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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 : V

Time:3 Hours

Course Code & Title : **HTOE301 Product Design**

Maximum Marks: 100

PART-A

(10×2=20 Marks)

Answer all the questions within two to three sentences

1. Define Kaizen Model.
2. What is Brain storming?
3. List any two important marketing aspects that are to be considered during the product development phase.
4. Define Generic product.
5. What is called Innovation?
6. Define evolution of design.
7. Define optimization in design.
8. What is called simulation?
9. Why economic factor should be considered in product designing?
10. Define Re-Engineering.

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Describe the different level of products with an example. (6)
B. Explain the steps involved in New Product Development (NPD). (10)
(OR)
C. Write short notes on idea generation and creativity. (6)
D. Explain the steps involved in Design Process with the Diagram. (10)
12. A. What are the techniques used for product analysis with an example. (6)
B. Explain the design for simplification, standardization and product development practices used in industry. (10)

(OR)

- C. Explain steps of a generic product development process. (6)
- D. Do you agree Product life cycle can change the Business Strategy? Discuss. (10)

- 13. A. Explain the evolution and its types of Product Design. (6)
- B. Give the detail explanation for factors affecting in product design with suitable example. (10)

(OR)

- C. Write short notes on design by innovation and design by imitation. (6)
- D. Write down the different phases of Morphology Design. (10)

- 14. A. Write short notes on six sigma principles. (6)
- B. Write step by step procedure for making model by using Rapid prototype techniques. (10)

(OR)

- C. Differentiate the Product Development Vs Product Design. (6)
- D. What is Design for Manufacturing (DFM)? Explain the principles of DFM in detail. (10)

- 15. A. What are the various characteristics of product design. (6)
- B. Explain steps involved in re-engineering of used garments in textile sector. (10)

(OR)

- C. What are the steps involved in product design development process. (6)
- D. Explain all the necessary steps required in designing Handloom product in Handloom industry. (10)

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Diploma in Handloom & Textile Technology

APR/MAY-2025 SEMESTER EXAMINATION

(Regulation-2021)

Semester : V

Time:3 Hours

Course Code &Title : **HTOE310-Renewable Energy Technologies**

Maximum Marks:100

PART-A

(10×2=20 Marks)

Answer all the questions within two to three sentences

1. Differentiate renewable and Non-renewable energy.
2. Define Levelized cost of energy conversion.
3. List the different types of PV Systems.
4. Define Global radiation.
5. State Betz Limit.
6. List main components of Wind power plant.
7. What do you mean by Biomass Direct Combustion?
8. Give a short note about Biodiesel.
9. Define - Wave Energy.
10. List the methods of Hydrogen Energy Storage.

PART-B

(6+10) × 5=80 Marks)

Answer all the questions in detail

11. A. Write short note on Energy Scenario around the World. (6)
B. Explain in detail about the Reserves of Energy Resources in India. (10)
- (OR)**
- C. Briefly explain about Economics of Renewable Energy Systems. (6)
D. Discuss in detail about an Environmental Aspects of Energy Utilization. (10)
12. A. Distinguish the Flat Plate and Concentrating Collectors. (6)
B. Explain the Liquid heating flat plate collector with suitable diagram (10)

(OR)

- C. Write a short note of Concentrating Collector. (6)
- D. Explain the operation of Solar direct Thermal Power Generation with neat sketch. (10)
13. A. Enumerate the factors to be considered for the site selection to install the wind power plant. (6)
- B. Elaborate the details of Wind Turbine Generator with appropriate diagram. (10)
- (OR)**
- C. Compare advantages and disadvantages of Wind Power Systems. (6)
- D. Discuss in detail about Performance of Wind Energy Conversion. (10)
14. A. List out the advantages and disadvantages of Biogas. (6)
- B. Explain the construction and working of any two Biomass Gasifiers. (10)
- (OR)**
- C. Write a short note on Cogeneration. (6)
- D. What are the types of Dome and Drum type Biogas Digesters? Explain the construction and working of any one type of it with neat sketch. (10)
15. A. Give a brief note on Hybrid Systems. (6)
- B. Discuss about the Electrical Energy Generation from Geothermal Energy. (10)
- (OR)**
- C. Explain with a neat sketch the operation of OTEC plants. (6)
- D. Explain in detail about Tidal energy with suitable diagram. (10)

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Diploma in Handloom & Textile Technology

APR/MAY-2025 SEMESTER EXAMINATION

(Regulation-2021)

Semester : V

Time:3 Hours

Course Code & Title : **HTPC301 Weaving Technology - II**

Maximum Marks: 100

PART-A

(10×2=20 Marks)

Answer all the questions within two to three sentences

1. What do you mean by figuring capacity of a jacquard?
2. What are the necessities of jacquard in weaving?
3. Write the role of accumulator in shuttle less weaving
4. Give the classification of rapier loom
5. Why hydrophilic weft yarns are not suited for water jet looms?
6. Write the importance of profiled reed in air jet weaving.
7. Find out the diameter of 100^s Ne using Pierce formula.
8. What do you understand about relative diameter?
9. Write on areal density of fabric.
10. Give the formula to change the count of yarn by keeping the same denseness of the fabric in New English system.

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Give short notes on electronic jacquard (6)
B. With the help of a neat sketch, explain the mechanism and working of single lift single cylinder (SLSC) jacquard. (10)
(OR)
C. Write about different types of harness ties used in jacquard weaving (6)
D. With the help of a neat sketch, explain the mechanism and working of double lift single cylinder (DLSC) jacquard (10)
12. A. Why are shuttle-less looms preferred over traditional shuttle looms? (6)
B. Give a detailed classification of rapier looms and their features. (10)

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APRIL/MAY-2025 SEMESTER EXAMINATION

(Regulation-2021)

Semester : V

Time:3 Hours

Course Code & Title : **HTPC302 Textile Testing II**

Maximum Marks: 100

PART-A

(10×2=20 Marks)

Answer all the questions within two to three sentences

- 1 . Why testing conditions crucial for accurate textile testing?
- 2 . How do you calculate the fabric cover factor?
- 3 . What is the specimen length required for testing fabric ballistic test?
- 4 . What is CRE in textile testing, and what are the standards for conducting CRE testing?
- 5 . Give the formula for calculating drape co – efficient.
- 6 . What are the methods used to measure the water resistance of fabrics.
- 7 . What are the types of rubbing fastness?
- 8 . How does the grey scale help in evaluating color change during washing?
- 9 . State the objectives of fabric inspection.
- 10 . Highlight the general fabric inspection procedures.

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. What challenges might arise when measuring different types of fabrics (like woven vs. knit), and how can they be addressed? (6)
- B. Demonstrate the standard procedure for measuring the thickness of a fabric sample with neat sketch. (10)

(OR)

- C. Describe the precautions that should be taken while drawing a fabric sample to ensure its accuracy and reliability. (6)
 - D. Explain the procedure to measure the crimp percentage of yarn from fabric, using a line diagram to illustrate the setup and methodology (10)
12. A. Describe the various key factors that influence the tear strength of fabrics. (6)
 - B. Explain the working principles of a bursting strength tester in detail, and illustrate the process with a well-labeled diagram. (10)

(OR)

- C. Explain the different methods for preparing fabric samples for tensile strength testing, and what is the appropriate specimen size for each method? (6)
- D. How does a tear strength tester function, and what is its working principle? Explain including a sketch. (10)

- 13. A. How do crease recovery and wrinkle recovery differ in terms of fabric performance, and what are the specific testing methods used to evaluate each? (6)
- B. Explain the principle and functioning of fabric air permeability tester, and illustrate their operation with a detailed sketch. (10)

(OR)

- C. What are the main factors that cause fabric pilling, and how do they impact its severity of pilling? (6)
- D. With suitable line diagram, explain the method of measurement of abrasion resistance using Martindale abrasion tester. (10)

- 14. A. Write the importance of testing of colour fastness of a textile material. (6)
- B. Describe the procedures involved in conducting a washing fastness test and how the results are interpreted. (10)

(OR)

- C. Discuss the process and standards involved in testing the light fastness of textile materials. (6)
- D. Explain the procedures and standards for testing perspiration fastness in textiles and why is it an important property to consider for fabrics used in clothing and textiles? (10)

- 15. A. Classify the different types of fabric defects and provide suitable examples for each category. (6)
- B. Why Fabric inspection is important in apparel industry? Explain automatic fabric inspection systems with neat sketch. (10)

(OR)

- C. Discuss the common defects or issues observed during the fabric cutting process. (6)
- D. Elaborate on the method of fabric grading using the 4-point system and explain the points assigned to various fabric faults. (10)

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Diploma in Handloom & Textile Technology

APRIL/MAY-2025 SEMESTER EXAMINATION

(Regulation-2021)

Semester : V

Time:3 Hours

Course Code & Title : **HTPE301 Knitting Technology**

Maximum Marks: 100

PART-A

(10×2=20 Marks)

Answer all the questions within two to three sentences

1. How does the loop formation differ in weft and warp knitting?
2. In knitting industry, “combed hosiery yarn is preferred than carded yarn”- Justify your answer.
3. Define the term of “cast-off” position.
4. Illustrate the shape of a sinker and identify its key parts.
5. Identify the reasons for the curling behavior of the single jersey fabric
6. Draw the diagrammatic representation of a rib and purl structure.
7. State the principles of flat knitting.
8. What are the key differences between flat knitting and circular knitting?
9. What is closed lap and open lap?
10. Highlight the uses of warp knitted fabrics in technical applications.

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Analyze the factors contributing to the recent growth of the knitting industry. (6)
B. Explain the differences in properties and characteristics between Knit, Woven, and Non-woven fabrics. (10)
- (OR)**
- C. Discuss the classification of warp and weft knitting machines and the processes they perform. (6)
D. Describe the staple spun yarn selection and yarn quality requirement for efficient running of knitting. (10)
12. A. Explain the knitting actions and show the various positions of compound needle with neat sketch. (6)
B. Illustrate the knitting needles which are considered to be the best, explain your answer by comparing other types of needles. (10)

(OR)

- C. Illustrate the cam profile for needle travel in a circular knitting machine, highlighting the various key positions and their functions. (6)
- D. With necessary sketch explain the passage of material through circular weft knitting machine along with its functional elements and its importance (10)

13. A. Describe the plain jersey weft knit structure, including its diagrammatic representation, symbolic notation and key properties. (6)
- B. Investigate the effect of loop length and loop shape factor on physical and mechanical properties of single jersey knitted fabric. (10)

(OR)

- C. Explain the principles behind the formation of knit, tuck and float stitches, and describe the cam design involved. (6)
- D. Draw the structures and provide diagrammatic and symbolic representations of rib and interlock weft knit fabrics and compare their properties. (10)

14. A. What are the various types of flat knitting machines and how are they classified? (6)
- B. Explain the working mechanism of mechanical and computer control flat knitting machine with suitable sketch. (10)

(OR)

- C. Outline the basic elements of a flat knitting machine and explain their functions. (6)
- D. Discuss in detail how various structures produced by using flat knitting machines with suitable structure. (10)

15. A. Describe the let-off mechanism used in warp knitting machine with suitable sketch. (6)
- B. Compare Tricot and Rachel warp knitting machine and its loop forming sequences with suitable diagrams. (10)

(OR)

- C. Discuss in detail about the principles of patterning mechanism with neat sketch. (6)
- D. With suitable diagram explain the construction and working of guide bar movement mechanism and chain link in warp knitting. (10)

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Diploma in Handloom & Textile Technology

APR/MAY-2025 SEMESTER EXAMINATION

(Regulation-2021)

Semester : V

Time:3 Hours

Course Code &Title : **HTPE302 Advanced Fabric Structure**

Maximum Marks:100

PART-A(10×2=20 Marks)

Answer all the questions within two to three sentences

1. What are the advantages of using healds with jacquard ?
2. How many warp beams are required in extra warp weaving ?
3. Write the purpose of using working comber board in figured patent satin.
4. Name the series of ends and picks used in pique design.
5. How many series of warp and weft are used in traditional tapestry ?
6. Define the structure of the Warp Backed cloth
7. Mark 3 pick Terry weave indicating the warp series and weft used.
8. How is the figure produced using the Double cloth structure ?
9. List the different sheds formed in leno weaving.
10. What is the use of shaker motion in Gauze weaving.

PART-B((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Differentiate Pressure Harness and Bannister Harness in respect of Damask fabric. (6)
B. Indicate the complete structure of a figured extra warp design on 36 x 12, with the warp ratio of 2 ground: 1 extra. Taking a guide graph of 12 x 12 (10)
(OR)
C. Table the difference between Extra Warp and Extra Weft. (6)
D. Indicate the complete structure of a damask fabric on 48 x 48 woven with pressure harness set of 3 eyes per decked mail and 8 healds shafts by taking a guide graph/punching graph of 16 x 12. (10)
12. A. Mark two weaves (ground and figure) of figured pique. (6)
B. Develop the complete structure of the Figured Patent Satin on 48 x 48 using the guide graph on 16 x 12. (10)

(OR)

- C. Draw the drafting order followed in the loom set with working comber board and healds to weave Patent Satin. (6)
- D. Using 12 x 9 punching graph, Indicate the complete structure of fast back figured pique on 36 x 36. (10)
13. A. Show the method of interlacing colour picks in plain shed to develop figures in the traditional tapestry. (6)
- B. Develop the complete structure of the Warp Backed cloth on 48 x 24 using the guide graph on 24 x 24. (10)

(OR)

- C. Differentiate Warp backed and Weft backed. (6)
- D. Indicate the three weaves of non-reversible three pick tapestry, also draw the interlacement diagram for it. (10)
14. A. Explain the method of weaving Figured Terry fabric using the jacquard with sectional harness-sectional draft and healds setup. (6)
- B. Indicate the complete structure of two colour figured double cloth on 36 x 36 (10)

(OR)

- C. Show punching process followed for loom set with the sectional tie sectional draft to weave Plain Figured interchanging double cloth fabric. (6)
- D. Mark the complete structure of figured terry on 48 x 36 using the guide graph on 12 x 12 (10)
15. A. Explain different types and system of douping. (6)
- B. Draw the threads interlacement diagram and drafting order to produce a leno structure with pointed draft. (10)

(OR)

- C. Explain the method of manufacturing Chenille pile fabric. (6)
- D. Draw the Draft and Interlacing diagram of the Leno Stripe effect formed by combing straight draft Leno with plain weave. (10)

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Diploma in Handloom & Textile Technology

APR/MAY-2025 SEMESTER EXAMINATION

(Regulation-2021)

Semester : V

Time:3 Hours

Course Code & Title : **HTPE303 Fashion Designing**

Maximum Marks: 100

PART-A

(10×2=20 Marks)

Answer all the questions within two to three sentences

1. Differentiate classic fashion from Fad with a suitable example.
2. Enlist various components of fashion design.
3. What is structural design? Provide an example
4. List the determinants of the texture of a fabric.
5. State the importance of harmony in fashion designing.
6. Name the methods of creating rhythm in clothing design
7. Classify the different types of skirt styles.
8. Report the various types of pockets and their application.
9. Compare and contrast the terms long-term and short-term forecasting.
10. What is a trend in fashion?

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Analyse the terms style, design, and fashion with their relevance (6)
B. Illustrate and explain the various stages of the fashion cycle and their importance with suitable examples. (10)
- (OR)
- C. Compare and contrast the consumer buying cycle with use cycle. (6)
D. Outline the role of a designer in developing a fashion style by understanding the consumer preference. (10)
12. A. Analyse any three visual effects created in the garment with shapes. (6)
B. With suitable illustration, outline the various types of the lines, line direction (10)

in women's apparel designs.

(OR)

- C. Enumerate the effect of texture on the physical proportion of the garment. (6)
- D. Interpret the role of Prang's colour scheme in selecting suitable colour harmony in fashion clothing. (10)

- 13. A. Illustrate the types of balance with suitable sketches. (6)
- B. What do you mean by balance in dress designing? Outline the various types of balances used in design process with example. (10)

(OR)

- C. Write the role of colour in creating harmony in dress. (6)
- D. What are the different types of rhythm that can be created in garments? Explain in detail the suitable application. (10)

- 14. A. Brief the steps involved in designing a formal trouser for Men. (6)
- B. Illustrate and analyse the features of different types of sleeves. (10)

(OR)

- C. Analyse any three types of fullness elements used in a skirt. (6)
- D. Classify the different types of pleats used in apparel, and explain their features with a suitable sketch. (10)

- 15. A. Enlist the tools used to perform the market research process with their pros and cons. (6)
- B. Interpret the steps involved in performing market research to understand the market trend. (10)

(OR)

- C. Differentiate any three silhouettes based on their application. (6)
- D. Discuss in detail the different steps involved in developing a fashion portfolio. (10)

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Diploma in Handloom & Textile Technology

MAR/APR - 2025 SEMESTER EXAMINATION

(Regulation-2021)

Semester : 05

Time:3 Hours

Course Code &Title : **HTPE304 : TECHNICAL TEXTILES**

Maximum Marks:100

PART-A

(10×2=20 Marks)

Answer all the questions within two to three sentences

1. State the difference between conventional textiles and technical textiles.
2. Mention the most commonly used fibre in technical textiles and justify the same.
3. Why nylon fibres are most preferred one for tyre cord manufacturing?
4. Mention the objectives of carcass fabric in conveyor belts.
5. State the advantages of nonwovens in filtration.
6. List the factors influencing the selection of filtration media.
7. Mention the fibres used in ballistic protection.
8. List the basic categories of requirements of any protective clothing.
9. Give the classification of medical textiles.
10. State the functions of geotextiles.

PART-B

(6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Give the broad classification of technical textiles based on their applications. (6)
B. Give a detailed note on various raw materials used in technical textiles with respect to applications. (10)
- (OR)
- C. Discuss the structure and properties of carbon fibres used in technical textiles. (6)
D. With suitable illustrations, explain the properties, structure and applications of UHMPE fibres. (10)
12. A. Outline the various property requirements for tyre cord. (6)
B. With suitable diagram, explain the manufacturing process of nylon tyre cord (10)

fabric with their specifications.

(OR)

C. Describe the various property requirements for seat belts and air bags. (6)

D. Explain the various types of conveyor belts, their manufacturing and characteristics. (10)

13. A. Outline the influence of textile structures on filtration efficiency. (6)

B. With suitable sketches, explain the various mechanisms of filtration. (10)

(OR)

C. Explain the theory of dust collection in dry filtration. (6)

D. With suitable illustrations and examples, explain the various cleaning mechanisms adopted for filters. (10)

14. A. Outline the influence of fabric structure on ballistic protection. (6)

B. Describe the working mechanism of ballistic body armour with suitable sketches. (10)

(OR)

C. Outline the different layers of chemical protective clothing. (6)

D. Discuss the purpose of protective clothing and elaborate the requirements for flame resistance protective clothing. (10)

15. A. Give a brief note on materials used in bio-textiles. (6)

B. Elaborate on the various implantable textile materials with respect to its requirements, fibres, and fabric structure used. (10)

(OR)

C. Give a brief note on role of textile materials in geo-textile applications. (6)

D. With suitable illustrations, explain the various functions, property requirements and testing of geo-textiles. (10)

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APR/MAY-2025 SEMESTER EXAMINATION

(Regulation-2021)

Semester : V

Time:3 Hours

Course Code & Title : **HTPE305 Apparel Marketing and Merchandising**

Maximum Marks: 100

PART-A

(10×2=20 Marks)

Answer all the questions within two to three sentences

1. Define Apparel Marketing.
2. List the different types of Printed medias for advertising.
3. Give the main objective of an Apparel Merchandiser.
4. What is Sampling in apparel manufacturing.
5. Discuss any two advantages of Global sourcing.
6. How the QR (Quick Response) Supporting in Apparel orders?
7. List any four post -shipment documents.
8. LC is one of the most important documents in export documents. Why?
9. Define the action plan in Time Management.
10. Write about the CAD application in Exports.

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Discuss in detail the steps involved in apparel marketing research. (6)
B. Summarise the strategies used to improve apparel marketing. (10)
(OR)
C. Explain the roles and functions of apparel Department. (6)
D. Define Advertising and explain the types of Advertising. (10)
12. A. Differentiate the Export merchandiser and the retail merchandiser. (6)
B. Summarise the roles and responsibilities of a Merchandiser. (10)
(OR)
C. Discuss a merchandising plan in a company with an example. (6)

- D. Communication is very important for a merchandiser. Explain why? (10)
13. A. Analyse the factors to be considered while sourcing raw materials for production. (6)
- B. Elaborate the sourcing strategy used in apparel industries. (10)
- (OR)**
- C. Discuss the importance of MRP in Apparel Industries. (6)
- D. Elaborate the supply chain and demand chain analysis in apparel Industry. (10)
14. A. List the pre-shipment documents required (6)
- B. Develop an example of Techpack of an order. (10)
- (OR)**
- C. Discuss on mode of payment terms in exporting. (6)
- D. Discuss in detail how an export order is confirmed. (10)
15. A. Enlist the importance of Time management in Apparel Industries. (6)
- B. Discuss Time Management in purchasing Accessories in Garment industry. (10)
- (OR)**
- C. Elaborate on the route-card process in the apparel industry. (6)
- D. Discuss the application of computers in Merchandising and export process. (10)

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Diploma in Handloom & Textile Technology

APR/MAY-2025 SEMESTER EXAMINATION

(Regulation-2021)

Semester : V

Time:3 Hours

Course Code & Title : **HTPE306 Advances in Textile Processing**

Maximum Marks: 100

PART-A

(10×2=20 Marks)

Answer all the questions within two to three sentences

1. Mention the factors that affect the efficiency of enzyme treatment.
2. Name the enzymes used in the bleaching of cotton?
3. Which dyes are suitable for a cotton/spandex blend?
4. Mention the recipe for combined scouring and bleaching operation.
5. What is the crepon style of printing?
6. Mention the demerits of foam printing.
7. What is micro-encapsulation?
8. What is the benefit of using Ultrasonic waves in textile dyeing?
9. What do you mean by Sedimentation?
10. Mention the harmful effect of Azo dyes.

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. What are enzymes? Discuss the mechanism of enzyme action on textile substrate. (6)
B. Describe the procedure for enzymatic desizing and enzymatic degumming along with merits and demerits. (10)
- (OR)
- C. What is Bio-scouring? Compare it with the conventional scouring process. (6)
D. Describe the use of enzymes in Denim processing. (10)
12. A. Explain the procedure for dyeing the P/W blend with the necessary precautions. (6)

- B. Describe a method of combined Desizing and Scouring along with the function of various chemicals used. (10)

(OR)

- C. Explain the batch process for dyeing the Polyester/Cotton blend. (6)
D. Describe a continuous method of combined Desizing, Scouring, and bleaching operation a neat diagram. (10)

13. A. Mention the procedure for Khadi printing of cotton. (6)
B. What is Flock printing? Describe the working of a machine used to produce Velvet effect on cotton. (10)

(OR)

- C. Explain briefly Brasso and high-density printing effects. (6)
D. What is ink-jet printing? Discuss the type of ink-jet printers used for Digital printing. (10)

14. A. Discuss how Plasma treatment improves the efficiency of wet processing of textiles. (6)
B. What is the specialty of nanomaterials? Discuss the application of nanotechnology to impart UV protection and antimicrobial finishing to cotton. (10)

(OR)

- C. What are the factors to be considered in garment processing? (6)
D. Describe the working of a Garment dyeing machine with a neat diagram. (10)

15. A. What are the sources of water pollutants in the wet processing of textiles? (6)
B. List the various harmful chemicals used in wet processing and suggest suitable alternatives. (10)

(OR)

- C. Define the following and mention their tolerance limits : (6)
a) Suspended solids b) COD c) BOD
D. Describe the design and working of the Effluent Treatment Plant with a neat diagram. (10)
