



كلية الهندسة

Faculty of Engineering



جامعة أهرام الكندية
AHRAM CANADIAN UNIVERSITY

Course name: Introduction to Engineering

Course Code: HUM107

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Exam number: Midterm Exam

Exam Date: Model answer

Time Allowed: March 2017

60 minutes

Questions sheet

Total
30

Part 1:

1	Both the engineer and scientist are thoroughly educated in the mathematical and natural sciences, but the engineer primarily uses this knowledge to acquire new knowledge. a) True b) False	b
2	Which of the following professions is not considered as an engineering support personnel a) Technologists b) Analyst c) Technicians d) Craftsmen	b
<p>This paragraph belongs to questions 3:7 The Accreditation Board for Engineering and Technology: defines engineering as "the3..... in which a knowledge of the4.....and natural sciences gained by study,.....5..... , and practice is applied with judgment to develop ways to utilize,6..... , the materials and forces of nature for the benefit of.....7....."</p>		
3	(a) profession (b) experience (c) mathematical (d) economically (e) mankind	a
4	(a) profession (b) experience (c) mathematical (d) economically (e) mankind	c
5	(a) profession (b) experience (c) mathematical (d) economically (e) mankind	b
6	(a) profession (b) experience (c) mathematical (d) economically (e) mankind	d
7	(a) profession (b) experience (c) mathematical (d) economically (e) mankind	e
8	Engineer's typical activities include: (a) Conceptual design, Project planning (b) Routine product development and Coordination of work force, materials, and equipment (c) Field inspections, Surveying and Technical writing (d) service, maintain, and operate machines	a

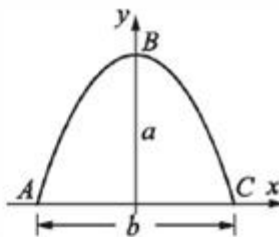
9	<p>Technician's typical activities include</p> <p>(a) Conceptual design, Project planning</p> <p>(b) Routine product development and Coordination of work force, materials, and equipment</p> <p>(c) Field inspections, Surveying and Technical writing</p> <p>(d) service, maintain, and operate machines</p>	c
10	<p>Electrical Engineers:</p> <p>(a) Measure and map the earth's surface, and Plan, layout, construct, and maintain railroads, highways, and airports.</p> <p>(b) Do the planning, designing and constructing form, space and ambience that reflect functional, technical, social, environmental, and aesthetic considerations.</p> <p>(c) Working in marine engineering, designing machinery for boats, naval vessels, and merchant ships; in the automotive industry designing and manufacturing automobiles, trucks, and buses; and in the aerospace industry working in the design of new aircraft and spacecraft.</p> <p>(d) Are concerned with electrical devices, currents, and systems and work with equipment ranging from heavy power generators to tiny computer chips.</p> <p>(e) Are concerned with the design, improvement, and installation of integrated systems to increase worker productivity and control the quality of products.</p>	d
11	<p>Technologist's typical activities include</p> <p>(a) Conceptual design, Project planning</p> <p>(b) Routine product development and Coordination of work force, materials, and equipment</p> <p>(c) Field inspections, Surveying and Technical writing</p> <p>(d) service, maintain, and operate machines</p>	b
12	<p>Craftsman's typical activities include</p> <p>(a) Conceptual design, Project planning</p> <p>(b) Routine product development and Coordination of work force, materials, and equipment</p> <p>(c) Field inspections, Surveying and Technical writing</p> <p>(d) service, maintain, and operate machines</p>	d
13	<p>Mechanical Engineers:</p> <p>(a) Measure and map the earth's surface, and Plan, layout, construct, and maintain railroads, highways, and airports.</p> <p>(b) Do the planning, designing and constructing form, space and ambience that reflect functional, technical, social, environmental, and aesthetic considerations.</p> <p>(c) Working in marine engineering, designing machinery for boats, naval vessels, and merchant ships; in the automotive industry designing and manufacturing automobiles, trucks, and buses; and in the aerospace industry working in the design of new aircraft and spacecraft.</p> <p>(d) Are concerned with electrical devices, currents, and systems and work with equipment ranging from heavy power generators to tiny computer chips.</p> <p>(e) Are concerned with the design, improvement, and installation of integrated systems to increase worker productivity and control the quality of products.</p>	c

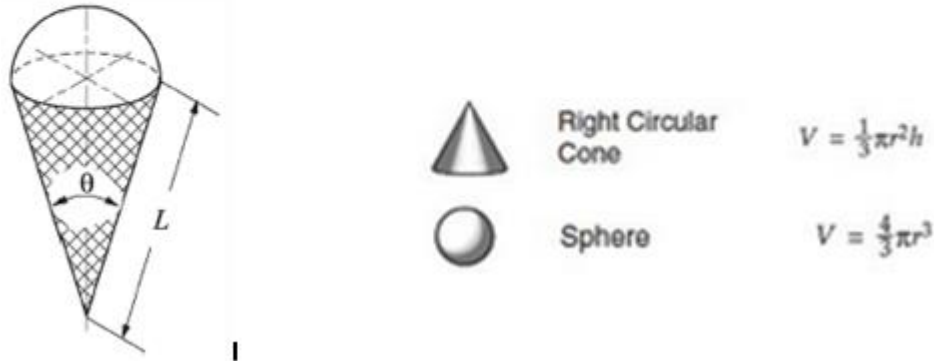
<p>14</p>	<p>Architecture Engineers: (a) Measure and map the earth's surface, and Plan, layout, construct, and maintain railroads, highways, and airports. (b) Do the planning, designing and constructing form, space and ambience that reflect functional, technical, social, environmental, and aesthetic considerations. (c) Working in marine engineering, designing machinery for boats, naval vessels, and merchant ships; in the automotive industry designing and manufacturing automobiles, trucks, and buses; and in the aerospace industry working in the design of new aircraft and spacecraft. (d) Are concerned with electrical devices, currents, and systems and work with equipment ranging from heavy power generators to tiny computer chips. (e) Are concerned with the design, improvement, and installation of integrated systems to increase worker productivity and control the quality of products.</p>	<p>b</p>
<p>15</p>	<p>Civil Engineers: (a) Measure and map the earth's surface, and Plan, layout, construct, and maintain railroads, highways, and airports. (b) Do the planning, designing and constructing form, space and ambience that reflect functional, technical, social, environmental, and aesthetic considerations. (c) Working in marine engineering, designing machinery for boats, naval vessels, and merchant ships; in the automotive industry designing and manufacturing automobiles, trucks, and buses; and in the aerospace industry working in the design of new aircraft and spacecraft. (d) Are concerned with electrical devices, currents, and systems and work with equipment ranging from heavy power generators to tiny computer chips. (e) Are concerned with the design, improvement, and installation of integrated systems to increase worker productivity and control the quality of products.</p>	<p>a</p>

Part 2:

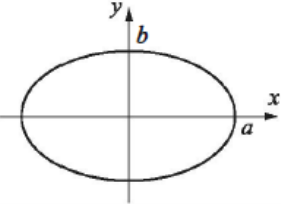
16	<p>When you type the following commands in matlab command window</p> <pre>a=61 a=387 a</pre> <p>the output of the last line is</p> <p>a) 61 b) 61.0000 C) 387 d) 378.000</p>	c
17	<p>When you type the following commands in matlab command window</p> <pre>3^(3^3)</pre> <p>the output is</p> <p>a) 19683 b) 7.6256e+012 C) 27 d) 0.3333</p>	b
18	<p>An incorrect name for a variable is</p> <p>A) num1 B) num_1 C) num_the_first D) 1num</p>	d
19	<p>The clc command is used to</p> <p>A) clear the command window B) erase everything in the workspace C) clean the desktop D) open calculatior</p>	a
20	<p>A matrix is considered to be square if the</p> <p>A) matrix contains all zero elements B) number of rows and columns are the same C) number of rows is greater than the number of columns D) number of columns is greater than the number of rows</p>	b
21	<p>A diagonal matrix contains non-zero elements</p> <p>A) above the diagonal B) anywhere except the diagonal C) below the diagonal D) only on the diagonal</p>	d
22	<p>The absolute difference between consecutive numbers in the vector [6:0.1:20] is</p> <p>A) 1 B) 0.1 C) 15 D) 1.5</p>	b



<p>23</p>	<p>When inputting a matrix, each new row is separated by a</p> <p>A) : B) ; C) D) ,</p>	<p>b</p>
<p>24</p>	<p>The correct matlab form of following expression</p> $\cos\left(\frac{7\pi}{9}\right) + \tan\left(\frac{7}{15}\pi\right) \sin(15^\circ)$ <p>A) $\cos(7*\pi/9)+\tan(7*\pi/15)*\text{sind}(15)$ B) $\text{cosd}(7*\pi/9)+\text{tand}(7*\pi/15)*\text{sind}(15)$ C) $\cos(7*\pi/9)+\tan(7*\pi/15)*\sin(15)$ D) $\text{cosd}(7*\pi/9)+\text{tand}(7*\pi/15)*\sin(15)$</p>	<p>a</p>
<p>25</p>	<p>The correct matlab form of following expression</p> $\frac{22 + 5.1^2}{50 - 6.3^2}$ <p>A) $22+5.1^2/50-6.3^2$ B) $((22+5.1)^2)/((50-6.3)^2)$ C) $(22+5.1^2)/(50-6.3^2)$ D) $(22+5.1)^2/(50-6.3)^2$</p>	<p>c</p>
<p>26</p>	<p>The correct matlab form of following expression</p> <p>The arc length of a segment of a parabola ABC of an ellipse with semi-minor axes a and b is given approximately by:</p> $L_{ABC} = \frac{1}{2}\sqrt{b^2 + 16a^2} + \frac{b^2}{8a} \ln\left(\frac{4a + \sqrt{b^2 + 16a^2}}{b}\right).$ <p>Determine L_{ABC} if $a = 11$ in. and $b = 9$ in.</p>  <p>A) $L_{abc} = (b^2+16*a^2)/2^{1/2} + b^2/(8*a)*\log((4*a+((b^2+16*a^2)^{1/2}))/b)$ B) $L_{abc} = (\text{sqrt}(b^2+16*a^2))/2 + b^2/(8*a)*\log((4*a+(\text{sqrt}(b^2+16*a^2))))/b)$ C) $L_{abc} = (b^2+16*a^2)/2^{1/2} + b^2/(8*a)*\ln((4*a+((b^2+16*a^2)^{1/2}))/b)$ D) $L_{abc} = (\text{sqrt}(b^2+16*a^2))/2 + b^2/(8*a)*\ln((4*a+(\text{sqrt}(b^2+16*a^2))))/b)$</p>	<p>b</p>

<p>27</p>	<p>The correct matlab form of following expression According to special relativity, a rod of length L moving at velocity v will shorten by an amount δ, given by:</p> $\delta = L\left(1 - \sqrt{1 - \frac{v^2}{c^2}}\right)$ <p>where c is the speed of light (about 300×10^6 m/s). Calculate how much a rod 2 m long will contract when traveling at 5,000 m/s.</p> <p>A) $\delta=L*1-\text{sqrt}(1-(v^2/c^2))$ B) $\delta=L*1-\text{sqrt}(1-v^2/c^2)$ C) $\delta=L*1-(1-v^2/c^2)^{0.5}$ D) $\delta=L*(1-\text{sqrt}(1-v^2/c^2))$</p>	<p>d</p>
<p>28</p>	<p>In the ice cream cone shown, $L = 4$ in. and $\theta = 35^\circ$. The cone is filled with ice cream such that the portion above the cone is a hemisphere. Determine the volume of the ice cream.</p>  <p>the following matlab code is <u>clear;</u> <u>clc;</u> <u>L=4; theta=35;</u> <u>r=L*sin(theta/2);</u> <u>H=L*cos(theta/2);</u> <u>V=pi*r^2*H/3 + 2/3*pi*r^3</u></p> <p>A) will run but it will give wrong answer B) will run and will give a correct answer C) contains error, and matlab will refuse to calculate the expression D) doesn't contain error, but matlab will be unable to calculate the expression</p>	<p>a</p>



29	<p>The correct matlab form of following expression</p> <p>The circumference of an ellipse can be approximated by:</p> $C = \pi[3(a+b) - \sqrt{(3a+b)(a+3b)}]$ <p>Calculate the circumference of an ellipse with $a = 16$ in. and $b = 11$ in.</p>  <p>A) $C = \pi * (3 * (a + b) - ((3 * a + b)^{1/2} * (a + 3 * b)))$ B) $C = \pi * (3 * (a + b) - \text{sqrt}((3 * a + b) * (a + 3 * b)))$ C) $C = \pi * (3 * (a + b) - \text{sqrt}(((3 * a) + b) * ((a + 3) * b)))$ D) $C = \pi * (3 * (a + b) - \text{sqrt}(3 * a + b) * (a + 3 * b))$</p>	b
30	<p>The volume of a circular cylinder of height h and radius r is given by $V = \pi r^2 h$.</p> <p>A particular cylindrical tank is 15 m tall and has a radius of 8 m. We want to construct another cylindrical tank with a volume 20 percent greater but having the same height. How large must its radius be?</p> <p>A) 8.7636 B) 3.5777 C) 8.000 D) 1.1578</p>	a