

KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year 1st Term Examination, 2017

TE 2101

(Yarn Manufacturing Engineering-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 down the process sequence of 50 Ne combed yarn mentioning the output product in each stage. 8
- 1(b) Show importance of Mixing and Blending. 6
- 1(c) What is bale management? Why it is necessary for cotton yarn production? what is IPI? 8
- 1(d) Write short note on HVI 5
- 1(e) Find out the production in kg/day of a Blow room line with 2 scutchers if : 8
Bottom calendar roller dia = 7 inch
Bottom calendar roller speed = 12 rpm
Lap weight = 14 oz/yd
Waste = 5%
Efficiency = 90%
- 2(a) Mention the blow-room Line for both "Rieter & Trutzschler" companies. 6
- 2(b) Describe the working principle of 'Unimix' of Rieter blowroom line with a neat sketch. 15
- 2(c) Show different elements of grid with sketches. What is CIW? 6
- 2(d) Sketch a modern metal part separator of a modern blowroom line. 8
- 3(a) Draw and indicate the parts of a carding machine. 15
- 3(b) State the advantages of chute feed system. Write short note on foundation material in flexible Card clothing. 10
- 3(c) Point out the surface speed and wire direction of the following parts of the Carding machine : 10
i) Taker- in ii) Cylinder iii) Flat iv) Doffer
- 4(a) Describe a chute feed system with neat sketch. 15
- 4(b) Sketch a modern flat bar mentioning functions of it. 8
- 4(c) Where and how Carding action is occurred? 5
- 4(d) Find out the production per day in lbs of a modern carding m/c from the following data : 7
Doffer speed = 300 m/min,
Waste = 3%,
Efficiency = 95%,
Assume necessary data if required.

SECTION-B

- 5(a) Explain (mathematically & graphically) the effects of doubling & draft on the quantity of drawn sliver. 15
- 5(b) Distribute the Total draft among three zones of a 4 over 4 drafting system (Assume total draft = 8). 5
- 5(c) Discuss the auto stop mechanisms of a modern drawframe. 7
- 5(d) Find out the production in Kg/shift of Draw frame from the following data : 8
- Delivery roller speed = 700 m/ min
- Draft = 7.5
- Doubling = 8
- Card sliver hank = 0.15
- Delivery/ head = 2
- No. of draw frame = 4
- Efficiency = 85%.
- 6(a) Show the flow process of jute yarn. 10
- 6(b) Discuss the faults of emulsion mentioning the remedies of it. 5
- 6(c) Give the recipe of stainless emulsion. Why it is called stainless emulsion? 8
- 6(d) Define batch and batching. 6
- 6(e) Give the batch composition of the following jute yarn : i) CBC warp ii) Sacking weft. 6
- 7(a) Give the classification of Jute card. 5
- 7(b) Define Dollop weight and Clock length. 5
- 7(c) Draw a X-sectional diagram of breaker card machine and mention different roller speed, pin angle and Picks/ inch². 20
- 7(d) Breaker card clock length = 13 yards, dollop weight = 30 lb, draft = 10 & waste = 3% ; 5
Find out the sliver wt./100 yds.
- 8(a) Differentiate between card clothing and staving. 5
- 8(b) Why pilling is needed and how it is done? 6
- 8(c) Find out the in lb/day/machine of a breaker card from the following data 7
- surface speed of feed roller = 18 ft/minute
- Clock length = 12 yds
- Dollop weight = 25 lb
- Waste = 5 %
- Efficiency = 80%
- 8(d) Why two types of Carding machines are used in jute spinning? 6
- 8(e) Describe the working principle of jute spreader machine with its diagram. 11

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year 1st Term Examination, 2017

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) What do you mean by computer generation? shortly discuss about 5th generation computer. 8
- 1(b) Suppose you are writing a C program in your computer. But your computer doesn't understand the commands you are using in your code. It only understand machine code then how would your computer run the code you are writing ? 7
- 1(c) Make short notes on the followings : 8
i) Loader
ii) Assembler
- 1(d) In spite of having RAM for program execution, why we use cache memory ? Briefly explain it's working procedure. 12
- 2(a) Make short notes over : 12
i) L1, L2 , L3 cache
ii) PRom
iii)EPRom
iv)EERom
- 2(b) In which analytical phase, compiler does the auto type casting? 5
- 2(c) What is flow chart? Draw a flow chart which will determine the Fibonacci series given any number of elements. 9
- 2(d) Describe how computer represents data? 9
- 3(a) Briefly explain how does achieve parallelism. 8
- 3(b) Describe how a computer employs Arithmetic Logic Unit(ALU), Control unit and Bus for the execution of the programs. 12
- 3(c) Explain how does a computer deal with a negative number. Using 1's and 2's compliment, calculate: 8
i) 10-7 ii) 7-10
- 3(d) Describe the working procedure of the magnetic storage device. 7
- 4(a) Convert the following numbers according to the given instructions : 12
(i) $(B57)_{16} = (?)_{10}$ (ii) $(137.9)_{10} = (?)_2$ (iii) $(513)_8 = (?)_{16}$

- 4(b) Find the output of the circuit diagram in case the input nodes are A= 1, B= 1, C= 0 and D= 0. Fig -4(b) 10

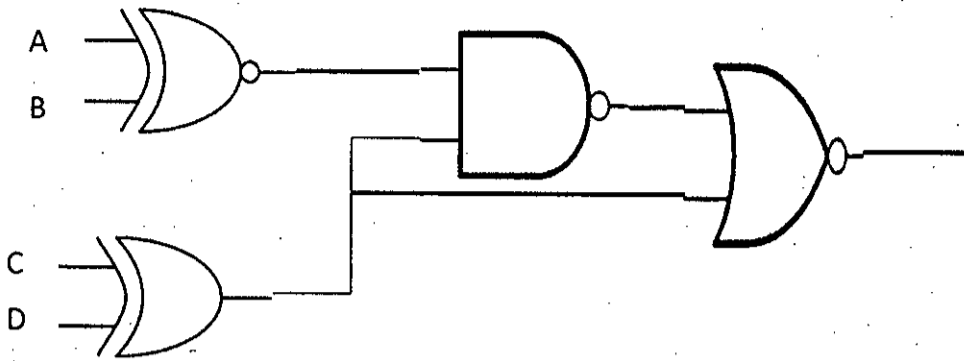


Fig- 4(b)

- 4(c) From the truth table given below build up the k-map and then draw the diagram of a circuit which can implement the truth table. Finally validate the circuit diagram with respect to the truth table. 13

A	B	C	D	Output
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	1

SECTION-B

- 5(a) What is data type? Discuss about the fundamental data types of C. 8
- 5(b) List the branching techniques that are used in C. What do you mean by entry controlled and exit controlled loop? 10
- 5(c) Write a program which will take an integer number as input and will print the digits of this number reversely. 10
- 5(d) Write the rules of naming variables. 07
- 6(a) What is string? Write a program which will join two strings without using library function(strcat()). 12
- 6(b) What do you mean by nesting loop? Write the techniques of jumping out from loop. 5

- 6(c) Which operations are not performed directly on the string variables ? How are they executed? 8
- 6(d) Describe the followings with example 10
 i) External variable ii) Register variable
 iii) Static variable iv) Local variable
- 7(a) What is function ? what are the advantages of using user defined functions ? 7
- 7(b) Write a program which still calculate the Greatest Common Divisor (GCD) between two numbers. Use recursion method. 12
- 7(c) Write the techniques of passing data from calling function to called function. 8
- 7(d) What is pointer ? Write the benefits of using pointer in program. 8
- 8(a) "All character arrays are not string but all strings are character array" – justify the statement. 7
- 8(b) Describe different modes of opening a file. Why is file necessary for programming? 12
- 8(c) Write a program for reading a list of data from a file and print the summation of these data. 10
- 8(d) Shortly describe the library functions which are used in a program for accessing a file randomly. 6

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year 1st Year Examination, 2017

EE 2121

(Electrical Circuits, Mechanics and Electronics)

Time: 3 Hours

Total Marks: 210

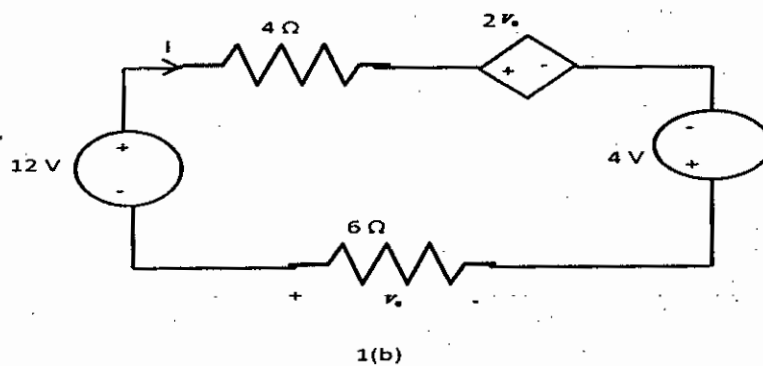
N.B.: i) Answer any THREE questions from each section in separate scripts.

ii) Figures in the right margin indicate full marks.

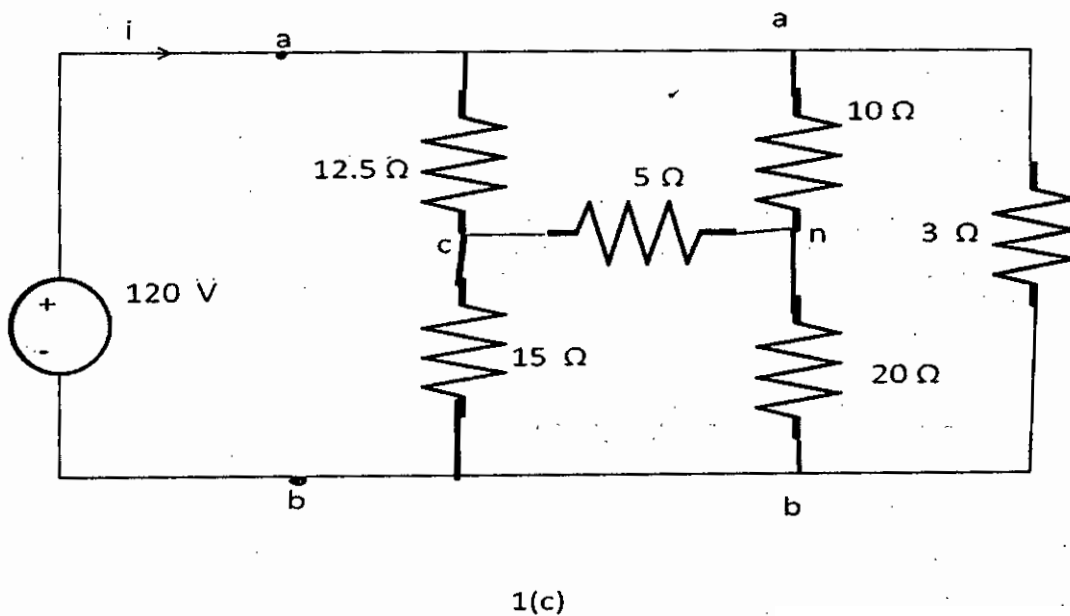
SECTION-A

1(a) Define Electrical Circuit and Network with two differences between them. 5

1(b) Define loop, branch and node with circuit examples. Determine V_o and I in the circuit in Fig-1(b). 7

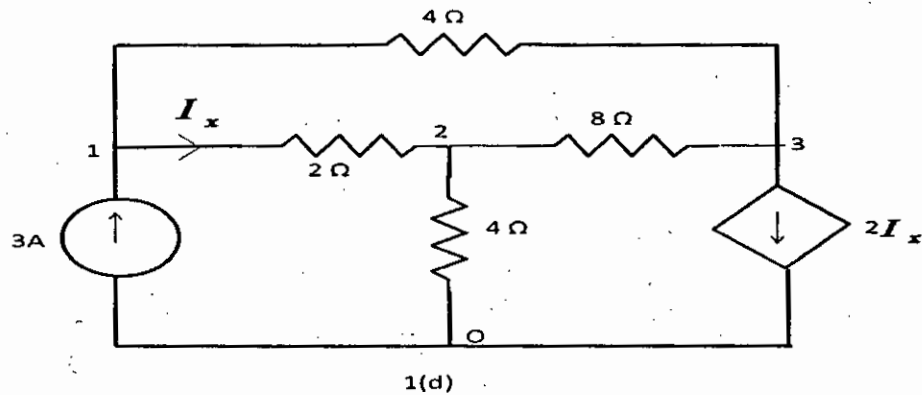


1(c) Obtain the equivalent resistance R_{ab} for the circuit in Fig-1(c) and find current. 10



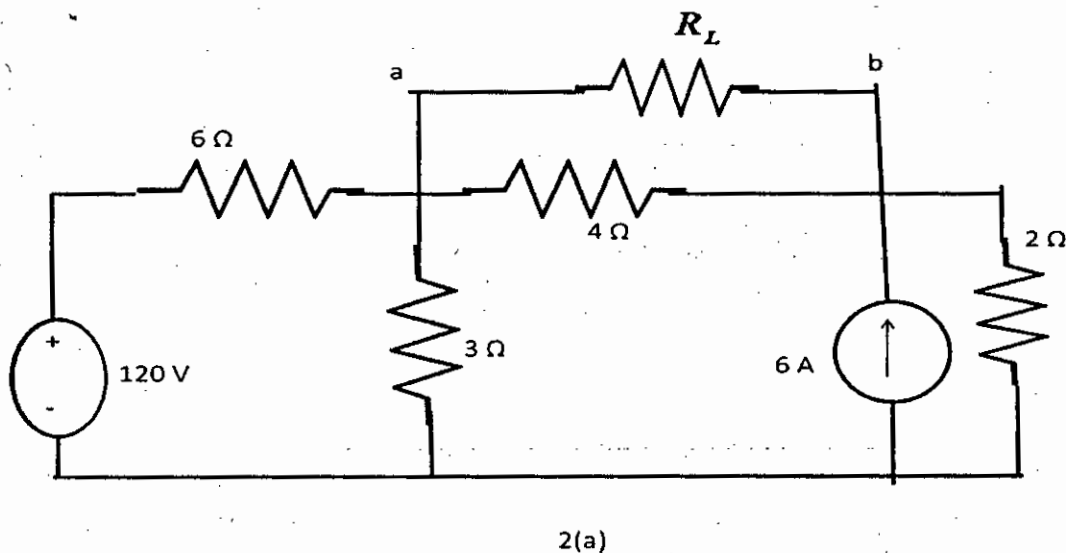
1(d) Determine the node voltage for Fig- 1(d).

13



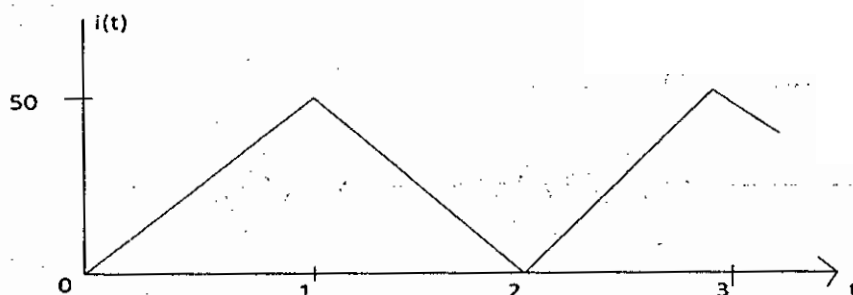
2(a) For the network in fig 2(a); Calculate the value of R_L for maximum power at R_L .

13



2(b) Define Effective value , Average Value, Form Factor (FF) and Peak Factor (PF) for the ac quantity. Find these parameters as shown in fig 2(b).

12

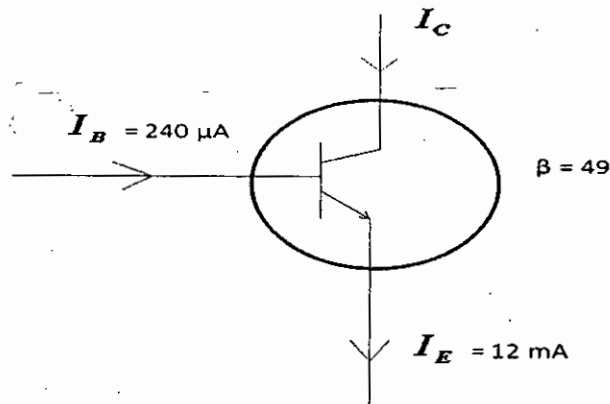


2(b)

2(c) Calculate energy stored in pure C branch. A voltage $V = -150 \sin 377t$ Volts is applied to a particular circuit element and it is found that $i = 10 \cos 377t$. make a sketch of the v and i and mention which one is lead and which one is lag. Find the nature and magnitude of the circuit parameter.

10

- 3(a) Define semi conductor and semi conductor diode. Draw the connection for half wave and full wave rectifier. Also calculate the efficiency for both half wave and full wave rectifier. 12
- 3(b) Define transistor. How transistor acts as an amplifier and as a switch. 13
- 3(c) Establish the relationship between α , β , γ where symbols have their usual meaning. Find the α rating of the transistor shown in fig 3(c). Hence determine the value of I_c using both α and β . 10



3(c)

- 4(a) What are the different types of electrical safety devices and describe them briefly. 5
- 4(b) Write down the methods of installing wiring. What is the most suitable wiring method used for textile industries and why? 6
- 4(c) What are the difference among neutral, ground and earth? Describe major components in electrical substation and their functions. 12
- 4(d) Write down the basic functions of circuit breaker, isolator, lightning arrestor and relay. 12

SECTION-B

- 5(a) State Faraday's law of electromagnetic induction. Drive the E.M.F equation of a DC generator. 12
- 5(b) What are the main parts of DC generator? Write down the basic functions of magnetic frame, pole-cores and commutator. 6
- 5(c) Define critical resistance. Explain the voltage build-up process for self-excited DC generator. 10
- 5(d) Draw the open circuit characteristic (O.C.C) of a DC series generator. The coil of a two pole generator is rotating at a speed of 1500 R.P.M. The flux per pole is 2.5×10^3 maxwells. Find the voltage induced in the coil if it has 200 turns. 7
- 6(a) Drive the speed equation of DC series motor. 10
- 6(b) Why starter is needed for starting of DC motor. Describe the four point starter with proper circuit diagram. 10
- 6(c) Draw the mechanical and electrical characteristics of DC series motor. Explain from the characteristics, why DC series motors are never used unless they are directly connected to 8

- the load.
- 6(d) Describe the method of speed control by which speed of DC motor can be controlled above base speed. 7
- 7(a) Describe the test by which core loss of a transformer can be determined. 10
- 7(b) Why transformer rating is KVA ? Drive the condition for maximum efficiency of a transformer. 10
- 7(c) Why core loss in a transformer is constant under all load conditions? 5
- 7(d) A 25 KVA transformer has 500 turns on the primary and 50 turns on the secondary winding. The primary is connected to 3000 V, 50 Hz supply. Find the full load primary and secondary currents, the secondary E.M.F and the maximum flux in the core. Neglect leakage drops and no load primary current. 10
- 8(a) Describe the basic operating principle of alternator. 8
- 8(b) Draw the equivalent circuit and T-S curve of induction motor . How will you control the speed of induction motor? 12
- 8(c) Draw the power stage of induction motor. The power input to a 500V, 50 Hz 6 pole, 3 ϕ induction motor running at 975 r.p.m is 40 KW. The stator losses are 1 KW and FWL are 2 KW. Calculate (i) slip (ii) the rotor Cu loss (iii) shaft power (iv) the efficiency. 15

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year 1st Term Examination, 2017

ME 2121

(Engineering Mechanics)

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) A 250 kg Cylinder A rests on a smooth inclined plane as shown. For a tension in the rope of 125 Kg, find the inclination of the plane and the plane reaction. 17.

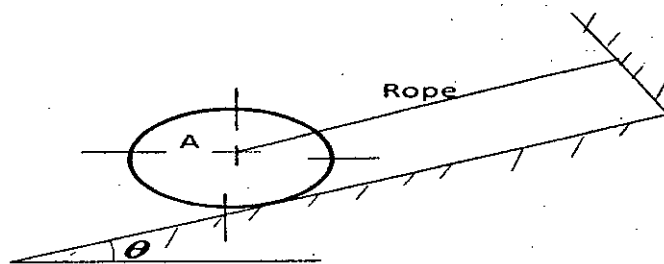


Fig- 1(a)

- 1(b) A 1250 Kg wheel with a radius of 2 m is acted upon by a force F as shown in figure, which tends to pull the wheel over the obstruction at A. At the instant the wheel is about to move, the pressure between the wheel and the ground is zero. What is the magnitude of the force F at this instant if $\theta = 30^\circ$? 18

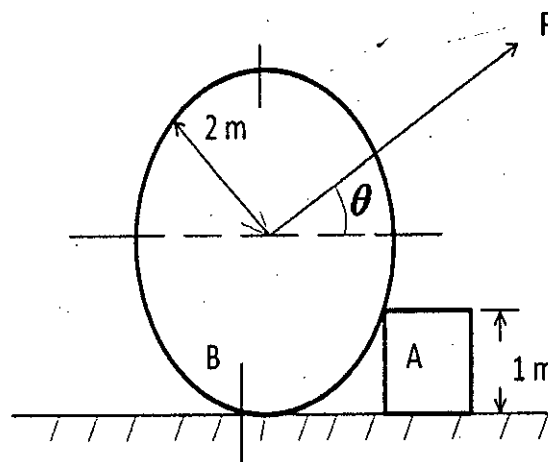


Fig-1(b)

- 2(a) The bell-crank shown in figure has a load $F = 100 \text{ N}$. If $\theta = 30^\circ$, solve the reaction at B and C. 18

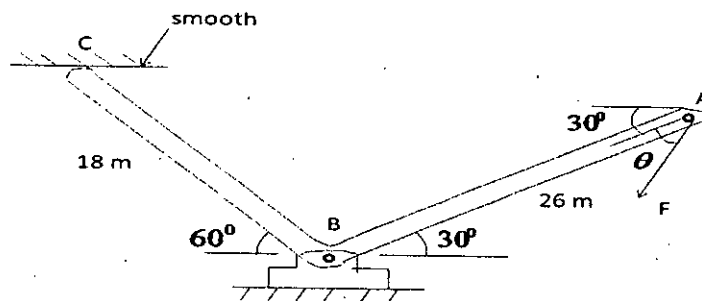


Fig- 2(a)

- 2(b) The member AB mass 203.9 Kg and rest against a smooth wall at B. Determine the reaction at B and A when $\theta = 30^\circ$. What are the components of the reaction at A ? 17

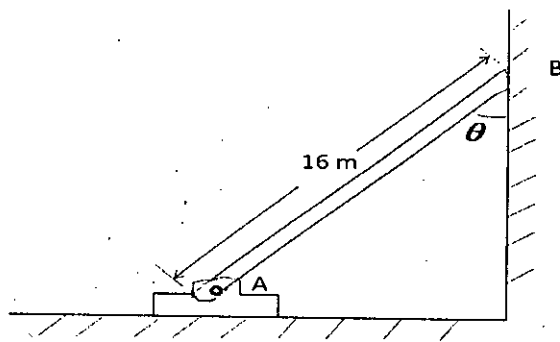


Fig- 2(b)

- 3(a) In figure, CD is a rigid, weightless body, $F = 150 \text{ Kg}$, the pegs are smooth and the cable is weightless and flexible. Determine the weights of A and B if the bodies are in equilibrium and CD remains horizontal. 18

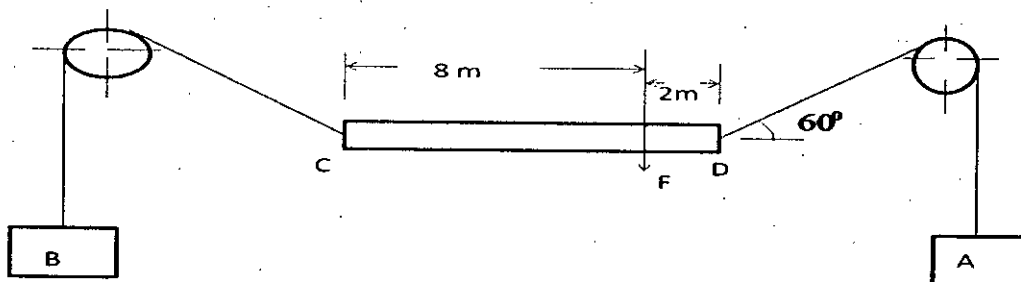


Fig- 3(a)

- 3(b) In figure, the bodies A weighing 5.1 Kg and B weighing 7.65 Kg are connected by a cord and rest on smooth inclined planes. What is the angle θ if the bodies are in equilibrium ? 17

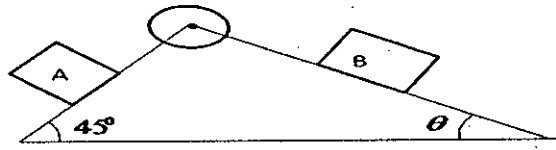


Fig- 3(b)

4(a) In the bridge truss as shown in figure, find the forces in member AB, AF, BF and EF. 20

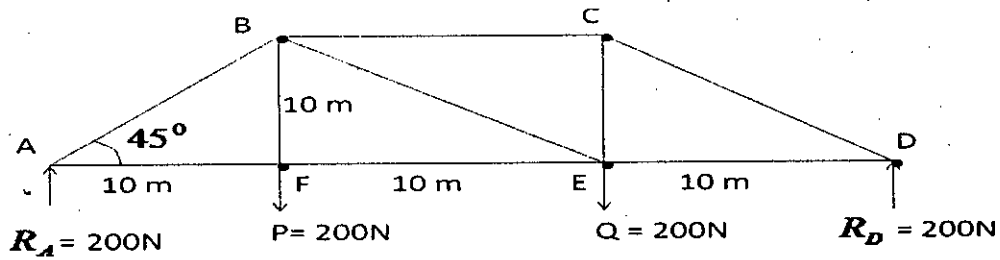


Fig- 4(a)

4(b) Find the forces in member AB and AD of the cantilever truss shown in figure, when $F = 10 \text{ N}$ and $\theta = 30^\circ$. 15

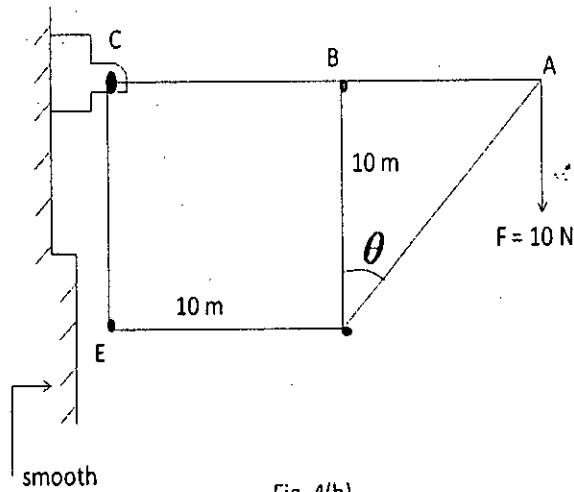


Fig- 4(b)

SECTION-B

5(a) A ladder AB with a mass of 51 Kg shown in figure is held in impending motion toward the right by the horizontal force Q. If $F_A = 0.2$ and $F_B = 0.3$. What is the value of Q? 18

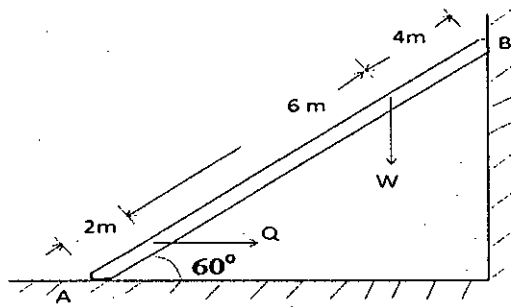


Fig- 5(a)

- 5(b) Determine the minimum value of P which must be applied to the wedge in order to move the 2000 Kg block. The co-efficient of static friction is 0.30 at all surface of contact. 17

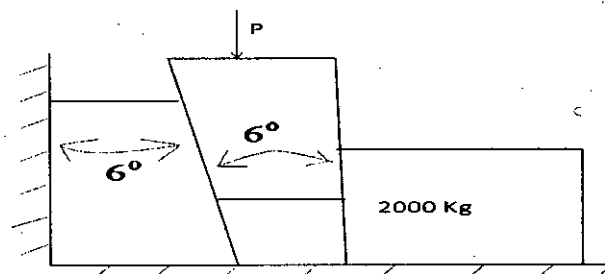


Fig- 5(b)

- 6(a) 18

For a V-belt Prove that $\frac{T_2}{T_1} = e^{\left\{ \frac{\mu_s \beta}{\sin \frac{\alpha}{2}} \right\}}$, where β is angle of contact, α is angle of V and other symbols have their usual meanings.

- 6(b) A brake drum of radius $r = 150$ mm is rotating clockwise when a force P of magnitude 75N is applied at D. Knowing that the Co-efficient of friction $f = 0.25$, Determine the moment about O of the friction forces applied to the drum when $a = 75$ mm and $b = 400$ mm. 17

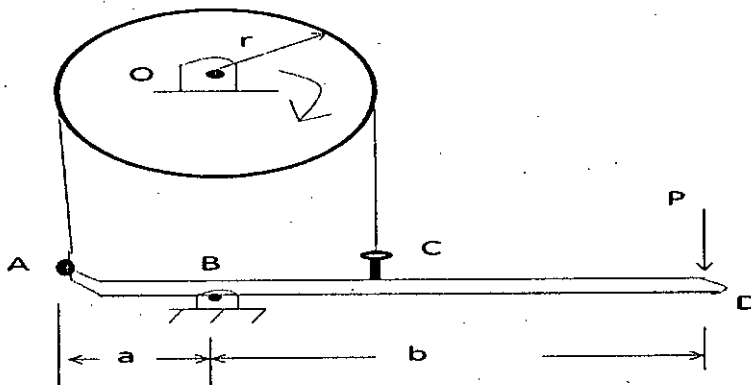


Fig- 6(b)

- 7(a) Find the centroid of the area shown in figure. 15

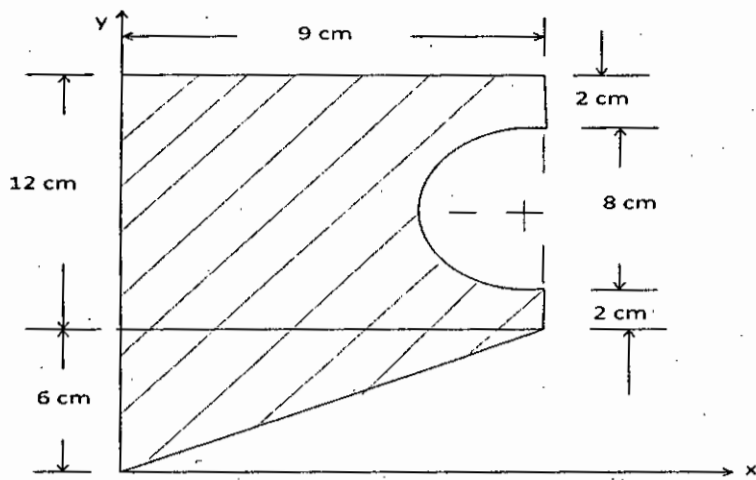


Fig-7(a)

Fig-7(a)

7(b) Determine by direct integration the centroid of a parabolic spandrel.

20

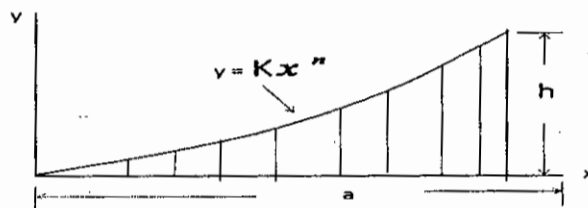


Fig-7(b)

8(a) Determine the location of the center of gravity of the homogeneous body of revolution as shown in figure, which was obtained by joining a hemisphere and a cylinder and carving out a cone. 16

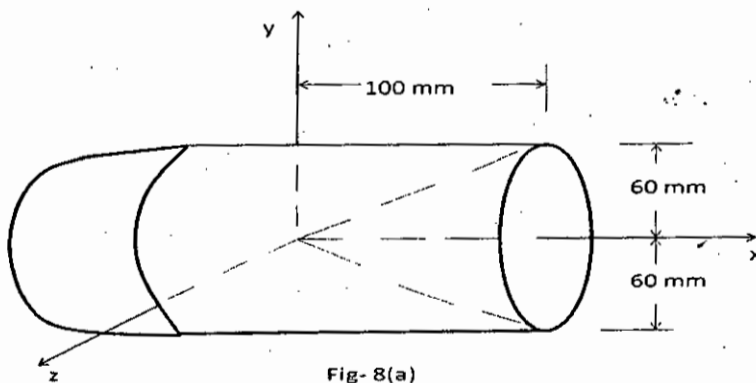


Fig-8(a)

8(b) Determine the location of the centroid of the half right circular cone.

19

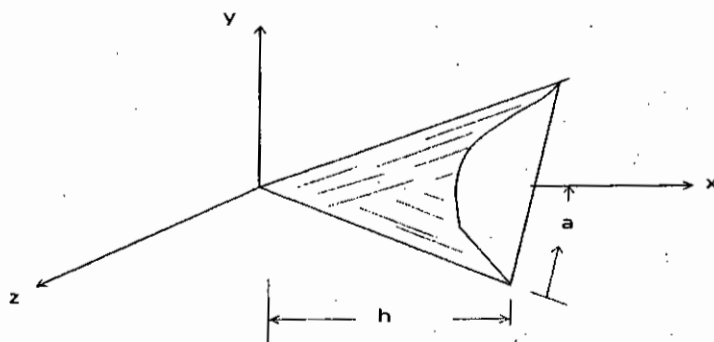


Fig-8(b)

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year 1st Term Examination, 2017

TE 2111

(Statistical Analysis & 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.

SECTION-A

- 1(a) Distinguish between primary and secondary data. What precautions would you take before using data from a secondary source? 8
- 1(b) Write the importance of frequency distribution. 5
- 1(c) Draw the histogram and the ogive curve from the following data : 12

Monthly income(\$ USD)	No. of employees
18-20	10
20-22	35
22-24	140
24-26	300
26-28	370
28-30	320

- 1(d) 10 test results of a given yarn sample are found as follows : 28.10, 28.67, 28.64, 28.83, 28.49, 29.37, 29.96, 28.99, 29.10; Find out the CV% for these data and comments on yarn quality. 10
- 2(a) What is Central tendency? Mention its measures. 6
- 2(b) Which is the ideal measure of Central tendency and why? 8
- 2(c) For the following frequency table calculate Mean , Median and Mode: 12

Weekly rent(tk)	No of persons paying the rent
200-400	6
400-600	9
600-800	11
800-1000	14
1000-1200	20
1200-1400	15
1400-1600	10
1600-1800	8
1800-2000	7

- 2(d) Prove that $AM \geq HM \geq GM$. 9

3(a) Prove that the variance of first n natural number is $\frac{n^2 - 1}{12}$. 10

3(b) A collar manufacturer is considering the production of new style of collar to attract young man. The following statistics of neck circumference are available based on measurement of a typical group. 15

Mid value (in inch)	12.5	13	13.5	14	14.5	15	15.5	16
No. of men	4	19	30	63	66	29	28	1

Compute the arithmetic mean & standard deviation and comment on the result.

3(c) Given data 2, 3, 7, 8 and 10 ; compute Sk_k & β_2 from the given data and comments on the result. 10

4(a) Prove that the Coefficient correlation lies between -1 to +1. 12

4(b) The hourly wages of the weaving workers showed that mean hourly salary was Tk 2500 with a S.D of Tk 300 . Assume the distribution of hourly wages follows the normal distribution. If we select a worker of random, what is the probability that the worker earns :

i) between tk 2500 and tk 2800

ii) About 90% of the wages

iii) about 70% of the wages.

4(c) Establish a relationship between Correlation Co-efficient and regression Co- efficient. 8

SECTION-B

5(a) Define X^2 (chi) test. Write down the steps involved in the X^2 test. 10

5(b) What are the uses and limitations of X^2 test. 8

5(c) What is ANOVA ? Write the steps involved in one way analysis of variance. 12

5(d) What is level of significance? 5

6(a) What is hypothesis? Explain Type I and Type II error. 10

6(b) Write down the methods of hypothesis testing. 5

6(c) Mention steps in significance testing. 5

6(d) Product is produced two ways; Method - 1 & Method- 2. Tested its product and find the following data : 10

	Method -1	Method -2
i) Sample Size	$n_1 = 8$	$n_2 = 7$
ii) Mean tensile strength	$\bar{x}_1 = 403$	$\bar{x}_2 = 205$
iii) SD	$S_1 = 36$	$S_2 = 40$

Greater tensile strength in the product is preferable. Use an appropriate small sample test of 5% level

of significance to test whether or not Method -1 is better for processing the product(Here $t_{0.05} = 1.77$; $df = 13$)

- 6(e) What is degree of freedom? 5
- 7(a) Classify the control chart. State its importance to control quality of textile product. 10
- 7(b) Draw the i) Mean chart and ii) Range chart from the following data : 25

Experiment No.	1	2	3	4
1	65.00	65.80	66.00	64.00
2	66.90	65.90	66.20	66.00
3	64.20	65.00	67.20	67.70
4	68.80	67.00	66.00	65.50
5	67.00	65.40	66.00	67.20
6	66.00	70.00	67.80	70.00
7	68.10	72.00	69.00	68.50
8	71.00	70.50	67.40	66.00

Also comments about the process.($A_2 = 0.73$ $D_2 = 0$ & $D_4 = 2.28$)

- 8(a) Differentiate between process control and product control. 6
- 8(b) What is sampling? Write the purpose of sampling. 10
- 8(c) Point out the methods of sampling. Which method is widely used and why? 10
- 8(d) Write short notes on : i) Defects ii) Defectives and iii) Census method 9

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