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**INDIAN INSTITUTE OF HANDLOOM TECHNOLOGY**

Bargarh/Fulia/Guwahati/Jodhpur/Salem/Varanasi/Champa/Kannur/KHTI-Gadag/SPKM-Venkatagiri

Diploma in Handloom & Textile Technology

**APR/MAY-2025 SEMESTER EXAMINATION**

(Regulation-2021)

Semester : **III**

Time:3 Hours

Course Code & Title : **HTPC201 Textile Fibers**

Maximum Marks: 100

**PART-A**

(10×2=20 Marks)

**Answer all the questions within two to three sentences**

1. Define monomer and co-polymer with suitable example.
2. What is Syndotactic and Isotactic polymer?
3. What is texturing?
4. Define textile fiber with example.
5. What is xanthation?
6. Quote any four example of regenerated fiber.
7. What is silk rearing?
8. What are the monomers of Nylon 6 and Nylon 66?
9. What is aromatic polyamide? Give an example.
10. Draw the chemical structure of polyester fiber.

**PART-B**

((6+10)×5=80 Marks)

**Answer all the questions in detail**

11. A. Compare the structure of Homo polymer and Co - polymer with examples of each. (6)  
B. Which types of fibers are manufactured by wet spinning? Describe the wet spinning technique with proper diagram. (10)
- (OR)
- C. Interpret the difference between melt spinning and dry spinning. (6)  
D. Discuss the various polymerization techniques and explain any two of them. (10)
12. A. Explain the essential and desirable properties of textile fibers. (6)  
B. Outline the classification of textiles fibers according to their origin. (10)

(OR)

- C. Compare the characteristics of UDY and FOY filaments. (6)
- D. Explain in details about the concept of crystallinity and orientation with diagram & example. (10)
13. A. Briefly discuss the chemical composition of jute and linen fiber. (6)
- B. Describe the morphological structure of cotton fiber with diagram. (10)

(OR)

- C. Write a note on the chemical properties and uses of cotton fibres. (6)
- D. Illustrate the manufacturing process of Viscose Rayon with neat diagram. (10)
14. A. Draw and explain the chemical structure of silk polymer. (6)
- B. Describe the life cycle and production process of silk fiber with diagram. (10)

(OR)

- C. Compare the chemical properties of silk and wool fiber. (6)
- D. Describe the manufacturing process of polyamide 66 with proper diagram. (10)
15. A. Analyze the physical and chemical properties of polypropylene fibres. (6)
- B. Discuss the manufacturing process of acrylic fibre in detail (10)

(OR)

- C. Summarize the chemical structure and application of Kevlar fiber. (6)
- D. Differentiate the physical and chemical properties of meta-Aramid and para Aramid fibres in detail. (10)

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Diploma in Handloom & Textile Technology

**APR/MAY-2025 SEMESTER EXAMINATION**

(Regulation-2021)

Semester : **III** Time:3 Hours

Course Code & Title : **HTPC202 Yarn Manufacturing Technology** Maximum Marks: 100

**PART-A**

(10×2=20 Marks)

**Answer all the questions within two to three sentences**

1. What is meant by ginning outturn?
2. The percentage of trash in cotton bale is 6%. The total cleaning efficiency of the blowroom is 56 %. Find out the percentage of trash remains in the lap.
3. Write the objectives of carding machine.
4. Show the licker-in and mote-knife arrangement in carding machine with specifications.
5. What are the methods of doubling available in comber preparatory process?
6. List the functions of detaching roller in comber preparatory process.
7. Write the formula to calculate the mechanical draft and actual draft in drawframe.
8. Write the objectives of speedframe.
9. State the objectives of ringframe.
10. Name the different types of traveller used in ring frame.

**PART-B**

((6+10)×5=80 Marks)

**Answer all the questions in detail**

11. A. Illustrate the process flow chart of carded yarn manufacturing process. (6)  
B. With neat diagram, explain anyone method of separation of cotton seed and fiber from the kapos. (10)

**(OR)**

- C. Calculate the production of blow room machine in pounds per hour with the following particulars. Speed – 15 rpm, diameter of lap roller - 9” inch , 86% efficiency, count of lap - 0.0012<sup>s</sup> Ne (6)  
D. Explain the objectives of blowroom process. Also explain the sequence of machines used in blowroom process with suitable line diagram. (10)

12. A. Write the importance of an auto-leveler in carding machine with suitable examples (6)
- B. Calculate the production of carding machine in kg per hour with the following particulars. Doffer diameter - 27", surface speed of Doffer = 200 yards / min, Sliver hank = 0.119 Ne, Card efficiency = 95%, No of Cards = 10 (10)
- (OR)**
- C. Brief about the various types of doffing system in carding machine. (6)
- D. With a neat sketch, explain the principle of operation of a modern high production card indicating the various functional elements and its specifications. (10)
13. A. Compare web doubling and sliver doubling method of comber preparatory process. (6)
- B. With suitable diagram, explain anyone method of comber lap preparation method with detailed specification of each process. (10)
- (OR)**
- C. Calculate the production in Kg per shift of 8 hour of a comber machine with the following particulars. (6)  
Combing roller speed = 400 Nips/min, Length of lap fed per nip = 5 mm , Efficiency = 93%, feed Lap weight = 65 g/m, number of heads present in the machine = 8 and Noil extracted = 17%
- D. With a neat sketch, explain the principle of operation of a modern high production comber indicating the various functional elements and its specifications. (10)
14. A. Write the importance of open loop auto-leveler used in drawframe machine. (6)
- B. With a neat sketch, explain the principle of operation of a drawfarme indicating the various functional elements and its specifications. (10)
- (OR)**
- C. With neat diagram, explain the constructional features of flyer used in speedframe. (6)
- D. With a neat sketch, explain the principle of operation of a speedfarme indicating the various functional elements and its specifications. (10)
15. A. Write short notes on ring and traveller used in ringframe. (6)
- B. With a neat sketch, explain the principle of operation of a ringframe indicating the various functional elements and its specifications. (10)
- (OR)**
- C. Write a brief note on bundling and baling process. (6)
- D. Explain the construction and working principle of reeling machine with suitable schematic diagram. (10)

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Diploma in Handloom & Textile Technology

**APR/MAY-2025 SEMESTER EXAMINATION**

(Regulation-2021)

Semester : **III**

Time:3 Hours

Course Code & Title : **HTPC203 Handloom Weaving  
Technology**

Maximum Marks: 100

**PART-A**

(10×2=20 Marks)

**Answer all the questions within two to three sentences**

1. Differentiate the cheese and spool yarn package form.
2. What are the objectives of sizing?
3. Write the functions of lease rod.
4. Write the two differences in throw shuttle handloom and fly shuttle handloom.
5. Define fell of the cloth.
6. Write the names of two auxiliary motions of handloom.
7. Define the 10<sup>s</sup> worsted count.
8. Write the conversion factor for tex system to cotton English system.
9. Count of the folded yarn in spun silk system has been expressed as 80/2. What is the resultant count of the folded yarn?
10. What are the two systems of numbering of reed count?

**PART-B**

((6+10)×5=80 Marks)

**Answer all the questions in detail**

11. A. What are precautions to be taken during warping process? (6)  
B. What are the different methods of warping and explain the method of preparation of warp on a sectional warping machine? (10)  
(OR)  
C. What are the sizing ingredients used in size mixture and write the main function of any two ingredients? (6)  
D. What are the various forms of sizing? Explain briefly the process of street warp sizing. (10)
12. A. Write the main functions of reed. (6)  
B. Taking a suitable weave explain the shedding mechanism of handloom using jack and lam rod. (10)

(OR)

- C. Draw the passage of warp in fly shuttle frame loom. (6)  
D. Explain about different types of shed formation with their diagrams. (10)

13. A. Explain about different types of shuttle used in handloom industry with their suitability. (6)  
B. What are different types of reed used on handlooms with their suitability. (10)

(OR)

- C. Differentiate between closed shed beating and cross shed beating. (6)  
D. Explain the working principle of Barrel dobby with neat diagram. (10)

14. A. If 1 bundle contains 180 hanks of cotton yarn, what is the count of the yarn in New English? (6)  
B. (a) Calculate the length of 340 grammes of nylon yarn whose count is 20 Tex. (10)  
(b) The count of 300 yards of worsted yarn was found to be 60<sup>S</sup> worsted. Calculate the weight in ounces.

(OR)

- C. Convert 30 tex count to New French system. (6)  
D. Derive the conversion factor to convert from New English system to Denier Metric system and convert 50<sup>S</sup>Ne cotton to Denier Metric System. (10)

15. A. A three fold yarn composed of 8<sup>S</sup>, 24<sup>S</sup> and a thread of unknown count. If the count the folded thread was found to be of 4<sup>S</sup>. Calculate the count of the unknown thread. (6)  
B. A 5<sup>S</sup> folded yarn is composed of one thread of 25<sup>S</sup>cotton and another thread of 10<sup>S</sup>cotton. 10<sup>S</sup>count of thread is having a regain of 60%. Calculate the weight of component threads in 100 pounds of the folded yarn. (10)

(OR)

- C. A warp consists of yarns of the following particulars. (6)  
3 pounds of 20<sup>S</sup>yarn  
6pounds of 16<sup>S</sup> yarn  
9 pounds of 24<sup>S</sup> yarn  
Calculate the average count.
- D. Calculate the total number of ends in the warp with the following particulars: (10)  
Count of reed : 48<sup>S</sup>ST  
Denting :2 ends per dent for body and 4 ends per dent in selvedge  
Reed Width : 52inch ( including ½ inch on each side)

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Diploma in Handloom & Textile Technology

**APR/MAY-2025 SEMESTER EXAMINATION**

(Regulation-2021)

Semester : **III**

Time:3 Hours

Course Code &Title : **HTPC204Fabric Structure – I**

Maximum Marks:100

**PART-A**

(10×2=20 Marks)

**Answer all the questions within two to three sentences**

1. Name any two types of basic weaves.
2. Define drafting order.
3. Name two types of twill derivatives.
4. Draw the warp faced twill on 4x4.
5. Construct the smallest irregular sateen weave.
6. Write two differences between diamond and diaper weaves.
7. Why honey comb weaves are suitable for towelling fabrics?
8. Name the weave suitable for using mosquito net fabric.
9. Mention the two ways of producing crepe fabrics.
10. Write about the tensioning of the different warp series in distorted warp effects.

**PART-B**

((6+10)×5=80 Marks)

**Answer all the questions in detail**

11. A. Explain about the classification of woven fabrics with examples. (6)  
B. i) What is the object of ornamentation of plain fabrics? (10)  
ii) Construct the design, draft and peg plan of 3 and 1 warp rib, 2 and 2 weft rib and 3 and 3 mat weave.
- (OR)**
12. A. Write about any 6 ways of ornamentation of plain fabric. (6)  
B. Discuss the derivatives of plain weave with suitable examples. (10)
12. A. Define warp faced twill and weft faced twill with suitable examples. (6)  
B. i) Mention any 4 differences between wavy twill across and wavy twill along the cloth. (10)  
ii) Construct a herring bone twill across the cloth taking the base of 2 up 2 down twill. Indicate the draft and peg plan for it.

**(OR)**

- C. Construct the combined twill by end and end combination of  $\frac{2}{1} \frac{1}{2}$  and  $\frac{3}{3}$  twill. (6)
- D. i) Define figured twills. (10)  
 ii) Construct the design and draft of regular wavy twill across the cloth on 12x6 using  $\frac{3}{3}$  twill base.
13. A. Draw the twill dice check design on 8x8. (6)
- B. i) Write on the characteristics of satin and sateen weave (4 points). (10)  
 ii) Construct the 10-thread irregular satin weave. Indicate the draft and peg plan of it.
- (OR)**
- C. Draw a diamond design on 8x8 using 2 up 2 down twill. (6)
- D. Construct the diaper design on 12x12 along with the draft and peg plan taking base twill 3 up 3 down. (10)
14. A. Construct Devon huck – a – back weave. (6)
- B. Construct Brighton honey comb weave on 16x16 along with its draft and peg plan. (10)
- (OR)**
- C. Construct mock leno weave on 8x8 along with its draft. (6)
- D. Construct the both warp corkscrew and weft corkscrew weave on 11x11. (10)
15. A. Construct a crepe weave on 8x8 by reversing method. (6)
- B. Combine 8x8 brighton honey comb with plain weave to produce check effect. (10)  
 Indicate it's draft and peg plan.
- (OR)**
- C. Construct warp distorted thread effect on 14x14. (6)
- D. i) Define colour and weave effects. (10)  
 ii) Draw an all-over pattern using 4 up 4 down twill with the colour pattern of 6 dark, 6 light in both directions.

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**INDIAN INSTITUTE OF HANDLOOM TECHNOLOGY**

Varanasi

Post Diploma in Textile Processing

**APR/MAY-2025 SEMESTER EXAMINATION**

(Regulation-2021)

Semester : **III**

Time:3 Hours

Course Code &Title : **PDTP302 Technology of Finishing**

Maximum Marks:100

**PART-A**

(10×2=20 Marks)

**Answer all the questions within two to three sentences**

1. Mention the importance of Textile finishing.
2. List out the different types of resin used for textile finishing.
3. Give the concept of pyrolysis.
4. Enlist the methods to evaluate the antimicrobial and UV protective finishes.
5. How do you produce antistatic finish?
6. How do evaluate the efficiency of antipilling finish?
7. State the functions of compacting on knitted fabrics.
8. Mention the objectives and various methods of heat setting.
9. What are the main advantages of using silicon emulsion softeners?
10. Name one nano material commonly used in nano finishing.

**PART-B**

(6+10) ×5=80 Marks)

**Answer all the questions in detail**

11. A. State the concept behind the crease formation. (6)  
B. Discuss in detail the causes and remedies of strength losses of resign finished cotton fabric. (10)
- (OR)
- C. Write detailed notes on polycarboxylic acid for crease recovery finish (6)  
D. Write detailed notes on formaldehyde release from resin finished goods. (10)
12. A. Evaluate the environmental and health implications associated with commonly used flame-retardant chemicals. (6)  
B. Differentiate between flame-proof and flame-retardant finishes. Explain the (10)

chemical processes, particularly pyrolysis, involved in achieving flame retardancy in cotton textiles.

**(OR)**

- C. Write detailed account on decorant and perfume finishes. (6)
  - D. Explain the concept, chemicals used and application of rot proof finishes. (10)
13. A. Discuss the challenges faced in applying soil release to blended fabrics (6)
- B. Briefly discuss on different methods of soil release finish on polyester and P/C blend materials. (10)

**(OR)**

- C. Discuss the working principle of antistatic finishes on synthetic fibers like polyester. (6)
  - D. Explain the causes of pilling in textiles and how anti-pilling finishes work to prevent it. (10)
14. A. Describe the various methods of heat setting used in the textile industry. (6)
- B. Explain the working principal and application of various types of mechanical finish on textile materials. (10)

**(OR)**

- C. How do heat setting and foam finishing contribute to the functional and aesthetic properties of textiles? (6)
  - D. Discuss the role of chemical finishing processes in enhancing the performance of synthetic fabrics like polyester. (10)
15. A. Discuss in detail the microencapsulation technique. (6)
- B. Discuss in detail the mechanism in the weight reduction of polyester. (10)

**(OR)**

- C. Different types and functions of softners. (6)
- D. Explain the concept of nano finishing and plasma treatment of textiles substrates. (10)

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**INDIAN INSTITUTE OF HANDLOOM TECHNOLOGY**

Varanasi

Post Diploma in Textile Processing

**APR/MAY-2025 SEMESTER EXAMINATION**

(Regulation-2021)

Semester : **III** Time:3 Hours  
Course Code & Title : **PDTP303 Chemistry of Intermediates & Dyes** Maximum Marks: 100

**PART-A**

(10×2=20 Marks)

**Answer all the questions within two to three sentences**

1. Mention the byproducts obtained from middle oil in coal tar distillation.
2. Define Esterification process.
3. Give the structure of one acridine class of dyes.
4. List the various bonds involved in the dye fibre interactions.
5. Mention the differences in the structure of indigoid and thioindigoid dyes. Give example.
6. What are fluorescent brightening agents?
7. Write the sulphonation process of Aniline.
8. Give the structure of BON acid.
9. Name the intermediates involved in the production of Rhodamine B.
10. What is Indanthrene Blue?

**PART-B**

((6+10) ×5=80 Marks)

**Answer all the questions in detail**

11. A. i) Write about the extraction process of alizarin dye. (6)  
ii) Mention the limitations of natural dyes.  
B. Explain the process of fractional distillation of coal tar. (10)  

**(OR)**

  
C. Briefly explain the process of Diazotisation with example. (6)  
D. Explain the unit process of i) Halogenation and ii) Sulphonation with an example of each. (10)
12. A. Classify dyes based on their chemical constitution. (6)

- B. Explain the reaction process of manufacturing Metanil Yellow and Fluorescein dyes. (10)
- (OR)**
- C. Write notes on the Bathochromic effect in dyes. (6)
- D. Describe the Witt's Theory of colour and chemical constitution. (10)
13. A. What are anthraquinone dyes? Give the structure of any one of its dye. (6)
- B. Explain the various methods of synthesis of Indigo dye. (10)
- (OR)**
- C. Classify Fluorescent brightening agents. (6)
- D. What are Reactive dyes? Explain the synthesis of any one reactive dye. (10)
14. A. Write the reaction process involved in synthesis of Koch acid. (6)
- B. Describe the Bechamp reduction and sulphide reduction process of nitrobenzene. (10)
- (OR)**
- C. Explain the structure of H- acid. (6)
- D. Explain the synthesis of various intermediates from chlorobenzene. (10)
15. A. Describe the process of synthesis of Naphthol AS. (6)
- B. Explain the synthesis of Caledon Jade Green and Alizarine. (10)
- (OR)**
- C. Explain the synthesis of Fast red TR base. (6)
- D. Explain the synthesis of Methylene Blue and Auromine. (10)

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**INDIAN INSTITUTE OF HANDLOOM TECHNOLOGY**

Varanasi

Post Diploma in Textile Processing

**APR/MAY-2025 SEMESTER EXAMINATION**

(Regulation-2021)

Semester : **III**

Time:3 Hours

Course Code & Title : **PDTP304 Ecology & Pollution Control  
in Textile Industry**

Maximum Marks: 100

**PART-A**

(10×2=20 Marks)

**Answer all the questions within two to three sentences**

1. Define atmosphere. Name the different layers of atmosphere.
2. Define Radioactive pollution. Write any three radioactive nuclides.
3. Write the air quality standard in India.
4. Difference between primary pollutant and secondary pollutant.
5. Name the process in textile industry that produce alkali waste.
6. Define Chemical oxygen demand.
7. Which gases are responsible for ozone layer depletion. Write any four gaseous name.
8. What is purpose of coagulating agent? Give two examples of coagulating agent.
9. Define - Eco-standard and EMS.
10. Define noise pollution. How to measure noise?

**PART-B**

((6+10) ×5=80 Marks)

**Answer all the questions in detail**

11. A. What is Acid rain? Give its causes and effects of acid rain. (6)  
B. Discuss in brief four segments of environment. (10)
- (OR)**
- C. Briefly explain the pollutants in textile industry. (6)  
D. Explain the various types of pollution in textile industry.Explain it. (10)
12. A. Explain the effects of CO, SO<sub>x</sub> and hydrocarbon on human being (6)  
B. Tabulate indoor and outdoor air pollutants. (10)

**(OR)**

- C. Elaborate the sources and characteristics of some important air pollutants. (6)
- D. What are the harmful chemicals used in textile industry. Write about their sources and detrimental effects. (10)
13. A. State the importance of material recycling in textile industries. (6)
- B. Explain the organic and inorganic water pollutants. (10)
- (OR)**
- C. What are the various steps to reduce waste water consumption in textile industries? (6)
- D. Give the characteristics of waste water from textile industries. (10)
14. A. Write a short note on activated sludge treatment. (6)
- B. Discuss the control measures for solid waste management. (10)
- (OR)**
- C. Discuss tolerance level of an effluent in wet processing of textile industry (6)
- D. Briefly discuss the design and working of effluent treatment plant (10)
15. A. Write short notes on Eco standards and Eco labels for textiles. (6)
- B. Explain the effect, sources and control measures of Noise pollution in textile (10)
- (OR)**
- C. Write a short note on chemical hazards and accidents in textile industry. (6)
- D. Explain the new challenges towards achievements of strict standards in textile processing industry. (10)

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