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|  | TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF PHYSICS | | |
| | EXAMINATION FOR SESOND YEAR STUDENTS OF PHYSICS AND BIOPHYSICS | | |
| | COURSE TITLE: | ACOUSTICS | COURSE CODE: PH2141 |
| DATE: 5 JANUARY 2017 | TERM: FIRST | TOTAL ASSESSMENT MARKS: 100 | TIME ALLOWED: 2 HOURS |

Answer the following questions

FIRST QUESTION

(25 marks)

A- Choose the correct answer:

(20 marks)

- 1- Stiffer bonds between molecules (increase – decrease) the pressure exerted by a molecule of speed c .
- 2- When the impedance mismatch is very large, the reflection is (low – high).
- 3- In A-mode imaging, the (frequency – amplitude) of returning echoes is recorded.
- 4- The application of ultrasound waves generates electrical signals depend on the (amplitude – pressure) of the incident waves.
- 5- The string under greater tension has a (greater – lower) wave speed.
- 6- Standing waves generates when the two wanes are in the (same – opposite) directions.
- 7- Reflections that undergo scattering are called (defuse – specular) reflection.
- 8- The energy transferred to a medium when a sound wave propagates through it causes (attenuation – vibration) to the molecules.
- 9- Dosimetry is the measurement of (transmitted – absorbed) energy.
- 10- (Lungs – Bones) are most susceptible to the effect of acoustic cavitation.

B- In blood flow measurement: blood flow is given by $Q = Av\cos\theta$. Why large sample volume is preferred to be used?

(5 marks)

SECOND QUESTION

(25 marks)

A- Write (✓) or (x) and correct the wrong sentence: (20 marks)

- 1- The sound wave created by vibrating objects propagates through vacuum. ()
- 2- In standing waves, the particle displacement is perpendicular to the direction of wave propagation. ()
- 3- When a dielectric is placed in an electric field, electric charges flow through the material. ()
- 4- Scatter cross section: is the ratio of the incident energy to the total power scattered by an object. ()
- 5- On logarithmic scale, a change between two values is based on the difference between them. ()
- 6- The absorption of ultrasound energy by tissues can be expressed in terms of temperature rise or degree of cell damage. ()
- 7- C- mode imaging provides information about the variations in signal amplitude due to static objects. ()
- 8- The absorption coefficient is the same in bone and soft tissues. ()
- 9- The speed of sound depends on the density and compressibility. ()
- 10- When the objects which cause reflection are much greater than the wavelength of the incident waves, it is called Rayleigh scattering. ()


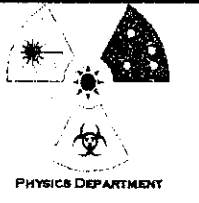
B- Which of the following frequencies are higher harmonics of a string with fundamental frequency of 150 Hz?

(a) 200 Hz (b) 300 Hz (c) 400 Hz (d) 500 Hz (e) 600 Hz. (5 marks)

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|  | TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF PHYSICS | |  |
| | FINAL EXAM. FOR BIOPHYSICS (LEVELTWO) | | |
| | COURSE TITLE: Introduction For Thermodynamic | COURSE CODE: PH2181 | |
| DATE: 27/12/2016 | SEMESTER:FIRST | TOTAL ASSESSMENT MARKS: 100 | TIME: 2 HOURS |

Answer the following questions:

Question [1]

25Mark

- (a)-Draw the relation between Pv/T and P for carbon dioxide at three different temperatures. **6Marks**
- (b)-Write short notes about the following :(i)- P - v - T surface of an ideal gas and (ii) -The critical constants of a van der Waals gas. **13Mark**
- (c)-Mention: Reduced relation for pressure, volume, and temperature, The work of ideal gas in isothermal process, Law of corresponding states. **6Marks**
-

Question [2]

25Mark


- (a)-Put (\checkmark) or (X) for the following and then correct the false: **8Marks**
- 1-The work done for an ideal gas under adiabatic process is : $w = u_1 - u_2$.
 - 2-The mean heat capacity \bar{C} of a system in a given process, is defined as the ratio of the heat flow Q into the system, to the corresponding change in time Δt .
 - 3-The specific enthalpy is given by: $h = u + Pdv$.
 - 4-If there are finite departures from equilibrium, the process is quasistatic.
 - 5-The values of the remaining properties are then determined by the nature of the substance.
- (b)-Define: (i)- The specific value of an extensive property , (ii)-The specific enthalpy, and (iii)-Heat of transformation. **6Marks**
- (c)-Deduce the relation between C_p and C_v . **11Mark**
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Question [3]

25Mark

- (a)-Find the energy equation if P and v are considered independent at different processes. **13Mark**

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|  | TANTA UNIVERSITY FACULTY OF SCIENCE ZOOLOGY DEPARTMENT | | |
| | FINAL EXAM OF MAJOR ZOOLOGY, Chemistry / Zoology, Biophysics, BIOCHEMISTRY, CHEM/BIOCHEMISTRY Divisions | | |
| | COURSE TITLE: | Cell Biology and Genetics | COURSE CODE: ZO 2101 |
| | TERM: 1 st SEMESTER | DATE OF EXAM: 17 JAN, 2016 | ASSESSMENT MARKS: 150 |
| | | TIME ALLOWED: 2 HOURS | |

First Question: (40 marks)

Q1-a: Identify only four of the following: 10 marks

1. Infarction 2. Cell death 3. Contrast 4. Centrifugation 5. Karyorrhexis

Q1-b: What is different between of the following: 20 marks

- 1: Apoptosis and necrosis 2: Atrophy and hypertrophy.
 3: Histology and histopathology. 4: Hyperplasia and metaplasia.

Q1-c: Write of the following: 10 marks

1. Causes of cell injury 2. Importance's of apoptosis

Second Question: (30 marks)

Q2-a: Fill in the spaces: 20 marks

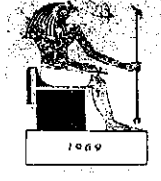
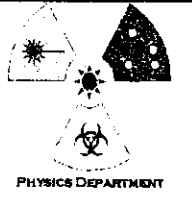
1. ----- is abnormal increase in interstitial fluid. The volume of IF carefully controlled by osmotic pressure, hydrostatic pressure and lymphatic drainage
2. ----- is abnormal blood clot formation in the circulatory system
3. ----- is extravasation of blood due to vessel rupture. May be due to trauma l.
4. ----- is an inflammatory disease of large and medium sized systemic arteries characterised by the formation of lipid-rich plaques in the vessel wall.
5. ----- is a *reversible* change in which one adult cell type is replaced by another.
6. ----- is part of a complex system of communication that governs basic cellular activities and coordinates cell actions.
7. ----- means the series of morphological changes occurring in a cell or group of cells following lethal injury.
8. ----- It is the study of microstructures of abnormal tissues and organs.
9. ----- is to separate the major organelles of the cells.
10. ----- Refers to the thickness of the specimen that will be in acceptable focus.

Q2-b: With full labeled drawing illustrate the following: 10 marks

- 1) The morphology of apoptosis and necrosis.
- 2) Cell fractionation to separate the major organelles of the cells.

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|  | TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF PHYSICS | |  |
| | FINAL EXAM. FOR BIOPHYSICS (LEVEL TWO) | | |
| | COURSE TITLE: Introduction For Thermodynamic | COURSE CODE: PH2181 | |
| DATE: 27/12/2016 | SEMESTER: FIRST | TOTAL ASSESSMENT MARKS: 100 | TIME: 2 HOURS |

Answer the following questions:

Question [1]

25Mark

(a)-Draw the relation between Pv/T and P for carbon dioxide at three different temperatures.

6Marks

(b)-Write short notes about the following : (i)- $P-v-T$ surface of an ideal gas and (ii) -The critical constants of a van der Waals gas.

13Mark

(c)-Mention: Reduced relation for pressure, volume, and temperature, The work of ideal gas in isothermal process, Law of corresponding states.

6Marks

Question [2]

25Mark

(a)-Put (\checkmark) or (X) for the following and then correct the false:

8Marks

1-The work done for an ideal gas under adiabatic process is : $w = u_1 - u_2$.

2-The mean heat capacity \bar{C} of a system in a given process, is defined as the ratio of the heat flow Q into the system, to the corresponding change in time Δt .

3-The specific enthalpy is given by: $h = u + Pdv$.

4-If there are finite departures from equilibrium, the process is quasistatic.

5-The values of the remaining properties are then determined by the nature of the substance.

(b)-Define: (i)- The specific value of an extensive property , (ii)-The specific enthalpy, and (iii)-Heat of transformation.

6Marks

(c)-Deduce the relation between C_p and C_v .

11Mark

Question [3]

25Mark

(a)-Find the energy equation if P and v are considered independent at different processes.

13Mark

Go to the next paper



TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS

BIOPHYSICS LEVEL 2

EXAMINER DR. AYMAN ELTAHAN

2125

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|--------------------|-------------|-----------------------------|
| COURSE TITLE: | Mechanics | COURSE CODE: PH 2123 |
| DATE: 10 JAN, 2017 | TERM: FIRST | TOTAL ASSESSMENT MARKS: 100 |
| | | TIME ALLOWED: 2 HOURS |

Final Exam

Answer the following questions:

First question:

1- Choose the correct answer:

The velocity of object become constant, when

- A- The net force acting on it is equal to zero .
- B- The acceleration is equal to zero
- C- both A and B
- D- None of them.

II A ball is thrown up in the air. It goes up and then eventually comes down again. On its way up (after being let go), which is correct?

- A- Its acceleration decreases
- B- Its acceleration increases
- C- Its accelerations stays pretty much the same
- D- Impossible to stay unless the ball's mass is known

III Right Now you are at rest on a chair. Ignoring the rotation and orbit of the earth, what is your acceleration?

- A- zero
- B- 9.8 m/s
- C- 9.8 m/s²
- D- 9.8 N

IV A ball rolls of a horizontal 1-m high table with an initial speed of 1m/s. It then takes about 0.5 seconds to fall to the floor. As it falls to the floor (i.e. while the ball is in the air), the horizontal component of the ball's velocity

- A- remains roughly constant at about 0 m/s
- B- remains roughly constant at about 0 m/s
- C- decreases steadily from 1m/s to about 0 m/s
- D- increases steadily from 0m/s to about 5 m/s

V A boy and a girl are riding on a rotating turntable that is turning at a constant rate. The boy is near the outer rim and the girl is closer to the center of rotation. How do their linear (that is, tangential) velocities compare?

- A- Each has a linear velocity of zero.
- B- The girl has the greater linear velocity.
- C- The boy has the greater linear velocity.
- D- The boy and the girl have the same linear velocity.



- 2- A projectile object has initial velocity 10^7 m/s at angle 30° with a horizontal, find
 - a) The maximum height of this projectile?
 - b) The horizontal distance when the projectile moves down at the same level of the start point?

3- Write short notes about the frictional force?

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|  | TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF PHYSICS | |  |
| | FINAL EXAM. FOR BIOPHYSICS (LEVEL TWO) | | |
| | COURSE TITLE: Introduction For Thermodynamic | COURSE CODE: PH2181 | PHYSICS DEPARTMENT |
| DATE: 27/12/2016 | SEMESTER: FIRST | TOTAL ASSESSMENT MARKS: 100 | TIME: 2 HOURS |

Answer the following questions:

Question [1]

25Mark

(a)-Draw the relation between Pv/T and P for carbon dioxide at three different temperatures.

6Marks

(b)-Write short notes about the following : (i)- P - v - T surface of an ideal gas and (ii) -The critical constants of a van der Waals gas.

13Mark

(c)-Mention: Reduced relation for pressure, volume, and temperature, The work of ideal gas in isothermal process, Law of corresponding states.

6Marks

Question [2]

25Mark

(a)-Put (\checkmark) or (X) for the following and then correct the false:

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1-The work done for an ideal gas under adiabatic process is : $w = u_1 - u_2$.

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(b)-Define: (i)- The specific value of an extensive property , (ii)-The specific enthalpy, and (iii)-Heat of transformation.

6Marks

(c)-Deduce the relation between C_p and C_v .

11Mark

Question [3]

25Mark

(a)-Find the energy equation if P and v are considered independent at different processes.

13Mark

Go to the next paper

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| TANTA UNIVERSITY- Faculty of Science -Department of Physics | | | | |
| EXAM FOR LEVEL TWO STUDENTS OF BIO- AND GEOPHYSICS Ph 2183 | | | | |
| COURSE TITLE | Electromagnetism | | | COURSE CODE: 2184 |
| DATE: | 3-1-2017 | TERM: SECOND | TOTAL ASSESSMENT MARKS: 100 | TIME ALLOWED: 2 HOURS |

First Question:

- I) The vector from the origin to point A is given as $6\mathbf{a}_x - 2\mathbf{a}_y - 4\mathbf{a}_z$, and the unit vector directed from the origin toward point B is $\left(\frac{2}{3}, -\frac{2}{3}, \frac{1}{3}\right)$. If points A and B are 10 units apart, find the coordinates of point B. [10marks]
- II) Express the vector field $\mathbf{D} = \frac{x\mathbf{a}_x + y\mathbf{a}_y}{x^2 + y^2}$ in cylindrical components and cylindrical variable. [10marks]

Second Question:

- Point charges of 50nC each are located at A (1, 0, 0), B (-1, 0, 0), C (0, 1, 0) and D (0, -1, 0) in free space. Find
- I) The total force on the charge at point A. [10marks]
- II) The electric field at point P (0, 0, 1). [10marks]
- III) The electric potential at point P(0, 0, 1). [10marks]

Third Question:

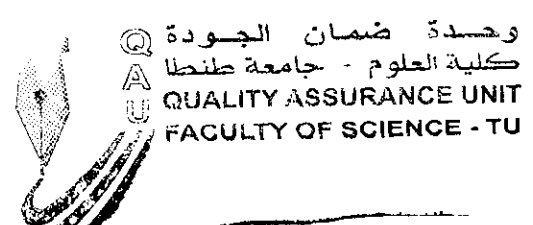
- I) Deduce the electric field of an infinite charged conducting sheet having a uniform density of $\rho_s \text{ C/m}^2$. If a second infinite charged conducting sheet, having a negative charge density $-\rho_s \text{ C/m}^2$, is located at distance $x = a$ from the first, find the total field in the region inside and outside the two conducting sheets. [10marks]
- II) Given the potential field, $V = \frac{100}{Z^2 + 1} \rho \cos \phi \text{ V}$, and point P ($\rho = 3\text{m}, \phi = 60^\circ, Z = 2\text{m}$). Find the numerical values at P for [15marks]
- (a) The potential (b) The electric field intensity \mathbf{E}
(c) The direction of \mathbf{E} (d) The electric flux density \mathbf{D}
(f) The volume charge density ρ_v .


Fourth Question:

- I) Deduce the equation of potential field V at point P in free space around an electric dipole which is consisting of two charges $(+Q)$ and $(-Q)$ separated by distance (d) , and then prove that the electric field \mathbf{E} of the electric dipole at point P is $\frac{Qd}{4\pi\epsilon_0 r^3} (2 \cos \theta \mathbf{a}_r + \sin \theta \mathbf{a}_\theta)$. [15marks]
- II) Prove that the electric field vector equals exactly the gradient of electric potential ($\mathbf{E} = -\nabla V$). [10marks]

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| EXAMINER | DR. REDA EL-SHATER |
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☺ BEST WISHES ☺



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|  | TANTA UNIVERSITY FACULTY OF SCIENCE ZOOLOGY DEPARTMENT | | |
| | FINAL EXAM OF MAJOR ZOOLOGY, Chemistry / Zoology, Biophysics, BIOCHEMISTRY, CHEM/BIOCHEMISTRY Divisions | | |
| | COURSE TITLE: | Cell Biology and Genetics | COURSE CODE: ZO 2101 |
| | TERM: 1 st SEMESTER | DATE OF EXAM: 17 JAN, 2016 | ASSESSMENT MARKS: 150 |
| | | TIME ALLOWED: 2 HOURS | |

First Question: (40 marks)

Q1-a: Identifid only four of the following: 10 marks

1. Infarction 2. Cell death 3. Contrast 4. Centrifugation 5. Karyorrhexis

Q1-b: What is different between of the following: 20 marks

- 1: Apoptosis and necrosis 2: Atrophy and hypertrophy.
 3: Histology and histopathology. 4: Hyperplasia and metaplasia.

Q1-c: Write of the following: 10 marks

1. Causes of cell injury 2. Importance's of apoptosis

Second Question: (30 marks)

Q2-a: Fill in the spaces: 20 marks

- is abnormal increase in intersistial fluid. The volume of IF carefully controlled by osmotic pressure, hydrostatic pressure and lymphatic drainage
- is abnormal blood clot formation in the circulatory system
- is extravasation of blood due to vessel rupture. May be due to trauma l.
- is an inflammatory disease of large and medium sized systemic arteries characterised by the formation of lipid-rich plaques in the vessel wall.
- is a *reversible* change in which one adult cell type is replaced by another.
- is part of a complex system of communication that governs basic cellular activities and coordinates cell actions.
- means the series of morphological changes occurring in a cell or group of cells following lethal injury.
- It is the study of microstructures of abnormal tissues and organs.
- is to separate the major organelles of the cells.
- Refers to the thickness of the specimen that will be in acceptable focus.

Q2-b: With full labeled drawing illustrate the following: 10 marks

- The morphology of apoptosis and necrosis.
- Cell fractionation to separate the major organelles of the cells.

