

KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year Backlog Examination, 2017

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.
iii) Assume reasonable data if missing any.

SECTION-A

- 1(a) Discuss the relationship between fiber properties and fiber structure. 10
- 1(b) Describe X-ray diffraction method to investigate fiber structure. 15
- 1(c) Tabulate the differences between Infrared radiation method and X-ray diffraction method. 10
- 2(a) Define swelling. How the swelling phenomenon can be used practically in textiles to improve functionality? 12
- 2(b) Derive the relation, $S_A = 2 S_D + S_D^2$; Where S_A = Transverse area of swelling, and S_D = Transverse diameter of swelling. 12
- 2(c) Classify swelling with brief description and sketch. 11
- 3(a) Prove that the retraction of yarn, $R_y = \tan^2(\frac{\alpha}{2})$ Where the symbols have their usual meanings. 12
- 3(b) Two yarns have same count and twist, one is single spun yarn and other is folded yarn. Which yarn's strength should be more and why? 08
- 3(c) What is meant by torsional rigidity? Show that specific torsional rigidity = $\frac{\epsilon\eta}{\rho}$, where ϵ = shape factor, η = specific shear modulus, and ρ = density of the material. 15
- 4(a) Prove that, contraction factor of yarn $C_y = \frac{1}{2} (1 + \sec \alpha)$, where the symbols have their usual meanings. 12
- 4(b) Differentiate between twist contraction and twist retraction. 06
- 4(c) For twist multiplier 4.2 and specific volume 1.12 cm/gm, find out the twist angle. 05
- 4(d) From idealized yarn geometry, prove that $\tan \alpha = 0.0112 V_y^{\frac{1}{2}} \tau$, Where the symbols have their usual meanings. 12

SECTION-B

- 5(a) State the conditions of warp jamming and weft jamming 05
- 5(b) Derive the equation for weft jamming in plain fabric. 10
- 5(c) Define crimp interchange. Derive the equation for crimp interchange. 13
- 5(d) In warp jamming condition, $D = 0.02$ cm, $\theta_1 = 20^\circ$, $C_1 = 0.15$. Find out the value of h_1 . 07
- 6(a) Derive the equation of yarn diameter for filament yarn. 10
- 6(b) Prove that, cotton yarn diameter, $d = \frac{1}{28\sqrt{N_e}}$ inch. Where, d = yarn diameter in inch and 10
 N_e = yarn count in English system.
- 6(c) What is cover factor? Distinguish warp jamming and weft jamming. 09
- 6(d) Find out the yarn diameter of a 40 Ne cotton yarn in (i) Mils unit, (ii) Inch unit, and 06
(iii) Micrometer unit.
- 7(a) Describe Riding's experiment to estimate the measurement of fiber migration in yarn. 12
- 7(b) What are the ways to minimize static problem of textile? 10
- 7(c) Discuss any suitable method to measure the magnitude of static charge of any textile 13
material.
- 8(a) How does moisture regain influence the frictional properties? 07
- 8(b) Discuss the effect of static electricity on the soiling of textiles with graphical 10
representation.
- 8(c) Describe a suitable method to measure the co-efficient of friction of a textile material. 08
- 8(d) Explain the geometry of plain knitted structure with the help of early geometrical 10
models and empirical dimensionless relationship.

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year Backlog Examination, 2017

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.

iii) Assume reasonable data if missing any.

SECTION-A

- | | | |
|------|---|----|
| 1(a) | Show the flow chart of weaving. | 08 |
| 1(b) | Describe different types of yarn guide with figure. | 12 |
| 1(c) | Why yarn preparation is necessary? Mention the features of a good warp. | 15 |
| 2(a) | What is meant by winding? Discuss different types of winding packages with neat sketch. | 12 |
| 2(b) | What are the differences between precision winding and non precision winding? | 08 |
| 2(c) | What are the factors influencing the selection of tensioners? | 10 |
| 2(d) | Define side withdrawl in winding process. | 05 |
| 3(a) | Distinguish between sectional warping and beam warping. | 10 |
| 3(b) | Describe the working principle of a high speed warping machine | 15 |
| 3(c) | Describe different types of creel with neat sketch. | 10 |
| 4(a) | What are the control systems of warping? | 10 |
| 4(b) | Narrate major faults and their remedies of warping. | 15 |
| 4(c) | Calculate the total number of ends on back beam which weighs 250 lb. The weight of the empty beam as indicated from the marking on its flanges is 51 lb. The count of the yarn is 36 ^S cotton and the length of warp on the beam is 16000 yds. | 10 |

SECTION-B

- 5(a) What is sizing? What are the requirements of sizing? 10
- 5(b) Describe different units of Slasher sizing machine. 15
- 5(c) Write the properties of good sizing materials. 10
-
- 6(a) What are the technological changes take place due to sizing? 12
- 6(b) What is meant by size take up%? 05
- 6(c) Describe different techniques of sizing. 13
- 6(d) Calculate the production per shift of a Slasher sizing machine from the following 05
particulars:
Circumference of drawing roller = 29.25 inch
Speed of drawing roller = 36 rpm
Efficiency = 80%
-
- 7(a) Write short note on infrared drying system. 07
- 7(b) Describe different size ingredients and their functions. 14
- 7(c) What are the factors to be considered while drying? 08
- 7(d) Draw the sizing-weaving curve. 06
-
- 8(a) Describe the secondary motions of loom. 10
- 8(b) Classify the loom. 10
- 8(c) What are the advantages of shuttleless looms? 08
- 8(d) If PPI = 50, efficiency = 75%, Speed 200 rpm, Wastage = 6yds, Take-up = 6%, 07
Length of weavers beam 1000 yds.
How much time will be required to finish the beam?

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year Backlog 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.
iii) Assume reasonable data if missing any.

SECTION-A

- 1(a) Write the functions of blow room. 05
- 1(b) Show the process sequence for 'combed yarn with mentioning input and output materials. 10
- 1(c) Describe the cotton fiber properties considered by cotton spinner. 14
- 1(d) Write short notes on: i) HVI and ii) Vision Shield 06
- 2(a) Mention the Rieter and Trutzschler blow-room Line for coarse and fine grade cotton. 10
- 2(b) Find out the lap hank when lap weight = 500 grain/yd. 05
- 2(c) Describe the working principle of "Uniclean" of Rieter blow room line with neat sketch. 15
- 2(d) State the common faults of blow room lap. 05
- 3(a) Draw a carding machine and indicate its different parts. 15
- 3(b) Mention the surface speed and wire direction of the following parts of a carding machine: 08
i) Taker- in ii) Cylinder iii) Flat and iv) Doffer
- 3(c) State the different actions of the carding machine with their diagrams 12
- 4(a) What is grinding? Point out advantages of flexible card clothing over metallic card clothing. 10
- 4(b) Depict the irregularities of draw frame sliver with their causes and remedies. 15
- 4(c) Calculate the production /shift in kg of the carding machine from the following data: 10
Doffer speed = 40 rpm, Doffer dia = 27", Lap hank = 0.00136, Card draft = 100,
Waste = 3%, Efficiency = 90%, and No. of carding machines = 20.

SECTION-B

- 5(a) Write the features of a modern draw frame. 06
- 5(b) Discuss an auto leveling system of a modern draw frame. What is roller slip? 10
- 5(c) Describe the operating principle of a modern draw frame with a neat sketch. 12
- 5(d) Discuss the factors considered for roller setting. What is roller lapping? 07
-
- 6(a) Show the process flow-chart of jute yarn. 10
- 6(b) What are batch and batching? Write the objectives of batching. 10
- 6(c) Write down the ingredients of emulsion and also mention their functions. 15
-
- 7(a) Describe and sketch a jute spreader machine. 10
- 7(b) Show a diagram of an automatic batch mixer with description. 09
- 7(c) Estimate the production /100 yds of a goods spreader machine from the following data: 08
Dollop wt = 2000 lb, Clock length = 375 yds, Draft = 10, Emulsion applied = 35% and
Waste = 3%.
- 7(d) What is grinding? Write down the advantages of tandem cards. 08
-
- 8(a) Why two types of Carding machines are used in jute spinning? 05
- 8(b) Describe a finisher carding machine of jute spinning with neat sketch. 15
- 8(c) State the faults of emulsion used in jute spinning mill mentioning their remedies. 05
- 8(d) Classify jute carding machine. 05
- 8(e) What is clock length and dollop weight? What is shell setting? 05

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year Backlog Examination, 2017

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.

SECTION-A

- 1(a) What is Central Tendency? Mention the measures of Central Tendency. 10
- 1(b) Which is the best measure of Central Tendency and why? 10
- 1(c) Prove that $AM \geq GM \geq HM$. 15
- 2(a) Describe the moments, skewness and kurtosis. 10
- 2(b) Differentiate between skewness and kurtosis. 10
- 2(c) Given 2,3,7,8 & 10; Find skewness and kurtosis β_2 . 15
- 3(a) State the assumption for binomial distribution. Mention the practical applications of Poisson's distribution. 10
- 3(b) The Alabama Department of Labor reports that 20% of the workforce in Mobile is unemployed and interviewed 14 workers. 10
- i) What is the probability at least three are unemployed?
- ii) What is the probability at least one is unemployed?
- 3(c) Professor Zane has determined that the scores in the statistics course are approximately normally distributed with a mean of 80 and a S.D. of 5. He announces to the class that the top 15 percent of the scores will earn an A. What is the lowest score a student can earn and still receive an A? 15
- 4(a) Explain positive and negative correction. 08
- 4(b) Show that, correlation co-efficient is independent of origin and scale of measurement. 12
- 4(c) Find out the rank correlation co-efficient for the following data: 15

x:	68	64	75	50	64	80	75	40	55	64
	62	58	68	45	81	60	68	48	50	70

SECTION-B

- 5(a) Classify the control-chart. Write down its importance. 10
- 5(b) A modern cotton spinning is going to produce the following yarn count: 30^s, 34^s, 31^s, 29^s, 28^s, 32^s, 33^s, 34^s, 33^s, 31^s. 25

Draw a Mean control chart from the above data and make a comment about the process.

- 6(a) What is ANOVA? What are the steps involved in one way ANOVA? 15
- 6(b) ANOVA for no. of garments factory and city type- 20

Garments	City type		
	x ₁	x ₂	x ₃
	5	7	2
2010			
2011	6	9	4

Is there any significance of variance? (level of significance 0.05; df 2/3; tabulate value=9.55)

- 7(a) Short notes on: (i) Hypothesis (ii) Null hypothesis and (iii) Degree of freedom. 10
- 7(b) Discuss different types of sampling. 15
- 7(c) What is cause and effect diagram? When and how a cause and effect diagram can be used? Explain with proper example. 10
- 8(a) If you can't interpret a process accurately, what will be the consequences? 07
- 8(b) How can you recognize an in-control and out of control process? Show the ranges of in control process with normal distribution curve. 12
- 8(c) Briefly discuss the process of developing a control chart for variables. 16

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year Backlog Examination, 2017

ME-2221

(Solid Mechanics and Machine Design)

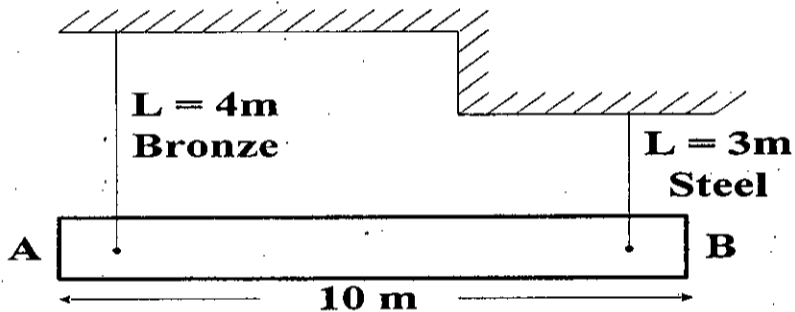
Time: 3 Hours

Total Marks: 210

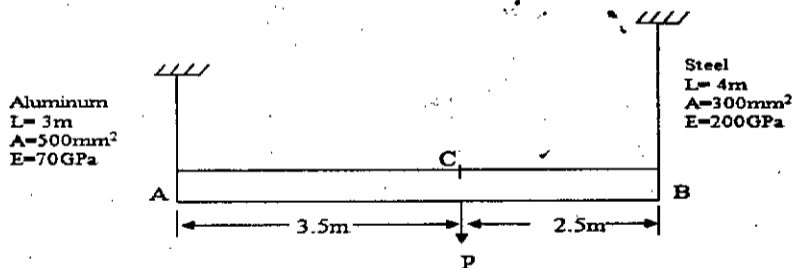
- N.B.:** i) Answer any THREE questions from each section in separate scripts.
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SECTION-A

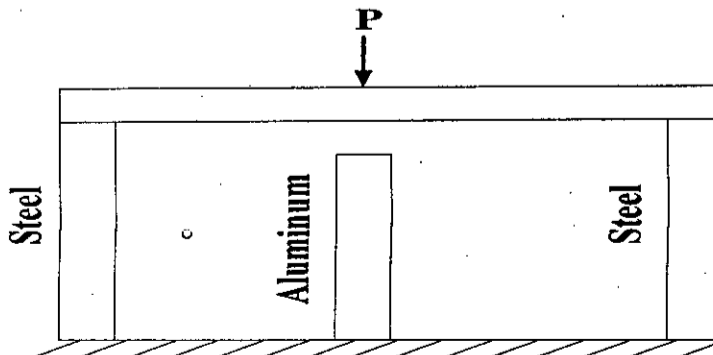
- 1(a) Draw the stress-strain diagram for structural steel and explain the various points of the diagram. 08
- 1(b) For a spherical vessel, show that the tangential stress is expressed by $\sigma = \frac{PD}{2t}$, where the symbols have their usual meanings. 12
- 1(c) A homogenous 800 Kg bar AB is supported at either end by a cable as shown in the figure. Calculate the smallest area of each cable if the stress is not to exceed 90 MPa in bronze and 120 MPa in steel. 15



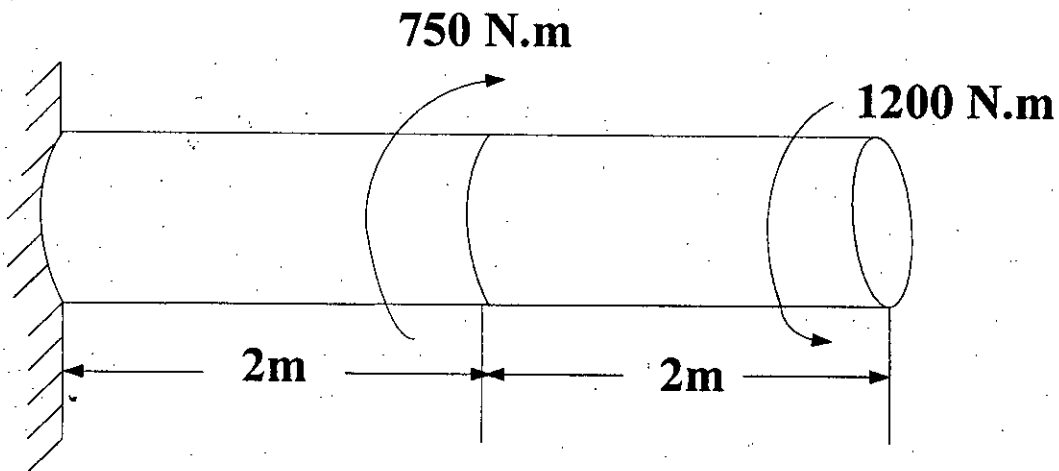
- 2(a) The rigid bar AB attached to two vertical rods as shown is horizontal before the load P is applied. Determine the vertical movement of P if its magnitude is 50 kN. 17



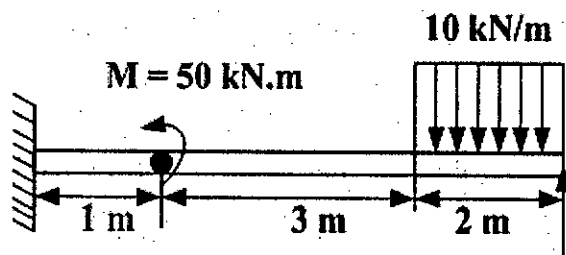
- 2(b) The rigid platform as shown negligible mass and rests on two steel bars, each 250.00 mm long. The center bar is aluminum and 249.80 mm long. Compute the stress in the aluminum bar after the center load P=400 kN has been applied. For each steel bar, the area is 1200 mm² and E =200 GPa. For the aluminum bar, the area is 2400 mm² and E = 70GPa 18



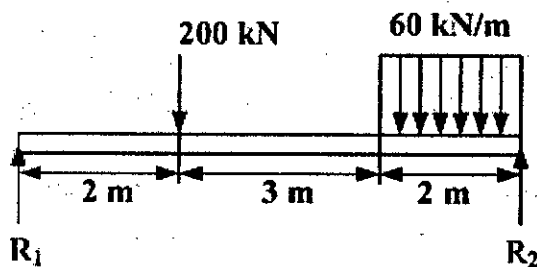
- 3(a) Prove that, the maximum stress for hollow shaft is $\tau_{\text{Max}} = \frac{16TD}{D(D^4-d^4)}$, where T = torque, 17
D = Outer diameter, and d = inner diameter.
- 3(b) As solid shaft is loaded as shown in the figure. Using $G = 83 \text{ GPa}$, determine the required 18
diameter of the shaft, if the shearing stress is limited to 60 MPa and the angle of reaction
at the free end is not to exceed 5 degree.



- 4(a) Without writing shear and moment equations, draw the shear and moment diagrams for 18
the cantilever beam acted upon by uniformly distributed load and couple as shown in
figure.

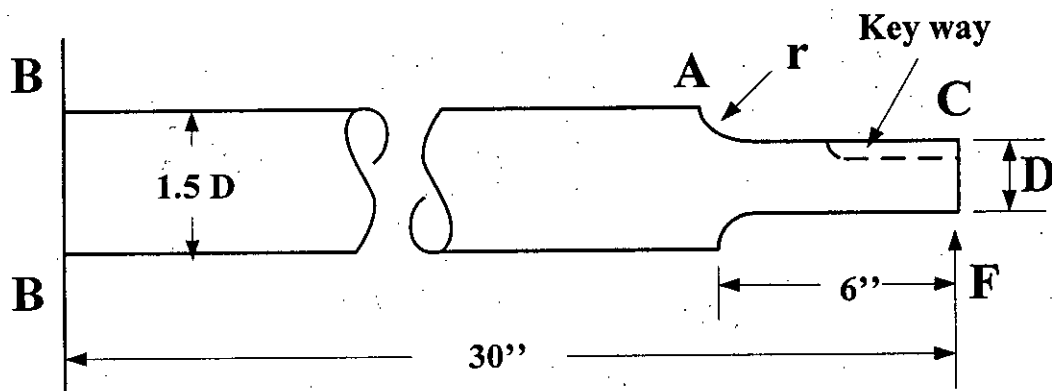


- 4(b) Write shear and moment equations for the simple supported beam carrying a distributed 17
load and a point load as shown in the figure. Also draw shear and moment diagrams
specifying value at all change of loading positions and at points of zero shear. Neglect
the mass of beam.



SECTION-B

- 5 An axle (nonrotating) is to be machined from AISI 1144 OQT 1000° F to the 35 proportions shown with a fillet radius $r \approx 0.25D$; F varies from 400 lb to 1200 lb; the supports are to the left of BB, not shown. Let $N = 2$, i) At the fillet, compute D and the maximum tensile stress. ii) Compute D at section BB.



- 6 A coils spring is to be used for the front spring of an automobile. The spring is to have a 35 rate of 400 lb/in, an inside diameter of $4\frac{3}{64}$ in and a free length of $14\frac{1}{8}$ in. With squared-and-ground ends. The material is to oil tempered chrome-vanadium steel. Decide upon the diameter of the wire and the number of free coils for a design load of $F = 1500$ lb. Be sure solid stress is all right. How much is the pitch angle?
- 7 A 4-in. 360° bearing with $L/D = 1.1$ (Use the table and chart values for 1) is to support 5 35 kips with a minimum film thickness 0.0008 in. $C_d = 0.004$ in. & $n = 600$ rpm. Determine:-
- (i) The needed Absolute viscosity of the oil.
 - (ii) A suitable oil if the average film temperature is 160°F.
 - (iii) The frictional loss in hp.
 - (iv) Adjusting only h_0 to the optimum value for minimum friction, determine the fhp and compare
 - (v) This load varies, What could be the magnitude of the maximum impulsive load if the eccentricity ratio becomes 0.8? Ignore squeeze effect.
- 8 The 20° full-depth teeth for a pair of steel gears are to transmit 40 hp at 1200 rpm of the 35 20-tooth pinion; $m_g = 3$; continuous service and indefinite life. The driven machine is an off-and-on reciprocating compressor. i) Determine the pitch, face width and steel (with treatment); considering at least three alternatives, including carefully cut teeth ii) For the gear teeth decided on, what would be the power capacity if only intermittent service (wear not considered) were required? iii) If a limited life of 10^7 cycles were satisfactory?

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year Backlog Examination, 2017

ME-2121

(Engineering Mechanics)

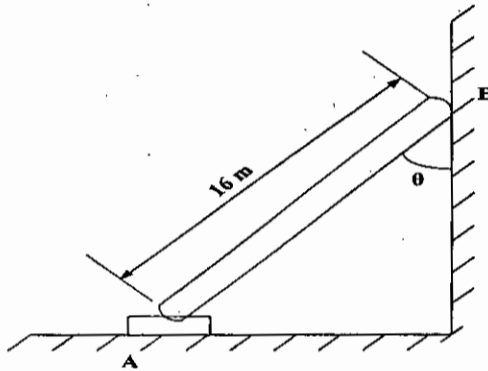
Time: 3 Hours

Total Marks: 210

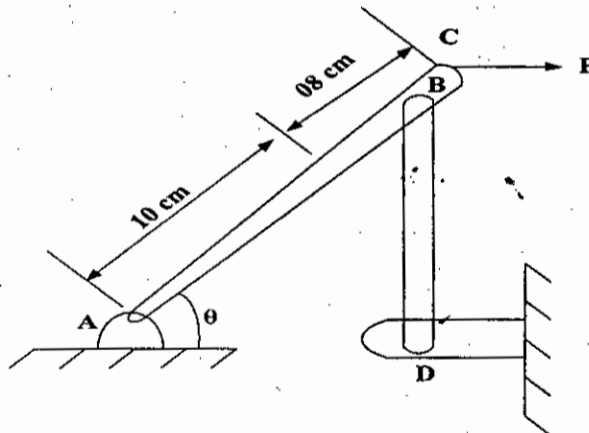
N.B.: i) Answer any THREE questions from each section in separate scripts.
ii) Figures in the right margin indicate full marks.

SECTION-A

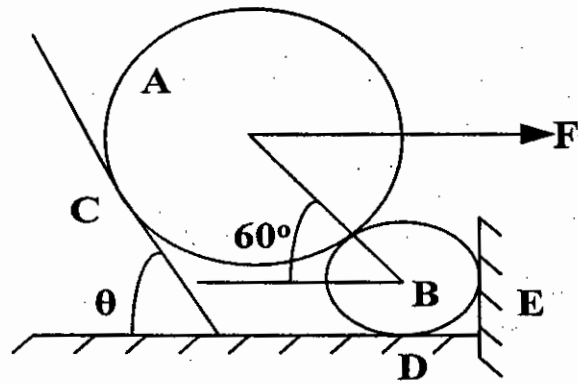
- 1(a) The member AB weighs 20 Kg and rests against smooth wall at B. Determine the reaction at B and A when $\theta = 30^\circ$. What are the components of the reaction at A? 18



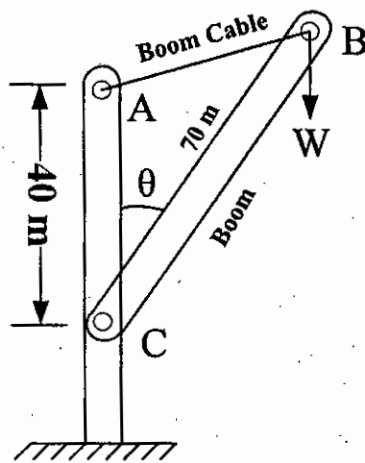
- 1(b) A timber ABC is supported by another timber DB. A load $F = 4.5 \text{ Kips}$ acts horizontally at C. If $\theta = 60^\circ$, find the reaction at A and B. 17



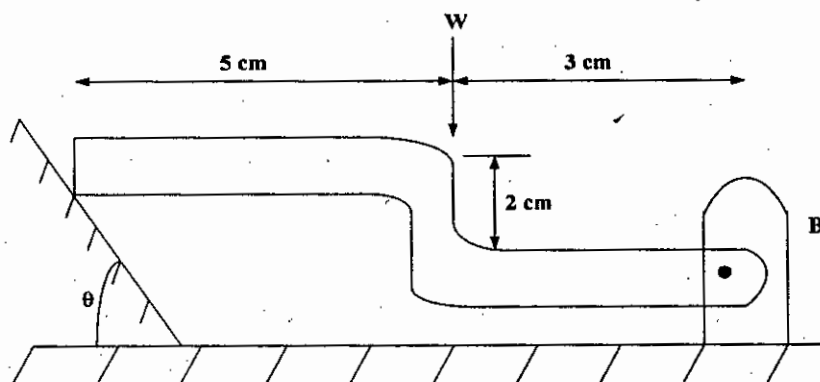
- 2(a) Two spheres are at rest against smooth surfaces as shown in figure. Sphere A weighs 3200 Kg and sphere B weighs 400 Kg. Let $F = 1000 \text{ Kg}$ and $\theta = 75^\circ$, find the reactions at C, D and E. 17



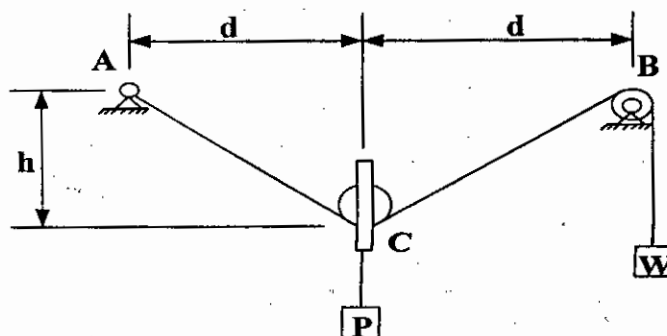
- 2(b) The derrick shown in figure, supports a load of $W = 2kN$. Find the tension in the boom cable and the compression in the boom when the angle θ is 30° and 150° . Which position produces the largest load on the boom? 18



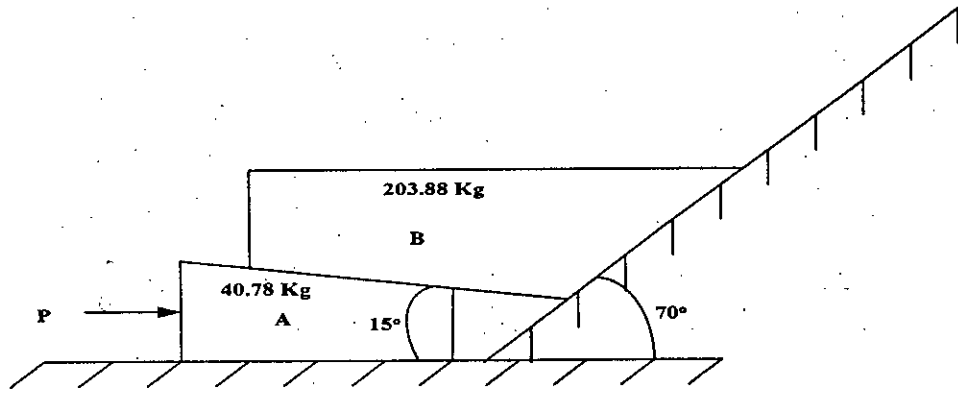
- 3(a) In figure the uniform bar weighs 100 Kg. If the reaction at B is 65 Kg at 120° with positive X axis, determine the value θ and the reaction at A. 18



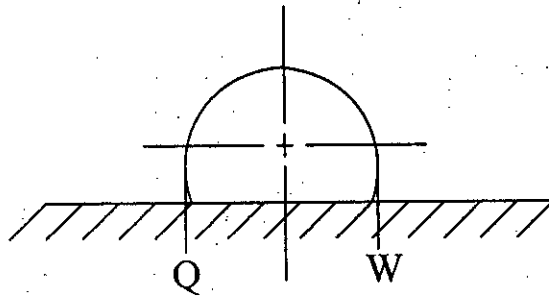
- 3(b) Express the weight W required to maintain equilibrium in terms of P , d , and h . 17



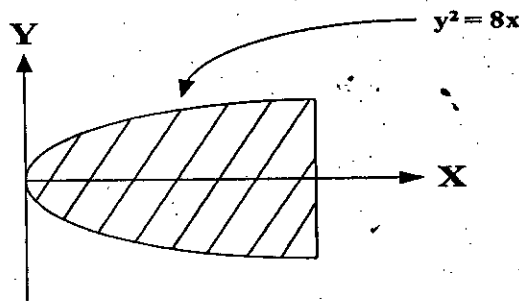
- 6(a) Determine the horizontal force P required to start the 40.78 Kg wedge (i) moving to the right and (ii) moving to the left. The angle of friction is 20° at all contact surfaces 18



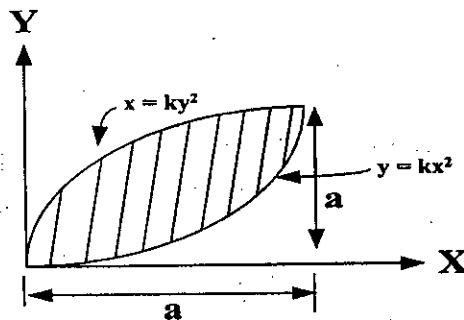
- 6(b) The weights W and Q are supported one from each end of a rope which passes about a stationary drum, where $\mu = \frac{1}{3}$. If Q is about to move downward, what is the value of $\frac{Q}{W}$? 17



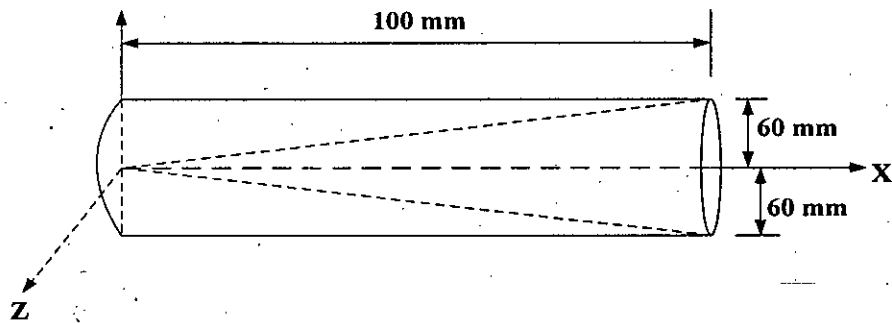
- 7(a) An area bounded by the parabola $y = 8x$ and the straight line $x = 15$ cm. Determine, by direct integration the centroid of the area. 15



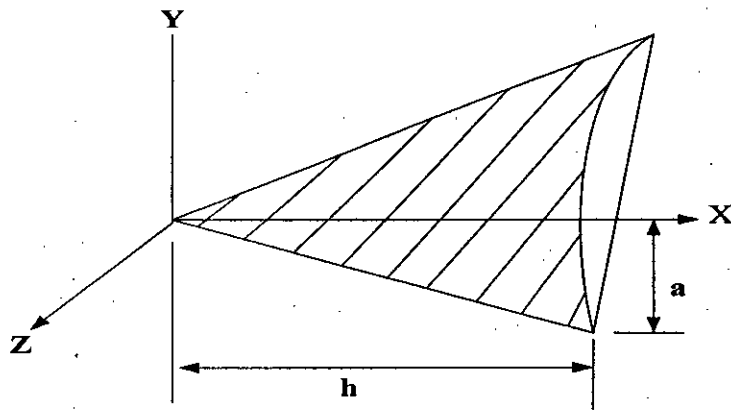
- 7(b) An area bounded by the parabola $y = Kx^2$ and $x = Ky^2$. Determine by direct integration the centroid of this area. 20



- 8(a) Determine the location of the center of gravity of the homogeneous body of revolution as shown in the figure, which was obtained by joining a hemisphere and a cylinder and carving out a cone. 17



- 8(b) Determine the locations of the centroid of the half right circular cone. 18



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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year Backlog Examination, 2017

EE-2221

(Instrumentation and Electrical 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.

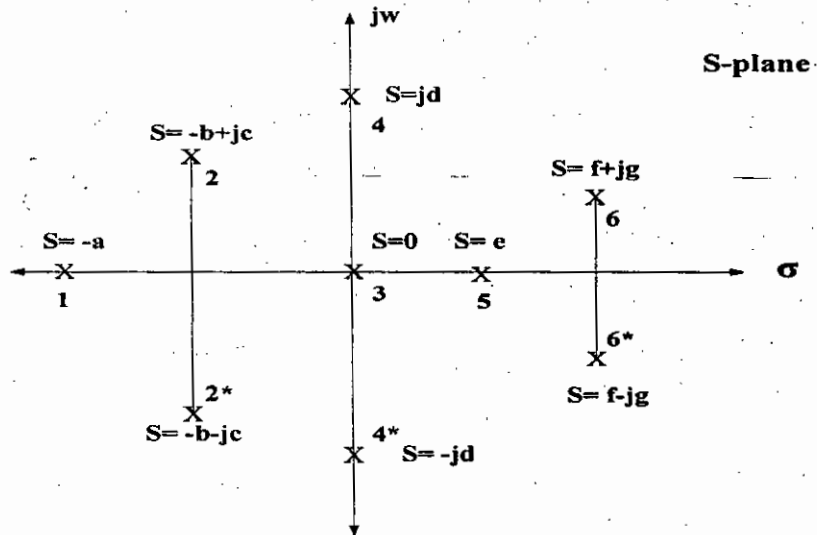
iii) Assume reasonable data if missing any.

SECTION-A

- 1(a) What is instrumentation system? Draw the typical block diagram of instrumentation system and describe each block. 10
- 1(b) Write down the limitations of measuring resistance with Wheatstone bridge. Show that the maximum sensitivity of Wheatstone bridge is- 15
- $S_{B\max} = \frac{S_v E}{4}$, Where the symbols carry their usual meanings.
- 1(c) Define relative limiting error. Derive the relative limiting error formula for sum of two components and difference of two components. 10
- 2(a) Classify resistance with specifying their ranges of values and write down some suitable methods for measurement of these resistances. 08
- 2(b) Describe a method for measurement of low resistance in which there is no error problem of lead resistance. 10
- 2(c) Explain the method of measurement of earth resistance. 08
- 2(d) On a 220 V supply a fault having a resistance of 20 Ω develops between the unearthed ends of the winding of an electric heater and the frame. If the resistance of the substation electrode is 4 Ω that of human body 2000 Ω and the safe maximum resistance is 25 mA, what is the safe maximum resistance of the consumer's earth electrode? 09
- 3(a) What are the differences between transducer and sensor? 10
- 3(b) What is strain gauge? Derive the equation of gauge factor. 15
- 3(c) Write short notes on thermal transducer and smoke detector. 10
- 4(a) Derive the equation for AC bridge and is it possible to measure R and L,C using this bridge? 10
- 4(b) Describe a method to measure the capacitance or inductance. 10
- 4(c) On a 250 V supply a fault having a resistance of 20 Ω develops between the unearthed ends of the winding of an electric heater and the frame. If the resistance of the substation electrode is 4 Ω that of human body 2000 Ω and the safe maximum resistance is 25 mA, what is the safe maximum resistance of the consumer's earth electrode? 15

SECTION-B

- 5(a) Define control system. Explain open loop and closed loop control system with basic block diagram representation and examples. 10
- 5(b) Define poles and zeros. For the following positions of poles in S-plane as shown in below figure, draw the system homogenous response and comment on system stability for each position of poles. 15

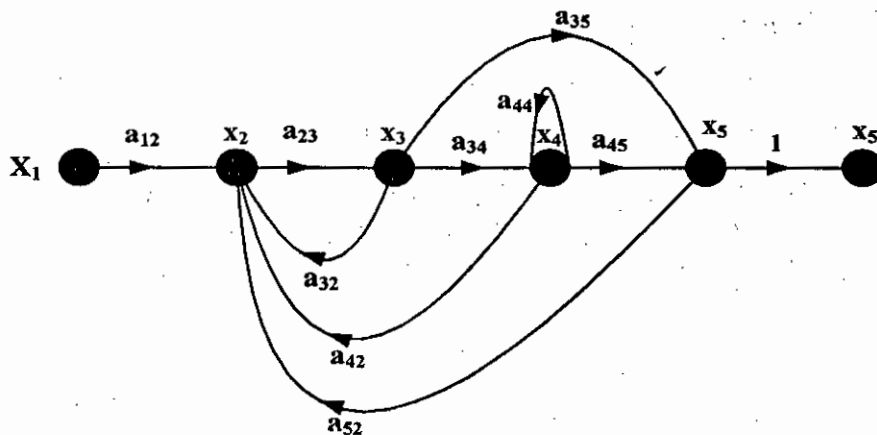


- 5(c) A system is modeled by the following differential equation 10
- $$\frac{d^2y(t)}{dt^2} + 5 \frac{dy(t)}{dt} + 6y(t) = 2 \frac{du(t)}{dt} + u(t)$$
- Find the system poles, zeros and gain factor.

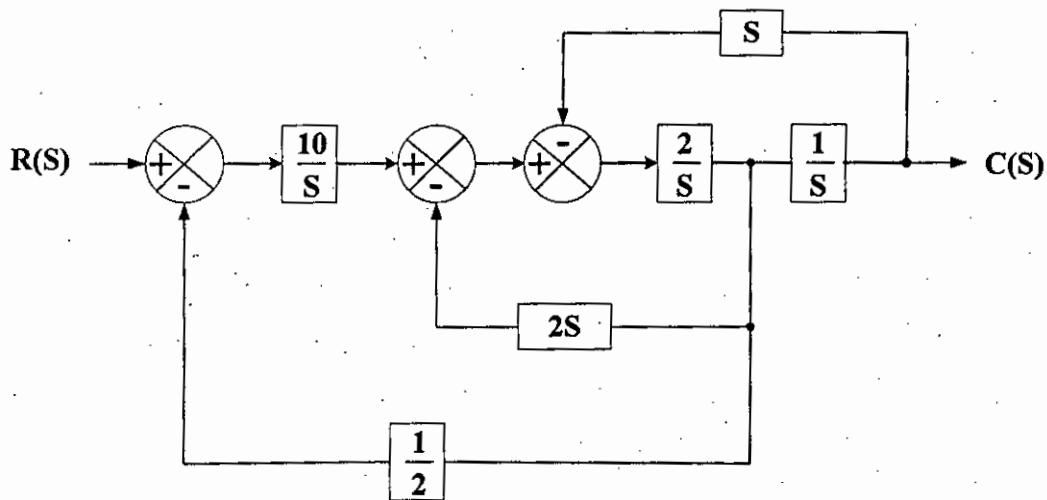
- 6(a) Characteristic equation of a system is given by 12
- $$Q(S) = S^4 + 2S^3 + 11S^2 + 18S + 18$$

Apply Routh's stability criterion to determine the number of roots in left half plane, right half plane and imaginary axis.

- 6(b) What is SFG? Obtain the overall transmittance of the system as shown in the figure using Mason's gain formula. 11



- 6(c) A system is represented by the block diagram as shown in the following figure. Reduce the block diagram to a single transfer function block. Also write the mathematical model for the system in differential form. 12



- 7(a) What is PLC? Draw the block diagram of 8085 microprocessor. What are the differences between microprocessor and microcontroller? 15
- 7(b) What is meant by transfer functions and its significance? 10
- 7(c) What is induction heating? Describe different types of welding used in practical. 10
- 8(a) The characteristic equation of a system is given as 15

$$S^3 + 6s^2 + 5S + K = 0$$
 Find the value of the gain K.
- 8(b) What is a signal flow graph? How is it used to analyze the stability of a system? 10
- 8(c) Write short notes on P, PI, PID and fuzzy controls. 10

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering
 B. Sc. Engineering 2nd Backlog Examination, 2017

EE 2121
 (Electrical Circuits, Machines and Electronics)

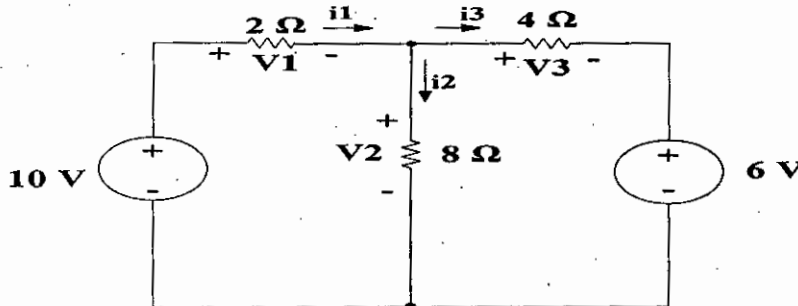
Time: 3 Hours

Total Marks: 210

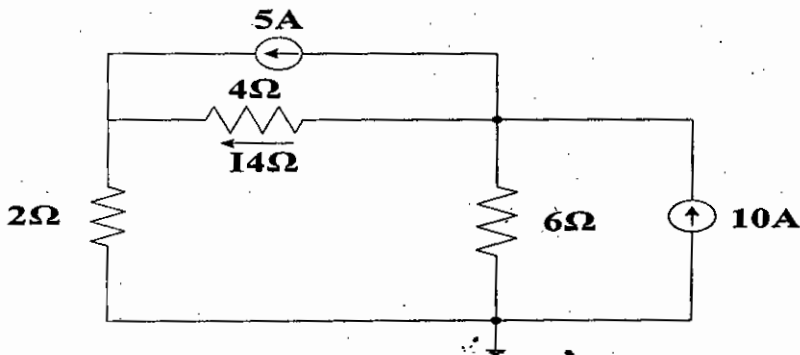
- N.B.:** i) Answer any THREE questions from each section in separate scripts.
 ii) Figures in the right margin indicate full marks.
 iii) Assume reasonable data if missing any.

SECTION-A

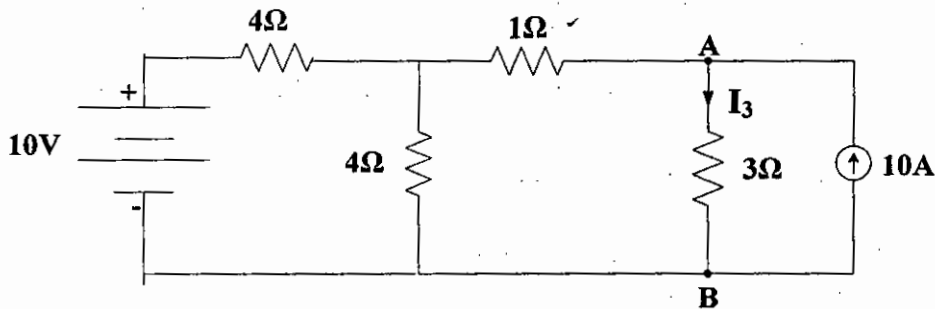
- 1(a) State KVL and KCL. Find the currents and voltages in the circuits shown in the figure. 12



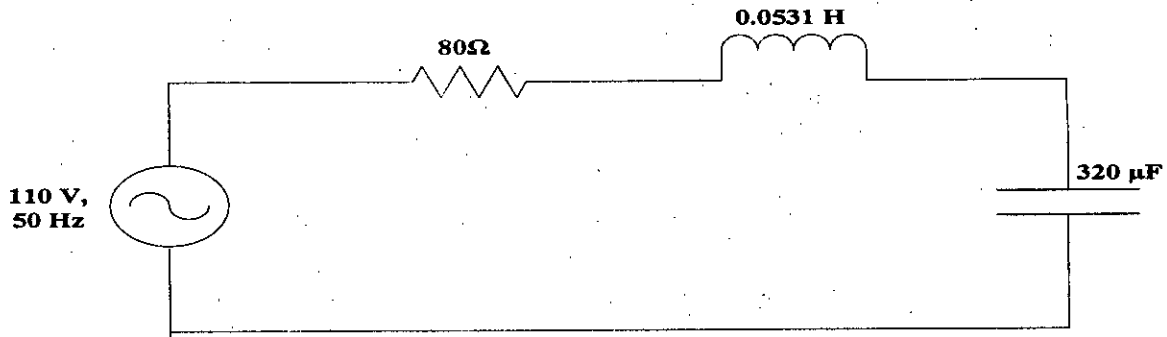
- 1(b) Define linear circuit. Calculate the current flowing through the 4Ω resistor of the circuit shown in the following figure. 10



- 1(c) State the conditions for applying superposition theorem to a circuit. Use superposition theorem to find the current I_m flowing through the 3Ω resistor branch connected between the functional points A and B of the circuit shown in the following figure. 13



- 2(a) What is the difference between resistance and impedance? If $v = 100 \sin(\omega t - 30^\circ)$ and $e = 10 \sin(\omega t - 60^\circ)$, what is the angle of phase difference between the current and voltage waves? Which wave leads? 06
- 2(b) Define r.m.s. value, average value, form factor and crest factor. Show that the impedance of a pure inductive branch is given by $Z_L = \omega L \angle 90^\circ$. 14
- 2(c) Define power factor. For the circuit shown in the following figure, calculate real power, reactive power, apparent power, power factor and also draw the complete vector diagram of this circuit. 15



- 3(a) Describe the formation of depletion layer of a p-n junction. Also describe its behavior in different biasing condition. 14
- 3(b) Draw different types of transistor connections. How transistor works as an amplifier? 10
- 3(c) "A full wave bridge rectifier converts 81.2% of ac power into dc power"- Justify the statement. 11
- 4(a) Mention the differences between neutral wire and ground wire. Why grounding is required? 08
- 4(b) Write down the basic functions of circuit breaker, potential transformer, relay and surge arrester. 12
- 4(c) A lamp having M.S.C.P. of 800 is suspended at a height of 10 ft. Calculate i) total lines of flux and ii) the illumination just below the lamp. 08
- 4(d) Mention some properties of insulator. 07

SECTION-B

- 5(a) Develop an expression for the voltage generated in a dc generator. 10
- 5(b) How does unidirectional current obtain from a dc generator? 07
- 5(c) Briefly describe the conditions for voltage buildup of a dc generator. 12
- 5(d) Write short notes on armature reaction. 06
- 6(a) Write down the working principle of dc motor. Mention the significance of back emf. 12
- 6(b) What are the factors controlling motor speed? Describe flux control method. 12
- 6(c) A 25 KW, 250 V dc shunt generator has armature and field resistance of 0.06Ω and 100Ω respectively. Determine the total armature power developed when working i) as a generator delivering 25 KW output ii) as a motor taking 25 KW input. 11
- 7(a) Why transformer rating is KVA? Derive the condition for maximum efficiency of a transformer. 10
- 7(b) Describe the test by which Cu loss of a transformer can be determined. 10
- 7(c) Mention the uses of conservators and breathers in transformer construction. 05
- 7(d) A 20 KVA transformer has 500 turns on the primary and 50 turns in the secondary winding. The primary is connected to 3000 V, 50 Hz supply. Find the full load primary and secondary currents, the secondary emf and the maximum flux in the core. Neglect leakage drops and no-load primary current. 10
- 8(a) Show that the rotating field of a three phase induction motor rotates at synchronous speed with constant magnitude in the stator core. 12
- 8(b) Draw the torque-speed curve of an induction motor. 05
- 8(c) Define slip. A 3Φ induction motor is wound for 4 poles and is supplied from 50 Hz system. Calculate: 08
- Synchronous speed
 - Rotor speed, when slip is 5%
 - Rotor frequency at 500 RPM
- 8(d) Briefly explain the operating principle of alternator. The rotor of a four pole alternator is rotating at a speed of 1500 rpm. Find the frequency of induced voltages of this alternator. 10

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 2nd Year Backlog Examination, 2017

CSE-2121

(Computer Fundamentals and Programming)

Time: 3 Hours

Total Marks: 210

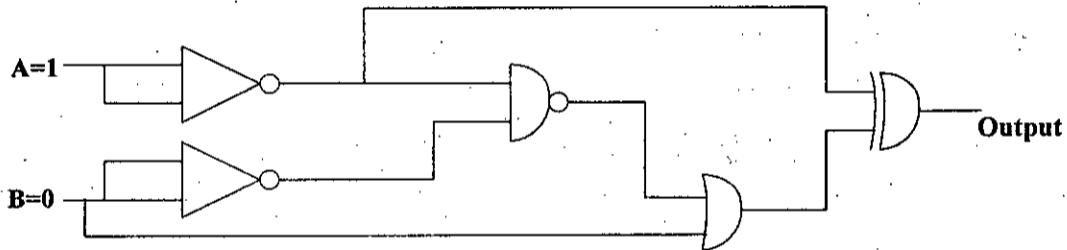
N.B.: i) Answer any THREE questions from each section in separate scripts.

ii) Figures in the right margin indicate full marks.

iii) Assume reasonable data if missing any.

SECTION-A

- 1(a) Briefly explain the generations of computer with proper examples. 15
- 1(b) Suppose you have written a source code in 'C' programming language and now you want to run it on your computer. Computers don't understand anything apart from machine language. Then how your source code would run on your computer? 15
- 1(c) Differentiate between compiler and interpreter. 05
- 2(a) Find the decimal equivalent of the following numbers: 10
i) $(354.13)_8$ ii) $(ABIC.D)_{16}$
- 2(b) Define logic gate. Prove that NAND and NOR gates are universal logic gates. 15
- 2(c) What would be the output of the given circuit? 10



- 3(a) What is computer language? Write the differences between Machine language and High level language. 10
- 3(b) What is Internet? Write short notes on webpage, website and web browser. 10
- 3(c) Why NAND and NOR gates are called universal gates? Construct AND gate using universal gates. 10
- 3(d) Differentiate between a bit, a byte and a word. 05
- 4(a) Discuss the functions of operating system. What are the differences between DOS and Linux operating system? 10
- 4(b) Discuss different type of buses. Explain how different bus passes information between processor and other memory elements. 15
- 4(c) "Software and Hardware are reciprocal but unlike Hardware, Software never die", Explain it. 10

SECTION-B

- 5(a) What is structured programming? Write the importance of C programming. 10
- 5(b) What is Token? Discuss different types of C tokens. 10
- 5(c) Write a program which will take a number and it will print the digits reversely. 15
-
- 6(a) Write the differences between Array and String (3 significant difference). How you will pass an Array and a String data from calling function to called function? 10
- 6(b) Write a program to determine whether the given positive integer N is a prime number or not. 15
- 6(c) What do you know about switch element? Draw the flowchart of else-if ladder. 10
-
- 7(a) Determine the value of each of the following logical expression if a =5, b = 10, c = -6 15
- i) $!(a/b)\&\&, \alpha !=b;$
 - ii) $a = c\| b>a$
 - iii) $b>15 \&\& c<0 \| a>0$
 - iv) $a\leq b \&\& (a+b\leq c)$
 - v) $!a\|!c$
- 7(b) Write down the C statements to do the following: 15
- i) Declare an array named "TE" of 60 components of type float.
 - ii) Initialize this array with inputs from end user.
 - iii) Set the 5th element of this array to the 10 times of the current value it contains.
 - iv) Determine the sum of the elements of all components of this array.
- 7(c) What do you mean by passing an array to a function? 05
-
- 8(a) With suitable example explain the effect of call by value and call by reference of a function. 15
- 8(b) Implement a function named StrConcat() that would concatenate two strings. Don't use any built in function. 15
- 8(c) Why eof() is required after completion of file operations? 05

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