole through the atria an igh the open pulmon ins closed ted to decrease when contractility ase in aortic pressur	nd the open AV valves nary valve n:	
A. B. C. D. E. Strok	ing the period of ventricul pressure in the heart in the atria remain in dia blood flows passively blood is flowing through the mitral valve remains to volume would be expectable is an increase in there is a sudden increase the end-diastolic volume.	ar filling: s at its peak estole through the atria and gh the open pulmon as closed ted to decrease where contractility ase in aortic pressur as increases	nd the open AV valves nary valve n:	
A. B. C. D. E. Strok	ing the period of ventricul pressure in the heart in the atria remain in dia blood flows passively blood is flowing through the mitral valve remains the volume would be expectable is an increase in there is a sudden increase the end-diastolic volume there is a slow heart ra	ar filling: s at its peak estole through the atria and gh the open pulmon ins closed ted to decrease when contractility ase in aortic pressur ite increases te	nd the open AV valves nary valve n:	
A. B. C. D. Strok A. C. D. E.	pressure in the heart in the atria remain in dia blood flows passively blood is flowing through the mitral valve remains the volume would be expect there is an increase in there is a sudden increase the end-diastolic volume there is a slow heart rawhen blood flow returns.	ar filling: s at its peak estole through the atria and gh the open pulmon as closed ted to decrease where contractility ase in aortic pressur ase increases te ing to the heart is in	nd the open AV valves nary valve n: re	
A. B. C. D. Strok A. C. D. E.	pressure in the heart in the atria remain in dia blood flows passively blood is flowing through the mitral valve remains the volume would be expect there is an increase in there is a sudden increase the end-diastolic volume there is a slow heart rawhen blood flow return artilaginous structure that	ar filling: s at its peak stole through the atria and gh the open pulmon as closed ted to decrease when contractility ase in aortic pressur ase increases te ing to the heart is in surrounds the exter	nd the open AV valves nary valve n: re	
A. B. C. D. Strok A. B. C. D. E.	ing the period of ventricul pressure in the heart in the atria remain in dia blood flows passively blood is flowing through the mitral valve remains the volume would be expectable is an increase in there is a sudden increase the end-diastolic volume there is a slow heart ra	ar filling: s at its peak estole through the atria and gh the open pulmon as closed ted to decrease where contractility ase in aortic pressur ase increases te ing to the heart is in surrounds the exter	nd the open AV valves nary valve n: re	

15

· 1	virtually disappear.	o at each end move closer together, and the	re I band and H
a myteria	B The thin actin filaments slide along the	thick myosin filaments as they move toward	
	center of the sarcomere.	move towa	rd the M line in the
r	C. When a muscle contracts, myosin molec	riles soil I'r	4,0
•	A and B are true	cules coil up like springs to shorten the len	igth.
	E. A, B and C are true		
17.	The near were out the	It would I	·
	The field would ston since the record		
	B. parasympathetic stimulation would increase	ves ingger the heart to contract	
	C. the AV node would become the	ase, causing a decrease in heart rate	
	the heart rate would increase by about 25	or of the heart	•
	E. None of the above is correct.	beats per minute	
	Description of the Company of the Co	en e	
18.	To void neur contraction.	•	
	A refers to the short period during ventricular occurs while the AV valves are open		
	B. occurs while the AV valves are open	r systole when the ventricles are complete	ly closed chang
	multidiciv affer the complement		-) closed chambers
	D. only occurs in people with heart valve defe	ves close	
	E. occurs immediately after the atria relax	cts	
			,
19.	The shape of the lens is controlled by the:		
	A. papillary constrictor muscles		
	C. Ins	/ Fabruary miator muscles	
	E. aqueous body	ciliary muscles	
20	rm		
20.	The deflection waves in an ECG tracing include:		
	Wave, Which indicates want .	lo-i	
9 4			
	C. the PQRS complex, which follows ventricular the P wave, which is only present in part.	autai contraction	
	D. the P wave, which is only present in patients	who have I	
21.	Which for our	who have had a heart attack	
21.	Which of the following is <u>NOT</u> characteristic of smooth muscle connective tigous f	th mucole?	
	mai maci vale smooth mannala	der innel	
	C. smooth muscles are uninucleate	der involuntary control	
	Smooth muscles do not contain acres		
.1	E. the thin filaments of smooth muscle fibers are	attached to 1	
22.	Charles to	attached to dense bodies	
	The tricuspid valve is closed: While the ventricle is in the	The state of the s	
Ë	while the ventricle is in diastole	A company of the comp	4 (A)
r	are all ittill is contracting		
	by movement of blood from atrium to	The state of the s	
(D	when the ventricle is in systole		
23. T	ho donale		
	he depolarization phase of the conducting system musc increased membrane permeability to sodium ions	le action (
n.	increased membrane permeability to sodium ions	to action potential is the result of:	
.D.	increased membrane nermeability to	· ' for	
© D.			
E.	increased membrane permeability to chloride ions	e agreement and a company of the com	
Part of	Dr. Bernard - Human Physiology Exam 3	The state of the s	
	a nysiology Exam 3	- Spring 2006 - Page 3 of 7	
		· · · · · · · · · · · · · · · · · · ·	

The sarcomere shortens, the two Z disks at each end move closer together, and the I band and H

Which statement is true?

virtually disappear.

	Wł A	ich of the following v	vould act as a	stimulus t	o initiate a mus	cle contraction?	********
assert a Artifal Control and Assert	C.	a change in the n	U of a man a		B. neurot	ransmitters	The Market State of the Control of t
e de la companya de La companya de la co	alk Hopelin	a property of the second of th	and a muscle	Markette star	D. All of	ransmitters the above	e de la companya de La companya de la co
_{zz} 25.	The	plateau phase of the	cardiac muscle	action no	toutil	Bedretz Bernard (1959-1966)	the water water of the solution of
1	\mathbf{A} .	the coloium share					
	(\mathbf{B})	the calcium chang	els remaining	ions acros	s the cell memb	rane	
	C,	the calcium chang	icis icinaming	open long	er than the sodi	ium channels	
	D.	Caboa Inter	aurane bermea	DUBBLE TO THE	Ot		
	E.	a decrease in the a	mount of calc	ium diffus	sing across the	membrane	
,		and moroused mem	orane permeat	outly to so	dium ions		
26.	In m	iscle contraction, calc	ium apparentl	v acts to:			
	77.	merease the action	potential trans	smitted al	ong the - 1		
	B.	- average rive municific	Ju on me 7. nn	ec		nma	
	(C)	remove the blockin	g action of tro	nomuoais			9
	D.	cause ATP binding	to actin	Pomyosiii	-		an da Begintellyggether
			to norm			•	
27.	The o	ssicles connect the:			70 × 1		2.18 G
((A)	tympanic membrane	e to the ovel		,		
	B.	tympanic membrane	to the row-	moow (/			
,	C.	oval window to the	round windows	window		**	
	D.	cochlea to the tympa	anic momb	,			•
	E.	cochlea to the oval v	vindow	2			
			•				
28.	The am	ount of blood flowing	to skeletal m	urelea :-	.1		This redirection of blood
•	into mu	scles is accomplished	bv.	uscies is g	reatly increased	l during exercise.	This redirection of blood
(A .)	contraction of muscle	e in the walle	of o-41			
<u></u>	B.	relaxation of muscle	in walle of ort	л апепок	es		• .
1.9	C .	opening of valves in	veins or are	cuotes		•	:
) <u> </u>	opening of valves in a	onteries				
I	Ξ.,,,	relaxation of muscle i	n the walla es	·			•
							Marie Carlos
29. I	f the pe	riod of ventricular fill	Mo were incre	1		•	•
	<u>.</u> 1	ess blood would flow	into the wort	ased in du	ration:		•
(B) t	he amount of blood in	the vent-i-1	icle for an	y given time int	erval	A. 60
, .C							
D		he amount of blood in he stroke volume wou		at the end	l of systole wou	ild be greater	indigen in the second s

30. In	circula	ting from the brain to	the o				
fo	lowing	?	uic aini, a dro	op of blood	l would <u>NOT</u> h	ave to pass throng	h which of the
A.	le	ft atrium.				,	v. Which of the
.e€.		perior vena cava		В.	aorta		Mark Commence
(E)	in	ferior vena cava		D.	pulmonary ve	ein	
	2.32	conor vona cava			. ,		•
31. W	ich of t	he following in NOT		# <u>i.</u> :	ν,		1918
Α.	alt	he following is NOT a	a function of s	mooth mu	scle tissue?		
В.		S Grantetol Ol I	HE HESTHITATOR	passagew	avs		
		rame mans on the arr	n				
© D	101	cing blood from the he	eart into the m	ajor arteri	es		
	1110	vang rood materials at	Ong the dinect	ive tract	-5		•
E.	for	cing urine out of the u	rinary tract				
		•					
32. Vibr	ations 1	eceived th the ear are	amplified by	the action."	of the		to the tolk own
		COLY CONTOICS	В.	cochta	οι rué:		the second section of the section of the second section of the section of the second section of the secti
D.		nd window	Б. Е.	cochlea	ANGO GA WANG	C. oval win	odow w w
		Parmand T	Li.	tympani	c membrane	. 7	e faf

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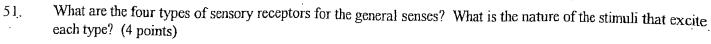
32.

	A.	Pulmonary blood flow is only half that of the cardiac output.	the first terms of the control of th
o Seuliani	B_{i}	There are no arterioles in the pulmonary circulation.	Valenti 1802 (2008) 1802 (1804) (1804) (1804) (1804) (1804)
Arth. The	C	It is a low pressure system while the systemic circulation is a high	gh pressure system.
	D.	It is less distensible than the systemic circulation.	en Timber (1997). Geografia
34.	Whi	ich of the following has a pulsatile flow into capillaries?	
	A.	the systemic circulation B. the pulmonary	circulation
	C.	both D neither	
25	3375;	ch statement best describes arteries?	
35.		·	
	A.	All carry oxygenated blood to the heart.	
	B.	All contain valves to prevent the back-flow of blood.	
	©.	All carry blood away from the heart.	•
	D.	Only large arteries are lined with endothelium.	series and legal made and a series
36.	The	bacterium that causes tetanus produces a toxin that affects the centra	al nervous system and skeletal muscl
50.		ucing powerful tetanic contractions of the skeletal muscles. The toxi	
	A.	increasing the amount of acetylcholinesterase in the synapse	m producty details by:
	В.	making the cells less permeable to sodium ions	
	.C.	increasing the amount of potassium ions in the intercellular fluid	v Nas Ox≎essa
	(D)	making the cell membranes more permeable to calcium ions	A Comment of the Comm
	E.	competing with acetylcholine for receptors at the motor end plate	
	.	compound was acceptable for receptors at the motor cha place	
37.	Centr	ral fatigue .	
	A.	include feeling tired	4. *
	В.	may precede physiological muscle fatigue	
	C .	may be related to changes in the brain related to changes in the pl	H of the blood
	D	A and B	The second of
	Ĕ.	A, B and C	
		A PARAMETER STATE OF THE STATE	e gestado e de es do e sco
38.	Which	h of the following are involved directly in the systemic circulation?	Standard State
	(A.)	superior vena cava, right atrium, and left ventricle.	
	B.	right ventricle, pulmonary artery, and left atrium.	a complete the control of the contro
	C.	left ventricle, pulmonary artery, and inferior vena cava	
	P.	right atrium, right ventricle, and left ventricle	性性では1、10円21 m - 1 1010 m
			to the state of th
39.	Which	description is NOT correctly matched to the tissue?	
	A.	skeletal muscle - controls voluntary body movements	
	<u>B</u> .	skeletal muscle – always attached to bones	
Garage	C.	cardiac muscle – found only in the heart	the control finite of the Control of
	D.	cardiac muscle - classified as striated muscle	the containing of the time of the state of t
	E .	smooth muscle - the primary muscle of internal organs	
40	3 -7		3.4.1
40.		tion-contraction coupling refers to	·
	A.	acetylcholine opening ion channels	
	B.	the arrival of acetylcholine at the neuromuscular junction due to its	s exocytosis from the axon terminal
	\bigcirc	the chemical and electrical events that trigger the mechanical event	s in a muscle fiber
	D.	the enzymatic removal of acetylcholine from the synapse which can	then allow relaxation to occur
	E.	B and D	

The pulmonary circulation differs from the systemic circulation because:

J. J.	at these events in the correct. End plate potentials trig	per action notentials	The second se	prikation i
41.	 I ransverse tubules conv Acetylcholine binds to re 	ey action potentials into the	interior of the muscle fib	
	Binding sites on actin are	e uncovered allowing myon	ate.	· 阿拉克斯 "我就是我们的我们的,我就是我们的人,就能是一个的人的人。" "
				ower strokes.
,	. Uncorrecally regulated ion	channels onen causing da-	ologication	
7	. Ca lons office to troponi	n-C, pulling on tropomyosin	olarization,	
(cras	2, 2, 1, 4, 7, 6			
Œ	3, 6, 1, 2, 5, 7, 4	S.6, 1	, Lance	
C	7 -7 -7 -7 -7 U ₂ U ₃ U			
$\overline{\mathbf{D}}$	-, ', ', ', ', ', ', ', ', ', ', ', ', ',	•		
Е	3, 6, 1, 5, 7, 2, 4			
1.42^A	n important difference between	en single-unit and	e de la companya de l	•
A	numerous gap junction	ns in single-unit smooth mus	t smooth muscle is	- Section of the sect
	sheet	and stable that smooth mile	scle, which allow many co	ells to work together as a
В.	longer actin and myos	in filamenta in mula	1 A. C. Shirt	
C.	the ability of single-un	it fibers to change into mult vidual fibers in single unit of	ooth muscle, which allow	v coordination of contraction
D.	Closely controlled indi	vidual fibers in single-unit a	mooth more when advant	ageous
300	contractions, by selective	vidual fibers in single-unit s ve activation	muscle to allow fi	ne control and graded
E.	All of these	4		
43 The	structure that separates the tectorial membrane	cochlea duat francis		
A.	tectorial membrane	B) basilar me	anic duct is the:	
D.	bony labyrinth		embrane	. membrane labyrinth
		supedius		.,
4 The	thick, gel-like fluid that help	os support the structure of the	se evoball is al	•
		B aqueous h	V 1 7 1 1 1 V 1 1 1 1 1 1 1 1 1 1 1 1 1	,
D.	perilymph	E. otolymph	C.	ora serrata
45 Ligh	t passes through the following	-	Apple 441	
A.	vitreous humor, lens, aqu	ig structures in which order	?	
- (B)	cornea, aqueous humor, l	lene vitrome l		
Ĉ.	cornea, vitreous humor, l	ens, vincous numor	State of the Land	
D.	aqueous humor, cornea, l	ens vitreous humor	· 网络特拉克 医神术病 (4)	
/ - 1 - 1 <			The first section is a section of the section of th	
16 in the	sympathetic nervous system	, preganglionic fibers are	and poet gonelies.	r
A. D.	winte, gray	B. long; short	and post ganglionic	
D.	thick; skinny	(E.) short, long	C.	square; round
LAA certa	ain drug decreases heart rate art. This drug probably bind	hiv produced	and the second s	
the hea	ert. This drug probably hind	s to	ation at the membrane of	the pacemaker cells of
A.	nicotinic	and the second s		. Sales cond of
D.	alpha -2 adrenergic	E State of the sta	¹ 2 C.	alpha-l adrenergic
		E. beta	•	3
Set A DD 700	m t			
# ANB (I)	/F) White blood cells for	orm a plug that seals a brea	k in a blood yearst	
10 X/R (T)	(ID) C AD		ard blood vesser.	
9 "VD (1)	(F) F All muscle cells are	elongated and are therefore	called muscle fibers	
∧.The \				
	s a map of the motor cor	tex of the cerebrum. Writ	te in your answer	
5 /		10.145 (1.00)	w madfiel.	e en po
<i>)</i> '				
o was a was	Dr. Bernard - Human Pl	nysiology Exam 3 - Spri	ng 2006 - Page 6 of 7	Militari geologica (m. 1995) 1885 - Maria Maria (m. 1885)
	Att Market Control of the Control of			THE RESERVE TO SERVE THE PROPERTY OF THE PROPE

Please answer these questions briefly. Label diagrams correctly, with lines pointing to the proper structures. Partial credit will be given where appropriate. Write legibly!! You can use the back of the last page to continue any question. Number them, please!!



Merkel = pressure

perkinge: vibrations

Round = light touch

= Stretenary of skin.

Mechanorouptor - vibration

Ochemoreceptor-demicals, pr

3 Tremoreceptor_temperature

@ Photoreceptor - photors of light

Imagine grasping an object with a handle and lifting it 20 centimeters. What is different about the muscle behavior lifting a coffee mug, a full half gallon of milk, or a 10 kilogram suitcase? (Ignore positional differences of the arm; address the effort required.) Do sarcomeres behave differently? Explain! (5 points)

Your physiology professor has suffered a myocardial infarction (after seeing the grades on the last exam).

Although his heart rate is 60 beats per minute, his ejection fraction (SV divided by EDV) is only 25%, with a stroke volume of 40 mL. What is his EDV, ESV, and CO? Show your calculations for full points. (5 points)

SN = 25% Of EDV 40 = 25 y CDV 1009 40 = 25 y CDV 1009 40 = 25 y CDV 1009 40 = 25 y CDV

Fleast rate = 60 beals / Min SV = 25% EDV S.V= 40 ML

 $CO = HR \times SV$ $CO = 60 \times 90$ = 2900

Each of the numbered items or incomplete statements in this section is followed by answers or completions of the statement. Select the ONE lettered answer or completion that is BEST in each case and write your selection in the left margin beside the question. Each multiple choice question is worth 2 points.

1. The ciliary muscle helps to:

control the amount of light reaching the retina

control the shape of the lens

control the production of aqueous humor

D. move the eyeball

None of the above is correct. E.

The vitteous chamber of the ever 2.

contains the lens

helps to stabilize it and gives physical support to the retina

is located between the lens and the iris

contains blood vessels that nourish the retina

All of the above

= not struted

3. Which of the following is NOT a function of smooth muscle tissue? Α.

altering the diameter of the respiratory passageways

B. elevating hairs on the arm

forcing blood from the heart into the major arteries X Ď.

moving food materials along the digestive tractv

E. forcing urine out of the urinary tract \checkmark

Salhe lacional apparatus:

is a system of glands and ducts

keeps the cornea moist with continuous tear flow

is innervated by sympathetic neurons from cranial nerve VII

A and R

All of the above are correct.

5. Information about sound must through each of these areas of the brain. Put them in the correct order. 2. medulla

3. auditory cortex of cerebrum

4. midbrain

1, 2, 3, 4 3, 2, 1, 4

2, 1, 4, 3 3, 4, 1, 2

2, 4, 1, 3

6. Tonic receptors:

2,4,13

A. are slowly adapting receptors

fire rapidly when first activated, then slow and stop firing even with a continuing stimulus are activated by parameters that must be continuously monitored by the body

D. are proprioreceptors, for example

A.C. and D

During the cardiac cycle,

round window

the p wave of the ECG occurs between the first and second heart sounds

the ORS complex of the EKC precedes the increase in ventricular pressure

the third heart sound occurs during atrial systole χ

the second heart sound coincides with the QRS complex of the ECG

the greatest increase in ventricular pressure occurs during the ejection phase

Wibrations received the ear are amplified by the action of the:

A. cochlea

D.

E.

bones of the middle ear tympanic membrane

C. oval window

		-(i-+	ulale				
<i>№</i> 9.	The	purpose of transverse tubules	s is to:				
	A	ensure a supply of Ca2+ ic		the musc	le fiber X	,	
1 1		rapidly conduct the action	notentials	to the inte	erior of the muscle	fiber 🗸	
	2.	ensure a supply of glycog	en through	out the mi	uscle sarconlasmX		
	D.	conduct the ATP molecul	es out of th	e mitocho	ondria throughout t	he sarcoplasr	n 🗶
	E.	All of these statements are	e true.				,
10	In c	ardiac muscle:					
10.	A	calcium ions are not relea	sed from th	e caroonla	ormio rotioulus V		
The state of the s	В.	calcium ions do not bind t	o troponin	molecules	s v		•
	C.	calcium ions play no role	in the proce	ess of con	rraction Xi ∈ c	ECF	
	0	some of the calcium ion re	equired for	contractio	on comes from outs	side of the ce	11 -
	Ĕ.	calcium ion plays an impo	rtant role in	n repolari:	zing the membrane	after the dep	oolarization phase く
11.	În ci				•		
11.	follo	rculating from the brain to the wing structures?	arm, a droj	p of blood	l would <u>NOT</u> have	to pass throu	igh which of the
. /	Α.	left atrium	В.	aorta		16	: C:
	D.	pulmonary vein	1		or vena cava	.	inferior vena cava
		•		Japon	or volla ouva		一一三
12.	The	I band contains:				,	~ 1 7 7 7 7
,	Α.	thick filaments		V	thin filaments		= 1-3-
ν	C. E.	an area of overlapping fila	ments	D.	All of the above	are correct.	
	E.	None of the above is correct	et.				
13.	The r	plateau phase of the cardiac m	uscle action	notentia	l is due to:		
	Α.	the movement of fewer sod	lium ions ac	cross the o	cell membrane		
		the calcium channels remai	ning open !	longer tha	in the sodium chan	inels	
	Č.	the increased membrane pe	rmeability	to potassi	um		
	D.	a decrease in the amount of	calcium di	iffusing a	cross the membran	ie	
	E.	an increased membrane per	meability to	o sodium	ions		
14.	Ca ²⁻ i	s important in the contraction	of				
1	muscl	s important in the contraction e contraction?	or striootti .	muscie.	which of the follo	wing is NO 1	True about smooth
7	Α.	Ca ²⁻ enters the cytosol from	the sarcon	lasmic re	ticulum 🗸		
	В.	Ca ² binds to calmodulin.	•				
		Contraction is immediately	triggered b	y calmodi	ulin binding.		
	D.	MLCK (myosin light chain	kinase) for	ms a com	plex to activate my	yosin.	
	•	When MLCK activates myc	osin, ATPas	se activity	is high and crossb	oridge format	ion is active.
15.	Anim	portant difference between sir	N C	NAMIN		•	
13.	A.	the ability of single-unit fibe	igie-unit an	id multiur	iit smooth muscle	1S:	
	В.	longer actin and myosin fila	ments in m	ge muo mu ultiunit er	mooth muscle wher	i auvantageo	us. X
		contraction ×		artiumt Si	noom musere, win	ich allow coo	rumation of
	6	numerous gap junctions in s	ingle-unit r	nuscle w	hich allow many c	ells to work t	ogether as a sheet
			THE REAL PROPERTY OF THE PERSONS	COLUMN TO A			The state of the s
	D.	closely controlled individual	fibers in s	ingle-unit	smooth muscle to	allow fine co	ontrol and graded
	E.	contractions by selective act	ivation				
	E.	All of the above are correct.		mu	ltiunit-has	s few	
16.	The os	sicles connect the:					
	A.	cochlea to the oval window					
	C.	tympanic membrane to the ro		w			•
		oval window to the round wi	ndow			•	
	D.	cochlea to the tympanic men					•
	Œ.	tympanic membrane to the or	val window	,			

viral infection involving the vestibular nuclei may result in: loss of hearing В. loss of sight D. local paralysis C. E. a sense of dizzine high blood pressure 18. The structure that separates the cochlear duct from the tympanic duct is the: C. membranous labyrinth basilar membrane E. D. bony labyrinth stapedius 19. During the isovolumic phase of ventricular systole, the atria contract the atrioventricular valves and semilunar valves are closed blood is ejected into the great vessels D. the ventricles are relaxing E. the ventricles are filling with blood The loudness of intensity of a sound wave is related to its: В. frequency decibels C. duration E. pitch 21. Which description is \underline{NOT} correctly matched to the tissue? skeletal muscle - controls voluntary body movements cardiac muscle - classified as striated muscle В. cardiac muscle - found ONLY in the heart skeletal muscle - always attached to bones smooth muscle - the primary muscle of internal organs As ATP binds to the myosin head at the beginning of a muscle contraction cycle, 22. the myosin head detaches from actin the myosin head initiates binding with actin $\boldsymbol{\mathsf{x}}$ В. C. the myosin head tightens its bond to actin x D. ATP does not bind to the myosin head Xpr- Value None of these complete the statement correctly χ E. 23. The first heart sound is heard when: Α. the AV valves open C. the semilunar valves close the AV valves close the atria contract blood enters the aorta Which event happens at the start of a cardiac cycle?

Blood is ejected from the atrium. yecked — f bu? The SA node fires. Ventricular systole occurs. The P wave develops Atrial systole occurs. If the EDV is 140 mL, which other values are most likely to occur in a healthy, normal person? 25. The ESV could be 70 mL and the SV could be 70 mL. В. The ESV could be 190 mL and the SV could be 50 mL. C.

The ESV could be 50 mL and the SV could be 90 mL.

A and B A and C

	2	A. Pul	 isovolumetric atrial systole closure of the ventricular fil 	e semilunar valves c contraction begins AV valves ling is complete stole begins extion 6 7 7 7 ?		4,218		mag are in
D	27	. The	intensity of a stimulu population coding A and C	s can be determined.	ed by: - labeled line co All of the abov		C	frequency coding
	28.	A. B.	the chemical and	ylcholine at the ne ning ion channels electrical events th	euromuscular junction at trigger the mechaline from the synaps	anical events in	n a muscle f	om the axon terminal iber laxation to occur
7	29.	Whice B. D. D. E.	th of the following are superior vena cava right ventricle, pul left ventricle, pulm right atrium, right inferior vena cava,	n, right atrium, and monary artery, and nonary artery, and ventricle, and left	l left ventricle. d left atrium. inferior vena cava ventricle	culation?		
	30.	The the the transfer of the tr	nick, <u>gel-like fluid</u> tha vitreous humor perilyinph	t helps support th B. E.	e structure of the ey aqueous humor ortholymph	veball is the:	(C. ora serrata
ji Venz	31.	At the A. B. C. D.	conclusion of the po inorganic phosphat actin has been mov ADP is released fro the myosin head is All of the above are	e has been release ed toward the M l om the myosin hea tightly bound to ac	ine 🗸			
	32.	B. C. D. E.	cement of stereocilia produces a depolari- produces a hyperpol decreases the memb increases the membi does not affect the tr	zation of the mem larization of the m rane permeability rane permeability	brane nembrane to sodium ions to potassium ions			
	33.	The rec A. D.	eptors in the inner ea utricles supporting cells	r are the: B. E.	saccules ampullae		Œ	hair cells

3. Which statement best describes arteries? A. All carry oxygenated blood to the heart. B. All contain valves to prevent the back-flow of blood. All carry blood away from the heart. D. Only large arteries are lined with endothelium.		
All are larger than veins. What structures monitor vertical movements? cristae and the semicircular canals		
maculae of the saccule C. maculae of the utricle D. B and C E. All of the above		energy of the second of the se
A. vitreous humor, cornea, lens, aqueous humor cornea, aqueous humor, lens, vitreous humor C. cornea, vitreous humor, lens, aqueous humor D. aqueous humor, cornea, lens, vitreous humor E. vitreous humor, lens, aqueous humor, cornea	CANA	
Short Answer Questions briefly. Label diagrams e proper structures. Partial credit will be given when a can use the back of the last page to continue any question. Number the action path of light from the time it is converted to an action partial credit.	correctly, where appropriation is the contract of the contract	te. Write legibly!!
t -> corner -> esqueous humor -> lens -> occupin los	Vitrees hu	mor -> photoraceptor
(Catherine)	fhulamu	2 just bounce to from
Discuss pain modulation as it relates to the gate control theory. (5	points)	
1		