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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-2024 SEMESTER EXAMINATION

(Regulation-2021)

Semester : 05

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 . Give the classification of jacquard loom.
- 2 . What is casting out in jacquard?
- 3 . State the importance of quick style change.
- 4 . Give the weft insertion rates of various types of shuttleless looms
- 5 . List the various yarn insertion configurations in air-jet loom.
- 6 . State the limitations of water jet loom.
- 7 . Give the Pierce's formula for calculating diameter of cotton yarn in inch.
- 8 . Define the term 'Fabric cover factor'.
- 9 . Define the terms thread density and areal density.
- 10 . Give the formula for calculating EPI and PPI in a fabric.

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Give the classification of types of shedding in jacquard loom and mention (6)
their advantages and limitations.
- B. With a neat diagram, explain the working mechanism of Double Lift Single (10)
Cylinder Jacquard weaving.

(OR)

- C. Discuss the advantages and limitations of Single Lift Single Cylinder (6)
Jacquard.
- D. Explain the working mechanism of Electronic Jacquard machine with suitable (10)
sketch.

12. A. Give a detailed account of weft accumulators with diagram. (6)
B. With suitable sketch, explain the functioning of torsion bar picking mechanism. (10)

(OR)

- C. Give a brief note on the techno-economics of shuttleless looms over shuttle looms. (6)
D. Describe the various rapier drive arrangements with neat diagrams. (10)
13. A. Discuss the selvage formation in shuttleless loom. (6)
B. Elaborate on weft insertion mechanism in water jet loom and developments in the same with suitable sketch. (10)

(OR)

- C. Give a brief note on loom monitoring systems and their advantages. (6)
D. With neat sketch, discuss the principle of multiphase weaving and compare it with multi layer weaving. (10)
14. A. Calculate the yarn diameter in inches for the following yarns as per Pierce formula. (6)
(i) 2/80 Ne (ii) 20 Tex
B. Derive the Pierce's formula for estimation of diameter of yarns. (10)

(OR)

- C. Derive the formula for cloth cover factor. (6)
D. A plain cotton fabric is woven to the following details: warp: 20 tex, 28 ends/cm; Weft: 35 tex, 25 picks/cm (density of cotton 1.52 g/cm³). What is the total fractional cover factor? (10)
15. A. Distinguish between fabric cover factor and fractional cover factor. (6)
B. Calculate the warp weight and weft weight in kgs to produce 4000m of the fabric with the given particulars. (10)
- Number of warp ends – 400
 - Warp count – 40 Ne
 - EPI - 60

- Fabric width – 58 inches
- PPI – 50
- Weft count – 30 Ne
- Warp crimp – 8%
- Weft crimp – 8%

(OR)

- C. A cloth is made with 40 ends per inch of 20 Ne yarn. Calculate the EPI of cloth to be used, if a cloth of the same compactness is to be produced with 40 Ne. (6)
- D. Calculate the amount of yarn to produce 100 yds fabric with the given particulars. (10)
- No. of warp yarn per cm = 90
 - No. of weft yarn per cm = 85
 - Count of warp yarn = 70 denier
 - Count of weft yarn = 70 denier
 - Fabric width = 60 inch
 - Warp yarn crimp = 4%
 - Weft yarn crimp = 6%

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Diploma in Handloom & Textile Technology

APRIL/MAY-2024 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. Name any four instrument used for measurement of yarn count.
2. Write the formula to calculate the cover factor of a fabric.
3. When does the grab test method be preferred in tensile strength test?
4. What are the samples to be inducted for bursting strength test?
5. What is the sample size used for fabric stiffness testing?
6. Name any two products that would require to be tested for water repellency.
7. Name any two products required to be tested for colour fastness against light.
8. What are the two methods of rubbing in colour fastness test against rubbing?
9. Mention any two packing defects in garment industry.
10. What are all the fabric inspection systems followed in the garment industry?

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Explain the procedure to be followed with precautionary measures during the measurement of length and width of a fabric (6)
B. With neat sketch, explain the process of measurement of thickness of a fabric. (10)
- (OR)
- C. Discuss about the yarn crimp measurement. (6)
D. Explain the features of a random sampling technique and explain the selection of random fabric sample from the bulk. (10)
12. A. Discuss in brief about the preparation of fabric sample for tensile strength test. (6)
B. Explain the process of measurement of tear strength using elemendorf tear strength tester. (10)

(OR)

- C. Clarify the requirement of bursting strength over tensile strength for certain fabric. (6)
 - D. Discuss in detail on principle of working and measurement of tensile properties in universal tensile testing equipment. (10)
13. A. Briefly discuss the process of testing of wrinkle recovery of a fabric. (6)
- B. With schematic diagram, explain the sample preparation and testing of fabric crease recovery (10)

(OR)

- C. Briefly discuss the process of testing of fabric shrinkage. (6)
 - D. With schematic diagram, explain the sample preparation and assessment of fabric pilling resistance. (10)
14. A. Discuss the importance of grey scale and its usage in colour fastness testing. (6)
- B. Discuss in detail about the sample preparation, washing solution formulation and testing of colour fastness against washing process. (10)

(OR)

- C. Write the importance of measurement of colour fastness against perspiration. (6)
 - D. Discuss in detail about the sample preparation and assessment process involved in testing of colour fastness against light. (10)
15. A. Discuss on different fabric inspection instruments used in garment industry. (6)
- B. Explain the procedure of determination of quality of a fabric using 4-point system. (10)

(OR)

- C. Write short notes on AQL. (6)
- D. Elaborate the process of ensuring the quality of garment during its preparation from fabric to packing stage. (10)

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Diploma in Handloom & Textile Technology

APRIL/MAY-2024 SEMESTER EXAMINATION

(Regulation-2021)

Semester : 05

Time:3 Hours

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

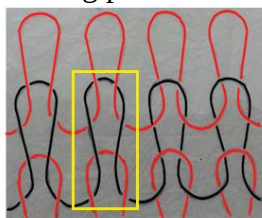
Maximum Marks: 100

PART-A

(10×2=20 Marks)

Answer all the questions within two to three sentences

- 1 . What is stitch length?
- 2 . In knitting industry, combed hosiery yarn is preferred than carded yarn- Justify your answer.
- 3 . Draw the diagram of sinker and mention its parts.
- 4 . Differentiate between top creel and side creel of knitting.
- 5 . What are the reasons for the curling behavior of the single jersey fabric?
- 6 . Identify the number of intermeshing points from the highlighted structure.



- 7 . State the principles of flat knitting.
- 8 . Mention the basic structures produced by flat knitting machine.
- 9 . What is closed lap and open lap?
- 10 . Differentiate tricot and raschel warp knitting machine with respect to needle.

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Identify the reasons for the growth of knitting industry. (6)
 - B. Infer the properties and characteristic difference between the knit, woven and nonwoven fabrics. (10)
- (OR)**
- C. Compare warp knitting and weft knitting process (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 latch 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. Describe the elements of knitted loop structures with suitable illustration. (6)

D. With necessary sketch explain the passage of material through weft knitting machine along with its functional elements and its importance (10)

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

B. Describe the structures, diagrammatic, symbolic representations and properties of plain weft knit structure. (10)

(OR)

C. Explain the factors affecting the formation of knitted loop structures in knitted fabrics. (6)

D. Analysis the structures, diagrammatic, symbolic representations and properties of purl weft knit structure. (10)

14. A. Explain the classification of flat knitting machines. (6)

B. Explain the working mechanism of computer control flat knitting machine with suitable sketch. (10)

(OR)

C. Describe the basic elements and its functions of flat knitting machine. (6)

D. Discuss in detail how various structures produced by using flat knitting machines with suitable structure. (10)

15. A. Describe the basic elements and its functions of 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 various applications of warp knitted fabrics in technical applications (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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APRIL/MAY-2024 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 the four dress materials woven with Extra Warp and Extra Weft figuring.
2. When are the plain cards required to weave figured Extra Weft fabric?
3. Indicate the warp and weft series used in the Patent Satin structure.
4. What is the use of the Working Comber Board?
5. Write the salient features of Traditional Tapestry.
6. Define the structure of the Warp Backed cloth.
7. How is the figure produced using the Double cloth structure?
8. Mark 4 pick Terry weave indicating the warp series and weft used.
9. List the different sheds formed in Leno weaving.
10. How does the Chenille pile differ from other pile structures?

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Table the difference between Extra Warp and Extra Weft figuring structures. (6)
B. Using the guide graph on 20 x 20, develop the figured Extra Warp graph on 60 x 20 taking the 2 ground ends: 1 extra warp figure end ratio. (10)
- (OR)
- C. Explain the method of weaving Extra Warp figured fabric using the jacquard and healds setup. (6)
D. Taking the guide graph on 24 x 24, explain the punching, lacing, and weaving method to produce figured Extra Weft fabric using only jacquard (without healds). (10)
12. A. Draw the drafting order followed in the loom set with working comber board and healds to weave Patent Satin. (6)
B. Develop the complete structure of the Fast Back Figured pique on 48 x 48 using the guide graph on 16 x 12. (10)

(OR)

- C. Explain the method of weaving Fast Back Pique figured fabric using the jacquard and healds setup. (6)
- D. Develop the complete structure of the Figured Patent Satin on 48 x 48 using the guide graph on 16 x 12. (10)
13. A. Table the difference between Warp Backed and Weft Backed figured cloth structures. (6)
- B. Mark the four weaves of 4 picks reversible Contemporary Tapestry. Also, draw the picks interlacing diagram for the same. (10)
- (OR)**
- C. Mark the three weaves of 3 picks reversible Contemporary Tapestry. Also, draw the picks interlacing diagram for the same. (6)
- D. Develop the complete structure of the Warp Backed cloth on 48 x 24 using the guide graph on 24 x 24. (10)
14. A. Explain the method of weaving Figured Terry fabric using the jacquard with sectional harness – sectional draft and healds setup. (6)
- B. Using the 24 x 24 guide graph develop the complete structure of Figured Interchanging Double Cloth on 48 x 48. (10)
- (OR)**
- C. Explain the method of weaving Figured Interchanging Double Cloth using the jacquard with straight harness – sectional draft setup. (6)
- D. Using the 12 x 16 guide graph develop the complete structure of Figured 3 pick Terry on 48 x 48. (10)
15. A. Table the difference between Gauze and Leno (6)
- B. Draw the Draft and Interlacing Diagram of the Leno Stripe effect formed by combining straight draft Leno with plain weave. (10)
- (OR)**
- C. Explain the method of manufacturing Chenille pile fabric (6)
- D. Draw the Draft and Interlacing Diagram of the Leno Cord effect formed by combining straight draft Leno over cord ends with plain weave. (10)

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APRIL/MAY-2024 SEMESTER EXAMINATION

(Regulation-2021)

Semester : 05

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. Define FAD.
2. State the reasons for the change in fashion.
3. What is hue, value and intensity in fashion designing?
4. List the basic elements of design.
5. Differentiate formal, informal and radial balance
6. What is proportion in design?
7. Illustrate any two collars and necklines.
8. Classify the different types of sleeves.
9. Brief the term “wardrobe planning”
10. Name and Illustrate any four types of silhouettes

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Explain the designers’ role in styling and production of costumes (6)
B. Illustrate and outline the various stages of fashion cycle with suitable example (10)
- (OR)
- C. Classify the different fashion theories with example. (6)
D. Explain different fashion cycle with suitable example and discuss the reason (10)
for the same.
12. A. Discuss the term texture and its types & applications in clothing with (6)
illustration.
B. Outline the various elements of design and their application in apparel with (10)
illustration

(OR)

- C. Illustrate and explain the Prangs colour chart. (6)
- D. State and explain the psychology of colour and its impact on the apparel design selection. (10)

13. A. Explain the various ways through which rhythm can be created with illustration (6)
- B. Illustrate and explain how the “emphasis and harmony” can be achieved in a garment design (10)

(OR)

- C. Detail the concept of balance with suitable sketch. (6)
- D. Enumerate the role of scale or proportion in planning the shapes in apparel design. (10)

14. A. Classify the different types of skirts with their design features. (6)
- B. .Illustrate and explain the various designs of trousers. (10)

(OR)

- C. Evaluate the different application of tucks in kids frock with neat illustration. (6)
- D. Discuss in detail the various types of collar design and their application in different garments with suitable sketch. (10)

15. A. What do you mean by tend forecast? State their impact on garment design. (6)
- B. State the purpose of portfolio and elucidate in detail the steps involved in developing a portfolio? (10)

(OR)

- C. State the necessity of the wardrobe planning. (6)
- D. Analyse in detail about the methods used in performing the fashion forecasting process (10)

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APRIL/MAY-2024 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. How are technical textiles different from fashion apparel?
2. Give any two properties of carbon fibres.
3. List the fibres suitable for manufacturing tyre cord.
4. Name the processes in conveyor belt manufacturing.
5. Mention the various areas where textile filters are used.
6. What is the theory behind dust collection?
7. What are the various fibres used in protective clothing.
8. State the need for protective clothing.
9. List the different materials used in bio textiles.
10. What are implantable medical textiles? Give an example.

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Write a brief note on the various raw materials used for technical textiles. (6)
B. Explain the twelve sectors of technical textiles in detail. (10)
- (OR)
- C. Highlight the various applications of technical textiles. (6)
D. Discuss the properties, structure and applications of glass fibre in detail. (10)
12. A. Explain the characters of a fiber that would be required for tyre-cord manufacturing. (6)
B. Detail the process of manufacturing tyre-cords. (10)

(OR)

- C. Briefly state the requirements of seat belt and air bags. (6)
- D. Elucidate the physical and mechanical properties of conveyor belts along with their construction. (10)
13. A. Brief the process of cleaning of filters. (6)
- B. Elucidate the role of textiles in liquid filtration in detail. (10)
- (OR)**
- C. Discuss the various types of filtration. (6)
- D. Elaborately discuss the principles of filtration. (10)
14. A. Write a note on the requirements of protective clothing. (6)
- B. Discuss the principle behind ballistic protection and also detail the characteristics of fabrics used for it. (10)
- (OR)**
- C. How are chemical protective textiles made? State their usage. (6)
- D. Explain the significance of flame-resistant protective clothing and detail how they are manufactured. (10)
15. A. Discuss the various types of materials used in geotextiles. (6)
- B. Explain the classification of medical textiles in detail with their characteristics and usage. (10)
- (OR)**
- C. Explain the various types of sutures used and state the processes behind their development briefly. (6)
- D. Describe the applications of geotextiles in detail. (10)

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APRIL/MAY-2024 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. State the purpose of advertising.
2. Why market research need to be done before launching any product?
3. List the functions of merchandising department.
4. List the role of visual merchandiser.
5. Classify the different sourcing methods used in apparel industry
6. Mention the role of merchandiser in sourcing process
7. State the functions of Shipping bill.
8. What do you mean by clean bill of lading?
9. How time and action plan will help the merchandiser in achieving milestones?
10. Provide the advantages of Gantt chart.

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Mention various marketing strategies used in apparel product sales. (6)
B. Outline the importance of market research in positioning an apparel product in the market. (10)
- (OR)
- C. Classify different sales promotion methods used for textile products (6)
D. Summarise the different types of advertising methods and various medias used to advertise fashion products with suitable example. (10)
12. A. Differentiate retail merchandising and visual merchandising. (6)
B. Discuss in detail the various roles and responsibilities of an apparel merchandiser. (10)

(OR)

- C. Enlist the responsibilities of fashion merchandiser. (6)
- D. Explain the necessity and importance of merchandiser to interact with other departments of apparel manufacturing firm. (10)

- 13. A. Illustrate and explain the various steps involved in sourcing process. (6)
- B. Analyse and report the importance of “make to stock or make to order” decision in apparel industry (10)

(OR)

- C. How will you evaluate the performance of the vendor? (6)
- D. List out the various factors that influence the sourcing process in detail. (10)

- 14. A. Differentiate pre-shipment and post-shipment process (6)
- B. Discuss in detail the functions, components and importance of various principal documents used in export process (10)

(OR)

- C. Classify the different types of invoices used in apparel export. (6)
- D. Outline the importance of different regulatory documents used in apparel export. (10)

- 15. A. State the importance production scheduling process in managing time. (6)
- B. Analyse and report the advantages and disadvantages of computerizing the marketing and merchandising activities. (10)

(OR)

- C. Illustrate and explain the functions of route card and its components. (6)
- D. Develop a scheduling chart for sewing process using graph method. Assume necessary data to showcase the buffer time and bottle neck point. (10)

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APRIL/MAY-2024 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 is the mechanism of enzyme action on textile?
2. How the scouring process of cotton is performed using enzymes? Explain.
3. Can Sodium Hypochlorite be used for combined scouring and bleaching? Justify.
4. Write the process sequence steps involved in the pretreatment of Polyester/Cotton fabrics.
5. Enlist the methods used to produce Flock printing in textiles.
6. What are the demerits of digital printing?
7. What are the various methods used for preparation of microcapsules in textiles?
8. What is meant by Solar Protection Factor? Explain with formula.
9. State the problems in using formaldehyde in textile finishing with acceptable limits of formaldehyde content in clothing.
10. Define BOD.

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Describe in detail about the use of enzymes for degumming and bleaching of Silk with mechanism, recipe and application procedure. (6)
B. Brief about the Biopolishing process on cotton with mechanism, recipe and application procedure. (10)
- (OR)
- C. Enumerate in detail about the process conditions for activating enzymes and factors effecting the enzyme treatment on textiles. (6)
D. Brief about the Denim washing process in detail. (10)
12. A. Brief about the combined desizing and scouring process performed on cotton goods. (6)
B. Explain in detail about pretreatment and dyeing process of Polyester/Wool blends. (10)

(OR)

- C. Brief about the pretreatment and dyeing processes of Cotton/Spandex blends. (6)
- D. Explain in detail about pretreatment and dyeing process of Polyester/Viscose blends. (10)

- 13. A. Brief about the Crepon style of printing. (6)
- B. Describe in detail about the Khadi printing and Metallic powder printing. (10)

(OR)

- C. Brief about the pretreatment done for the substrates used in Digital printing. (6)
- D. Explain in detail about the mechanism of Drop on demand digital printing with advantages. (10)

- 14. A. Brief about the chemistry and mechanism of antimicrobial finishing on textiles. (6)
- B. Describe in detail about the definition, concept and application of Nanotechnology in textiles. (10)

(OR)

- C. Brief about the applications of Plasma Technology in Textile Processing. (6)
- D. Enumerate in detail about the Rotary garment dyeing machine with neat sketch. (10)

- 15. A. Brief about the list of banned dyes and its alternatives. (6)
- B. Enumerate in detail about the pollution in textile processing with tolerance level of effluents. (10)

(OR)

- C. Brief about the characteristics of waste water. (6)
- D. Describe in detail about the design and working of Effluent Treatment Plant. (10)

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APRIL/MAY-2024 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 NPD?
2. Define Kaizen Model.
3. Define Introductory Stage.
4. What do you mean by Consumerism?
5. What is called Innovation?
6. Define Decision making.
7. Why the product designs depend on Concepts?
8. What is called simulation?
9. Define Re-Engineering.
10. What is Benchmarking?

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Briefly Explain the types of product and its Level? (6)
B. Illustrate the NPD process with suitable Examples. (10)

(OR)

 - C. How does the Brainstorming can apply by the Production Manager? (6)
D. Explain the steps involved in Design Process with the Diagram. (10)
-
12. A. What are the Characteristics of Successful Product Development? (6)
B. Do you agree Product life cycle can change the Business Strategy? Discuss. (10)

(OR)

 - C. Describe the need of Customer Identification for the Product Design. (6)

- D. What are the phases of Generic Product Development Process? (10)
13. A. Difference between decision making and iteration method. (6)
B. What are factors affecting from design Innovation to design Imitation? (10)
- (OR)**
- C. Explain the evolution and its types of Product Design. (6)
D. Write down the different phases of Morphology Design. (10)
14. A. Explain the role of Computers in design. (6)
B. How the economic factor and financial feasibility does work in design? (10)
- (OR)**
- C. Differentiate the Product Development Vs Product Design. (6)
D. What do you understand by RPD (Rapid Prototyping Design)? (10)
15. A. Explain the role of Weaver in the Design Technology. (6)
B. Do you agree design evaluation is done by Research? Write down the steps. (10)
- (OR)**
- C. What is the role of Designer in the product module? (6)
D. Product design is a “Boon or Bane” to the Handloom sector – Discuss. (10)

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

Diploma in Handloom & Textile Technology

APRIL/MAY-2024 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. List the types of Renewable Energy (RE) sources.
2. Discuss the role of renewable source.
3. Define solar radiation.
4. List the different types of PV Systems.
5. Classify different types of Wind power plant.
6. List main components of Wind power plant.
7. What is Biomass?
8. Point out the factors affecting biogas generation.
9. What is tidal energy?
10. List methods of Hydrogen Energy Storage.

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Write short note on Reserves of Energy Resources in India. (6)
B. Explain about the different types of Renewable energy (RE) sources. (10)

(OR)

 - C. Write short note on World Energy Use. (6)
D. Explain the Energy Scenario around the World. (10)
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12. A. Explain the in detail about the solar radiation phenomena. (6)
B. With a neat sketch explain the construction and the principle operation of solar photovoltaic system (10)

(OR)

- C. Differentiate the Flat plate and Concentrating collectors. (6)
- D. Explain in detail about the construction of solar cell, solar module and solar array. (10)
13. A. What are the advantages of wind power systems? (6)
- B. Explain in details about the various components present in the wind power plant with neat sketch. (10)
- (OR)**
- C. Discuss principle used in the measurement of speed of the wind. (6)
- D. Generalize the factors to be consider for the site selection to install the wind power plant. (10)
14. A. What are the types of dome and drum type biogas digesters? (6)
- B. List out the classification of biogas plants and explain any two with neat sketch. (10)
- (OR)**
- C. Write down the applications of Bio-energy. (6)
- D. Explain the impacts of biomass construction, production and operation. (10)
15. A. Write a short note on Fuel cell systems. (6)
- B. Explain the operation of hydrogen energy system with schematic diagram. (10)
- (OR)**
- C. Discuss about the Electrical Energy Generation from Geothermal Energy. (6)
- D. Explain with a neat sketch the operation of OTEC plants. (10)
