



Course title: Yarn Physics and
Testing
Year: second year
Time allowed : 3 hours

اسم المقرر : طبيعة الخيوط واختباراتها
السنة الدراسية: الثانية
مدة الامتحان: ٣ ساعات

Answer the following questions:

1. Explain the importance of inserting twist in yarns. Show why twist insertion reduces the tensile strength of continuous filament yarns?
2. Derive an equation for the calculation of the contraction and retraction factors of a yarn as a function of its surface angle of twist.
3. Explain an experimental method used to examine fiber migration.
4. What is the practical importance for testing the yarn sudden impact? Explain the apparatus used to perform this test.
5. Explain the following:
 - a. The importance of measuring the yarn breaking extension.
 - b. Blending Cotton with Polyester is more popular than blending cotton with Acrylic.
 - c. How the fiber coefficient of friction affects the yarn strength
 - d. The difference between rupture in first stage and rupture in second stage while blending cotton with polyester (give examples for each case)
6. Draw a general figure showing the relation between: the relative fiber to yarn strain, the yarn surface angle of twist and the radial position of the fiber in the yarn. Explain the figure in detail.



Second Year.
Time allowed: Three hours

احتمالات واحصاء
السنة الثانية (هندسة غزل ونسيج)
الزمن: ثلاث ساعة

Answer the following questions: 70 Marks

Instructor Prof.Dr. Galal Elkobrosy

Question # 1 .(14 Marks)

1. A) Let A and B be two events with $P(A) = 1/2$ $P(B) = 1/3$ $P(A \cap B) = 1/4$.

Find:

- a) $P(A/B)$ b) $P(B/A)$ c) $P(A \cup B)$ d) $P(A^c/B^c)$

B) A four digit number is selected at random from the digits 2, 3, 5, 8 and 9.

If it is assumed that the number are not repeated in the selection.

- i) How many numbers do we have?
ii) What is the probability that the number is even?

Question # 2 (14 Marks)

A) A Box contains 16 different Tablets of which 6 are red, 7 are white, and 3 are blue. Four Tablets are taken at random

- i) What is the probability that the four Tablets are red???
ii) What is the probability that two are red, one is white, and one is blue???

B) In a certain Factory for Drug Manufacturing there are Four machines A, B, C, and D produce respectively 40%, 30%, 20%, And 10% of the total number of items . The percentages of defective output of these machines are respectively 2%, 3%, 4%, and 5%. An item is selected at random

- 1) Find the probability that the selected item is defective.
2) Find the probability that the selected defective item in (b) was produced by machine B.

Question # 3 (14 Marks)

A) a coin is tossed three times. Let the random variable K denotes the number of heads which Occur. Find by Using the Binomial Distribution

- i) The probability density function of the random variable K.
ii) The mean value μ_k , variance σ_k^2 And Standard deviation σ_k .
iii) a) $P(k = 0)$ b) $P(k \geq 1)$ c) $P(k = 1)$

d) $P(k = 2)$

e) $P(k = 3)$

B) Find the mean value μ , the Variance σ^2 , and the standard deviation σ for the following distribution of the random variable X.

x	-1	0	1	2	3
f(x)	0.3	0.1	0.1	0.3	0.2

Question # 4. (14 Marks)

A fair coin is tossed 12 times. Determine the probability P that the Number of Heads occurring is between 7 and 9 inclusive by using

- 1) The Binomial distribution.
- 2) The Standard normal Distribution approximation to Binomial distribution

Hint: The area under the curve for

$$\Phi(2.02) = 0.4783 \quad \Phi(0.29) = 0.1141 \quad \Phi(0.39) = 0.1517$$

$$\Phi(2.29) = 0.4890 \quad \Phi(1.89) = 0.4706$$

Question # 5. (14 Marks)

The data given in the following frequency table represents the scores of the students, Faculty of Engineering- Engineering Textile Department, in the Midterm Exam.

- a) Draw the Histogram
- b) Compute the Mean value \bar{X} and the variance S^2 .
- c) Compute the Mode, and the Median

Score	Frequency
0	1
1	0
2	2
3	6
4	2
5	11
6	6
7	10
8	8
9	3
10	1

With my best wishes

Prof. Dr. Galal Elkobrosy



Course title: Weaving Technology TE242
Second Year
Time allowed: Three hours

المادة : تكنولوجيا المنسوجات
السنة الثانية
الزمن : 3 ساعات

Answer All the Following questions:

Candidate must satisfy the examiners in each section of the paper:

Section A

- 1) a- Arrange the following yarns in descending order with respect to the fineness.
Yarn A (40) tex, B (30) metric and C (20) English and D (180) Denier.
b- Given the yarn English Tkt No (60), what will be the gms/mt and mts/kg for this yarn?
c- Given the yarn diameter (cms) = $K\sqrt{TV}$
Calculate the constant K in this equation, and then determine the combed yarn clearer setting and the tension in winding, where: T is the yarn tex (40) &
V is the specific volume cm^3/gm (1.1).
d- Which is the heaviest fabric:-
Fabric (A) 150 cm, 180 gms/mt, (B) 120 cm, 150 gms/mt², (C) 70 cm, $\frac{30 \times 20}{24 \times 24 \text{ tex}}$
e- Which fabric will give more production in mts (using the same conditions):-
i- $\frac{28 \times 24 / \text{cm}}{40 \times 30 \text{ metric}}$ & ii- $\frac{24 \times 20 / \text{cm}}{16 \times 20 \text{ tex}}$
2) A printed fabric 90 cms, $\frac{36 \times 30 / \text{cm}}{30 \times 30 \text{ tex}}$ has 48 selvedge ends, warp and weft crimps are 8% & 6% respectively.
Find the followings:
a- Reed calculations (DOA, WIR and R.N.), take a suitable denting.
b- Total number of ends
c- Length of warps required for one meter of fabric.
d- Fabric weight in gms/mt & mts/kg.
e- Estimate how many hours it takes to run out a loom beam holds enough warp to weave 500 mts of fabric (estimate any required data).
3) a- State five types of DID and give the requirements of ideal draft.
b- Paint 2x4 repeats of plain fabric of count 40x28/cm; complete with the suitable DID, C.P. & R.P.
c- Draw $\frac{5 \quad 4}{5 \quad 2}$ Compound twill.
d- From the base weave 8H reversible twill construct only two types of broken twill.
e- Construct 8H satin weave for ground and using tape selvedge.

Section B

- 1) a- State only four loom attachments of the automatic weaving machine?
b- For the loom drive of the shuttle weaving machine, calculate the speed of each shaft if the loom runs with 200 p.p.m to produce: Plain weave, Satin 5 and Twill 3/2?
- 2) a- Explain the function of the weaving terms: Picking Mechanism, Sley Mechanize, Warp Stop Motion, Shuttle, Loom Timing and Race Board of the shuttle weaving machine?
b- What are the advantages and disadvantages of the cam shedding system of the shuttle weaving loom?
c- State the different weft insertion systems of the shuttleless weaving machines? State the advantages of the M8300 multi-phase weaving loom?
- 3) a- Paint on the pointed paper the following:
- 2 x 2 Rib structure
- 2 x 2 Plain single jersey structure "back side"
b- Explain the knitting terms: fabric density, machine gauge, Combi creel and fabric spreader?
c- State only the loop formation steps of a single jersey fabric for relative technology technique? What are the advantages of the relative technology technique?
- 4) a- Explain briefly three different approaches which are being used for the Contra knitting technique?
b- Compare between **Plain Single Jersey and Rib** knitted fabric structures related to their appearance, thickness and warmth, un-roving, curling and end-uses?
c- The technical details of a single-jersey circular knitting machine are given below:

Machine nominal diameter	30 inches
Machine gauge	24
Total number of feeders	96
Machine speed	30 rpm
Courses/inch	45
Wales/inch	32

The machine is set to produce a fabric with an average course length equal to 234 inch with using 24/1 Ne cotton yarn, assuming an average knitting machine efficiency 91%.
Calculate the following:

 - Machine speed factor
 - Machine pitch in millimeter
 - Fabric width in open form
 - Machine production in kg/shift "Shift = 8 hours"
 - Fabric weight "g/m²"



weaving Preparation

2nd year
Time allowed: 3 Hrs.

السنة الثانية
الزمن : ثلاثة ساعات للجزئين

Final Term Exam

Part I

Answer all the following questions:

Q1:

- i- Compare between 2 for 1 (TFO) and ring twister M/C.
- ii- State different types for yarn splicing.

Q2:

Calculate the productivity of a sectional warping machine, in case of warping striped batch of a 120 ends/repeat warped from 40/2 Nm cotton yarns using the following data:

- Total no. of ends 7000 ends.
- Creel capacity 400 cones.
- Warp density 30 ends/cm.
- Warping speed 500m/min.
- Leasing time 2 min/section.
- Beaming speed 50 m/min.
- Ends down rate 7/100 kg.Nm.
- Repair time 1 min.
- No. of operators 2 op.
- Length of the order as long as possible (max. possible length).
- Displacement rate of the reed 1000 mm/100 revolution of the drum.
- Creeling rate 2 cones/op./min.
- Preparing time for beam winding 10 min.
- Length of inclined part 700 mm.
- Drum diameter (empty) 1000mm.
- Packing density on the drum 0.4 kg/dm³.
- Fatigue and cleaning time 10%.

Q3:

The following defects produced from winding, plying and sectional warping sections, complete this table.

Source	Defect	Effect	Precaution
Labor carless	Bobbin Mixing.		
	Breakage of a yarn through doubling process		
	Lose knots.		Maintenance
	Wrong distance between beam flanges.		
	Unequal yarn tension during twisting process		Maintenance
		Yarn Slough off	
Labor fault	wrong colors arrangement		



Weaving preparation

part 2

Second year
Time allowed: 3 Hrs.

Answer the following questions:-

(Assume the required data with a reasonable values)

- 1- a) With free hand sketch show the yarn path diagram of the hi- speed warping machine.
b) You are asked to prepare a striped warp on a beaming machine. Show the warp dressing of each beam, if the pattern of coloring is 40 ends red, 25 pinks, and 35 white. If the number of repeats is 64, and the number of beams is 10, calculate the package net weight, the required weight of each color considering 0.4 % for waste, using the given data :
 - Yarn count 50/1 Nm.
 - Batch length is 30000 m.
- 2- a) Mention the Technological change on warp yarn due to sizing.
b) What are the factors affecting the size take up %?
c) For a sizing m/c if yarn Nm=40/1, calculate SRC if warp width 180 cm, total ends =5150, $p_y = 0.8 \text{ gm/cm}^3$, how many size box is used.
- 3- a) It is required the warp tension in different zones in sizing m/c (5 zone) if $N_m = 50$ total ends =4000, ultimate tensile strength = 12 cN/tex
b) In case of sizing a batch containing 4800 ends of Nm 40/1 cotton yarn, it is required to have a production of warps at an actual rate of 300 kg /hr (unsized weight). Calculate the sizing machine speed, its running efficiency, and the required number of drying cylinders using the following data: -
 - length of the batch is 20000 m
 - Idle time 2.5hr
 - size liquor pickup P is 110 %
 - size add-on is(S%) 12.5
 - Dry cap./cylinder=50kg water/hr

امتحان الفصل الدارسي الثاني يونيو ٢٠١٥
مادة: القوانين المنظمة للمهن الهندسية
مدة الامتحان: ساعتين

جامعة الاسكندرية
كلية الهندسة
قسم غزل ونسيج

أجب عن السؤال الآتي: (إجباري)

اكتب عن موطن الشخص الاعتباري.

اكتب عن ثلاثة موضوعات فقط مما يلي:

١. الحالات التي يجوز فيها لرئيس الجمهورية اصدار تشريعات عادية.
٢. مراحل سن (وضع) التشريع العادي.
٣. طرق التعبير الصريح عن الإرادة.
٤. سلطة القاضي إزاء الشرط الجزائي.

Alexandria University
Faculty of Engineering
Mechanical Engineering Dept.
June 2015



جامعة الإسكندرية
كلية الهندسة
قسم الهندسة الميكانيكية
يونيو ٢٠١٥

Thermal Engineering
2nd Year Textile
Time allowed: 3 hours

الهندسة الحرارية
السنة الدراسية : الثانية قسم غزل
مدة الإمتحان: ٣ ساعات

Assume any missing data

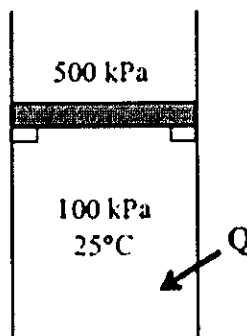
Answer the following questions:

1- (24 Marks)

- Is the density intensive or extensive property?
- Express in equation the conservation of energy principle for an open system.
- What make the reversible process irreversible process?
- Write the equation of perfect gas law for the steam.
- Differentiate between Wet Bulb Temperature. (WBT) & Dew Point Temperature. (DPT).
- Differentiate between Humidity Ratio (H) & Relative Humidity (RH).

2- (20 Marks)

A cylinder equipped with a set of stops for the piston to rest on is initially filled with air at a specified state. **Determine** the amount of heat that must be transferred to raise the piston, and the total work done by the piston.



م. ك. د.

3- (20 Marks)

Air enter a compressor operating at steady state, the inlet conditions are $P_1=100$ kPa, $v_1=0.85$ m³/kg, $C_1=15$ m/s, $u_1=120$ kJ/kg. During the compression an amount of heat of 140 kJ/kg air is transferred from the air to the cooler and the air was delivered at $P_2=500$ kPa, $v_2=0.17$ m³/kg, $C_2=35$ m/s, $u_2=210$ kJ/kg. **Determine** the work required to the compression. **What** is the inlet to exit area?

4- (20 Marks)

Saturated air at 5 °C is first preheated and then saturated by air washer and reheated to a final condition of 40 °C dry bulb and 30% RH. **To what temperature** must the air, initially, to be heated in the preheating coil?

5- (21 Marks)

The waving hall in a textile factory is maintained at 26 C dbt and 70% RH when the outside condition is 35 C dbt and 17 C wbt. If the amount of supply air is 6800 m³/hr, **write** the names of devices that must use to reach the required air conditions, and then **calculate** the capacities of the devices used for the following cases:

- a) All fresh outside air.
- b) Outdide air is 50% of supply air

Good luck

Exam Committee:

Dr. Mohamed Elhelw

Alexandria University
Faculty of Engineering
Mechanical Engineering Dept
11/12/15



جامعة الإسكندرية
كلية الهندسة
قسم الميكانيكا
11/12/15

Thermodynamics, refrigeration and
air conditioning /
2nd Year / Lecture
Thermodynamics

الترموديناميك والتبريد والتكييف
السنة الثانية / المحاضرة الأولى
الترموديناميك

Answer the following questions

- 1- The pressure in an automobile tire depends on the temperature of the air in the tire. When the air temperature is 25 °C the pressure gage reads 210 kPa. If the volume of the air is 0.025 m³, determine the pressure rise in the tire when the air temperature in the tire rises to 50 °C. also determine the amount of air that must be bled off to restore the pressure to its original value at this temperature. Assume the atmospheric pressure to be 100 kPa.
- 2- Air enters an adiabatic nozzle steadily at 300 kPa, 200°C with a velocity of 10 m/s and leaves at 100 kPa and 180 m/s. The inlet area of the nozzle is 80 cm². Determine:
 - a) The mass flow rate through the nozzle.
 - b) The exit temperature of the air.
 - c) The exit area of the nozzle.
- 3- A stream of outdoor air at 35 °C dbt, 28 °C wbt is mixed with return air at 25 °C dbt, 50% RH in an air conditioner system. After mixing, the mixture is cooled to 16 °C dbt. determine :
 - a) The cooling coil capacity in T.R if the total mass flow rate is 3000 kg/hr.
 - b) Outside mass flow rate (kg/hr).

4- The conditions of atmospheric air are 40°C DBT and 60% RH. The air is cooled to 20°C DBT if the air supply to system is 230 m³/min, find:

- Coil Cooling Capacity (kW T.R.).
- Relative humidity and wet-bulb-temperature for the exit point.

5- The weaving hall in a textile factory is maintained at 26 °C dbt and 70% RH when the outside condition is 35 °C dbt and 17 °C wbt. If the amount of supply air is 6800 m³/hr, devices and the internal heat gain in the following cases:

a) All fresh outside air.

Exam Committee:

Dr. Mohamed Elkelw

امتحان الفصل الدارسي الثاني يونيو ٢٠١٥
مادة: القوانين المنظمة للمهن الهندسية
مدة الامتحان: ساعتين (تخلفات)

جامعة الاسكندرية
كلية الهندسة
قسم غزل ونسيج

أجب عن السؤال الآتي: (إجباري)

ما الفرق بين الموطن الاختياري والموطن المختار؟

اكتب عن ثلاثة موضوعات فقط مما يلي:

١. خصائص القاعدة القانونية.
٢. تقسيم القواعد القانونية إلى قواعد أمر وقواعد موصحة معايير التمييز بينهما.
٣. اكتب عن مدى اعتبار السكوت وسيلة للتعبير عن الإرادة عند إبرام العقد.
٤. الفوائد التأخيرية.

Alex. Univ.

FOE

TED

Mechanics of spin
machines
time 1½ hrs.

ميكانيكا آلات لف
2014-2015 (May/June)

Answer the following Qs & assume any
required data.

Q #1:

By a line diagram show the construction of
one of the spindles (heavy or light).

Q #2:

Illustrate the objectives, details & operation of
one of the following.

a. a builder of ring spinning package

b. a builder of flyer frame package

Q #3:

By a neat sketch show the construction of
a rotor-set of a rotor spinning machine.