

Registration Number

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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

NOV/DEC-2023 SEMESTER EXAMINATION

(Regulation-2021)

Semester : 05

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. What is product?
2. What is Brain storming?
3. What is Product Life Cycle?
4. Define Generic product.
5. What is aesthetics design?
6. What do you understand from design by evolution?
7. Define optimization in design.
8. What is design for reliability?
9. What do you mean by promotion?
10. Why economic factor should be consider in product designing?

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Define the different type of products with suitable example of each. (6)
B. Describe the different level of products with an example. (10)
- (OR)**
- C. What are 4Ps in marketing mix? Define each of them with example. (6)
D. Explain the steps involved in New Product Development (NPD). (10)
-
12. A. What are the techniques used for product analysis?. Define each of them with an example. (6)
B. Describe the different stages of Product Life Cycle with suitable diagram. (10)

(OR)

- C. How product characteristics can be viewed? Mention one example. (6)
- D. Explain the characteristics of successful product. (10)
13. A. Differentiate between design by innovation and design by imitation. (6)
- B. Give detail explanation for factors affecting in product design with suitable example. (10)

(OR)

- C. How aesthetics play an important role in product design? (6)
- D. Explain the different phases in Morphology of design. (10)
14. A. What are the applications of Rapid Prototype in product design? (6)
- B. What is Design for Manufacturing (DFM)?. Explain the principles of DFM in detail. (10)

(OR)

- C. Differentiate between product development and product design. (6)
- D. What is Six sigma? Explain the different phases of design for six sigma. (10)
15. A. Briefly explain that, how a product design can be evaluated? (6)
- B. Explain all the necessary steps required in designing Handloom product by considering any one product in Handloom industry. (10)

(OR)

- C. Why research and analyses are necessary for product designing? (6)
- D. Explain the various aspects of product development for new product in Handloom sectors. (10)

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Diploma in Handloom & Textile Technology

NOV/DEC-2023 SEMESTER EXAMINATION

(Regulation-2021)

Semester : 05

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. Define – 1. Energy & 2. Renewable Energy.
2. Define - Wave Energy.
3. Define - Solar Cells.
4. Mention the Solar PV applications.
5. Enumerate advantages and disadvantages of Wind Energy.
6. Define – Energy estimation.
7. What do you mean by Biomass Direct Combustion?
8. Specify the average composition of Bio-gas.
9. What is Hybrid System?
10. What do you mean by Turbine?

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Write short note on World Energy Use. (6)
B. Discuss in detail about Economics of renewable energy systems. (10)
(OR)
C. Write short note on Reserves of Energy Resources in India. (6)
D. Explain the Energy Scenario around the World. (10)
12. A. Differentiate the Flat plate and Concentrating collectors. (6)
B. Explain the construction and working of Liquid heating flat plate collector with neat sketch. (10)
(OR)
C. Describe any one type of Solar direct Thermal Application. (6)
D. Discuss about Solar Radiation and its measurements. (10)

13. A. Enumerate the performance characteristics of Wind turbine rotors. (6)
B. Explain in detail about Wind Turbine Generator. (10)
- (OR)**
- C. Write a short note about Site Selection for Wind Energy Systems. (6)
D. Explain the construction and working of various types of Wind Energy Systems. (10)
14. A. Enumerate the advantages and disadvantages of Biogas. (6)
B. 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)
- (OR)**
- C. Write down the applications of Bio-energy. (6)
D. Explain the construction and working of any two Biomass Gasifiers. (10)
15. A. Describe the working principle of OTEC. (6)
B. Explain the working of Tidal Energy Conversion process. (10)
- (OR)**
- C. Write a short note on Fuel cell systems. (6)
D. What do you mean by Geothermal energy? Discuss about the Electrical Energy Generation from Geothermal Energy. (10)

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Diploma in Handloom & Textile Technology

NOV/DEC-2023 SEMESTER EXAMINATION

(Regulation-2021)

Semester : 05

Time:3 Hours

Course Code & Title : HTPC 301: Weaving Technology – II

Maximum Marks:100

PART-A

(10×2=20 Marks)

Answer all the questions within two to three sentences

1. Write the name of 4 main parts of Jacquard Machine.
2. A 200 hook figuring capacity of a DLSC Jacquard machine how many hooks and needles will be there?
3. What type of shed is formed by Single lift Single cylinder jacquard?
4. Name few shuttleless looms.
5. Write different types of selvedge formation in shuttleless weaving.
6. Classify the Rapier loom.
7. Why hydrophilic weft yarns are not suited for water jet loom?
8. Write down the Pierce's formula for calculating diameter of cotton yarn in inch.
9. What do you understand by the term 'Relative Diameter' of yarn?
10. Define the terms "cover Factor of a fabric"

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Discuss in brief the merits and demerits of Double Lift Double Cylinder Jacquard with that of Single Lift Single Cylinder Jacquard weaving. (6)
B. With a suitable sketch explain the working mechanism of single lift single cylinder Jacquard weaving. (10)
(OR)
C. Write the advantages of open shed Jacquard weaving. (6)
D. Explain briefly the functions of different parts of Jacquard weaving machine. (10)
12. A. Explain the main features of an electronic Jacquard. (6)
B. With a neat sketch explain the working of Double lift single cylinder Jacquard. (10)
(OR)
C. Write short notes on harness building & harness ties of Jacquard Machine. (6)

- D. With a neat sketch explain the working of Double lift Double cylinder Jacquard. (10)
13. A. Write a brief note on advantages of shuttleless weaving. (6)
- B. Discuss the sequence of weft insertion technique for single Rapier and Double Rapier in Rapier looms. (10)
- (OR)**
- C. With neat diagram explain the selvedge formation in shuttleless loom. (6)
- D. Discuss in sequence the weft insertion technique in Air jet loom. (10)
14. A. By taking the specific volume of yarn as 1.1 cubic cm per gram derive the constant for calculating cotton yarn diameter in inch as per Peirce's Rule. (6)
- B. Calculate the diameter in inch of the following yarns as per Peirce's Rule. (10)
1. $2/60^s$ cotton yarn 2. 100 Tex yarn
- (OR)**
- C. By taking the specific volume of yarn as 0.06713 cubic inch per gram derive the diameter in inch as per Peirce's Rule. (6)
- D. Calculate as per the Peirce's Rule the count of the following cotton yarn, whose diameter is as under. (10)
- I. $1/89$ inch
- II. $1/280$ inch
15. A. If the diameter of 80^s cotton yarn is $1/240$ inch, what will be the diameter of 40^s & 20^s cotton yarn? (6)
- B. Ascertain the (10)
- a) Warp fractional cover
- b) Weft fractional cover along with the % cover of the following
- Warp : 20 Tex : 30 ends per cm.
- Weft : 30 Tex : 30 picks per cm.
- (OR)**
- C. A cloth is made with 44 ends per inch of 16^s yarn. Calculate the count of yarn to be used, if a cloth of the same compactness is to be produced with 66 ends per inch. (6)
- D. A cloth $44 \frac{1}{2}$ inches wide on a 72^s Stockport reed, is woven with 32^s warp and 40^s weft and 64 picks per inch. Selvedges $\frac{1}{4}$ inches on each side are drawn 4 ends per dent. The count of the selvedge yarn is same as that of the warp yarn. The length of the piece is 40 yards. If the regain of warp is 5%, calculate-
- Total no. of ends in the warp.
 - Total length of warp yarn in hanks.
 - Total weight of warp yarn in the piece.
 - Total weight of weft yarn in the piece.
 - Total weight of yarn in the piece.

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Diploma in Handloom & Textile Technology

NOV/DEC-2023 SEMESTER EXAMINATION

(Regulation-2021)

Semester : 05

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. What is meant by Linear Density of a yarn?
2. Write the importance of sampling techniques.
3. List the different principles used in tensile testing instruments.
4. Which fabrics are required Ballistic testing? Why?
5. How the fabric shrinkage is calculated. Give the formula.
6. State the importance of fabric stiffness testing.
7. What is Washing Fastness of fabrics.
8. Which fabrics are tested for perspiration fastness?
9. What is AQL?
10. List any two major defects that would occur during garment manufacturing.

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Brief on fabric sampling and the factors to be considered on selection of samples. (6)
 - B. Why sampling is important in the textile industry. Discuss in detail the random and Bias sampling techniques. (10)
- (OR)**
- C. Calculate the Mean, Median and Mode calculating with given readings taken for yarn count. (6)
40, 39, 38, 38, 39, 39, 41, 42
 - D. List the basic construction parameters of a fabric and explain the importance of testing these parameters. (10)

12. A. What is tear strength. Show any two sample preparation methods. (6)
B. Explain the ravel strip method of Testing of tensile strength of fabric with suitable diagrams. (10)

(OR)

- C. How the bursting strength tester is working. Brief with suitable diagram. (6)
D. Elaborate the principle and working of Air permeability tester with suitable diagram. (10)

13. A. Explain on measuring Crease Recovery. (6)
B. Discuss on the Principle and method of drape testing of fabrics. (10)

(OR)

- C. Why shrinkage testing is more important. Discuss in detail. (6)
D. What is Pill box? How is the pilling tested for fabrics? Explain. (10)

14. A. List the different fastness properties and their importance. (6)
B. How is the Rubbing fastness assessed using crock meter? Explain in detail. (10)

(OR)

- C. Why fabrics require different fastness properties? Explain with application examples. (6)
D. Explain the washing fastness testing method in detail. (10)

15. A. Discuss on semi-automatic and automatic fabric inspection system. (6)
B. Explain the four-point grading system and give the fault size and their grades. (10)

(OR)

- C. What is AQL and brief on the standards. (6)
D. Elaborate the quality inspection and assessment of garments in each department. (10)

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NOV/DEC-2023 SEMESTER EXAMINATION

(Regulation-2021)

Semester : 05

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 . Calculate the stitch density of the knitted fabric with WPI of 30 and CPI of 35.
- 2 . What is tightness factor? Give the formula for calculating it.
- 3 . List the types of needles in weft knitting machine.
- 4 . Draw the diagram of sinker and mention its parts.
- 5 . Draw the technical face side of a knit stitch.
- 6 . Draw the diagrammatic representation of a rib and purl structure.
- 7 . Mention the usage of a flat knitting machine along with its types.
- 8 . How is flat knitting different from circular knitting?
- 9 . What is underlap and overlap?
- 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. Briefly state the yarn quality requirements for knitting process. (6)
- B. Compare the properties of knitted and woven fabrics in detail. (10)
- (OR)
- C. Write a brief note on how warp knitting process is different from weft knitting process. (6)
- D. Give the detailed classification of weft knitting machines. (10)
12. A. Write a brief note on the functions of cylinder and sinker in a knitting machine. (6)
- B. What is a compound needle? State its usage and detail the loop formation sequence of the compound needle. (10)

(OR)

C. Draw a latch needle and mark its parts. Briefly explain the loop forming sequence of latch needle. (6)

D. Explain the passage of material through a circular knitting machine in detail with a line diagram. (10)

13. A. Briefly discuss the effect of loop length and shape on fabric properties. (6)

B. Explain the types of notations with neat diagrams. (10)

(OR)

C. Describe the factors affecting the formation of loops in knitted fabrics. (6)

D. Discuss in detail how tuck and float stitches are formed in knitted fabrics. (10)

14. A. Briefly explain the elements of flat knitting machines. (6)

B. Discuss in detail how various weft knitted structures are produced using flatbed knitting machines. (10)

(OR)

C. Write a note on the features of computer controlled flat knitting machines. (6)

D. Explain the working of a V-bed knitting machine in detail. (10)

15. A. Explain the role of chain links in warp knitting briefly. (6)

B. Discuss in detail the various knitting elements of a tricot machine. (10)

(OR)

C. Briefly discuss the elements of warp knitted loops. (6)

D. Explain the knitting cycle on a raschel machine in detail. (10)

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NOV/DEC-2023 SEMESTER EXAMINATION

(Regulation-2021)

Semester : 05

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. Name two extra warp figured fabrics produced by using jacquard with heald.
2. How many beams are required in extra warp weaving?
3. Name the series of ends and picks used in pique design.
4. Name the series of ends and picks used in patent satin design.
5. Name two traditional tapestries.
6. How many series of warp and weft are used in traditional tapestry.
7. Mention the fabric produced by using figured terry.
8. What is meant by loose pick in terry weave?
9. Which structure is constructed by using standard and doup warp threads?
10. What is the other term used for cross weaving?

PART-B

(6+10)×5=80 Marks)

Answer all the questions in detail

11. A. What are the advantages of using healds along with jacquard in figured extra warp weaving? (6)
B. Indicate the complete structure of a figured extra warp design on 40 x 20, with the warp ratio of 1 ground : 1 extra taking a guide graph of 20 x 20. (10)
(OR)
C. Explain the card punching procedure for straight tie & straight draft arrangement. (6)
D. Indicate the complete structure of a damask fabric on 48 x 48 woven with pressure harness set of 3 decked mail eye and 8 heald shafts taking a guide graph of 16 x 12. (10)
12. A. Mark two weaves (ground and figure) of figured pique. (6)

- B. Indicate the ground and figure weaves for patent satin cloth. Explain the operation of heald shafts and working comber boards for weaving figured patent satin. (10)
- (OR)**
- C. Explain the principle and use of working comber board. (6)
- D. Draw a guide graph of 10 x 8 and show the complete structure of figured pique. (10)
13. A. Write the difference between modern and traditional tapestries. (6)
- B. Indicate the three weaves of non-reversible three pick tapestry, also draw the interlacement diagram for it. (10)
- (OR)**
- C. What are the advantages of using jacquard and healds method in production of tapestry? (6)
- D. Develop a warp backed structure on 48 x 24 taking a guide graph of 24 x 24. (10)
14. A. How four different colour effects are produced in figured double cloth? (6)
- B. Mark the complete structure of figured terry on 48 x 36 using the guide graph of 12 x 12. (10)
- (OR)**
- C. Draw the diagram of sectional harness with sectional draft system for weaving figured terry. (6)
- D. Indicate the complete structure of four colour figured double cloth on 32 x 32. (10)
15. A. Explain different types and systems of douping. (6)
- B. Draw the threads interlacement diagram and drafting order to produce a leno structure with pointed draft. (10)
- (OR)**
- C. Construct the draft to produce a stripe effect with combination of plain weave and straight draft leno. (6)
- D. Draw the threads interlacement diagram and draft of net leno structure. (10)

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NOV/DEC-2023 SEMESTER EXAMINATION

(Regulation-2021)

Semester : 05

Time:3 Hours

Course Code & Title : **HTPE 303 : FASHION DESIGNING**

Maximum Marks: 100

PART-A

(10×2=20 Marks)

Answer all the questions within two to three sentences

1. Define Costume
2. Classify the length of fashion cycle.
3. Diagonal lines in a garment make the person look slim - Justify
4. What is Value in colour?
5. Differentiate symmetrical and asymmetrical balance
6. What are the different ways of achieving rhythm?
7. List 2 different types of tucks used in women's wear.
8. Classify sleeves based on construction.
9. With illustrations give 2 basic silhouettes for upper and lower torso.
10. What is Wardrobe?

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Draw and explain the fashion cycle of FAD. (6)
B. What are the key responsibilities and creative contributions of fashion designers when it comes to designing and producing costumes for fashion shows (10)
- (OR)
- C. List out the reasons for the changes in fashion (6)
D. Explain the various stages of fashion cycles for Jeggings and Jeans. (10)
12. A. Elaborate on the Psychology of colors and its application. (6)
B. Explain the role of lines as an element of design in garments with illustration (10)

(OR)

- C. How do natural, stylized, geometrical, and abstract shapes differ in their visual aesthetics in design contexts? (6)
 - D. With an illustration brief about the prang color wheel (10)
13. A. Proportion is not pleasing when all areas are exactly equal in size - Justify with an illustration (6)
- B. Explain on the different methods of achieving emphasis while designing garments (10)

(OR)

- C. Can you explain the concept of asymmetrical balance in fashion, and provide examples of how designers have successfully incorporated it into their collections to create unique and striking looks? (6)
 - D. How Rhythm can effectively be used for designing a women's dress? (10)
14. A. What is a Pocket? List down the different types of pockets used in Men's cargo Trousers. (6)
- B. Imagine you are a designer and you have to design a trendy skirt for your customer. What design you would suggest? Explain with an illustration. (10)

(OR)

- C. List down the different types of necklines and collars with a neat sketch (6)
 - D. Design a women's garment incorporating 4 different fullness. (10)
15. A. How do fashion analysts and trend forecasters gather and interpret data from social media, consumer behavior, and industry insights to predict upcoming fashion trends? (6)
- B. What are the key methodologies and tools used in conducting market research for fashion trend forecasting, and how has technology influenced the accuracy and efficiency of these methods? (10)

(OR)

- C. What are the fundamental principles of wardrobe planning and portfolio development for fashion professionals? (6)
- D. Explain the different types of silhouettes in fashion, such as A-line, sheath, and fit-and-flare, and provide examples of when each silhouette is most suitable for everyday wear or specific occasions? (10)

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Diploma in Handloom & Textile Technology

NOV/DEC-2023 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 . List any four sectors of technical textiles.
- 2 . Outline the key properties of para-aramid fibres.
- 3 . Show the simple diagram of bias belted tires.
- 4 . State the objectives of carcass fabric in conveyor belts.
- 5 . Synthetic fibres are preferred over natural fibres for filtration. Justify
- 6 . What is cake filtration technique?
- 7 . Give the various layers in the fire fighter protective clothing and their objective.
- 8 . List the factors influencing the ballistic protection.
- 9 . Differentiate non-implantable and implantable materials used as medical textile.
- 10 . Outline the functions of geotextiles.

PART-B

(6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Discuss the scope of technical textiles in India. (6)
 - B. Give a detailed note on classification of technical textiles. (10)
- (OR)**
- C. Discuss the properties and applications of glass fibres in technical textiles. (6)
 - D. With suitable illustrations, explain the properties, structure and applications of High Performance Carbon fibres. (10)

12. A. Discuss the properties required for tyre cord and fibres used for manufacturing of the same. (6)

B. With suitable diagram, explain the manufacturing process of tyre cord. (10)

(OR)

C. Give a brief note on air bags used in automobiles. (6)

D. Discuss the construction and manufacturing of conveyor belts and fabrics. (10)

13. A. Discuss the method of fabric selection for filtration. (6)

B. Explain the principles of solid – liquid filtration mechanism with suitable illustrations. (10)

(OR)

C. Discuss in brief about the dry filtration. (6)

D. With suitable sketch, explain the various methods of Dust cleaning mechanisms. (10)

14. A. Give a brief note on principle of ballistic protection with suitable representations. (6)

B. Elaborate the influence of type of fibres and fabric structure on designing the ballistic protective materials. (10)

(OR)

C. Write a brief note on flame protective clothing. (6)

D. Give a detailed account on different types of chemical protective textiles. (10)

15. A. Discuss in detail about the biomaterials used in medical textiles. (6)

B. Give a detailed account on various implantable textile materials used in medical field with respect to its requirements, fibres, and fabric structure used. (10)

(OR)

C. Give a brief note on various property requirements and testing methods for geotextiles. (6)

D. Discuss in detail on various textile structures used for geo textile applications. (10)

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NOV/DEC-2023 SEMESTER EXAMINATION

(Regulation-2021)

Semester : 05

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 the term apparel marketing.
2. List out the different types of advertising media.
3. Define the term sourcing.
4. List out the important raw material and accessories required to produce a garment.
5. Mention the different types of apparel merchandising.
6. Define retail merchandising.
7. What do you mean by post- shipment documentation.
8. Mention the different types of Export finance.
9. Write any four garment marketing related software applications.
10. Mention the basic terms of payment in an international market.

PART-B

(6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Briefly explain the scope and functions of apparel marketing. (6)
B. Explain the different types of advertising media in detail. (10)
(OR)
C. Write the comparison of International and domestic market. (6)
D. Briefly explain the marketing strategies. (10)
12. A. Write a note on role of merchandiser in an apparel industry. (6)
B. Briefly explain about retail and visual merchandising. (10)
(OR)
C. List out the functions of merchandising dept in an apparel industry. (6)

- D. Describe the responsibilities of a merchandiser. (10)
13. A. List out the important factors to be considered in sourcing of raw material and accessories. (6)
- B. Describe how the fabric is sourced based on the end use. List out the specifications of fabric. (10)

(OR)

- C. Write a note on need of materials management in a sourcing department. (6)
- D. Briefly explain the sourcing of accessories. (10)
14. A. Give an outline of export procedures and formalities. (6)
- B. Briefly explain the documents an exporter has to prepare when the goods are ready for shipment. (10)

(OR)

- C. Briefly explain an export rules and regulations. (6)
- D. Compare pre-shipment and post – shipment documentation. (10)
15. A. Explain the scope of time management in merchandising. (6)
- B. Briefly explain the applications of computer and software's in different department of garment industry. (10)

(OR)

- C. Why production scheduling is necessary explain in brief. (6)
- D. Explain the following (10)
- a) Accessories follow-up
 - b) Practical check points.

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NOV/DEC-2023 SEMESTER EXAMINATION

(Regulation-2021)

Semester : 05

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. What are enzymes?
2. Mention the merits and demerits in using enzymes.
3. Which bleaching agent is suitable for the combined process and why?
4. Give the flow chart for the pretreatment and dyeing of Polyester/Wool fabric.
5. List the chemicals used in khadi print with their functions.
6. Mention the methods of digital printing.
7. Define plasma.
8. List any four factors to be considered while processing garments.
9. Suggest alternatives to any two harmful chemicals used in wet processing.
10. Define TDS.

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Discuss on the mechanism of enzyme action. (6)
B. Explain the process of enzymatic degumming and scouring. (10)
(OR)
C. Write notes on bio-finishing process. (6)
D. In detail explain the role of enzymes in denim washing. (10)
12. A. Write on the need and importance of combined processing. (6)
B. Explain the process of combined scouring and bleaching of cotton goods. (10)
(OR)
C. Discuss about the machines used in the continuous process. (6)

- D. Explain the process of pretreatment and dyeing of Polyester/Cotton. (10)
13. A. Discuss the process of Brasso print. (6)
B. Describe the process of flock and foam printing with recipe. (10)
- (OR)**
- C. Write notes on the inks and substrate used in digital printing. (6)
D. Discuss on the concept of digital printing process with advantages and disadvantages. (10)
14. A. Write the concept of UV protection finish. (6)
B. Discuss in detail on the process of microencapsulation. (10)
- (OR)**
- C. List the advantages and disadvantages of processing garments. (6)
D. Explain the working of paddle garment dyeing machine with neat sketch. (10)
15. A. Discuss about the various pollution caused by the textile industry. (6)
B. Summarize the harmful chemicals used in textile wet processing and suggest the alternatives for the same. (10)
- (OR)**
- C. Suggest the tolerance level of effluent with respect to various water characteristics. (6)
D. Explain the design and working of ETP for textile wet processing industry. (10)
