أجب عن أربعة فقط من الأسئلة الآتية :-

السؤال الأول

أ – اذكر المزيد عن بيئة التفكير والفكر ؟ ثم أذكر أدوات التفكير ؟ ثم أذكر تتابع عمليات التفكير الذهنية ؟

ب – اذكر مضا نص لعملية التفكير ؟ ثم أذكر معوقات التفكير السليم ؟

ج – اذكر ما تعرفه عن الأسس التي يستند اليها درجة للتقييم ؟ ثم ما تعرفه عن التفكير الحي ؟ ثم اذكر العقل ومكانه ؟

د – اذكر ما تعرفه عن الخصائص المميزة للتفكير من مرحلة المراهقة ؟

السؤال الثاني

أ – اذكر ما تعرفه عن التقييم من المختلفة أو مخاطر التقييم ؟

ب – اذكر ما تعرفه عن أساليب التفكير ؟ ثم اشرح اثنان منهم ؟

ج – اشرح التفكير العلمي ؟

د – اشرح التفكير الابتكاري ؟ ثم اذكر السمات بين الاسره والتقييم الابتكاري ؟

السؤال الثالث

أ – اشرح مفهوم المنظومة ؟ ثم اذكر هل يمكن تصنيف المنظومات ؟ ثم اذكر ما تعرفه عن النظم وآليات تنفيذه ؟

ب – اذكر ما تعرفه عن سمات شخصية الفرد ؟

ج – بعضا مما يؤثر على الفرد مع بيئته تعرفت له أنماط مختلفة من عمليات التأثير بعضها يرتبط بالبيئة الذهنية فيه وبعضها يتعلم بأحوال ذاتيه واشرح ذلك ؟

د – اذكر سبعة من مظاهر الذكاء ؟ ثم اذكر سبعة من معايير الذكاء ؟

هـ – طفل عمره اثنتي ٣ سنوات واجاب على جميع أسئلة سن اتمم الرابع وعن سؤاليه سن خمسة أسئلة موضوعه لسن اتمم الخامس .اذكر نسبة ذكاؤه وكيف تصنفه ؟

Ø28
M5
⑩
6

Sq.th.11X3
⑥
18
Ø18

Ø24
Ø12
⑤
Ø18

Ø8
Ø12
32
R7
Ø24

Ø24
Ø12
2
⑥
6
M20

Ø26
M20
⑧
8
11
6.3
Ø34
③

106
Ø7
2
2
Ø8
Ø18
⑨
2

M6
10
10
3
40
140
Sq..th.11X3
⑤
Ø11
78
Ø15
2
⑧

45°X2
8
⑦
Ø26
Ø34

Ø18
30
7
7
Ø24
Ø18
M12X10
10
30°
12
Ø12
Ø20
Ø32
Ø68
②

7
8
32
SEC. A_A
A   A

10
52
88
52
15 4 7

Ø152
3
8
49
8
72
Ø28
Ø18
Ø30
P.C.D 46
28
38
60
Ø24
Ø34
Ø7
10
Ø52
52   52
①

52   44   6
54
34 40
56
Ø60
54
10
R7   Ø7

10 _ Bolt M 5 X 6   St.
9 _ Handle 2 arms   St.
8 _ Spindle   St.
7 _ Seat   St.
6 _ Round nut   St.
5 _ Gland   St
4 _ Cap nut   St.
3 _ Valve   St.
2 _ Cover   Cast St.
1 _ Body   Cast St.

GLOBE VALVE

(2/2)

With my best wishes

Course Title : Mechanical Drawing
Course Code : MPD1103
Year : 1st year Mechanics

Date : Jan 2012 (first term, final exam)
Allowed time: 4 hrs.
No. Of pages: 2

Assume any missing data

1- Draw neat sketches of the following (with free hand) ?   **(30 Marks)**

   a- Locking devices for screw.   **(10 Marks)**

   b- Three types of key and key way.   **(10 Marks)**

   c- Two types of connection between spindle with valve.   **(10 Marks)**

2- Globe Valve   (90 Marks)

Key to assembly:

The various parts of a globe valve are shown in the back . Globe valves are used to cut off the flow or to control the pressure in the fluid pipe systems. The valve seat (7) is fitted into the body (1). The cap nut (4) is assembled by free sliding on spindle (8) and is screwed to the valve (3) which placed underneath the spindle. The spindle assembly is inserted into the valve body in such a way that the valve (3) rest on the valve seat (7). V ring packing is mounted in the stuffing box of the cover (2) and is kept in position by the gland (5) which is assembled to the cover (2) by means of two **M8** bolts (11). A 56x40x2 sealing gasket (12) is placed on the top of the valve body (1) before the cover (2) is assembled by four **M6x24** bolts (13). The round nut (6) is screwed on the spindle (8) until it beds into the cover (2) and is locked in position by **M5x6** screw (10). The handle (9) is assembled to the square section part of the spindle and held in position by means of an **M6** nut(14) and washer (15).

   - **Draw to a suitable scale the following:**

     a- Sectional elevation   **(40 Marks)**

     b- Sectional side view   **(30 Marks)**

     c- Complete plan   **(20 Marks)**

Dimensions are in mms.

b- **Solve the following ordinary differential equations:**

1-) $y' = e^{2x+3y+5}$

2-) $(3x - y + 2)dx + (6x - 2y - 1)dy = 0$

3-) $(4xy + 3y^2 - x)dx + x(x + 2y)dy = 0$

4-) $y'' - y = \sin(5x)\cos(3x) + e^{2x}\sinh(x)$

5-) $y'' - 6y' + 9y = (e^{3x}/x^2)$

6-) $y''''' - y' = x^4$

7-) $x^2 y'' - 2x y' + 2y = 2x \ln(x)$

بالتوفيق دائما

Tanta University		Physics & Mathematics Dept. Total Mark : 100		Faculty of Engineering

Course Title: Engineering Mathematics (2)A
Date: 8/1/2012 (Final First Term Exam)
Allowed time: 3 Hours
Year: *First Year Mechanical*
No. of Pages: (1)

Please, answer all the following questions

Question 1   20 Marks

a- Write and sketch the domain of the following functions:

    i. $Z = \cos^{-1}(x + y)$

    ii. $Z = \sqrt{x^2 + y^2}$

    iii. $Z = \ln(x^2 + y^2 - 3) + \dfrac{1}{\sqrt{e^{x+4y}}}$

b- If : $\tan(Z) + \sin(xy) = 0$ find Z_x ?

Question 2   15 Marks

a- Let $f(x,y)=1$ be the density of mass in the region R where $0 \le x \le 1$ and $0 \le y \le \sqrt{1 + x^2}$. Find the center of gravity and the moments of inertia I_x, I_y and I_o ?

b- Evaluate $\iint_D \dfrac{dx\, dy}{\sqrt{x^2 + y^2}}$,where D is the region bounded by $x^2 + y^2 = 1$ and $x^2 + y^2 = 16$?

c- Find the envelop to the family of curves $y - c\,x = \dfrac{1}{c}$ where c is arbitrary constant?

Question 3   20 Marks

a- Find the work done by the force field $F = (3x - 4y)i + (4x + 2y)j - 4y^2 k$ in moving a particle along the ellipse **c** in XY- plane from θ=0 to θ=2π. The center of ellipse is (0,0) and a=3 and b=4 for the ellipse?

b- Evaluate the volume of the region bounded by

$$\frac{X}{a} + \frac{Y}{b} + \frac{Z}{c} = 1, \ X = 0, Y = 0 \text{ and } Z = 0?$$

Question 4   45 Marks

a- **Obtain the ODE whose solution is:**

    i) $y = A(x^2 + B)$

    ii) $y = A e^x + B e^{-x} + C$

<div dir="rtl">تابع باقي الأسئلة بالخلف</div>

TANTA UNIVERSITY
FACULTY OF ENGINEERING
PHY. & MATH. DEP.

FINAL EXAM. IN PHYSICS
(vibrations & wave motion)
TIME :3 Hrs

****

Answer the following :

1-a-There is analogy between electromagnetic vibrations and mechanical vibrations. Derive the equations for damped oscillations for both mechanical and electromagnetic viberations .

b-A 300 V D.C. power supply is used to charge a capacitor of 25 µ F . After the capacitor is fully charged , the power supply disconnected from the capacitor which directly connected across an inductor of 10 m H . The resistor in the circuit is negligible .
   Find : (i) the frequency of the produced oscillation .
          (ii) the capacitor charge and the circuit current after 1.2 mS

2-a-The velocity of the traveling wave depends on its inertial property as well as on its elastic property .Derive and compare between the two types of velocities for both e.m.w. and mech. wave.

b-Choose the correct :
   i-When a pulse traveling on a light string reaches the knot , (part of it) or (totally) Reflected (with) or (without) inversion , while (part of it) or (totally) is Transmitted to the heavier string .
   ii-When a pulse traveling on a heavy string strikes the boundary of a lighter string, (part of it) or (totally) is reflected (with) or (without) inversion and (part) or (totally) is transmitted .

c- With what tension must a rope of length 5 cm and mass 0.16 Kg stretched to produce a wave of frequency 60 Hz and a wavelength of 0.6 m ?

3-a -The harmonic wave function , which describe the displacement of the medium Particles, through which the energy propagate, is a solution of a linear wav equation .
   - Deduce this equation .

b-A sinusoidal harmonic wave traveling in the +ve x- direction, has an amplitude of 15 cm , wave number of 0.157 cm^{-1} and a periodic time T=0.125 s . The displacement of the wave at   t =0 and x =0 is 15 cm .
   Find : (i) the wavelength of this wave and its frequency .
          (ii) the angular frequency and phase constant

4-a- The rate at which energy transmitted is directly proportional to the inertial property of its medium . Discuss and then derive the power in case of the transverse waves .

b-A piano wire with mass 4 g and length of 0.8 m is stretched with a tension of 30 N. Waves of frequency 60 Hz and amplitude 1.5 mm are traveling along the wire .
   i- Calculate the average power carried by these waves .
   ii-What happens to the average power if the amplitude of the wave is doubled ?

Q4. (15 marks)

1- Explain the aim and technique of spheroidizing heat treatment process.

2- Consider 2.5 Kg of a 99.5% wt Fe - 0.5% wt C alloy that is cooled to a temperature just blow the eutectoid.

   a. How many kilograms of proeutectoid ferrite form?

   b. How many kilograms of eutectoid ferrite form?

   c. How many kilograms of cementite form?

   d. Sketch the microstructure of this alloy above and below the eutectoid temperature.

   e. What will be the structure of this alloy if it is rapidly quenched? And what will be the effect on the mechanical properties?

Q5. (25 marks)

1- For two metals "A" & "B" the eutectic point is (75; 780) Four points were detected in the phase diagram as follows:

Point	Note
(5; 1080)	a nuclei of a solid solution had been detected
(5;950)	a nuclei of liquid still remains in the alloy
(100; 1000)	start of solidification
(95;600)	lies on a solvus line

Knowing that at room temperature they contain 5% and 95% and all the given compositions are percentage of metal "B" determine the following:

a- The melting points of the two metals and how many phases exist in this system?

b- The maximum solubility of each metal in the other

c- Consider an alloy containing 20% B and at temperature 790°C make a phase analysis assuming equilibrium conditions. The analysis should include:

   i) What phases are present?

   ii) What is the chemical composition of each phase?

   iii) What is the amount of each phase?

2- Use a neat sketch to indentify each of the four cast iron types by the microscopic examination?

With my best wishes

Course Title : Engineering Materials
Course Code : MPD 1104
Year : 1st year Mechanics

Date : Jan 2012 (first term, final exam)
Allowed time: 3 hrs.
No. Of pages: 2

Answer all the following questions:

Q1. State which of the following statements is true and which is false : **(15 marks)**

a. HCP and BCC unit cells have the same APF.

b. The solid solution on a phase diagram is a single phase.

c. Fine-grained metals have the same unit cells of coarse-grained metals.

d. Ferrite and austenite are solid solution where carbon atoms dissolve interstitially.

e. Melting point of any alloy is always lower than the highest melting point of the alloying elements of the system.

Q2. Put a line under the correct answer: **(15 marks)**

a . The peritectic reaction in iron-carbon diagram results in (pearlite – austenite – eutectic – cementite).

b. The line in the phase diagram that gives the solubility of one element in the other solid element is:

(solidus - liquidus - eutectic - solvus) .

c. Cored structure can be eliminated by (aging - homogenization - cooling - quenching) treatment .

d. Atomic weight of material can affect its (linear density - volume density – APF - planar density -none).

e. Low carbon steels are used mainly for the production of (structural steels – machine parts – tool steel).

Q3. **(20 marks)**

a. Determine the Miller indices of the cubic crystal plane which intersects the following position coordinates: (1,0,0); (1/2,0,1/2); (0,1/4,1/2).

b. How many atoms per mm^2 are there on the (100) and (111) planes of lead (FCC) if the atom radius is 1.750 A ?

c. Define : polymorphism, Atomic packing factor, Austenite, and solid solution.

d. Titanium goes through a polymorphic change from BCC to HCP crystal structure upon cooling through 882 °C. Calculate the percentage change in volume when structure change from BCC to HCP. The lattice constant **a** of the BCC unit cell is 0.332 nm, and the HCP unit cell has a=0.2950 nm and C=0.4683 nm.

جامعة طنطا
كلية الهندسة
قسم هندسة الإنتاج والتصميم الميكانيكي

بسم الله الرحمن الرحيم
المادة/ هندسة الإنتاج
الفرقة/ أولى ميكانيكا

التاريخ : 22-1-2012
الزمن : 3 ساعات

أجب عن الأسئلة الآتية:- (75 درجة)

السؤال الأول

1- ارسم هندسية الحد القاطع لسنة المنشار.

2- احسب زمن التشغيل اللازم لخراطه عمود من الصلب بطول 76مم وقطر 38مم إلي قطر 36 مم إذا كانت سرعة القطع 12م/ دقيقه والتغذية 0,25 مم / لفة وعمق القطع 0,5 مم.

3- احسب القدرة المطلوبة عند خراطة عمود من قطر 2 بوصة إلى قطر 1,8 بوصة وطول 13 بوصة وطول 13 بوصة بتغذية 0,005 بوصة /لفة إذا كانت سرعة الدوران 250 لفة / دقيقة والقدرة النوعية لمادة الشغلة 0,76 حصان . دقيقة / البوصة.

السؤال الثاني

1- تكلم عن العمليات الانتاجيه التي تجري علي المثاقب مع الرسم.

2- شغله من الحديد الزهر الرمادي طولها 254مم وعرضها 200 مم – التغذية العرضية المستعملة 1,25 مم لكل مشوار ومطلوب إزالة سمك 5 مم على وجهين متساويين - احسب زمن التشغيل اللازم إذا كانت سرعة القطع 18 مم / دقيقة.

السؤال الثالث

1- ارسم بعض إشكال أحجار التجليخ مع ذكر عيوب عمليه التجليخ.

2- احسب وقت التجليخ لمشوار واحد لسطح اسطواني خارجي بقطر 50مم وطوله500مم ويدور ب 150 لفه/ دقيقه إذا كان سمك الحجر التجليخ 50مم وقطره 400 مم وسرعة دورانه 1200لفه/دقيقه وكذالك التغذية تساوي نصف سمك الحجر لكل لفه من الشغله.

السؤال الرابع

1- تكلم عن ميكانيكية التشكيل اللدن مع ذكر العوامل التي يتوقف عليها مقاومة المعدن للتشكيل.

2- احسب قوه الطرق اللازمة للطرق الحر لصبه من الصلب الكربوني ارتفاعها 125 مم وقطرها 65 مم ليصبح ارتفاعها 75مم علما بان معامل الاحتكاك بين أداه الطرق والشغله 0.4 ومقاومه المعدن للتشكيل 70 نيوتن/مم^2 - علما بأن (k=1) .

السؤال الخامس

1 - اذكر العلاقة بين قطر الدرافيل وقوة الدرفلة.

3- احسب أقصى نسبة تشكيل ممكنة لكتلة من الصلب سمكها 250 مم إذا أجريت عليها عملية درفلة على البارد عند معامل احتكاك 0.1 وكذلك إذا أجريت عليها عملية درفلة على الساخن عن معامل احتكاك 0.6 ما هو تأثير تغير نصف قطر الدرفيل من 500 إلى 1500 مم على أقصى نسبة تشكيل ممكنة؟

مع التمنيات بالتوفيق