KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year 1st Term Examination, 2016

TE 2127

(Textile physics)

Time: 3 Hours | Total Marks: 210

N.B.: i) Answer any THREE questions from each section in separate scripts.
ii) Figures in the right margin indicate full marks.

SECTION-A

1(a)	Show a schematic diagram of a SEM with brief description.	08
1(b)	Discuss the analysis of crystallinity of fiber by X-ray diffraction.	10
1(c)	Show infrared absorption spectrum of a textile fiber mentioning the disadvantages of it.	10
1(d)	How crystallinity and amorphous arrangement of polymer chains influence fiber properties?	07
2(a)	What is Torsional rigidity? Prove that specific Torsional rigidity=$\frac{\eta\varepsilon}{\rho}$ where the symbols have their usual meanings.	13
2(b)	Breaking twist of cotton fiber is 60 and diameter of it is 0.017 mm. Find out the BTA of it.	03
2(c)	Prove that specific flexural rigidity= $\frac{1}{4\Pi}\frac{\eta E}{\rho}$, where the symbols have their usual meanings.	13
2(d)	State the effects of lubricant on frictional force.	06
3(a)	Write about the effect of fiber fineness and moisture on yarn strength.	08
3(b)	Establish that, the spirality of a weft knitted fabric depends on the number of feeders of the machine with the help of an equation.	12
3(c)	How tensile properties of fabrics can be predicted? Discuss briefly.	07
3(d)	Write short notes on: (i) heat of wetting (ii) birefringence (iii) moisture content (iv) glass transition temperature.	08
4(a)	What is fiber migration? Briefly discuss the mechanism of fiber migration.	08
4(b)	Describe a process of measuring dielectric constant of a textile material.	08
4(c)	Explain the stress-strain curve where a load is applied on a fiber.	07
4(d)	Discuss the factors which have influences on lustre.	12

SECTION-B

5(a)	Present the interaction of structure and properties of fiber, yarn and fabric.	08
5(b)	From idealized yarn geometry, prove that , $\tan\alpha = 0.0112\ V_y^{(1/2)}\mathrm{T}$, where symbols have their usual meanings.	11
5(c)	Show that, twist contraction factor $C_y=\frac{1}{2}(1+\sec\alpha)$, where the symbols have their usual meanings.	11
5(d)	Define open packing and close packing of fiber.	05
6(a)	Derive the equation of yarn diameter for filament yarn.	10
6(b)	Considering pierce's model of fabric geometry, prove that $h_1= \frac{4}{3} P_2 \sqrt{C_1}$, where the symbols have their usual meanings.	15
6(c)	Define crimp interchange. Write down the equation for crimp interchange.	05
6(d)	Calculate the diameter of a 99 denier filament yarn, Assume ρ=1.38.	05
7(a)	What are the conditions of weft jamming in fabric? Derive the equation for weft jamming in plain fabric.	10
7(b)	If, l_1=0.0448 cm, l_2=0.042 cm, C_1=0.12, EPI=72; Calculate D, θ_1 and C_2%.	06
7(c)	Discuss the problems caused by static electricity and their solutions.	09
7(d)	Discuss the effect of static electricity on the soiling of cotton fabric.	10
8(a)	Define Swelling. Sketch a Swollen fiber and show different types of swelling.	10
8(b)	Establish the transverse area swelling and transverse diameter swelling.	12
8(c)	How the swelling phenomenon can be used practically in textiles to improve functionality?	08
8(d)	How externally applied antistats work?	05

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year 1st Term Examination, 2016

TE 2103

(Weaving Engineering)

Time: 3 Hours | Total Marks: 210

N.B.: i) Answer any THREE questions from each section in separate scripts.
ii) Figures in the right margin indicate full marks.

SECTION-A

1(a)	Discuss about different types of yarn fault.	08
1(b)	Why yarn preparation is necessary? Mention the features of a good warp.	10
1(c)	Show the schematic way of winding.	10
1(d)	Show the flow chart of weaving.	07
2(a)	Define winding and winding package. How many type of package are available during winding?	10
2(b)	Tabulate the difference between precision and non-precision winding.	08
2(c)	Differentiate between side and over end withdrawal.	06
2(d)	What is called yarn guide? What are the necessities of yarn guide? Describe about different types of yarn guide.	11
3(a)	What is warping? What are the importance of warping?	08
3(b)	Describe different types of creel with neat sketch.	10
3(c)	Distinguish between sectional warping and beam warping.	10
3(d)	Calculate the total number of ends on back beam which weighs 242 lbs. The weight of the empty beam as indicated from the marking on its flanges is 62 lbs. The count of the yarn is 40'S cotton and the length of warp on the beam is 15000 yds.	07
4(a)	Describe the working principle of a beam warping machine with neat sketch.	15
4(b)	What are the major faults and their remedies of warping.	15
4(c)	What are the major control system of warping?	05

SECTION-B

5(a)	What is sizing? What are the requirements of sizing?	10
5(b)	What are the major size ingredients? Mention the function of size ingredients.	20
5(c)	A beam of 250 kg contains sized yarn of 15% take up if the unsized count 40'S. Calculate sized count.	05
6(a)	What is meant by size take up%. Discuss the factors on which the size take up% depend on.	10
6(b)	Describe different techniques of sizing.	15
6(c)	A set of beams each containing 32,000 yds of warp is to be used for producing of weavers beams on a high speed slasher. If % of elongation is ½ % and wastage of warp is 60 yds. Calculate the number of beams. The length of sized warp on a weaver is 1200 yds.	10
7(a)	"Sizing is the heart of weaving"- Justify the statement.	07
7(b)	Describe Slasher sizing machine with neat sketch.	20
7(c)	Define: Drafting, Drawing, and Denting.	08
8(a)	Classify the loom.	10
8(b)	Describe primary and secondary motions of a loom.	15
8(c)	Find out the weight of 1000 yds whose warp and weft crimp is 8% and 10% respectably of following specification: $\frac{40X40}{50X40}$ X50"	10

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year 1st Term Examination, 2016

EE 2121

(Electrical Circuits, Machines and Electronics)

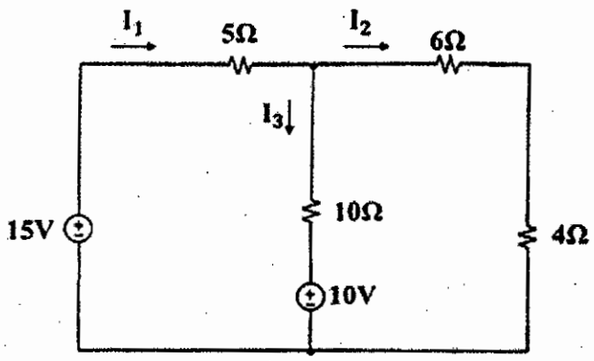
Time: 3 Hours | Total Marks: 210

N.B.: i) Answer any THREE questions from each section in separate scripts.
ii) Figures in the right margin indicate full marks.

SECTION-A

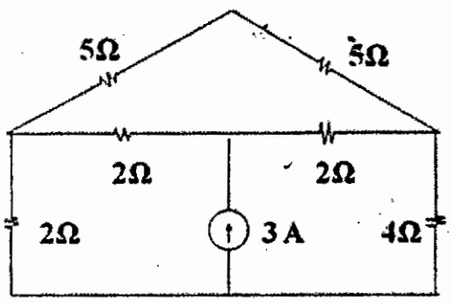
1(a) What are the active elements in an electrical circuit and classify the electrical source with proper symbol? 05

1(b) State KVL and KCL. Find the branch currents I_1, I_2 and I_3 using mesh analysis for the following circuit. 12



1(c) State and explain superposition Theorem. 06

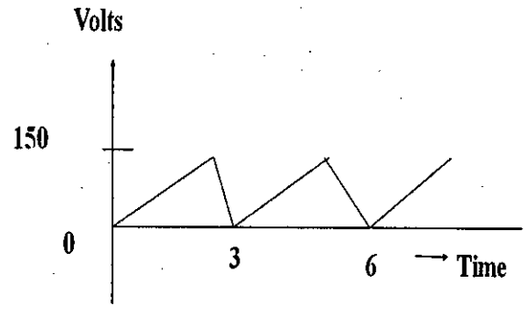
1(d) Using nodal analysis, determine the node voltages for the following circuit. 12



2(a) What is the difference between resistance and impedance? If $v=100\sin(\omega t-30^0)$ and $i=10\sin(\omega t-60^0)$, what is the angle of phase difference between the current and voltage waves? Which wave leads? 06

2(b) Define RMS value. Show the power variations of purely inductive and capacitive branch and also calculate the expression of energy for T/4 cycle. 09

2(c) Find the form factor and crest factor for the following wave. 10



2(d) A voltage e = 200 sin πt is applied to a load having R=200 Ω in series with L=638 mH. Estimate- 10

(i) Expression for current in $i=I_m \sin(\omega t \pm \varphi)$ form,

(ii) Power consumed by the load,

(iii)Reactive power of the load and

(iv)Voltage across R and L.

3(a) What is electronics? Explain the formation of barrier potential in a p-n junction. 08

3(b) Define crystal diode and peak inverse voltage (PIV). Draw and explain the V-I characteristic of a pn junction diode. 08

3(c) Describe the working principle and output efficiency of a full bridge rectifier circuit. 09

3(d) How transistor acts as an amplifier? Prove that, (i) $I_E=(\beta+1)\, I_B+I_{CEO}$; 10

(ii) $\beta=\frac{\alpha}{1-\alpha}$; where the symbols carry their usual meanings.

4(a) What are the factors to be considered for installation of wiring system? Write down the methods of installing wiring. 09

4(b) Write down the differences between neutral wire and earthing wire. Why grounding is required? 07

4(c) Define degree of illumination. State law of illumination. Why fuse is not connected to neutral? 08

4(d) What is switchgear? Write down the working functions of different switchgear equipments also mention their working sequence during the occurance of fault. 11

SECTION-B

5(a) Explain the factors upon which the induced voltage in a conductor is dependent. Drive the E.M.F equation for a generator. 12

5(b) State the functions of yoke, brush, and commutator. Classify dc generators according to the way in which their fields are excited. 07

5(c) Draw and explain the open circuit characteristic (O.C.C) and external 08

characteristic of a dc shunt generator.

5(d) Define armature reaction. The coil of a four pole generator is rotating at a speed of 1200 rpm. The flux per pole is 2.5×10^{-5} Wb. Find the voltage induced in the coil if it has 100 turns. 08

6(a) Define counter E.M.F. Derive the speed equation for both dc shunt and dc series motor. 12

6(b) What is starter? Describe the working principle of 4 point starter. Also mention the advantages of 4 point starter over 3-point starter. 12

6(c) Draw the speed-torque characteristic and electrical characteristic of dc series motor. Explain from the characteristics, "Why dc series motors are never used unless they are directly connected to a load." 08

6(d) Mention the methods of speed control of a dc motor. 03

7(a) Draw the equivalent circuit of a transformer. How core loss and copper loss can be measured in a transformer? 13

7(b) Why transformer rating is KVA. Derive the condition for maximum efficiency of a transformer. 12

7(c) What are the main components of a transformer? Mention the uses of conservators and breathers in transformer construction. 05

7(d) Draw the vector diagram of a transformer for resistive load. 05

8(a) How rotor is rotated in an induction motor? A 3-φ induction motor is wound for 4 poles and is supplied from 50 H_Z system. Calculate- (i) synchronous speed, (ii) rotor speed when slip is 4%, (iii) rotor frequency at 600 rpm. 14

8(b) Draw the complete torque-speed curve of an induction motor. 06

8(c) Write down the differences between an induction motor and synchronous motor. 06

8(d) Describe the excitation for rotating field system of a synchronous generator. 09

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year 1st Term Examination, 2016

CSE 2121

(Computer Fundamentals and Programming)

Time: 3 Hours | Total Marks: 210

N.B.: i) Answer any THREE questions from each section in separate scripts.
ii) Figures in the right margin indicate full marks.

SECTION-A

1(a) Write short notes on (i) Word size, and (ii) Bus speed. 06

1(b) Differentiate between: (i) Analog computers and digital computers (ii) General purpose computer and special purpose computer (iii) Fourth Generation and fifth generation computers. (iv) LAN and WAN. 12

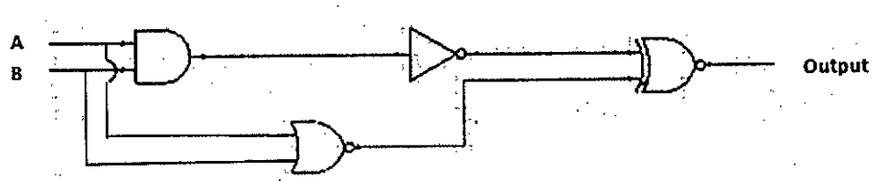
1(c) In spite of having RAM for program execution, why we use cache memory? Briefly explain it's working procedure. 12

1(d) Briefly discuss about laser printer. 05

2(a) Explain how computer represents negative number? Using 2's component find out the values of: (i) 5-3 and (ii) 3-5. 10

2(b) Convert the following numbers according to the given instructions 15
(i) $(B35)_{16}= (?)_8$ (ii) $(249.34)_{10}=(?)_2$ (iii) $(A23C)_{16}=(?)_{10}$.

2(c) A and B with value 1 and 0 correspondingly. So, what will be the output of the following logic circuit? 10



3(a) What is computer language? Write the differences between machine language and High level language. 08

3(b) Fibonacci series is a series of numbers in which each number is the sum of the two preceding numbers. The simplest is the series 1,1,2,3,5,8 where the number of elements are 6. Now, draw a flowchart that can determine the fibonaccii series for any given number of elements. 10

3(c) Write the differences between LCD and LED monitor. 07

3(d) What is internet? Write short notes on webpage, website and web browser. 10

4(a) What is operating system? Differentiate between multi-tasking and multi-programming operating system. 08

4(b) Suppose, you are writing programs in any high level programming languages like C, Python or anything else. But, computers can run program written in machine languages only. Then how your programs run onto your computer? Briefly explain those steps. 12

4(c) What are the disadvantages of using ball mouse? 05

4(d) Using truth table prove that: 10

(i) $(A+B)' = A'.B'$

(ii) $x \wedge (y \vee z) = (x \wedge y) \vee (x \wedge z)$

SECTION-B

5(a) What is structured programming? Write the importance of C. 10

5(b) Write a program that reads a character from keyboard and then prints it in reverse case is given in. That is, if the input is upper case, the output will be lower case and vice-versa. 12

5(c) Is it possible to compile a C program without any main ( ) function? Explain the reasons behind your opinion. 07

5(d) Differentiate between keyword and identifiers. 06

6(a) Write the differences between Array and String (3 significant differences). How will you pass an Array and String data from calling function to called function? 12

6(b) Write a program to determine whether the given positive integer N is a prime number or not. 13

6(c) What do you know about switch statement? Draw the flowchart of else ..... if lodder. 10

7(a) Define break statement with example. Why is the use of the goto statement generally discouraged? 08

7(b) What are the naming rules for variables in C. 06

7(c) Write down a C program that can take any year as input from the user , as many times as the user wants. Then it determines a prints out whether that is a leap year or not. Rules for determining leap year: 06

(i) The year must be divisible by 4 but shouldn't be divisible by 100. OR

(ii) The year has to be fully divided by 400.

7(d) Design an interchange function (swap function) that will interchange two values received by its two arguments (use call by reference technique) 09

7(e) Find out the errors in the following code: 06

```
# include <stdio.h>
# define X=25
Void main ( ){
int x,y,z,outut;
scanf("%d %d %d", x,y,z);
output+x=y-z;
printf("%d", output+x);
}
```

8(a) Write a program to calculate the factorial of a number using recursive method. 12

8(b) What is file? Describe how to open a file in different modes? 10

8(c) "All character arrays are not string but all strings are character arrays"- Justify the statement. 07

8(d) Describe briefly about the following functions: (i) get c ( ) (ii) fscanf ( ) (iii) fopen ( ) 06

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year 1st Term Examination, 2016

TE 2111

(Statistical Analysis and Quality Control)

Time: 3 Hours | Total Marks: 210

N.B.: i) Answer any THREE questions from each section in separate scripts.
ii) Figures in the right margin indicate full marks.
iii) Necessary table and chart may be supplied on request.

SECTION-A

1(a) What is central tendency? Mention the different measures of central tendency. 08

1(b) From the following frequency table, calculate mean, median and mode: 15

Weekly Wages:	200-400	400-600	600-800	800-1000	1000-1200	1200-1400	1400-1600
No. of persons:	6	9	11	14	20	15	10

1(c) What are the methods of collecting primary data? How can you differentiate qualitative data from quantitative data? 12

2(a) Depict the different measures of kurtosis. 10

2(b) Find the 1st, 2nd and 3rd moment about the mean for the data 2,3,7,8 and 10. Also find out the kurtosis β_2. 10

2(c) The selling price and frequency distribution for the airjet loom is as follows: 15

Selling prices	15 upto 18	18 upto 21	21 upto 24	24 upto 27	27 upto 30	30 upto 33
Frequency	8	23	17	18	8	6

Determine the measures of dispersion. Assume the information is based on population data.

3(a) State the assumption for binomial distribution. Mention the practical applications of Poisson's distribution. 10

3(b) ILO reports that 20% of the workforce in textile is unemployed and interviewed 14 workers. 10

(i) What is the probability at least five are unemployed?

(ii) What is the probability that exactly seven are unemployed?

3(c) The annual incomes of some composite textile factories are approximately normally distributed with a mean of $50,000 and a standard deviation of $20,000. Calculate 15

(i) what percentage of factory earn between $45,000 and $65,000?

(ii) what is the probabilities of earning 99% of the income?

(iii) what is the probabilities of earning 68% of the income?

4(a) M/S Universal Textiles was studying the relationship between sales and the amount spent on advertisement. The sales information of the last 4 months is as follows: 20

Month	x Advertising expenses (Lac)	y Sales revenue (Lac)
January	20	120
February	10	125
March	5	131
April	8	115

Give that S_x= 1.205 and S_y= 2.091. Determine,

i) the co-rrelation co-efficient.

ii) the regression equation.

iii) the sales when advertising expenditure is 25 Lac Taka.

iv) Draw a scatter diagram.

4(b) 30% of the Polo-Shirt produced in a garment factory has quality problem. 3 Polo-shirts are selected at random. 15

i) What is the probability all 3 of the selected Polo-shirts have a quality problem?

ii) What are the probability none of the 3 Polo-shirts has a quality problem?

iii) How do you assume the events either independent or dependent?

SECTION-B

5(a) What is meant by control chart? State the basic conception of control chart. 15

5(b) Following table represents the number of non-conformities observed in 10 successive samples of 100 printed circuit boards in a Textile factory. The inspection unit is defined as 100 boards . Set up a control chart using the data from the table. 20

Sample No.	1	2	3	4	5	6	7	8	9	10
No. of non-conformities	21	24	16	12	15	5	28	20	31	25

6(a) How can you recognize an in control and out of control process? Show the ranges of in-control process with normal distribution curve. 15

6(b) Determine trial control limit of X-bar chart by using the data from the following table: 20

Sample	Slip ring diameter (cm)				
	1	2	3	4	5
1	5.02	5.01	4.94	4.99	4.96
2	5.01	5.03	5.07	4.95	4.96
3	4.99	5.00	4.93	4.92	4.99
4	5.03	4.91	5.01	4.98	4.89
5	4.95	4.92	5.03	5.05	5.01

Given that, A_2=0.58

7(a) What is ANOVA? What are the steps involved in one way analysis of variance? 15

7(b) Is there a relationship between the production of the garments and gender of the employee involved in the production? At 0.01 level of significance can we conclude that the gender and production type of garments are related for a sample of 150 garments? 15

Observed Frequencies

Gender	T-shirt	Polo-shirt	Pant	Total
Male	60	20	10	90
Female	20	30	10	60
Total	80	50	20	150

7(c) State the Types-I and Type-II error. 05

8(a) Define the terms: i) Hypothesis, ii) Null hypothesis, iii) Degree of freedom, iv) Level of significance. 10

8(b) Discuss the different types of sampling. 15

8(c) What is causes and effect diagram? Give example of when and how a cause and effect diagram can be used? 10

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year 2nd Term Examination, 2016

TE 2209

(Fabric Structure and Design-I)

Time: 3 Hours | Total Marks: 210

N.B.: i) Answer any THREE questions from each section in separate scripts.
ii) Figures in the right margin indicate full marks.

SECTION-A

1(a)	Write the importance of fabric analysis very briefly.	05
1(b)	State the necessity of drafting plan, lifting plan and denting plan. Give graph paper example of drafting and lifting plan of any suitable weave.	10
1(c)	How warp and weft from a piece of woven cloth can be identified?	08
1(d)	Define contact field, interlacing field, free field and open field with suitable representation.	12
2(a)	How ornamentation of plain cloth can be done?	05
2(b)	Compare fancy matt and stitch matt.	06
2(c)	Give graph paper example with drafting and lifting plans of the followings:- (i) Regular matt on 16×16. (ii) Irregular warp rib on 20×20. (iii) Regular weft rib on 20×20.	24
3(a)	Describe the methods of indicating drafting plan. Compare divided draft and group draft.	12
3(b)	Give graph paper example with drafting and lifting plans of the following designs:- (i) Diamond weave on 20×20. (ii) Horizontal Zigzag based on $\frac{4}{3}$ twill.	16
3(c)	Give graph paper example of the followings:- (i) Expanded twill. (ii) Warp face twill.	07
4(a)	Depict the factors on which the prominence of twill line depends.	08
4(b)	Give graph paper example of the following designs with drafting plan and lifting plan- (i) Odd no. Cork screw weave (ii) Weft way elongated twill based on $\frac{4}{2}$ twill. (iii) Warp way stepped twill on $\frac{3}{1}$ twill base.	27

SECTION-B

5(a)	Classify satin weaves. State the conditions for selection of move number for satin weaves.	10
5(b)	Differentiate between satin and sateen weaves. Give graph paper examples of regular satin and irregular sateen.	20
5(c)	Mention the end uses of Zigzag, Herring bone, Diamond, Diaper and Broken twill.	05
6(a)	Give graph paper example with drafting and lifting plan of the followings:- (i) Devon Hucka back. (ii) 24×24 brighton Honey comb. (iii) Weft distorted effect	27
6(b)	Mention the technical features and specific end uses of Mock leno and ordinary Honey comb weaves.	08
7(a)	How crepe weaves can be constructed by superimposing? Discuss the construction principle and give example with drafting and lifting plan.	12
7(b)	Give graph paper example of a wadded twill faced Bedford Cord weave with drafting and lifting plan.	13
7(c)	Why wadded threads are used with Bedford Cords?	05
7(d)	State the feature of Bedford Cord weaves.	05
8(a)	Show graph paper example of stripe design which is constructed by combining warp and weft face weaves, with drafting and lifting plan.	15
8(b)	Give graph paper example of plain faced Bedford Cord on alternate picks, with drafting and lifting plan.	12
8(c)	Discuss the specific end uses of crepe weaves.	08

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year 2nd Term Examination, 2016

Hum 2221

(Sociology and Economics)

Time: 3 Hours | Total Marks: 210

N.B.: i) Answer any THREE questions from each section in separate scripts.
ii) Figures in the right margin indicate full marks.

SECTION-A

1(a)	What is Sociology? Why Sociology is important for the students of textile engineering?	10
1(b)	What is social stratification? Why human society is stratified?	10
1(c)	Differentiate between class system and caste system.	15
2(a)	What is "Urban Growth"? What are the causes of "Urban Growth"?	10
2(b)	Explain the social and behavioral characteristics of urban living.	15
2(c)	What is suburban? What are the problems of suburban living?	10
3(a)	What is difference between crime and deviant behavior?	05
3(b)	Explain the Demographic transition theory of population?	15
3(c)	Explain the role of social bonding for social control.	15
4(a)	Explain the Biological and Cultural context of human behavior.	15
4(b)	Explain the carriers of culture that share every society	20

SECTION-B

5(a)	How is ECONOMICS like a science? Distinguish between Microeconomics and Macroeconomics.	15
5(b)	Use a production possibility frontier (PPF) to illustrate society's tradeoff between a clean environment and high income. Explain.	10
5(c)	Show what happens to the Frontier if engineers develop an automobile engine with almost no emissions.	10
6(a)	Pharmaceutical drugs have an inelastic demand and computers have an elastic demand. Suppose, that technological advance doubles the supply of both products (that is, the quantity supplied at each price is twice what it was).	
	a) What happens to the equilibrium price of quantity in each market?	15
	b) Which product experiences a larger change in price and which in quantity?	10
	c) What happens to total consumer spending on each product?	10

7(a)	What is an indifference curve? Discuss the characteristics of an indifference curve.	10
7(b)	A person who consumes coke and cheese gets a raise, so his income increases from $3000 to $4000. Show what happens if both coke and cheese are normal goods. Now show what happens if cheese is an inferior good.	15
7(c)	Draw and explain the cost curves for a typical farm for a given price.	10
8(a)	If price rise, people's income from selling goods increases, the growth of real GDP ignores the gain, however, why does Economist prefer real GDP as a measure of Economic well-being?	15
8(b)	What are national savings, private savings and public savings?	10
8(c)	What is the role of system? Mention the name and describe two markets that are part of the financial system in our economy.	10

--) END (---