

KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 3rd Year 1st Term Examination, 2018

TE-3109

(Fabric Structure and Design)

Time: 3 Hours

Total Marks: 210

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



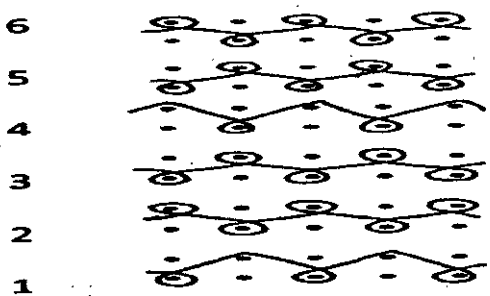
ii) Figures in the right margin indicate full marks.

iii) Assume reasonable data if missing any.

SECTION-A

- 1(a) What are the relations among weave design, drafting and lifting plan? 11
- 1(b) Briefly explain divided draft, skip draft and combined draft with examples. 12
- 1(c) Classify satin weaves with their distinguish features. 12
- 2(a) State five trade names of plain fabric with specifications. 05
- 2(b) Compare between warp rib and weft rib structure with graph paper examples. 12
- 2(c) Give graph paper examples with drafting and lifting plan of the followings: 18
- i) $\frac{1}{1}$ (4 + 2) Weft rib.
- ii) $\frac{3}{2}$ (3 + 2) Matt.
- iii) $\frac{5}{5}$ (5) Fancy Matt.
- 3(a) What are the ways by which the twill angle is influenced? 05
- 3(b) Give graph paper examples with drafting plan of the following designs: 12
- i) Horizontal herring bone based on $\frac{3}{4}$ twill.
- ii) Diamond twill based on $\frac{5}{4}$ twill.
- 3(c) Give graph paper examples of the following designs with drafting plan: 18
- i) Weft way elongated twill based on $\frac{4}{2}$ twill.
- ii) Transposed weave on 10x10.
- iii) Both warp and weft way stepped twill on $\frac{3}{1}$ twill base.
- 4(a) Define and classify stripe and check weaves. 07
- 4(b) Give graph paper examples with drafting plan of the following designs: 12
- i) Mock leno on 12x12.
- ii) Devon Hucka Back.
- 4(c) How would you produce crepe effect on plain and satin base? Explain with graph paper examples. 16

SECTION-B

- 5(a) Explain the statement with two examples- "No. of truck equal to maximum types of wales". 15
- 5(b) If the machine dia. of single lacoste fabric is 30 inch, then calculate the following: 20
- i) Total No. of needle.
 - ii) Total No. of Knit cam.
 - iii) Total No. of Tuck cam.
 - iv) Total No. of Miss cam.
 - v) Total No. of feeder used.
 - vi) Total No. of active feeder.
- 6(a) What are the basic weft knitted structures? 07
- 6(b) Differentiate between feeder stripe and auto stripe. 12
- 6(c) Briefly explain Mock rib design with repeat unit, cam arrangement and needle arrangement. 16
- 7(a) Why  or  symbol called back loop and face loop? Describe detail in neat sketch. 10
- 7(b) Differentiate (any 10) between 3x3 Rib and 3x3 Purl fabric with figure. 10
- 7(c) Find out needle arrangement and cam arrangement of single Relief fabric. 08
- 7(d) Draw the notation diagram of Half Milano Rib and Swiss Double Pique. 07
- 8(a) Find out the total No. of needle, total no. of knit cam, total no. of tuck cam and total no. of miss cam of following design if machine dia is 20 inch. 15
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- 8(b) Differentiate between 4 color finger box and 6 color finger box. 05
- 8(c) Design a pattern arrangement by using the 4 color finger box from following colors: 15
- Red: 25 Courses
- Yellow: 25 Courses
- Blue: 25 Courses
- Pink: 25 Courses
- Violet: 25 Courses

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 3rd Year 1st Term Examination, 2018

TE-3107

(Apparel 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) Define the following terms: 10
i) HPS length ii) Grain line iii) CFR iv) CMT v) Swatch
- 1(b) Discuss the role and responsibilities of textile engineers to develop textile sector. How 12
textile engineers can change the culture of textile processing industries in Bangladesh?
- 1(c) Show the cycle of an export letter of credit. Mention the importance of Back to Back 13
letter of credit.
- 2(a) What are meant by group marker and solid marker? Discuss comprehensively. 12
- 2(b) Define marker efficiency. Illustrate the factors affecting marker efficiency. 12
- 2(c) Define Digitizing. Why pattern grading is important for apparel production? 08
- 2(d) Write down the function of plotter in CAD room. 03
- 3(a) Classify cutting machines. 05
- 3(b) Describe the necessity and operating principle of a straight knife cutting machine. 15
- 3(c) How shape and movement of the cutting device create accuracy problem in manual 10
cutting process? Explain with figure.
- 3(d) Why numbering is essential after cutting? 05
- 4(a) Differentiate between manual cutting and automatic cutting. 10
- 4(b) Briefly describe about the characteristics of laser cutting machine. 12
- 4(c) What are the remedies of fused edge during cutting? 07
- 4(d) Write short notes on: 06
i) Incoterms
ii) Fabric drilling machine

SECTION-B

- 5(a) Define pattern. Describe flat and modelling methods of pattern making. 10
- 5(b) What is Anthropometrics? Write down the methodology of sizing system development. 15
- 5(c) Distinguish among block pattern, working pattern and production pattern. 10
-
- 6(a) What is fabric spreading? State the requirements of fabric spreading. 12
- 6(b) Discuss 'Face up in both direction' and 'zig-zag' modes of fabric spreading with necessary diagrams. 13
- 6(c) Write down the features of semi-automatic spreading process. 10
-
- 7(a) What is fabric splicing? Describe about different types of fabric splicing. 14
- 7(b) Demonstrate different types of loss in fabric spreading. 13
- 7(c) State the techniques involved for controlling quality in fabric spreading. 08
-
- 8(a) What properties are generally expected from a fusible interlining? 10
- 8(b) Describe the methodology of continuous fusing press with neat sketch. 15
- 8(c) Differentiate between 'strike through' and 'strike back' in fusing with proper sketch. 10

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 3rd Year 1st Term Examination, 2018

TE-3105

(Wet Processing 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) Which bond present in water? Classify water according to hardness. 04
- 1(b) Why the presence of bi-carbonates salt of calcium and magnesium is considered as temporary hardness? 05
- 1(c) Define PPM and Degree. How the hard water create problem during dyeing? 11
- 1(d) How the water hardness can be reduced? Describe base exchange process of water softening. 15
- 2(a) What is wetting ability? Describe the influence of adhesive and cohesive force on wetting. 08
- 2(b) Describe the rolling up and emulsification mechanism of dirt removal from substrates. 12
- 2(c) Why desizing is necessary before scouring? Write down the names of desizing chemicals used for cotton fabric and also describe a suitable method of desizing. 15
- 3(a) Mention the objects of singeing. Describe the controlling points of singeing. 08
- 3(b) Why washing is important after scouring process? 07
- 3(c) Why scouring and bleaching is carried out at alkaline medium for peroxide bleaching? 05
- 3(d) Why gradient is necessary to raise temperature for S/J and L-S/J fabric? 07
- 3(e) Write short notes on the followings: 08
- i) Stabilizer
 - ii) Crease mark
 - iii) Sequestering agent
 - iv) Antifoaming agent
- 4(a) How the fabric reflectance can be turned to around 80%? Describe with relevant chemicals and process diagram. 12
- 4(b) What is RFD fabric? Discuss briefly the controlling factors of hypochlorite bleaching. 08
- 4(c) Mention the objects of mercerization. How the cellulose structure is converted into semi-circular shape? 10
- 4(d) Write short notes on: 05
- i) BAN ii) Surface Tension

SECTION-B

- 5(a) Describe the theory of dyeing. 10
- 5(b) Mention the components of colored organic compound and their functions. 10
- 5(c) Write down the general parameters of dyeing machine. If steam pressure and reel speed is less than required value, what types of problems can be created?-Explain. 08
- 5(d) "Due to aquacron system in Selavos machine, this machine provides special features than other machines"- Explain the argument with necessary diagram. 07
- 6(a) What is meant by super milling acid dye? Why super milling acid dyes have excellent wash fastness value? Explain. 07
- 6(b) Write down the theory of direct-dyeing on cotton fabric. 08
- 6(c) Write down any three after treatment process for improving wash fastness of direct dyed fabric. 10
- 6(d) Describe the dyeing procedure of direct dye on cotton fabric with recipe and curve. 10
- 7(a) Write down the classification of vat dyes according to chemical structure. 07
- 7(b) Describe the mechanism of dyeing with vat dyes. 08
- 7(c) State the properties of basic dye. 08
- 7(d) Describe the dyeing method of cotton fabric with basic dyes including recipe and curve. 12
- 8(a) What is printing? Describe the procedure of burn out printing. 10
- 8(b) What is mesh count? What are the effects of mesh count on printing quality? 07
- 8(c) Why photo emulsion is necessary for screen preparation? How does diazophotoemulsion perform its function in screen preparation? Explain with chemical reaction. 08
- 8(d) Write down the mechanism of discharge printing and its classification. 10

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 3rd Year 1st Term Examination, 2018

TE-3101

(Yarn Manufacturing Engineering-II)

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) Describe the main operations of the simplex. 12
- 1(b) Write down the drafting system used in simplex. 05
- 1(c) State any modern drafting for simplex with neat diagram. 12
- 1(d) Find out the required time to make a full-bobbin from the following data: 06
- Full roving bobbin weight = 3 lb
- Empty bobbin weight = 0.5 lb
- Roving hank = 1.0
- TPI = 1.56
- Spindle speed = 1000 rpm.
- 2(a) What is traveller? Describe the traveller size. 08
- 2(b) State the features of a good ring. 08
- 2(c) Prove that, traveller speed is less than spindle speed. 08
- 2(d) Define end breakage rate. State the causes of end-breakage of the yarn. 11
- 3(a) State the limitation of ring frame. 06
- 3(b) Write down the yarn faults. 06
- 3(c) Mention the change wheels of speed frame with their effects. 12
- 3(d) What is break draft? 05
- 3(e) Find out the production/shift/frame in kg of a modern ring frame at 90% efficiency in produce 40^s hosiery yarn (assume necessary parameters). 06
- 4(a) Write the importance of comber for producing better quality yarn. 06
- 4(b) Why lap preparation is necessary before combing? 08
- 4(c) Describe the functions of comber machine. 15
- 4(d) Feed/lap = 0.25 inch; Nips/minute = 300; No. of head = 8; Noil = 15% and efficiency = 85%. 06
- Find out the Production/shift of comber when i) Feed lap weight = 850 grain/yd and ii) Feed lap hank = 0.0095

SECTION-B

- 5(a) Prepare a spin plan to produce 30 tons/day of 30^S Ne yarn in a spinning mill from blowroom to ring frame. 23
- 5(b) Write short note on: i) Apron ii) Lappet iii) Balloon control ring iv) Spacer v) Condenser vi) Break draft. 12
- 6(a) Write down the objectives of jute draw frames. 03
- 6(b) Differentiate among 1st, 2nd and 3rd draw frames of jute. 10
- 6(c) Discuss the factors of fixing Reach. Mention the features of a modern jute draw frame. 12
- 6(d) Describe a crimping box with a sketch. 10
- 7(a) Classify the Jute draw-frame. 05
- 7(b) Differentiate between push bar and spiral drawing frame. 08
- 7(c) Mention the different types of drafting system used in jute spinning machines. 07
- 7(d) Describe the operational principle of a 1st draw-frame with neat diagram. 15
- 8(a) Mention the types of jute spinning frame and also write their features. 05
- 8(b) Depict the bobbin building mechanism of jute spinning frame and create relation with traverse length. 15
- 8(c) Find out the production/day of a jute sliver spinning frame when
Flyer speed = 4000 rpm; K-factor = 12; Jute yarn count = 10 lb/spindle;
Efficiency = 80%; No. of flyer = 100; Waste = 5%. 05
- 8(d) What is felt bob? State its importance. 05
- 8(e) Write the features of spinguard sliver spinning frame. 05

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 3rd Year 1st Term Examination, 2018

TE-3101

(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 flow-chart of combed yarn with mentioning machines, input and output materials. 10
- 1(b) Describe the spinable properties of cotton fiber. 15
- 1(c) What is bale management? State the importance of HVI for producing better quality yarn. 10
- 2(a) State the blow-room line both "Rieter and Trutzschler" companies. 10
- 2(b) Describe the working principle of "Uniclean" of Rieter blow-room line with neat sketch. 15
- 2(c) Calculate the production/shift in kg of Blow room line if- 06
Bottom calendar roller dia. = 7.5 inch; Bottom calendar roller speed = 12 rpm; Lap weight = 13.20 oz/yd; Waste = 3%; Efficiency = 85%; No. of scutchers = 2
- 2(d) Show the different components of blow room machineries. 04
- 3(a) "Carding is called the heart of spinning"- Explain this statement. 08
- 3(b) Write down the surface speed and wire direction of the following parts of carding machine: i) Licker-in ii) Doffer iii) Flat and iv) Cylinder 12
- 3(c) What is carding action? Where and how this action is occurred in carding machine? 08
- 3(d) Doffer dia. = 27 inch; Doffer speed = 45 rpm; Carding draft = 105; Lap weight = 13 oz/yd; Waste = 3%; Efficiency = 90% and No. of carding machine = 10 07
Find out the production/shift in lb of the carding machines.
- 4(a) Write the feature of a modern draw-frame. 08
- 4(b) Depict the auto-levelling system of a modern draw-frame. 12
- 4(c) Show the draft distribution on the 4-over-4 drafting system of a draw-frame with example. 08
- 4(d) Card sliver weight = 330 grains/6yds; drawn sliver hank = 0.16 and drawing draft = 7.5. Find out the number of card slivers in doubling. 07

SECTION-B

- 5(a) Write down the objectives and faults of a Draw frame of short staple spinning. 10
- 5(b) What is roller lapping? Discuss the roller settings of a draw-frame. 10
- 5(c) Write short notes on i) Doubling ii) Drafting. 06
- 5(d) State the drafting system of a modern draw frame with neat sketch. 09
-
- 6(a) Write the process-sequence of jute yarn. 10
- 6(b) Worsted yarn is better than woolen yarn. Why? 05
- 6(c) Mention the ingredients of emulsion and also describe their functions. 12
- 6(d) What is batch and batching? What factors are to be considered for batch selection? 08
-
- 7(a) List the different types of jute yarn. 04
- 7(b) Mention the batch composition for the following jute yarn: i) CBC ii) 7 lb/spyndle sacking yarn iii) 8.5 lb/spyndle hessian yarn. 06
- 7(c) Describe the working principle of jute spreader machine with neat sketch. 15
- 7(d) Define dollop weight and clock length. 06
- 7(e) Point out the position of clock-pointer of jute spinning machine. 04
-
- 8(a) Sketch a cross-sectional diagram of a Breaker card machine of jute spinning system with description. 15
- 8(b) Show classifications of jute carding machine. 05
- 8(c) Calculate the weight of sliver in lb/100yds from the following data: 05
Dollop weight = 30 lb
Clock length = 13 yds
Draft = 12
And loss = 4%
- 8(d) Why two types of carding machines are used in jute spinning system? 06
- 8(e) Write short note on shell setting. 04

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 3rd Year 1st Term Examination, 2018

TE-3103

(Knitting 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) What are the differences between warp knitting and weft knitting? 10
- 1(b) Mention the advantages and disadvantages of a latch needle. 10
- 1(c) Write down the main features of a bearded needle. Also describe its different parts. 15
- 2(a) Sketch bearded needle, latch needle and compound needle with proper labeling. 15
- 2(b) State the functions of sinker. 05
- 2(c) Briefly classify knitting machines. 08
- 2(d) Define and explain 1 point and 3 point waxing. 07
- 3(a) Describe different parts of a plain S/J machine. 15
- 3(b) Explain single pique and double pique with lapping diagram, needle arrangement and cam arrangements. 15
- 3(c) What are the main features of a plain fabric? 05
- 4(a) How can you identify an interlock machine? 10
- 4(b) Is it possible to convert rib machine to interlock machine? 05
- 4(c) Draw and describe the knitting action of a circular rib machine. 15
- 4(d) Write short note on circular rib machine. 05

SECTION-B

- 5(a) Sketch and describe the main parts of a flatbed knitting machine. 15
- 5(b) Show the cam system of a V-bed flat knitting machine. 15
- 5(c) Define function gap opening and racking lever. 05
- 6(a) How can you produce 1x1 Rib, 2x2 Rib, Half cardigan, full cardigan by flat knitting machine? 20
- 6(b) Describe the knitting action of a latch needle in a flat knitting machine. 15
- 7(a) Depict the state of knitted fabric. 10
- 7(b) Describe the main factors affecting the dimensional properties of knitted fabric. 15
- 7(c) Is it possible to make a fault free fabric? Give strong argument on your answer. 10
- 8(a) What is hosiery article? State the properties of hosiery yarn. 15
- 8(b) Describe the types of hosiery article with examples. 10
- 8(c) Explain the mechanism of a hand sock circular knitting machine. 10

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 3rd Year 1st Term Examination, 2018

Hum-3121

(Accounting and Industrial Law)

Time: 3 Hours

Total Marks: 210

N.B.: i) Answer any THREE questions from each section in separate scripts including Question No. 4 from section A.

ii) Figures in the right margin indicate full marks.

iii) Assume reasonable data if missing any.

SECTION-A

1(a) What is basic accounting equation? Explain its elements. 10

1(b) Mr. Rahi setup a consulting practice. After two months the consulting firm had the following assets and liabilities: 25

Cash Tk. 28800; Accounts receivable Tk. 1400; Office supplies Tk. 270; Office equipment Tk. 4200; Accounts payable Tk. 1900; Mr. Rahi capital Tk. 32770. During a short period of time, the following transactions were completed:

2017	
January-1	Paid one month's rent Tk. 300
January-2	Made payment towards accounts payable Tk. 500
January-3	Billed clients for services performed Tk. 800
January-4	Received from clients billed last month Tk. 1000
January-5	Purchased office supplies with cash Tk. 80
January-6	Paid salaries in cash Tk. 850
January-7	Paid utility expense Tk. 90
January-8	Received a bill for Tk. 65
January-9	Paid telephone expense Tk. 450
January-10	Purchased additional office equipment for cash Tk. 400
January-11	Received cash from clients for services performed Tk. 1200
January-12	Withdrawn for own purpose Tk. 900

Requirement: Arrange the following assets, liabilities and owner's equity account in a tabular summary using the following accounts titles: Cash; Accounts receivable; Office supplies; Office equipment; Accounts payable; Mr. Rahi capital.

2(a) Show the classification of accounts. Describe the rules of debit and credit of accounts with each example. 10

2(b) Mr. Rony is a C.A. During the first month of operations of the business, the following events and transactions occurred: 25

2017	
April 1	Rony invested Tk. 100000 cash.
April 8	Incurred advertising expenses of Tk. 5000 on account.
April 11	Hired secretary at a salary of Tk. 4000 per month.

April 13	Paid Tk. 3600 cash for one year insurance policy.
April 21	Completed a tax assignment and billed client Tk. 15000 for service rendered.
April 22	Received cash of Tk. 20000 for service completed.
April 24	Paid Tk. 3000 on account for advertising incurred.
April 26	Received Tk. 7000 advance on a management consulting engagement.
April 28	Salary paid in cash Tk. 3000
April 30	Utility bill paid in cash Tk. 1000

Instruction: Journalise the transactions.

3(a) What is a trial balance? Discuss its limitations. 10

3(b) The following data relating to Sara Trader are given below: 25

Details	Tk.
Purchases of raw materials	150000
Direct expenses	20000
Direct labor	60000
Raw materials 1-1-17	Tk. 20000, Factory overhead Tk. 40000
Raw materials 31-1-17	Tk. 30000, Office expenses Tk. 32000
Work-in-progress 1-1-17	Tk. 36000, selling expenses Tk. 25000
Work-in-progress 31-1-17	Tk. 26000, Sale of Sara P 2000
Finished goods 1-1-17	Tk. 40000, Profit 20% on total cost.
Finished goods 31-1-17	Tk. 35000

Required: Prepare a statement of cost for the month of January, 2017 and show:

- a) Raw materials used b) Prime cost c) Factory cost d) Production cost e) Cost of goods sold f) Total cost g) Profit/loss and sales.

4. The following trial balance was taken from the ledger of Amin Traders, at the end of his annual accounting period. 35

Amin Traders

Trial balance as on 31st December, 2016

Account Titles	Debit (Taka)	Credit (Taka)
Amin, Capital		32000
Sales		62000
Sales return and allowances	2000	
Purchases	24000	
Purchase discount		2000
Transportation-in	2000	
Salaries expense	12000	
Rent expense	12000	

Advertising expense	6000	
Cash	6000	
Accounts receivable	4000	
Stock 1-1-16	10000	
Store supplies	8000	
Store equipment	18000	
Accumulated depreciation-store equipment		4000
Accounts payable		4000
	104000	104000

Additional Information: i) Ending stock at 31st December 2016 Tk. 12000, ii) Ending store supplies Tk. 2000, iii) Estimated depreciation of store equipment for year Tk. 2000, iv) Salaries unpaid Tk. 4000.

Instructions: You are required to prepare the following statements a) Statement of comprehensive income for the year ended 31st December, 2016.

a) Owner's equity statement and

b) Prepare a statement of financial position as on 31st December, 2016.

SECTION-B

- 5(a) What is industrial law? 05
- 5(b) State the objectives of industrial law. 10
- 5(c) What are the duties of a certifying surgeon? 10
- 5(d) Write down five provisions regarding cleanliness in a factory. 10
- 6(a) Define pollution as per Bangladesh Environment Conservation Act, 1995. 05
- 6(b) Discuss functions of the Director General. 15
- 6(c) What are the deductions may be made from wages? 15
- 7(a) Define strike and lock-out. 08
- 7(b) Describe the provision- negotiation relating to industrial disputes. 12
- 7(c) Write down the situations when an employer shall not be liable to pay compensation for injury caused by accident. 15
- 8(a) What is the special definition of wages? 05
- 8(b) Discuss the provision about distribution of compensation. 10
- 8(c) What are the methods of calculating wages/monthly wages? 10
- 8(d) Write down the provision about restrictions regarding vehicles emitting smoke injurious to environment. 10

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