



Q1) a) If $W = x^3y - y^3x$, $x = uv$, $y = \frac{u}{v}$. To find $\frac{\partial W}{\partial u}$ and $\frac{\partial W}{\partial v}$.

b) Prove that $\frac{\partial z}{\partial y} = -\frac{1}{2}$, if $Z = (1 - x^2 - y^2)^{\frac{1}{2}}$, and $(x, y) = (\frac{2}{3}, \frac{1}{3})$. (12 mark)

Q2) Draw the region of integration and Evaluate the integral of $\iint e^{x+y} dR$
 $R = \{(x, y) : 0 \leq x \leq \ln y, 1 \leq y \leq \ln 8\}$. (12 mark)

Q3) Find the derivative of the function $f(x, y) = \frac{x-y}{xy+2}$ at $p = (1, -1)$ in the direction of the vector $\vec{V} = \langle 12, 5 \rangle$. (12 mark)

Q4) a) If $\vec{AB} = -7i + 3j + 8k$ and A is the point $(-2, -3, 6)$. Find the point B . (12 mark)

b) Is that the function $f(x, y, z) = 2z - 3(x^2 - y^2)$ satisfies the Laplace equation.

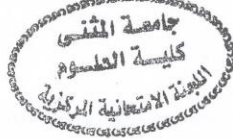
Q5) a) Prove that if two parallel columns (rows) of square matrix A are equal, then $\det(A) = 0$.

b) what value of x, y, z and h which satisfy the matrix equation: $\begin{bmatrix} x-3 & 2y+1 \\ x+3 & 10 \end{bmatrix} = \begin{bmatrix} 3 & -5 \\ z & 3h-2 \end{bmatrix}$. (12 mark)

We wish the Best

Nidaa Hasan AL-Giyashi
Name the Lecture

Dr. Hassan M. Jaber AL-Ta'ii
Head of Department





((Final exam for the first semester))
2017 -2018

22. 01. 2018

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Q4/ These words have more than one meaning. Write two sentences that show the different meaning.

Words

Sentence 1

(10Marks)

Sentence 2

- Book
- Kind
- Can
- Play
- Train

Q5/A/ Here is the past tense forms of some irregular verbs. Write the infinitive. (5Marks)

1. said
2. brought
3. chose
4. hit
5. sang

B/ Complete the sentences, using a word from box1 and the prefix from box 2 (5Marks)

Box 1	pack	possible	agree	tidy	fair
Box 2	un-	im-	in-	il-	dis-

1. Don't go into bedroom. It's really
2. I can't do Maths. For me, it's an easy.
3. It's very to ask someone how much they earn.
4. The thief stole my bag, ran into the crowd and I never saw him again.
5. You gave her more money than me! That's



Lecturer: Jafer Fahdel Odah

Head of Department: Hassan Al-Ta'ii



((Final exam for the first semester))
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Q1/ Answer all the following questions:

(20Marks)

1. How many different ways can people communicate?
2. What can animals do that people can't?
3. What did you like best about living in your country? What would you miss if you lived abroad?
4. What do you think men are generally better at? What are women better at?
5. How did Alice feel about Henry at beginning of the play "The Perfect Crime"?
6. What's good about Café Blikle?
7. What is the main shopping street in your town? What can you buy there that's special?
8. What do you like doing on holiday?
9. Do you feel sorry for children in Hollywood? Why?
10. Do you think it is dangerous to have everything you want? Why?

Q2/ A / Choose the correct verb form between the brackets:

(5Marks)

1. Maria (comes, is coming) from Chile.
2. I (don't have, no have) a mobile phone.
3. (I'm liking, I like) black coffee.
4. While I (went, go) to work this morning, I (met, meet) an old friend.

B / What are these words? Write noun, verb, adjective, adverb, or past tense.

(5Marks)

1. everyday
2. flew
3. history
4. huge
5. do

Q3/ Write a good paragraph about one of the following characters:

(10Marks)

1. Roberto Solano, aged 24, from Mexico
2. Endre Boros, aged 45, From Hungary
3. Yuet Tuang, aged 31, from Hong Kong





Q1 / A// Show the position vector of motion of a projectile in a uniform gravitational field (no air resistance) is given by: $\vec{r} = -\frac{1}{2}gt^2\hat{k} + V_0t$. (6 Mark)

B// Given the three vectors:

$$\vec{A} = 2\hat{i} - \hat{j}, \quad \vec{B} = 2\hat{j} + 3\hat{k} \quad \text{and} \quad \vec{C} = \hat{i} + \hat{j} + \hat{k}$$

Find $\vec{A} \cdot (\vec{B} \times \vec{C})$, $(\vec{A} \times \vec{B}) \cdot \vec{C}$ and $\vec{A} \times (\vec{B} \times \vec{C})$ (6 Mark)

Q2 / A// The polar coordinates of a particle are given by: (6 Mark)

$$\begin{aligned} \text{a) } r &= be^{kt} & \theta &= \omega t \\ \text{b) } r &= A \cos \omega t & \theta &= c \omega t \end{aligned}$$

Find the velocity and acceleration vectors as a function of t. Find also the speed and the magnitude of the acceleration at time t=0 (6 Mark)

B// Discuss variation of gravity with high? (6 Mark)

Q3 / A// Suppose the position vectors of a particle is given by: (6 Marks)

$$\vec{r} = i b \sin \omega t + j b \cos \omega t + k c$$

Prove that the distance from the origin remains constant and prove that $(\vec{a} \perp \vec{v})$.

B// what are the energy considerations in harmonic motion? (6 Mark)

Q4 / A// A force $\vec{F}_1 = \hat{i} + \hat{j}$ is applied to a body at a point P_1 where the vector $OP_1 = \vec{r}_1 = 2\hat{i} + \hat{j}$. A second force $\vec{F}_2 = \hat{j} - \hat{k}$ is applied at the point $\vec{r}_2 = \hat{i} + \hat{j} + \hat{k}$. Find the total moment \vec{N} and the magnitude of \vec{N} . (6 Mark)

B// What are the dynamic effects of the earth rotation? (6 Mark)

Q5 / Consider the two force functions:

$$\text{(a) } \vec{F} = \hat{i}x + \hat{j}y \quad \text{(b) } \vec{F} = \hat{i}y - \hat{j}x$$

Show that (a) is conservative and that (b) is nonconservative. Verify that the integral $\int \vec{F} \cdot d\vec{r}$ is independent of the path of integration for (a), but not for (b), by taking two paths in which the starting point is the origin (0,0) and the end point is (1,1). For one path take the line x=y. For the other path take the x-axis out to the point (0,1) and then the x=1 up to the point (1,1). (12 Mark)



Shaimaa K. Hussien

Dr. Hassan Ak Jaber AL-Ta'ii
Head of Department



((Assessment of the final exam for the First semester))

Academic year 2017 -2018

45

Q1/ (9 marks)

- What is the relation between special relativity and Lorentz transformations.
- Find the velocity of a rode, when its length contracted to half its original length.
- Show that for low velocities Lorentz equations tends to classical form.

Q2/ (9 marks)

- Define the black body. How much it's emissivity?
- Calculate the energy emitted from black body in thermal equilibrium at 927°C.
- Compare between continuous and line spectrum. Which one identifies the characteristics of the material.

Q3/ (12 marks)

- An electron and proton has the same speed. Which one is nearest to wave behavior according to de Broglie hypothesis?
- X-rays photon scattered with 60°. 1-Find $(\Delta\lambda)$, 2- Maximum $(\Delta\lambda)$
- Drive an equation to calculate the change of energy for photon in Compton limit.

Q4/ (10 marks)

- Two photons of $(\lambda=0.02 \text{ \AA})$. Discuss the possibility of production $(e^- e^+)$ pair near ${}^4_2\text{He}$ and ${}^{235}_{92}\text{U}$.
- Write in order the interaction of radiation with matter according to their energies.

Q5/ Answer any two : (10 marks)

- Explain the spectrum of black body.
- According to blank model why there is a displacement to wards minimum wavelength for higher temperatures?
- Drive an expression to find the intrinsic charge of the electron.

Q6/ (10 marks)

Write and define Schrödinger equation. For hydrogen atom give a solution for this equation.

Head of Department
Hassan M. Jaber Al-Ta'ii



good luck

Examiner
Dr. Qahtan A. Abdulqader



((Final exam for the first semester))
2017 -2018

16. 01. 2018

45

Q1// A/ What are the types of multistage amplifier? (5Marks)

B/ Common emitter amplifier of class A. $V_{CEQ}=10V$, $I_{CQ}=250mA$. Find:

1. Power distribution
2. Overall efficiency
3. Collector efficiency

if you know that $V_{CC}=+20V$ and $R_L=20\Omega$.

(10Marks)

Q2// A/ Explain the mechanism to the channel in the E-MOSFET to produce the drain current.

(4Marks)

B/ Draw the characteristic curves and transconductance curve of D-MOSFET.

(4Marks)

C/ How we can use JFET as analog switch?

(7Marks)

Q3// A/ Draw:

(6Marks)

1. JFET common source amplifier circuit
2. JFET common drain amplifier circuit
3. JFET common gate amplifier circuit

B/ For a voltage divider self-bias circuit using N-channel JFET, where $V_{DD}=20V$, $V_{GS(off)}=-4V$, $I_{DSS}=10mA$, $R_D=3K\Omega$, $R_S=2K\Omega$, $R_{G1}=15K\Omega$, and $R_{G2}=5K\Omega$, find the position of Q-point.

(9Marks)

Q4// A/ What are the properties of:

1. Common collector circuit
2. Common base circuit

then draw these circuits.

(6Marks)

B/ For Ge transistor in collector feedback bias circuit ($\beta_{dc}=100$), find the voltage between the collector and the emitter if you know that $V_{CC}=+20V$, $R_L=20\Omega$, and $R_B=100K\Omega$.

(9Marks)

Best of luck

Lecturer: Jafer Fahdel Odah

Head of Department: Hassan Al-Ta'ii

المرحلة: الثانية
المادة: الديناميكا الحرارية
الوقت: 3 ساعات
التاريخ: / ٢٠١٧



وزارة التعليم العالي والبحث العلمي
جامعة المنوفى
كلية العلوم
قسم: الفيزياء

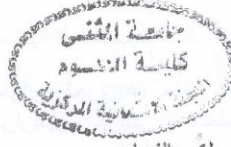
14. 01. 2019

((أسئلة الامتحان النهائي للفصل الدراسي الاول للسنة الدراسية ٢٠١٧- ٢٠١٨))

44

السؤال الخامس : أجب عن أحد الفرعين

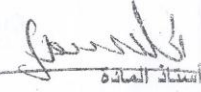
1. أحسب مقدار التغير في أنتروبي كتلة من الجليد مقدارها 50 gm ودرجة حرارتها (-30°C)، الذي ينتج عنه تحويل هذه القطعة من الجليد الى بخار ماء في درجة حرارة 100°C .
2. خلطت كتلتان متساويتان من نفس المادة ، أحدهما في درجة حرارة (t) والكتلة الأخرى بدرجة حرارة (T) ، أحسب مقدار التغير في الأنتروبي الكلي للخليط ، علما أن عملية الخلط تمت تحت ضغط ثابت.



تمنياتي لكم بالنجاح


رئيس القسم

د. حسن مكطوف الطائي


استاذ المادة

أ.م.د. هادي قاسم محمد

المرحلة: الثانية
المادة: الديناميكا الحرارية
الوقت: ٣ ساعات
التاريخ: ٢٠١٧ / ٢٠١٨



وزارة التعليم العالي والبحث العلمي
جامعة المنيا
كلية العلوم
قسم الفيزياء

14. 01. 2019

44

((أسئلة الامتحان النهائي للفصل الدراسي الأول للسنة الدراسية ٢٠١٧-٢٠١٨))

ملاحظة: لكل سؤال ١٢ درجة

السؤال الأول: في عملية أديباتيكية ضغط حجم قدره $(22.4)l$ من غاز النروجين في ظروف قياسية الى عشر حجمه الأصلي، أحسب: ١. درجة الحرارة النهائية ٢. الضغط النهائي ٣. الشغل الذي يبجزه الغاز. علما أن

$$C_v = 0.178 \text{ Cal / gm.k}^\circ$$

$$\gamma = 1.4$$

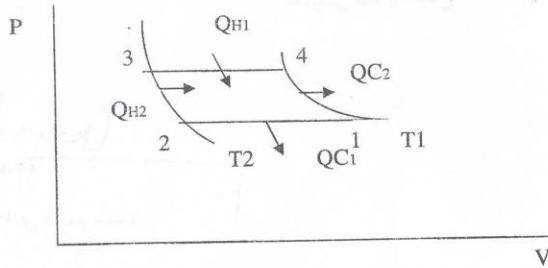
$$m_{N_2} = 28 \text{ gm}$$

السؤال الثاني: ١. عرف المتغيرات الشاملة والمتغيرات المركزة. أعد كتابة معادلة الحال لغاز فان درفال مستخدما

$$(p + \frac{an^2}{V^2})(V - nb) = nRT$$

٢. أثبت أن الأنتالبية للغازات المثالية تأخذ الصيغة $H = \frac{\gamma PV}{\gamma - 1}$ ، حيث أن $\gamma = \frac{C_p}{C_v}$

السؤال الثالث: الشكل المرافق يمثل دورة آلة حرارية تحوي غاز مثالي كمادة عاملة في المستوي $P - V$: تتكون هذه الدورة الترموديناميكية العكسية من عمليتين تحاريتين وأخريتين تضاعطيتين.



أثبت الآتي:

$$1. \int_1^2 du + \int_3^4 du = 0$$

$$2. \int_1^2 PdV + \int_3^4 PdV = 0$$

$$3. W = nR(T_1 - T_2) \ln(P_1 / P_2)$$

السؤال الرابع: أحسب معامل جول ثومسن لغاز فان درفال، إذا علمت أن معادلة الحال للغاز تكتب بالصورة:

$$(p + \frac{a}{V^2})(V - b) = RT$$

ثم أوجد درجة حرارة الانقلاب لهذا الغاز.

نبح لطفاً ←