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 : 01   Time:3 Hours

Course Code & Title : **BS101 MATHEMATICS-I**   Maximum Marks:100

PART-A   (10×2=20 Marks)
Answer all the questions within two to three sentences

1. Find the value of cos 75⁰.

2. Find the value of $3\text{Sin}10^0 - 4\,Sin^3 10^0$.

3. Evaluate $\lim\limits_{x \to 0} \dfrac{sin8x}{4x}$.

4. Find $\dfrac{dy}{dx}$, If y = $(x^2 + 5)^8$.

5. How many words can be formed by using all the letters in the word 'BHARAT'.

6. Evaluate $50C_{47}$.

7. A card from a pack of 52 cards is drawn. What is the probability of the card to be black?

8. State the addition theorem of probability.

9. If the mean of the data 4,5, x,9,11 is 7, find the value of x.

10. Define Acceptance Sampling.

PART-B   ((6+10)×5=80 Marks)
Answer all the questions in detail

11. A. Prove that: Cos 3A= 4 Cos³A-3 Cos A.   (6)

    B. If A+B=45⁰, prove that (1+tan A)(1+tan B) = 2 and hence deduce the value of (10) $tan22\frac{1}{2}^0$.

(OR)

    C. Prove that: $\dfrac{Sin\ 3A}{Sin\ A} - \dfrac{Cos\ 3A}{Cos\ A} = 2$ (6)

    D. If A+B+C = 180°, Verify that Sin2A− Sin2B + Sin2C = 4CosA. SinB. CosC.   (10)

12. A. Find the value of $\lim\limits_{x \to 0} \dfrac{5x-8x^2}{2x^2-3x}$.   (6)

B. If $y = x^2 Sin\ 2x$, Find $\frac{dy}{dx}$. (10)

(OR)

C. Differentiate $y = e^x \log x$ with respect to x. (6)

D. Find the differentiation of the function $\sqrt{\frac{1+x}{1-x}}$ with respect to x. (10)

13. A. $^{2n}C_3 : ^nC_3 = 11:1$, find n. (6)

B. Find the Coefficient of x^7 in the expansion of $(x^2 + \frac{1}{x})^{11}$. (10)

(OR)

C. Expand $(x^2 + 2y)^5$ by the binomial theorem. (6)

D. Find the 10th term of in the expansion of $(2x^2 + \frac{1}{x})^{12}$. (10)

14. A. Let A and B be the events such that (6)

$$P(A) = \frac{7}{13}, P(B) = \frac{9}{13}, P(A \cap B) = \frac{4}{13}.$$

Find: (i) P(A/B) (ii) P(B/A) (iii) P $(A \cup B)$.

B. State and Prove Baye's theorem. (10)

(OR)

C. A bag contains 7 white, 6 red and 5 black balls. Two balls are drawn at random. Find the probability that they will both be white. (6)

D. A bag X contains 2 white and 3 red balls and a bag Y contains 4 white and 5 red balls. One ball is drawn at random from one of the bags and is found to be red. Find the probability that it was drawn from bag Y. (10)

15. A. Explain in details about Sampling theory and its types. (6)

B. Draw the $\bar{X}$ control chart for the following data and state your conclusion: (10)

Sample No.	1	2	3	4	5	6	7	8	9	10
$\bar{X}$ (Mean)	37.5	49.5	51.5	59.2	54.7	34.7	51.4	61.4	70.4	75.3
R (Range)	9.5	12.8	10.0	9.1	7.8	5.8	14.5	2.8	3.7	8.0

Given that: sample size= 6, A_2= 0.483.

(OR)

C. The following table gives no. of defects in alignment observed of the final inspection of the certain model of an aeroplane. Calculate UCL and LCL for C- Chart. (6)

Aeroplane No.	1	2	3	4	5	6	7	8	9	10
No. of alignment Defects	2	3	2	5	2	3	5	3	0	1

D. The following data is of defective blades of 10 samples of size 100 each. Construct the np- chart and comment on the results. (10)

Sample No.:	1	2	3	4	5	6	7	8	9	10
No. of defective blade:	4	8	11	3	11	7	7	16	12	6

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Table: Quality Control- Chart Constants

| Sample Size | Chart for average $\bar{X}$ -chart | | | σ – chart – Chart for Standard Deviations | | | | | | Chart for Ranges – R- chart | | | | |
| | Factors for Control Limits | | | Factors for Control Line | Factors for Control Limits | | | | Factors for Control Line | Factors for Control Limits | | | |
n	A	A₁	A₂	c₂	B₁	B₂	B₃	B₄	d₂	D₁	D₂	D₃	D₄
2	2.121	3.760	1.880	0.5642	0	1.843	0	3.267	1.128	0	3.686	0	3.267
3	1.732	2.384	1.023	0.7236	0	1.858	0	2.568	1.693	0	4.358	0	2.575
4	1.500	1.880	0.729	0.7979	0	1.808	0	2.266	2.059	0	4.698	0	2.282
5	1.342	1.596	0.577	0.8407	0	1.756	0	2.089	2.326	0	4.918	0	2.115
6	1.225	1.410	0.483	0.8686	0.026	1.711	0.080	1.970	2.534	0	5.078	0	2.004
7	1.131	1.277	0.419	0.8882	0.105	1.672	0.118	1.882	2.704	0.205	5.203	0.076	1.924
8	1.061	1.175	0.373	0.9027	0.167	1.638	0.185	1.815	2.847	0.387	5.307	0.136	1.864
9	1.000	1.091	0.337	0.9139	0.219	1.609	0.239	1.760	2.970	0.546	5.394	0.184	1.816
10	0.949	1.028	0.308	0.9227	0.262	1.584	0.284	1.716	3.078	0.687	5.469	0.223	1.777
11	0.905	0.973	0.235	0.9390	0.299	1.561	0.321	1.679	3.173	0.812	5.534	0.256	1.744
12	0.866	0.925	0.265	0.9359	0.331	1.541	0.354	1.646	3.258	0.924	5.592	0.284	1.716
13	0.832	0.881	0.249	0.9410	0.359	1.523	0.382	1.618	3.336	1.026	5.646	0.308	1.692
14	0.802	0.848	0.235	0.9453	0.384	1.507	0.406	1.594	3.407	1.121	5.693	0.329	1.671
15	0.775	0.816	0.223	0.9490	0.406	1.492	0.428	1.572	3.472	1.207	5.737	0.348	1.652
16	0.750	0.788	0.212	0.9523	0.427	1.478	0.448	1.552	3.532	1.285	5.779	0.364	1.636
17	0.728	0.762	0.203	0.9551	0.415	1.465	0.466	1.534	3.588	1.359	5.817	0.379	1.621
18	0.707	0.738	0.194	0.9576	0.461	1.454	0.482	1.518	3.640	1.426	5.854	0.392	1.608
19	0.688	0.717	0.184	0.9599	0.477	1.443	0.497	1.503	3.689	1.490	5.888	0.404	1.596
20	0.671	0.697	0.110	0.9619	0.401	1.433	0.510	1.490	3.735	1.548	5.922	0.414	1.586

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Semester	: 01	Time:3 Hours
Course Code & Title	: **HS101 : COMMUNICATION SKILLS IN ENGLISH**	Maximum Marks: 100

PART-A   (10×2=20 Marks)
Answer all the questions within two to three sentences

1. What is communication?

2. Define 'Self-awareness' as the important life skill.

3. What is written communication?

4. Explain 'Case studies'.

5. Identify the following lines and name the poem from which these lines have been taken.

   "*Into the dreary desert sand of dead habit*

   Where the mind is led forward by thee

   Into ever-widening thought and action

   Into that heaven of freedom, my father, let my Country awake."

6. Explain the art of precis writing.

7. What is E-Mail writing?

8. Who is the author of "The Room of the Roof"?

9. Fill in the blanks with the appropriate verb forms.

   a) The bank_____(opens, open) at nine 'o' clock in the morning.

   b) There_____ (was/were) too many people in the room.

10. Fill in the blanks with suitable prepositions.

   a) This book lies_____ the table.(on/to)

   b) Kamal has lived in this village _____1978.(since/from)

PART-B   ((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. What are the types of communication?   (6)

    B. What are the different barriers to effective communication?   (10)

(6)

C. Elaborate art of effective communication.

(10)

D. Explain the 7 Cs for effective communication.

(6)

12. A. Explain the importance of soft skills.

(10)

B. Define soft skills .Differentiate between soft skills and hard skills.

(OR)

(6)

C. Explain about "Team Work" and "Creativity" as a soft skill.

(10)

D. Write about the importance of all the life skills.

(6)

13. A. *"The woods are lovely, dark and deep,*

But I have promises to keep,

And miles to go before I sleep,

And miles to go before I sleep".

    i)   How are the woods?

    ii)   Whom does 'I' refer to?

    iii)   What are the promises the speaker is talking about?

B. Read the passage given below and answer the questions that follow: (10)

Rasipuram Krishnaswami Iyer Narayanaswami, born on 10 Oct 1906 and died in Madras on May 13, 2001. Malgudi Days is a collection of short stories written by R.K.Narayan, published in 1943 by Indian Thought Publications, the publishing company Narayan himself founded in 1942. Malgudi days is a collection of 32 fictional stories set in a small beautiful town called Malgudi in South India. Malgudi is a fictional town located in South India in the novels and short stories of R.K.Narayan's work. The 1986 TV show Malgudi Days, based on Narayan's works and directed by Shankar Nag, became a phenomenon in no time, the show started many senior actors, became a popular name with his portrayal of swami.

    i)   How many stories are there in Malgudi Days?

    ii)   What is Malgudi famous for?

    iii)   Where did R.K.Narayan die?

    iv)   What is the full form of R.K.Narayan?

    v)   When did "Malgudi Days" Publish?

(OR)

C. *"I remember the night my mother* (6)

Was stung by a scorpion. Ten hours

Of steady rain had driven him

To crawl beneath a sack of rice".

    i)   Who was stung by the Scorpion?

    ii)   How the scorpion had come into the house?

    iii) Who is the evil one in the poem?

D. Read the passage given below and answer the questions that follow: (10)

It is a beautiful story of a poor couple Jim and Della. She wants to give a present to Jim for Christmas, but she does not have enough money with her. She became sad for him. She possesses very beautiful and long hair in which she takes pride. She decides to sell her beautiful long hair and buy a gift for him. She sells them for twenty dollars and buys a beautiful fob chain of platinum for Jim's gold watch. Jim returns home in the evening and he seems disturbed .He does not notice that Della has cut her hair. He has brought very beautiful and expensive combs for Della as a Christmas gift. When Della looks at them, she becomes very happy and she starts crying. Della presents the chain to Jim but he has sold the watch to buy the combs. Both Della and Jim are called the Magi. They have sacrificed for the true love of each other.

    i)   What did Della buy for her husband Jim?

    ii)   Why did Jim sell the gold watch?

    iii) Which occasion did Della buy a gift for Jim?

    iv) Write the name of the story from which the above passage has been taken.

    v)   How much Della got by selling hair?

14. A. Read the passage given below and summarize it by giving appropriate title:- (6)

Trees give shade for the benefit of others, and while they themselves stand in the sun and endure the scorching heat, they produce the fruit of which others profit. The character of good men is like that of trees. What is the use of this perishable body if no use is made of it for the benefit of mankind? Sandalwood, the more it is rubbed, the more scent does it yield. Sugarcane, the more it is peeled and cut up into pieces, the more juice does it produce. The men who are noble at heart do not lose their qualities even in losing their lives. What matters whether men praise them or not? What difference does it make whether they die at this moment or whether lives are prolonged?

Whatever may happen, those who tread in the right path will not set foot in any other. Life itself is unprofitable to a man who does not live for others. To live for the mere sake of living one's life the life of dog and cows. Those who lay down their lives for the sake of others will assuredly dwell forever in a world of bliss.

B. Write a letter to your father asking his permission to join an excursion. (10)

(OR)

C. Write an email to your uncle thanking him for the gift of a camera. (6)

D. Write a letter to the manager of a factory asking permission to visit it. (10)

15. A. Pick out the **Preposition** in the following sentences. (6)

    i) John went to Italy with his friends.

    ii) I brush my teeth before I go to bed.

    iii) She is rarely at home at this time.

B. Change the following sentences into **Passive Voice.** (10)

    i) Radha drew the painting.

    ii) I have done my work.

    iii) Kavya is receiving a gift.

    iv) Chand gave me the book.

    v) They are playing football.

(OR)

C. Fill in the blanks with suitable **Modal Verbs.** (6)

    i) _____I see my friend now, doctor? (can/could)

    ii) It _____rain today.(can/may)

    iii) Rahul _____drive a car at the age of ten.(can/must)

    iv) _____you please hand over that book to me. (would/may)

    v) I _____be the scientist in future.(will/might)

    vi) Kala _____speak English fluently.(can/would)

D. Pick out the **Pronoun** in the following sentences. (10)

    i) He read a story to his brother.

    ii) I am upset with them

    iii) She played our favourite game.

    iv) Give me your phone number.

    v) They ate with us.

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Semester : 01

Time:3 Hours

Course Code & Title : **BS105 Applied Chemistry**

Maximum Marks: 100

PART-A
(2×10=20 Marks)

Answer all the questions within two to three sentences

1. Write the hybridization and shapes of $BeCl_2$ and H_2O.

2. Define Heisenberg's Uncertainty principle.

3. What is difference between temporary hardness and permanent hardness? Write any two points.

4. Why is water softened before using in boiler?

5. Define polymer and monomer? Write any one example.

6. What is PVC? Write any three uses of PVC.

7. Give the chemical composition and uses of Producer gas.

8. Define octane number of petrol.

9. Define electronic concept of oxidation reaction and reduction reaction with a suitable example.

10. Write any four applications of Solar cell.

PART-B
(6+10) ×5=80 Marks

Answer all the questions in detail

11. A. Write a short note on Aufbau principle and Hund's Rule. (6)

    B. Explain the Rutherford atomic model. Draw the neat diagram. (10)

(OR)

    C. Define Quantum number. What are the types of Quantum numbers? (6)

    D. Explain the shapes of s, p and d orbitals. (10)

12. A. What are scales and sludges? Describe their disadvantages. (6)

B. Explain the demineralization of water by Ion exchange process or demineralization process. How are exhausted cation and anion resins regenerated? (10)

(OR)

C. Write short notes on sedimentation and filtration process. (6)

D. How is the softening of water carried out using Zeolite process? Write any two advantages and disadvantage of Zeolite process. (10)

13. A. What are the main purposes of alloying steel? (6)

B. Explain the extraction of Iron from Haematite ore using Blast Furnace with neat diagram. (10)

(OR)

C. Write the preparation and uses of Nylon 6:6. (6)

D. Write a short note on general principle of metallurgy. (10)

14. A. Write the chemical composition, calorific value and uses of LPG. (6)

B. Explain the proximate analysis of coal. (10)

(OR)

C. Define fuel. Give the classification of fuel with example. (6)

D. Describe the various physical properties of lubricant. (10)

15. A. Difference between chemical corrosion and electrochemical corrosion. Write any 4 Points. (6)

B. Explain the construction and working of Lead Storage battery. Write any three advantages and disadvantage of Lead acid battery. (10)

(OR)

C. Mention the important factors which influence the rate of corrosion of metal. (6)

D. What is Fuel cell? Explain the construction and working of H_2-O_2 fuel cell, giving a neat diagram. (10)

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Registration Number

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Semester : 02   Time:3 Hours

Course Code &Title : **BS102 Mathematics - II**   Maximum Marks:100

PART-A   (10×2=20 Marks)
Answer all the questions within two to three sentences

1. If $A = \begin{bmatrix} 3 & 2 & 1 \\ 0 & 1 & -2 \\ 1 & 3 & 4 \end{bmatrix}$ find $|A|$.

2. If $A = \begin{bmatrix} 3 & 1 & 2 \\ 1 & 0 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -1 \\ 2 & 1 \\ 3 & 1 \end{bmatrix}$ find AB.

3. Evaluate $\int x(x-1)^2 dx$.

4. Evaluate $\int \sin 7x \, dx$.

5. Find the equation of the circle with centre $(2,-3)$ and radius $\sqrt{7}$.

6. Show that the equation $4x^2 + 10xy + y^2 - 2x + 5y - 3 = 0$ represents a hyperbola.

7. If $\vec{a} = 5\vec{i} + 2\vec{j} - 3\vec{k}$ and $\vec{b} = -3\vec{i} - 2\vec{j} + 5\vec{k}$ find $3\vec{a} + 2\vec{b}$.

8. If $\vec{a}$ and $\vec{b}$ are any two vectors such that $|\vec{a}| = 6, |\vec{b}| = 4$, and $\vec{a}.\vec{b} = 12$ find the angle between them.

9. Define Type I and II error.

10. What is the assumption of t-test?

PART-B   (6+10)×5=80 Marks)
Answer all the questions in detail

11.
  A. Verify $(AB)^T = B^T A^T$ where $A = \begin{bmatrix} 1 & 2 & 3 \\ 3 & -2 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 2 \\ 2 & 0 \\ -1 & 1 \end{bmatrix}$ (6)

  B. Find the inverse of $A = \begin{bmatrix} 1 & 2 & 3 \\ -1 & 0 & 4 \\ 0 & 2 & 2 \end{bmatrix}$ (10)

(OR)

C. Find x and y when $\begin{bmatrix} 1 & 3 \\ 2 & -1 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 4 \\ 1 \end{bmatrix}$ (6)

D. Solve the equations by Cramer's rule. (10)

$2x + 2y + z = 1, x - y + 6z = 21, 3x + 2y - z = -4$

12. A. Evaluate $\int xe^{x^2} dx$ (6)

B. Evaluate $\int x \log x \, dx$ (10)

(OR)

C. Evaluate $\int_2^3 \frac{1}{x^3} dx$ (6)

D. Evaluate $\int_0^{\frac{\pi}{2}} \cos^3 x \, dx$ (10)

13. A. Find the value of p for which the points $(-1, 3)$, $(2, p)$ and $(5, -1)$ are collinear. (6)

B. Find the equation of parabola whose focus is (-1, -2) and directrix is $x - 2y + 3 = 0$. (10)

(OR)

C. Given an ellipse whose foci are at $(\pm 4, 0)$ and the eccentricity is $1/3$. Find the equation of the ellipse. (6)

D. Find the equation of a parallel line and a perpendicular line passing through the point (1,2) to the line $3x+4y=7$. (10)

14. A. Find the value of 'm' if the vectors $4\vec{i} + 7\vec{j} - 3\vec{k}$ and $m\vec{i} + 2\vec{j} - \overrightarrow{6k}$ are perpendicular. (6)

B. Find the angle between the vectors $-2\vec{i} - \vec{j} - \vec{k}$ and $4\vec{i} + 7\vec{j} + 3\vec{k}$. (10)

(OR)

C. Find $(\vec{a} + \vec{b}) \cdot (2\vec{b} - \vec{a})$ if $\vec{a} = \hat{i} + \hat{j} + 2\hat{k}$ and $\vec{b} = 3\hat{i} + 2\hat{j} - \hat{k}$ (6)

D. Find the work done by the force $2\vec{i} + \vec{j} + \vec{k}$ acting on the particle, if the particle is displaced from $4\vec{i} + \vec{j} - 3\vec{k}$ to the point $5\vec{i} + 4\vec{j} + 2\vec{k}$ (10)

15. A. A normal population has a mean of 6.48 and s.d of 1.5. In a sample of 400 **(6)** members mean is 6.75. Is the difference significant?

B. Find the value of Chi-square test **(10)**

Class	A	B	C	D	E	F
Observed frequency	15	45	85	95	60	20
Expected frequency	9.6	51.2	99.2	99.2	51.2	9.6

(OR)

C. A machinist is making engine parts with axle diameters of 0.7 inch. A random **(6)** sample of 10 parts shows a mean diameter of 0.742 inch with a standard deviation of 0.04 inch. Compute the statistic you would use to test, whether the work is meeting the specification.

D. Two random samples give the following results. **(10)**

Sample	Size	Sample mean	Sum of squares of deviations from the mean
I	10	15	90
II	12	14	108

Find if the variances are significantly different.

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Values of $F_{0.05}$

ν_2 = Degrees of freedom for denominator	ν_1 = Degrees of freedom for numerator																		
	1	2	3	4	5	6	7	8	9	10	12	15	20	25	30	40	60	120	∞
1	161	200	216	225	230	224	237	239	241	242	244	246	248	249	250	251	252	253	254
2	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38	19.40	19.41	19.43	19.45	19.46	19.46	19.47	19.48	19.49	19.50
3	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.79	8.74	8.70	8.66	8.63	8.62	8.59	8.57	8.55	8.53
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00	5.96	5.91	5.86	5.80	5.77	5.75	5.72	5.69	5.66	5.63
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77	4.74	4.68	4.62	4.56	4.52	4.50	4.46	4.43	4.40	4.37
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.06	4.00	3.94	3.87	3.83	3.81	3.77	3.74	3.70	3.67
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.64	3.57	3.51	3.44	3.40	3.38	3.34	3.30	3.27	3.23
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.35	3.28	3.22	3.15	3.11	3.08	3.04	3.01	2.97	2.93
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.14	3.07	3.01	2.94	2.89	2.86	2.83	2.79	2.75	2.71
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.98	2.91	2.85	2.77	2.73	2.70	2.66	2.61	2.58	2.54
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90	2.85	2.79	2.72	2.65	2.60	2.57	2.53	2.49	2.45	2.40
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80	2.75	2.69	2.62	2.54	2.50	2.47	2.38	2.38	2.34	2.30
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.67	2.60	2.53	2.46	2.41	2.38	2.34	2.30	2.25	2.21
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.60	2.53	2.46	2.39	2.34	2.31	2.27	2.22	2.18	2.13
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59	2.54	2.48	2.40	2.33	2.28	2.25	2.20	2.16	2.11	2.07
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.49	2.42	2.35	2.28	2.23	2.19	2.15	2.11	2.06	2.01
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49	2.45	2.38	2.31	2.23	2.18	2.15	2.10	2.06	2.01	1.96
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.41	2.34	2.27	2.19	2.14	2.11	2.06	2.02	1.97	1.92
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42	2.38	2.31	2.23	2.16	2.11	2.07	2.03	1.98	1.93	1.88
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.35	2.28	2.20	2.12	2.07	2.04	1.99	1.95	1.90	1.84
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37	2.32	2.25	2.18	2.10	2.05	2.01	1.96	1.92	1.87	1.81
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34	2.30	2.23	2.15	2.07	2.02	1.98	1.94	1.89	1.84	1.78
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32	2.27	2.20	2.13	2.05	2.00	1.96	1.91	1.86	1.81	1.76
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30	2.25	2.18	2.11	2.03	1.97	1.94	1.89	1.84	1.79	1.73
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28	2.24	2.16	2.09	2.01	1.96	1.92	1.87	1.82	1.77	1.71
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21	2.16	2.09	2.01	1.93	1.88	1.84	1.79	1.74	1.68	1.62
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12	2.08	2.00	1.92	1.84	1.78	1.74	1.69	1.64	1.58	1.51
60	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04	1.99	1.92	1.84	1.75	1.69	1.65	1.59	1.53	1.47	1.39
120	3.92	3.07	2.68	2.45	2.29	2.18	2.09	2.02	1.96	1.91	1.83	1.75	1.66	1.60	1.55	1.50	1.43	1.35	1.25
∞	3.84	3.00	2.60	2.37	2.21	2.10	2.01	1.94	1.88	1.83	1.75	1.67	1.57	1.51	1.46	1.39	1.32	1.22	1.00

Values of $F_{0.01}$

ν_2 = Degrees of freedom for denominator	ν_1 = Degrees of freedom for numerator																		
	1	2	3	4	5	6	7	8	9	10	12	15	20	25	30	40	60	120	∞
1	4,052	5,000	5,403	5,625	5,764	5,859	5,928	5,982	6,023	6,056	6,106	6,157	6,209	6,240	6,261	6,287	6,313	6,339	6,366
2	98.50	99.00	99.17	99.25	99.30	99.33	99.36	99.37	99.39	99.40	99.42	99.43	99.45	99.46	99.57	99.47	99.48	99.49	99.50
3	34.12	30.82	29.46	23.71	28.24	27.91	27.67	27.49	27.35	27.23	27.05	26.87	26.69	26.58	26.50	26.41	26.32	26.22	26.13
4	21.20	18.00	16.69	15.98	15.52	15.21	14.98	14.80	14.66	14.55	14.37	14.20	14.02	13.91	13.84	13.75	13.65	13.56	13.46
5	16.26	13.27	12.06	11.39	10.97	10.67	10.46	10.29	10.16	10.05	9.89	9.72	9.55	9.45	9.38	9.29	9.20	9.11	9.02
6	13.75	10.92	9.78	9.15	8.75	8.47	8.26	8.10	7.98	7.87	7.72	7.56	7.40	7.30	7.23	7.14	7.06	6.97	6.88
7	12.25	9.55	8.45	7.85	7.46	7.19	6.99	6.84	6.72	6.62	6.47	6.31	6.16	6.06	5.99	5.91	5.82	5.74	5.65
8	11.26	8.65	7.59	7.01	6.63	6.37	6.18	6.03	5.91	5.81	5.67	5.52	5.36	5.26	5.20	5.12	5.03	4.95	4.86
9	10.56	8.02	6.99	6.42	6.06	5.80	5.61	5.47	5.35	5.26	5.11	4.96	4.81	4.71	4.65	4.57	4.48	4.40	4.31
10	10.04	7.56	6.55	5.99	5.64	5.39	5.20	5.06	4.94	4.85	4.71	4.56	4.41	4.31	4.25	4.17	4.08	4.00	3.91
11	9.65	7.21	6.22	5.67	5.32	5.07	4.89	4.74	4.63	4.54	4.40	4.25	4.10	4.01	3.94	3.86	3.78	3.69	3.60
12	9.33	6.93	5.95	5.41	5.06	4.82	4.64	4.50	4.39	4.30	4.16	4.01	3.86	3.76	3.70	3.62	3.54	3.45	3.36
13	9.07	6.70	5.74	5.21	4.86	4.62	4.44	4.30	4.19	4.10	3.96	3.82	3.66	3.57	3.51	3.43	3.34	3.25	3.17
14	8.86	6.51	5.56	5.04	4.69	4.46	4.28	4.14	4.03	3.94	3.80	3.66	3.51	3.41	3.35	3.27	3.18	3.09	3.00
15	8.68	6.36	5.42	4.89	4.56	4.32	4.14	4.00	3.89	3.80	3.67	3.52	3.37	3.28	3.21	3.13	3.05	2.96	2.87
16	8.53	6.23	5.29	4.77	4.44	4.20	4.03	3.89	3.78	3.69	3.55	3.41	3.26	3.16	3.10	3.02	2.93	2.84	2.75
17	8.40	6.11	5.18	4.67	4.34	4.10	3.93	3.79	3.68	3.59	3.46	3.31	3.16	3.07	3.00	2.92	2.83	2.75	2.65
18	8.29	6.01	5.09	4.58	4.25	4.01	3.84	3.71	3.60	3.51	3.37	3.23	3.08	2.98	2.92	2.84	2.75	2.66	2.57
19	8.18	5.93	5.01	4.50	4.17	3.94	3.77	3.63	3.52	3.43	3.30	3.15	3.00	2.91	2.84	2.76	2.67	2.58	2.49
20	8.10	5.85	4.94	4.43	4.10	3.87	3.70	3.56	3.46	3.37	3.23	3.09	2.94	2.84	2.78	2.69	2.61	2.52	2.42
21	8.02	5.78	4.87	4.37	4.04	3.81	3.64	3.51	3.40	3.31	3.17	3.03	2.88	2.79	2.72	2.64	2.55	2.46	2.36
22	7.95	5.72	4.82	4.31	3.99	3.76	3.59	3.45	3.35	3.26	3.12	2.98	2.83	2.73	2.67	2.58	2.50	2.40	2.31
23	7.88	5.66	4.76	4.26	3.94	3.71	3.54	3.41	3.30	3.21	3.07	2.93	2.78	2.69	2.62	2.54	2.45	2.35	2.26
24	7.82	5.61	4.72	4.22	3.90	3.67	3.50	3.36	3.26	3.17	3.03	2.89	2.74	2.64	2.58	2.49	2.40	2.31	2.21
25	7.77	5.57	4.68	4.18	3.85	3.63	3.46	3.32	3.22	3.13	2.99	2.85	2.70	2.60	2.54	2.45	2.36	2.27	2.17
30	7.56	5.39	4.51	4.02	3.70	3.47	3.30	3.17	3.07	2.98	2.84	2.70	2.55	2.45	2.39	2.30	2.21	2.11	2.01
40	7.31	5.18	4.31	3.83	3.51	3.29	3.12	2.99	2.89	2.80	2.66	2.52	2.37	2.27	2.20	2.11	2.02	1.92	1.80
60	7.08	4.98	4.13	3.65	3.34	3.12	2.95	2.82	2.72	2.63	2.50	2.35	2.20	2.10	2.03	1.94	1.84	1.73	1.60
120	6.85	4.79	3.95	3.48	3.17	2.96	2.79	2.66	2.56	2.47	2.34	2.19	2.03	1.93	1.86	1.76	1.66	1.53	1.38
∞	6.63	4.61	3.78	3.32	3.02	2.80	2.64	2.51	2.41	2.32	2.18	2.04	1.88	1.77	1.70	1.59	1.47	1.32	1.00

t-Table

ν	Probability				
	0.9	0.1	0.05	0.02	0.01
1	0.158	6.314	12.706	31.821	63.657
2	0.142	2.920	4.303	6.965	9.925
3	0.137	2.353	3.182	4.541	5.841
4	0.134	2.132	2.776	3.747	4.604
5	0.132	2.015	2.571	3.365	4.032
6	0.131	1.943	2.447	3.143	3.707
7	0.130	1.895	2.365	2.998	3.496
8	0.130	1.860	2.306	2.896	3.355
9	0.129	1.833	2.262	2.821	3.250
10	0.129	1.812	2.228	2.764	3.169
11	0.129	1.796	2.201	2.718	3.106
12	0.128	1.782	2.179	2.681	3.055
13	0.128	1.771	2.160	2.650	3.012
14	0.128	1.761	2.145	2.624	2.977
15	0.128	1.753	2.131	2.602	2.947
16	0.128	1.746	2.120	2.583	2.921
17	0.128	1.740	2.110	2.567	2.898
18	0.127	1.734	2.101	2.552	2.878
19	0.127	1.729	2.093	2.539	2.861
20	0.127	1.725	2.086	2.528	2.845
21	0.127	1.721	2.080	2.518	2.831
22	0.127	1.717	2.074	2.508	2.819
23	0.127	1.714	2.069	2.500	2.807
24	0.127	1.711	2.064	2.492	2.797
25	0.127	1.708	2.060	2.485	2.787
30	0.127	1.697	2.042	2.457	2.750
40	0.126	1.684	2.021	2.423	2.704
60	0.126	1.671	2.000	2.390	2.660
120	0.126	1.658	1.980	2.358	2.617
∞	0.126	1.645	1.960	2.326	2.576

BS102 – Applied Mathematics – II
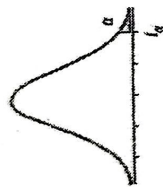
Values of t_α

v	$\alpha=0.10$	$\alpha=0.05$	$\alpha=0.025$	$\alpha=0.01$	$\alpha=0.00833$	$\alpha=0.00625$	$\alpha=0.005$
1	3.078	6.314	12.706	31.821	38.204	50.923	63.657
2	1.886	2.920	4.303	6.965	7.650	8.860	9.925
3	1.638	2.353	3.182	4.541	4.857	5.392	5.841
4	1.533	2.132	2.776	3.747	3.961	4.315	4.604
5	1.476	2.015	2.571	3.365	3.534	3.810	4.032
6	1.440	1.943	2.447	3.143	3.288	3.521	3.707
7	1.415	1.895	2.365	2.998	3.128	3.335	3.499
8	1.397	1.860	2.306	2.896	3.016	3.206	3.355
9	1.383	1.833	2.262	2.821	2.934	3.111	3.250
10	1.372	1.812	2.228	2.764	2.870	3.038	3.169
11	1.363	1.796	2.201	2.718	2.820	2.981	3.106
12	1.356	1.782	2.179	2.681	2.780	2.934	3.055
13	1.350	1.771	2.160	2.650	2.746	2.896	3.012
14	1.345	1.761	2.145	2.624	2.718	2.864	2.977
15	1.341	1.753	2.131	2.602	2.694	2.837	2.947
16	1.337	1.746	2.120	2.583	2.673	2.813	2.921
17	1.333	1.740	2.110	2.567	2.655	2.793	2.898
18	1.330	1.734	2.101	2.552	2.639	2.775	2.878
19	1.328	1.729	2.093	2.539	2.625	2.759	2.861
20	1.325	1.725	2.086	2.528	2.613	2.744	2.845
21	1.323	1.721	2.080	2.518	2.602	2.732	2.831
22	1.321	1.717	2.074	2.508	2.591	2.720	2.819
23	1.319	1.714	2.069	2.500	2.582	2.710	2.807
24	1.318	1.711	2.064	2.492	2.574	2.700	2.797
25	1.316	1.708	2.060	2.485	2.566	2.692	2.787
26	1.315	1.706	2.056	2.479	2.559	2.684	2.779
27	1.314	1.703	2.052	2.473	2.553	2.676	2.771
28	1.313	1.701	2.048	2.467	2.547	2.669	2.763
29	1.313	1.699	2.045	2.462	2.541	2.663	2.756
inf.	1.282	1.645	1.960	2.326	2.394	2.498	2.576

Values of χ^2_α

v	$\alpha=0.995$	$\alpha=0.99$	$\alpha=0.975$	$\alpha=0.95$	$\alpha=0.05$	$\alpha=0.025$	$\alpha=0.01$	$\alpha=0.005$
1	0.0000393	0.000157	0.000982	0.00393	3.841	5.024	6.635	7.879
2	0.0100	0.0201	0.0506	0.103	5.991	7.378	9.210	10.597
3	0.0717	0.115	0.216	0.352	7.815	9.348	11.345	12.838
4	0.207	0.297	0.484	0.711	9.488	11.143	13.277	14.860
5	0.412	0.554	0.831	1.145	11.070	12.832	15.086	16.750
6	0.676	0.872	1.237	1.635	12.592	14.449	16.812	18.548
7	0.989	1.239	1.690	2.167	14.067	16.013	18.475	20.278
8	1.344	1.646	2.180	2.733	15.507	17.535	20.090	21.955
9	1.735	2.088	2.700	3.325	16.919	19.023	21.666	23.589
10	2.156	2.558	3.247	3.940	18.307	20.483	23.209	25.188
11	2.603	3.053	3.816	4.575	19.675	21.920	24.725	26.757
12	3.074	3.571	4.404	5.226	21.026	23.337	26.217	28.300
13	3.565	4.107	5.009	5.892	22.362	24.736	27.688	29.819
14	4.075	4.660	5.629	6.571	23.685	26.119	29.141	31.319
15	4.601	5.229	6.262	7.261	24.996	27.488	30.578	32.801
16	5.142	5.812	6.908	7.962	26.296	28.845	32.000	34.267
17	5.697	6.408	7.564	8.672	27.587	30.191	33.409	35.718
18	6.265	7.015	8.231	9.390	28.869	31.526	34.805	37.156
19	6.844	7.633	8.907	10.117	30.144	32.852	36.191	38.582
20	7.434	8.260	9.591	10.851	31.410	34.170	37.566	39.997
21	8.034	8.897	10.283	11.591	32.671	35.479	38.932	41.401
22	8.643	9.542	10.982	12.338	33.924	36.781	40.289	42.796
23	9.260	10.196	11.689	13.091	35.172	38.076	41.638	44.181
24	9.886	10.856	12.401	13.484	36.415	39.364	42.980	45.558
25	10.520	11.524	13.120	14.611	37.652	40.646	44.314	46.928
26	11.160	12.198	13.844	15.379	38.885	41.923	45.642	48.290
27	11.808	12.879	14.573	16.151	40.113	43.194	46.963	49.645
28	12.461	13.565	15.308	16.928	41.337	44.461	48.278	50.993
29	13.121	14.256	16.047	17.708	42.557	45.772	49.588	52.336
30	13.787	14.953	16.791	18.493	43.773	46.979	50.892	53.672
40	20.706	22.164	24.433	26.509	55.758	59.342	63.691	66.766
50	27.991	29.707	32.357	34.764	67.505	71.420	76.154	79.490
60	35.535	37.485	40.482	43.188	79.082	83.298	88.379	91.952
70	43.275	45.442	48.758	51.739	90.531	95.023	100.425	104.215
80	51.172	53.540	57.153	60.391	101.879	106.629	112.329	116.321
90	59.196	61.754	65.646	69.126	113.145	118.136	124.116	128.299
100	67.328	70.065	74.222	77.929	124.342	129.561	135.807	140.169

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 : 02

Course Code & Title : **BS103 APPLIED PHYSICS**

Time:3 Hours

Maximum Marks: 100

PART-A

(10×2=20 Marks)

Answer all the questions within two to three sentences

1. Write down the dimensional formula of Force.
2. What are fundamental quantities.
3. What is Stress? Write down its unit.
4. Define Viscosity.
5. Convert 30 °C into Kelvin scale.
6. Write down the relation between Fahrenheit and Celsius temperature.
7. Define amplitude.
8. Write down the relation between frequency and wavelength.
9. Define electric current. Write down its unit.
10. What are semiconductors?

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. State the principal of Homogeneity. (6)

   B. Prove that $S = ut + \frac{1}{2}at^2$ is dimensionally correct. (10)

   (OR)

   C. What is derived physical quantity? Give two examples of it with their dimensions. (6)

   D. Convert 50 Joules into ergs using dimensions. (10)

12. A. State the Stokes's law. Write down its assumptions. (6)

   B. Define Friction. Explain different types of Friction in details. (10)

   (OR)

   C. State Hooke's law. Write down its application. (6)

D. Explain stress-strain curve with a neat sketch. (10)

13. A. Explain the three distinct modes of heat transfer. (6)
   B. State the relation among co-efficient of linear, surface and cubical expansions (10)

(OR)

   C. Explain about Thermal Expansion. (6)
   D. At 30° C, the area of a sheet of aluminum is 40 cm² and the coefficient of linear expansion is $24 \times 10^{-6} °C^{-1}$. Determine the final temperature if the final area is 40.2 cm². (10)

14. A. Explain the following terms with an example: - (6)
   (a) Free Vibration, (b) Damped Vibration, (c) Forced Vibration
   B. Define transverse wave and longitudinal wave with example and neat diagram. (10)

(OR)

   C. What is Total Internal Reflection? Write down the conditions for Total Internal Reflection. (6)
   D. An object is placed at a distance of 50 cm from a concave lens of focal length 20 cm. Find the nature and position of the image. (10)
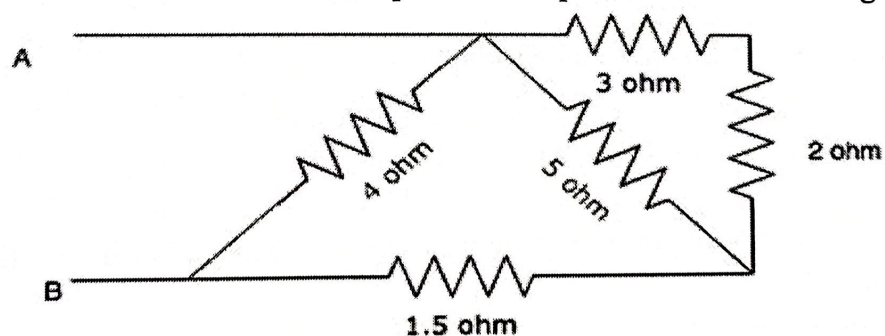
15. A. Explain in details Kirchhoff's Voltage and Current law. (6)
   B. Derive the equation for equivalent capacitance, when the capacitors are connected in series and parallel. (10)

(OR)

   C. Find the resultant resistance between point A and point B in the following circuit: (6)

   D. Explain the construction and working of NPN transistor. (10)

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NOV/DEC-2023 SEMESTER EXAMINATION

(Regulation-2021)

Semester	: 02	Time:3 Hours
Course Code & Title	: **ES102 INTRODUCTION TO IT SYSTEM**	Maximum Marks: 100

PART-A (10×2=20 Marks)

Answer all the questions within two to three sentences

1. What is search engine? Give any two examples.
2. What are the basic differences between volatile and non-volatile memory?
3. List out some important HTML elements.
4. Define image tag with an example.
5. What is software? How it differs from hardware? Why software is needed?
6. Define Operating System and give some open source operating systems available in the market.
7. Differentiate between Linux and Windows Operating system.
8. List various directory management commands in Linux.
9. What are the rules for declaring a variable? Give an example.
10. Differentiate between entry-controlled loop and exit controlled loop.

PART-B ((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Discuss about primary memory and its types in detail. (6)

    B. Draw the architecture of a computer system and explain its major (10) components.

(OR)

    C. Write short notes on secondary storage devices. (6)

    D. How computers are classified? Explain its types in detail. (10)

12. A. Write features of Windows Operating system. (6)

    B. With an example explain any five file management commands in Linux. (10)

(OR)

C. Bring out the important features of Linux operating system than Unix. (6)

D. With an example explain any five General purpose commands in Linux. (10)

13. A. Explain the structure of the HTML webpage with an example. (6)

B. How to set the width and height of an image using HTML ? (10)

(OR)

C. Explain about Cascading Style Sheets with an example (6)

D. How to set Background Color in HTML? (10)

14. A. What is power point presentation? Explain its features. (6)

B. How MS Word is different from MS Excel? Explain various features of MS Word. (10)

(OR)

C. Explain spreadsheet? Write the features of MS Excel. (6)

D. Describe and discuss MS office suits. (10)

15. A. Explain various operators available in C language with examples. (6)

B. Write a program to check whether the given year is leap year or not. (10)

(OR)

C. Explain various data types available in C language with examples. (6)

D. Write a C program to print all even numbers from 1 to 100. (10)

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Diploma in Handloom & Textile Technology
NOV/DEC-2023 SEMESTER EXAMINATION
(Regulation-2021)

Semester : 02   Time:3 Hours

Course Code &Title : ES104-Fundamentals of Electrical, Electronics Engineering   Maximum Marks:100

PART-A   (10×2=20 Marks)
Answer all the questions within two to three sentences

1. Compare Active and Passive components.

2. Draw the symbol of AND & OR Gate.

3. Define Slew rate.

4. Mention the applications of Op-Amp.

5. State Faraday's Law.

6. Distinguish EMF and MMF.

7. Draw a Power Triangle.

8. What do you mean by Cycle and Frequency?

9. Mention the applications of Motor in Textile Industries.

10. Define Transformation Ratio.

PART-B   (6+10)×5=80 Marks)
Answer all the questions in detail

11. A. Differentiate Diode and Transistor. (6)

    B. Explain the working principle and characteristics of PN Junction Diode with suitable diagram. (10)

    (OR)

    C. Discuss about the different types of Waveforms. (6)

    D. Construct the state table and explain the operation of Ripple Counter. (10)

12. A. Compare Open loop and Closed loop configuration of Op-Amp. (6)

    B. Explain in details about Half adder and Full adder. (10)

    (OR)

C. Compare the ideal and practical Op-Amp. (6)

D. What do you mean by inverting amplifier? Derive the expression for its output voltage. (10)

13. A. Brief the following terms i) EMF ii) Current iii) Power. (6)

B. Differentiate Electric and Magnetic circuit. (10)

(OR)

C. Explain in detail about the Hysteresis loop with suitable sketch. (6)

D. Describe about i) Self & Mutual inductance ii) Statically and Dynamically induced EMF. (10)

14. A. Define i) RMS Value ii) Form Factor iii) Power factor. (6)

B. Determine the Voltage and Current relationship in Star and Delta Connection with neat sketch. (10)

(OR)

C. Give the phasor representation of AC through pure Resistor, Inductor and Capacitor. (6)

D. Explain series R-C circuit with phasor diagram and derive equation of resonance frequency (f_r). (10)

15. A. Draw the characteristics curves of various types of DC Motors. (6)

B. Explain the construction and working principle of Squirrel Cage Induction Motor. (10)

(OR)

C. Briefly explain about Auto transformer. (6)

D. Explain the construction and working principle of Transformer and also derive the EMF equation with suitable diagram. (10)

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Semester   : 02

Time:3 Hours

Course Code & Title   : **ES106-ENGINEERING MECHANICS**

Maximum Marks: 100

PART-A   (10×2=20 Marks)
#### Answer all the questions within two to three sentences

1. Two equal forces are acting at a point with an angle of 60° between them. If the resultant force is equal to 20 x √3 N, find magnitude of each force.

2. Differentiate the couple and the moment.

3. State the conditions for static equilibrium of a two force planar member.

4. Illustrate with simple sketch, the different types of loads acting on a beam.

5. Define the following terms: (i) Co-efficient of friction, (ii) Angle of friction.

6. State any four applications of friction.

7. List the different methods that are used to find the centroid of plane figures.

8. Specify the significance of Centre of gravity of planar geometries.

9. Define the term 'mechanical advantage'.

10. What are reversible and non-reversible machines?

### PART-B   ((6+10)×5=80 Marks)
Answer all the questions in detail

11. A. Four forces equal to P, 2P, 3P and 4P are respectively acting along the four   (6)
    sides of square ABCD taken in order. Find the magnitude, direction and
    position of the resultant force

    B. Four forces act on bolt, A as shown in Fig. Determine the resultant of the   (10)
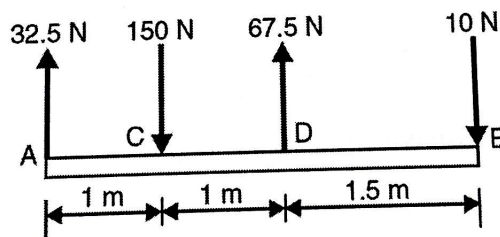   forces on the bolt
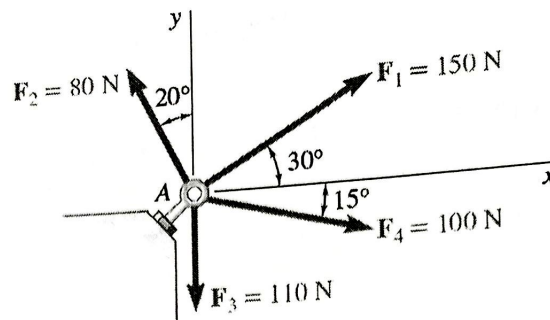
(OR)

C. Given that T = 28.3 kN and W = 25 kN, determine the magnitude and sense of the moments about point B of the following: (i) the force, T; (ii) the weight, W. **(6)**
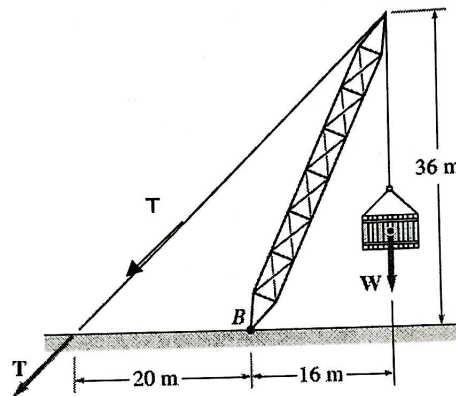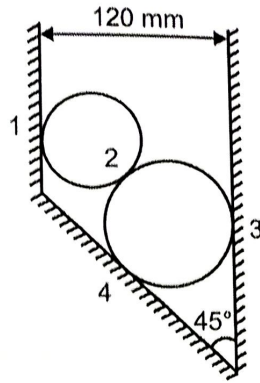

D. A system of parallel forces is acting on a rigid bar as shown in Fig. Reduce this system to: **(10)**

(i) a single force

(ii) a single force and a couple at A

12. A. Two cylinder of diameters 100 mm and 50 mm, weighing 200 N and 50 N, respectively are placed in a trough as shown in Fig. Neglecting friction, find the reactions at contact surfaces 1, 2, 3 and 4. **(6)**

B. A light string ABCDE whose extremity A is fixed, has weights W_1 and W_2 (10) attached to it at B and C. It passes round a small smooth peg at D carrying a weight of 300 N at the free end E as shown in Fig. If in the equilibrium position, BC is horizontal and AB and CD make 150° and 120° with BC, find (i) Tensions in the portion AB, BC and CD of the string and (ii) Magnitudes of W_1 and W_2.
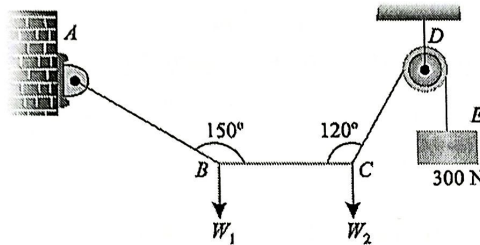

(OR)

C. A 12-m long cantilever beam carries a point load of 40 kN at 3 m from the (6) fixed end and a uniformly distributed load of 10 kN/m for a span of 6 m from the free end of the beam. Find the support reactions in the beam.

D. A simply supported beam has a span of 9 m and carries a uniformly (10) distributed load of 20 kN/m over a length of 5 m from the left end support. It also carries two point loads of 30 kN and 40 kN at 6 m and 8 m respectively from the left end support. Find the support reactions in the beam.

13. A. State the laws of static and dynamic friction. (6)

B. Two blocks A and B of weights 1 kN and 2 kN respectively are in equilibrium (10) position as shown in Fig. If the coefficient of friction between the two blocks as well as the block B and the floor is 0.3, find the force (P) required to move the block B
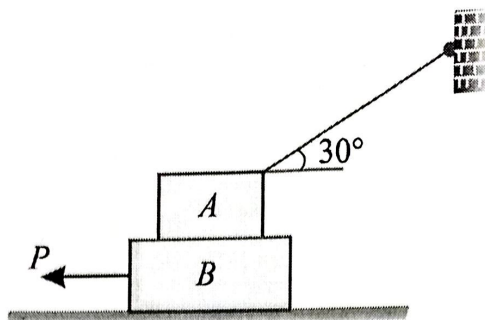
(OR)

C. Determine the minimum force, P required to push the crate up the plane. The crate has a mass of 50 kg and the coefficient of static friction between the crate and the plane, $\mu = 0.25$. (6)
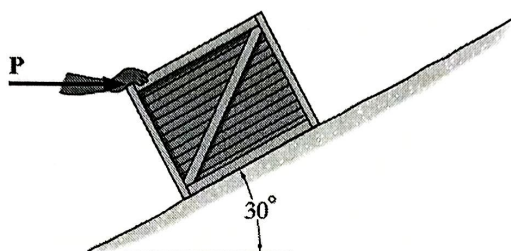
D. An effort of 200 N is required just to move a certain body up an inclined plane of angle 15° the force acting parallel to the plane. If the angle of inclination of the plane is made 20° the effort required, again applied parallel to the plane, is found to be 230 N. Find the weight of the body and the coefficient of friction. (10)

14. A. Find the centre of gravity of the T-section shown in Fig. (6)
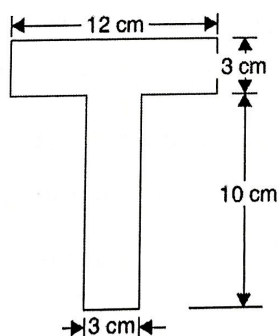
B. A semi-circular area is removed from the trapezoid as shown in Fig. Determine the centroid of the remaining area. (10)
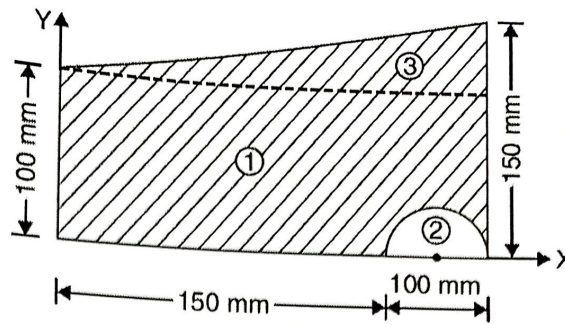
C. A frustum of a solid right circular cone has an axial hole of 50 cm diameter as (6) shown in Fig. Determine the centre of gravity of the body.

D. A right circular cylinder of 120 mm diameter is joined with a hemisphere of (10) the same diameter face to face. Find the greatest height of the cylinder, so that centre of gravity of the composite section coincides with the plane of joining the two sections. The density of the material of hemisphere is twice that the material of cylinder.

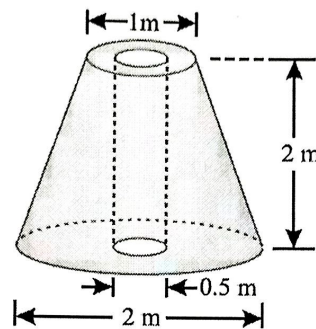15. A. In a lifting machine in which velocity ratio is 30, a load of 5000 N is lifted (6) with an effort of 360 N. Determine whether it is self-locking or reversible machine. How much is the frictional resistance?

B. In a lifting machine, an effort of 500 N is to be moved by a distance of 20 m (10) to raise a load of 10,000 N by a distance of 0.8 m. Determine the velocity ratio, mechanical advantage and efficiency of the machine. Determine also ideal effort, effort lost in friction, ideal load and frictional resistance

(OR)

C. A screw jack raises a load of 40 kN. The screw is square threaded having (6) three threads per 20 mm length and 40 mm in diameter. Calculate the force required at the end of a lever 400 mm long measured from the axis of the screw, if the coefficient of friction between screw and nut is 0.12.

D. In a wheel and axle, diameter of the wheel is 500 mm and that of the axle is (10) 200 mm. The thickness of the cord on the wheel is 6 mm and that of the axle is 20 mm. Find the velocity ratio of the machine. If the efficiency when lifting a load of 1200 N with a velocity of 10 m/min is 70%, find the effort necessary.

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NOV/DEC-2023 SEMESTER EXAMINATION
(Regulation-2021)

Semester   : 03   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 Oligomer.
2. What are post spinning operations in synthetic fiber manufacturing?
3. Which fiber is called; Artificial Wool & Artificial Silk?
4. Define crystalline & amorphous.
5. Write the chemical composition of cotton fiber.
6. Which natural fiber is called; King of fibers & Queen of fibers
7. What is carbonizing process in wool?
8. What is the difference between Nylon 6 & Nylon 6, 6 in chemical structure?
9. Which synthetic fibers are called floating fibers (floating on water)?
10. Name the spinning techniques used for production of following fibers; Polyester, Polypropylene, Viscose & Acrylic.

PART-B   ((6+10)×5=80 Marks)
Answer all the questions in detail

11. A. Classify the polymers; (i) Based on polymer structure of the monomer chain   (6) (ii) Based on polymerization.

 B. Name the commonly using spinning techniques for production of synthetic fiber?   (10) Explain the process of polymer to fiber conversion using melt spinning technique with neat diagram and its merits and demerits?

(OR)

 C. Name the different types of spin finishes and discuss the application of spin finish.   (6)

 D. With suitable line diagram, explain the draw texturing process and its principle with   (10) advantages and disadvantages.

12. A. Classify the Textiles Fibers. (6)
    B. Brief the essential and desirable properties of textile fibers. (10)

(OR)

    C. Write the difference between POY and FOY yarns and its properties. (6)
    D. Define the following; (i) Dope dyed (ii) Spun yarn (iii) De-luster (iv) Folded yarn (10)
       (v) Hydrophobic fiber.

13. A. Explain the morphological structure of Cotton fibers with suitable diagram. (6)
    B. Write minimum two properties in each on physical, chemical, thermal and biological (10)
       properties of cotton fiber and discuss briefly.

(OR)

    C. Write few important physical & chemical properties of Polynosic Rayon fiber and (6)
       its applications
    D. Brief the chemical reactions in the manufacture of Viscose Rayon with suitable flow (10)
       diagram.

14. A. Briefly Classify the wool fiber and write the chemical composition of wool Fiber. (6)
    B. Brief the life cycle of Bombyx Mori moth with diagram and write the chemical (10)
       composition of mulberry silk.

(OR)

    C. Write few important physical & chemical properties of Nylon 6, 6 fiber and its (6)
       applications
    D. Demonstrate the polymer production and fiber manufacturing process of Nylon 6. (10)

15. A. Write the following properties of polypropylene; (i) density (ii) melting point (6)
       (iii) moisture regain
    B. Explain the polymer production and fiber manufacturing process of Polyester. (10)

(OR)

    C. What are aromatic polyamide fibers? Give the chemical structures of aromatic (6)
       polyamides.
    D. Demonstrate the polymer production and fiber manufacturing process of (10)
       polypropylene.

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NOV/DEC-2023 SEMESTER EXAMINATION
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Semester   :   03   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. Write the objective of a Ginning process.

2. Name any four machines employed in blowroom process.

3. Show the positions of a front plate and back plate around the carding cylinder.

4. state the functions of a mote knives and show their position with respect to licker-in.

5. Write the objectives of combing machines.

6. Name any two comber lap preparatory methods

7. Write the following parameters of speedframe.

   Amount of draft and twist applied, Name of the feed and delivery material

8. Write the objectives of draw frame.

9. State the role of ring and traveller in ringframe machines.

10. Illustrate the relationship between delivery speed and TPI in ring spinning machines.

PART-B   ((6+10)×5=80 Marks)
Answer all the questions in detail

11. A. Write the process flow chart of a combed yarn manufacturing process.   (6)

     B. With neat diagram, explain the method of separation of cotton seed and lint in anyone type ginning machine.   (10)

(OR)

     C. Differentiate lap feed and chute feed system.   (6)

     D. Explain the objectives of a blowroom process. Also explain the sequence of various machines and their role in blowroom process.   (10)

12. A. Differentiate carding action and stripping action. (6)

   B. With neat diagram, explain the passage of material through various functional (10) elements of a carding machine.

(OR)

   C. Differentiate closed loop autoleveller and open loop autoleveller used in (6) carding machine.

   D. Calculate the production of a high speed carding machine in kg per shift of 8 (10) hours with the following particulars.

   Doffer speed – 40 rpm, Diameter of doffer – 27 inch, Hank of sliver delivered – 0.15^s Ne, Efficiency of the machine – 92%

13. A. Calculate the quantity of sliver lap delivered in kg/hour with the following (6) particulars.

   Surface speed of delivery roller - 140 metre / min and count of lap - 65 kilotex, efficiency of the machine – 75%, number of sliver lap machine – 2

   B. With neat diagram and technical specifications, explain the passage of (10) material through various functional elements of a sliver lap machine.

(OR)

   C. Calculate the production in Kg/hr of a comber machine with the following (6) particulars.

   Combing roller speed = 420 Nips/min, Length of lap fed per nip = 5 mm , Efficiency = 93%, feed Lap weight = 70 g/m, number of heads present in the machine - 8 and Noil extracted = 17%

   D. With neat diagram and technical specifications, explain the passage of (10) material through a modern combing machine.

14. A. Draw the block diagram of open – loop auto leveller in draw frame. (6)

   B. With schematic diagram and technical specifications, explain the passage of (10) material through a high speed draw frame.

(OR)

   C. Draw the schematic diagram of material passage in speedframe and indicate (6) the various functional parts.

   D. Calculate the production of a roving frame in kg / shift of 8 hours running at (10)

85% efficiency with the spindle speed of 1200 rpm. The amount of twist inserted on the roving in one inch is 1.5 and the count of roving delivered is 1.5 Ne. The number of spindle functioning on the frame is 120.

15. A. Find out the total draft applied in ring spinning machine with the following (6) particulars.

Count of roving is 1.5 Ne yarn produced in the ring frame is 40 Ne.

B. With schematic diagram and technical specifications, explain the passage of (10) material through a modern ring frame.

(OR)

C. Write brief note on bundling process. (6)

D. With neat diagram, explain the working principle of reeling machines. (10)

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PART-A   (10×2=20 Marks)
Answer all the questions within two to three sentences

1. What are the objectives of warping?

2. Write down the two common sizing defects occurs during sizing.

3. Write the names of two heald reversing motions in handloom weaving.

4. What are the two main differences between frame loom and pit loom?

5. What are the objectives of reed in handloom weaving?

6. Write the names of two let-off motions used on handloom.

7. Define the 10^S Decimal cotton count.

8. Write down the length and weight unit of Tex yarn count system.

9. Explain the term heald count.

10. What do you understand by Stockport reed count system?

PART-B   ((6+10)×5=80 Marks)
Answer all the questions in detail

11. A. Give the names of sizing ingredients used in size mixture with their functions.   (6)

    B. Write the objectives of warp sizing. With the help of neat sketch, explain the   (10)
       street warp sizing process.
(OR)

    C. Explain different forms of yarn packages used in handloom industry with the   (6)
       help of figure.

    D. Explain the sectional warping process in detail, with the use of suitable   (10)
       diagram.

12. A. Explain the roller heald reversing motion on handloom.   (6)

    B. Explain primary, secondary and auxiliary motions of handloom in detail.   (10)

(OR)

C. Differentiate between pit loom and frame loom. (6)

D. Explain different types of shed formations in detail with suitable sketches. (10)

13. A. Discuss different types of shuttles used in handloom weaving with their suitability. (6)

B. Write, types of let-off motions used in handloom weaving. Explain rope-lever and weight let-off motion with suitable sketch. (10)

(OR)

C. Explain different types of reed used in handloom weaving. (6)

D. Discuss the working principle of lattice dobby in detail with the help of suitable sketch. (10)

14. A. Convert 60 Denier metric count to Tex count system. (6)

B. Drive the conversion factor to convert Worsted system to New English system. Also convert 40^s Worsted count to New English count system. (10)

(OR)

C. Calculate the count of yarn in Tex system. If 135 grams of polyester yarn having 13500 meters of length. (6)

D. (a) Calculate the weight of yarn in kilogram. If 33000 yards of cotton yarn having 32^S Ne cotton count. (10)

(b) Calculate the count of a yarn in Nf system. If length of yarn is 6000 meters and weight is 240 grams.

15. A. Calculate the resultant count of two fold yarn composed of 40^S and 30^S Worsted. (6)

B. With the use of following particulars find out the total number of ends in 44^S stock-port reed. 60 inches reed width. Denting order - 2 ends per dent and 4 ends per dent in alternate order. (10)

(OR)

C. Calculate the average count of 20^S, 40^S, 50^S and 80^S New English cotton yarn. (01 Thread = 01 Hank) (6)

D. A folded cotton yarn whose length is 1680 yards and weight is 4 ounce. If one of the component thread is found to be 20^S Nec. What will be the count of another component thread? (10)

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Semester   : 03   Time:3 Hours

Course Code & Title   : HTPC204 Fabric structure -I   Maximum Marks: 100

PART-A   (10×2=20 Marks)
Answer all the questions within two to three sentences

1. Write the classifications of textile fabrics.

2. Write the need of using skipped draft for weaving plain fabrics.

3. What change is required in weaving to produce the wavy twill along the cloth in the loom running with 2up 2down regular twill?

4. Differentiate herring bone twill and broken twill.

5. Differentiate regular and irregular satin.

6. Name the twill derivatives used to produce diaper designs

7. Write the maximum float length of ordinary honey comb repeating on 8x8.

8. How to get gap in end way and pick way while weaving Mock leno?

9. What is meant by 'float' of thread in a weave?

10. Define Bird's Eye effect.

PART-B   ((6+10)×5=80 Marks)
Answer all the questions in detail

11. A. With a diagram explain the working of catch cord technique in weaving of   (6)
    mat and warp rib.

    B. Construct the design, draft and peg plan along with the interlacement diagram   (10)
    of the following design
    i) 4 and 2 warp rib   ii) 3 and 3 mat

(OR)

    C. How do you represent a weave by using a graph paper?   (6)

    D. Construct the following weaves   (10)

        i) 3 and 3 weft rib   ii) 4 and 2 mat weave

        iii) 5 and 3 mat weave   iv) 3 and 4 weft rib

12. A. Write the factors that influence the angle of twill. (6)

   B. Construct a transposed twill with its draft and peg plan on 24 ends x 8 picks (10) with 3-up 1-down and 1-up 3-down twill base having transposed in groups of 3.

(OR)

   C. How does the twist direction in the yarn influence the prominency of twill? (6)

   D. Construct a Broken twill with its draft and peg plan on 18 x 6 with 3 up 3 (10) down twill base by filling and missing style (3 fill 2miss)

13. A. Explain the principle of forming Diamond weave. (6)

   B. Construct the design, draft, peg plan for i) Satin dice check on 10 x 10 ii) twill (10) dice check on 8 x 8

(OR)

   C. Explain the salient features of satin fabric. (6)

   D. Construct the diaper design on 12 x 12 with draft and peg plan taking base (10) twill 2up 2 down.

14. A. Construct Huck a back on 10 x 10. (6)

   B. Construct Brighton Honey comb in 16 x 16 with draft and peg plan. (10)

(OR)

   C. Construct Warp cork screw weave in 9 x 9. (6)

   D. Construct design, draft, peg plan for Mock-leno weave on 10 x 10. Also, (10) indicate the denting order.

15. A. Construct crepe weave on 8 X 8 by the method of combination of floating (6) weave with plain threads.

   B. What is colour and weave effect? Show the stages of color application taking (10) a weave 2up/2 down twill warp way with colouring order of 1 black and 1 white both in warp and weft.

(OR)

   C. Construct the weft distorted thread effect in 14 x 14 taking 4 and 11 picks for (6) distortion.

   D. Combine the following weaves to form check effect on 20 x 20 with draft and (10) peg plan ;   Weave 1 - 10 x 10 mock leno, Weave 2 - plain

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Semester : 03   Time:3 Hours

Course Code &Title : **HTPC 205 Chemical Processing of Textiles-I**   Maximum Marks:100

PART-A   (10×2=20 Marks)
Answer all the questions within two to three sentences

1. What is the need for pretreatment process?

2. What are OBA's? How they are different from blueing agents?

3. Define Chromophores and Auxochromes with examples.

4. Compare between dyes and pigments.

5. Write the properties of Direct dyes.

6. What is the role of salt and soda in the application of reactive dyes? Explain with chemical reactions.

7. What are the advantages of solubilised vat dyes?

8. What is the role of Sodium Sulphide in the dyeing of cotton with Sulphur dyes?

9. Define the Crabbing and Potting process of wool.

10. What are metal complex dyes? What are their advantages?

PART-B   ((6+10)×5=80 Marks)
Answer all the questions in detail

11. A. Brief about the working of Gas singeing process with neat diagram.

  B. What is the composition of Cotton fiber? Explain in detail about the recipe of conventional scouring of cotton with all the mechanisms by which the impurities are removed.

(OR)

  C. Explain in detail about the acid and enzyme desizing process with appropriate recipe and mechanism.

  D. Brief about the pad chain mercerization process with neat diagram.

12. A. Brief about the different types of Padding mangles with neat diagram.

  B. Elaborate in detail about the Pressure Kier with the neat sketch.

(OR)

  C. Brief about the principle, construction and working of Jet dyeing machine with neat diagram.

  D. Enumerate in detail about the principle, construction and working of Jigger dyeing machine with neat sketch.

13. A. Brief about the components of a Reactive dye with chemical structure and examples.
    B. Why direct dyes have poor wash fastness? Explain the various after treatments used to overcome the problems with emphasis on the use of cationic dye fixing agents.

    (OR)

    C. Brief about the classification, recipe and method of application of direct dyes on cotton.
    D. Explain in detail about the mechanism, recipe and dyeing procedure of H reactive dyes on cotton.

14. A. Brief about the recipe, mechanism and application method of Solubilized vat dyes on cotton.
    B. Explain in detail about the process sequence, recipe and application of Vat dyes on cotton.

    (OR)

    C. Brief about the general properties of Azoic dyes.
    D. Describe in detail about the steps involved with recipe in the dyeing of cotton with sulphur dyes.

15. A. Brief about the degumming process of silk using enzymes.
    B. Elaborate in detail about the recipe, mechanism on dyeing of silk using acid dyes.

    (OR)

    C. Brief about the milling process of wool with neat sketch.
    D. Explain in detail about the recipe, chemistry and application of chrome dyes on wool.

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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	: **04**	Time:3 Hours
Course Code &Title	: **HTPE 202 GARMENT MANUFACTURING TECHNOLOGY**	Maximum Marks:100

PART-A   (10×2=20 Marks)

Answer all the questions within two to three sentences

1. List the departments in a garment industry.

2. Draw any two styles of women's party wear.

3. Define anthropometry.

4. Differentiate between the pattern making method followed by a tailor and a garment industry.

5. What do you mean by marker efficiency?

6. List the advantages of band knife cutting machine.

7. Classify stitches.

8. Name any four garment accessories.

9. State the function of pressure foot and back tack lever.

10. Overlock machines are widely used for sewing knitted garments. Justify.

PART-B   ((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Give short notes on the various types of fabrics used for producing men's wear.   (6)

    B. Discuss in detail about the quality assurance department and the function of quality controller in a garment industry.   (10)

    (OR)

    C. Describe the process flow chart for the production of men's full sleeved shirt.   (6)

    D. Classify garments based on season, gender and application.   (10)

12. A. Explain in detail about the precautions to be followed before taking   (6)

measurement from the body.

    B.   Give the measurements required and the drafting procedure of T- Shirt.   (10)

<p align="center">(OR)</p>

    C.   Explain in detail about the pattern making tools with neat illustration.   (6)

    D.   Describe the concept of pattern grading.   (10)

13. A.   Explain the types of cutting machines and give its functions.   (6)

    B.   Write in detail about computerized cutting machine.   (10)

<p align="center">(OR)</p>

    C.   Discuss about any three spreading and cutting defects. Also give their remedial solutions.   (6)

    D.   Describe the working principle of round knife and band knife cutting machine.   (10)

14. A.   Illustrate basic sewing machine and name its part.   (6)

    B.   Explain in detail about sewing thread and its size designation.   (10)

<p align="center">(OR)</p>

    C.   State the application of   (6)

       i) hook and loop   ii)interlining   iii)wadding

    D.   Discuss in detail about the classification of seams based on Federal standards.   (10)

15. A.   Compare SNLS and DNLS machine.   (6)

    B.   Discuss about feed of arm machine. List the area of application of the seam produced from feed of arm machine in various garments.   (10)

<p align="center">(OR)</p>

    C.   Explain fusing and pressing.   (6)

    D.   Draw a neat diagram of sewing needle and label its parts. State the purpose of each parts of sewing needle.   (10)

<p align="center">**********</p>

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Diploma in Handloom & Textile Technology
NOV/DEC-2023 SEMESTER EXAMINATION
(Regulation-2021)

Semester : 04   Time:3 Hours

Course Code & Title : HTPE203 Nonwoven Technology   Maximum Marks: 100

PART-A   (10×2=20 Marks)
Answer all the questions within two to three sentences

1. Write the definition of nonwovens as given by INDA.
2. What are the factors determining the choice of the fibre for nonwovens?
3. Which type of fibers is used in wet laid technique?
4. Give the different types of web forming system.
5. What is contact time in thermal bonding?
6. Compare foam bonding and spray bonding.
7. List the raw material requirements of spun bond fibers.
8. Justify the reasons for the requirements of high velocity air in melt blown process.
9. Compare raising and sueding treatments on nonwoven fabrics.
10. What are the property requirements of nonwoven chemical protective clothing?

PART-B   ((6+10)×5=80 Marks)
Answer all the questions in detail

11. A. List the various application of nonwoven products by relating their properties. (6)

    B. Classify the nonwoven based on their preparation and production technique. (10)

(OR)

    C. Explain the steps involved in fiber preparation process of nonwoven fabric. (6)

    D. Indicate the fiber physical and chemical characteristics required for (10)
       processing jute, polyester and polyethylene fiber in nonwoven process.

12. A. Describe the working principle of aero dynamic web forming. (6)

    B. How do you prepare the web layer by using dry laying carding technique? (10)
       Explain.

(OR)

C. Demonstrate the process sequence of wet laid technique with a neat sketch. (6)

D. Explain briefly the principle of working of parallel and cross laid web laying process with neat sketch. (10)

13. A. Categorize the principle of working of various chemical bonding processes with neat sketch. (6)

B. Demonstrate briefly the principle of working of needle punching process with suitable diagram. (10)

(OR)

C. Discuss the principle of working of various thermal bonding processes with neat sketch. (6)

D. Explain briefly the principle of working of spunlacing process with neat sketch. (10)

14. A. Differentiate the important process parameters that required for melt blown process as compared with spun bond process. (6)

B. Describe the principle of working of melt blown process with neat sketch. (10)

(OR)

C. Identify the web characteristics and application of spun bond nonwovens. (6)

D. Explain briefly the principle of working of spun bonding process with neat sketch. (10)

15. A. List out the testing based on applications of non-woven fabrics. (6)

B. List the chemical finishing treatments suitable for nonwoven structures and write about two finishing treatments. (10)

(OR)

C. Demonstrate the procedure to perform the abrasion and tear resistance test of nonwoven material. (6)

D. Which type of nonwoven technology would you prefer for medical applications? Explain with suitable examples. (10)

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PART-A   (10×2=20 Marks)
Answer all the questions within two to three sentences

1. State the functions of tensioner in cone winding and mention its types.

2. List various faults in wound packages.

3. Write the functions of expanding comb in a warping machine.

4. What are the factors affecting size pick up?

5. What are early shedding and late shedding?

6. How do the picking force be changed in cone over pick mechanism?

7. State the functions of temples.

8. What is sley eccentricity?

9. Mention types of warp stop motions wires used in loom.

10. State the purpose of drop box motion in loom.

PART-B   ((6+10)×5=80 Marks)
Answer all the questions in detail

11. A. Differentiate splicing and knotting.   (6)

    B. Explain the working principle of electronic yarn clearers with suitable   (10)
       sketches.

(OR)

    C. Calculate the production in lbs /8 hours of a modern cone winding machine   (6)
       with delivery speed – 630 yards/min, yarn count – 40ˢ Ne and efficiency –
       70%.

    D. With a neat sketch explain the working of modern pirn winding machine.   (10)

12. A. A warp containing 2650 ends is required to be sized to 12%. The length of   (6)
       sized warp on the beam is required to be 1120 yards. If the count of yarn is
       30ˢ Ne, find out the weight of unsized warp and the weight of size to put on
       the warp in lbs.

B. Explain the working of modern beam warping machine with neat sketch. (10)

(OR)

C. The fabric of 60 inch width and 52 EPI required to be produced. The warp beam is produced in a sectional warping machine with creel capacity of 240. Find out total number of ends in a beam and number of sections to be made. (6)

D. With neat sketch explain the working principle of multi cylinder sizing machine. (10)

13. A. Compare tappet shedding and dobby shedding. (6)

B. With a neat sketch explain the working principle of any one under pick mechanism. (10)

(OR)

C. Classify and explain the different motions in power loom weaving. (6)

D. Describe the working principle of negative tappet shedding mechanism in a loom with neat sketch. (10)

14. A. Compare side weft fork motion and centre weft fork motion. (6)

B. With a neat sketch explain the working of fast reed warp protection mechanism and mention for which type of fabric weaving it is suitable and why? (10)

(OR)

C. Explain negative let off motion. (6)

D. Describe the working principle of seven wheel take up motion with neat sketch and also compare with five wheel take up motion. (10)

15. A. What is weft replenishment mechanism? Mention its advantages in automatic loom. (6)

B. Explain the working principle of any one drop box motion employed in loom with neat sketch. (10)

(OR)

C. What is warp stop motion? State any two important elements and its functions used in mechanical warp stop motion. (6)

D. Describe the working principle of cop changing mechanism with neat sketch. (10)

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Diploma in Handloom & Textile Technology
NOV/DEC-2023 SEMESTER EXAMINATION
(Regulation-2021)

Semester　　　　　　　: 04　　　　　　　　　　Time:3 Hours

Course Code & Title　: **HTPC210 : Fabric Structure-II**　　Maximum Marks: 100

PART-A　　　　　　　　　　(10×2=20 Marks)

Answer all the questions within two to three sentences

1. By which weave the horizontal cord effect is produced?

2. Name the effect produced by Bedford cord weave?

3. What is the difference between a tubular cloth and a double width cloth?

4. What are the objectives of producing a double cloth?

5. Define "Reversible backed Cloth"

6. How many series of of warp and weft threads are required for producing treble cloth?

7. Differentiate between loop pile and cut pile.

8. How are corduroys different from velvets?

9. What is 'Doup'?

10. Mention two traditional fabrics produced by using extra warp and extra weft technique.

PART-B　　　　　　　　　　((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Construct Wadded Plain faced Bedford cord on 18 x 4. Also, indicate the draft and peg plan for it.　　(6)

　　B. Construct a Pique Design on 24 x 20 using a motif of 8 x 10.　　(10)

(OR)

　　C. Construct an ordinary welt structure on 6 x 6.　　(6)

　　D. Classify the Bedford cord weave with a suitable example for each variety.　　(10)

12. A. Construct cloth interchanging plain double cloth creating check effect.　　(6)

B. Construct a self-stitched double cloth and mention the method of stitching used with the following particulars (10)
Face Weave: 2/2 Twill; Back Weave: 1/3 Twill; Repeat Size: 16 x 16.

(OR)

C. Explain the different principles of making double cloth. (6)

D. Construct a centre warp stitched double cloth with the following particulars (10)
Face Weave: 2/4 Twill; Back Weave: 3/3 Twill; Repeat Size: 13 x 12.

13. A. Construct a treble cloth on 12 x 12 with 2/2 twill as face, centre and back weave. (6)

B. Construct Imitation weft backed design on 11 x 11. (10)

(OR)

C. Differentiate between warp and weft backed cloth. (6)

D. Construct weft wadded warp backed design on 16 x 16. Also, indicate the draft for it. (10)

14. A. Differentiate between Velvet and Velveteen. (6)

B. Construct 3 pick and 6 pick reversible terry weave. Show the interlacement diagrams of both. (10)

(OR)

C. Construct 4 pick terry weave. (6)

D. Explain the process of production of loose and fast back velvet fabrics using suitable weave. Show the interlacement diagrams of these. (10)

15. A. Differentiate between Gauge and Leno weaving. (6)

B. Taking a spot effect on 6 x 6, show the extra warp graph design on 12 x 24 with the in ratio of 1 ground : 1 extra. Indicate suitable binding marks for extra warp ends. (10)

(OR)

C. Compare extra warp and extra weft figuring. (6)

D. Show a weave of Leno design with cross and open shed in it. (10)

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PART-A   (10×2=20 Marks)

Answer all the questions within two to three sentences

1. Mention the various techniques of polyester dyeing.

2. Identify the various types of dyeing defects.

3. Define the term printing.

4. Differentiate between in Dyeing and Printing.

5. Give the recipe for printing of cotton material with direct dyes.

6. Mention the methods of after treatments employed in reactive printing.

7. State the objectives of finishing on textile materials.

8. Categorize the various types of mechanical finishing on textile materials.

9. Specify the two chemicals used to impart crease recovery finish in cotton.

10. Write a note on antistatic finish.

PART-B   ((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Brief the concept of scouring and bleaching of polyester with sodium chlorite.   (6)

    B. Discuss in detail about the purpose and various methods of heat setting   (10)

    process on polyester material.

(OR)

    C. Explain the concept of thermosol dyeing of polyester material.   (6)

    D. Clearly bring out the mechanism, recipe, and process conditions with   (10)

    procedure for dyeing of polyester with disperse dye using HTHP dyeing

    method.

12. A. Briefly discuss on various styles of printing.   (6)

    B. List the various types of ingredients used for preparation of print paste and   (10)

brief their importance and functions.

(OR)

C. Explain the various style of traditional printing process. (6)

D. List the various methods of printing process and briefly discuss on rotary (10)
screen printing process with suitable illustration.

13. A. Distinguish between dyes and pigments. (6)

B. Discuss in detail about the recipe, function of list of ingredients and procedure (10)
for direct style of printing of cotton material with reactive dyes.

(OR)

C. Brief the recipe and procedure for silk printing with acid dyes. (6)

D. Describe the procedure of printing of polyester material with disperse dye and (10)
give the recipe ingredients and their functions.

14. A. Classify the finishing process on textile materials. (6)

B. What is calendaring? What are the types of calendaring? Describe the process (10)
of swizzing calendaring with suitable diagram.

(OR)

C. Write the various factors that affects the selection of finishing process on (6)
textile materials.

D. With suitable illustrations briefly discuss on sanforizing mechanical finishing (10)
process on textile materials.

15. A. Briefly discuss on various types of softeners used for softening finishing of (6)
textile materials.

B. Explain on the process and mechanism of wrinkle recovery finish on cotton (10)
material.

(OR)

C. Differentiate between Water proof and water repellency with examples. (6)

D. Discuss the method of applications and different chemical agents used for (10)
flame retardant finishing on cotton materials.

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Diploma in Handloom & Textile Technology
NOV/DEC-2023 SEMESTER EXAMINATION
(Regulation-2021)

Semester : 04   Time:3 Hours

Course Code & Title : **HTPC212 Textile Testing -I**   Maximum Marks: 100

PART-A   (10×2=20 Marks)
Answer all the questions within two to three sentences
1. State the advantage of Random sampling.
2. Provide the role of zoning technique in fiber sampling.
3. What do you mean by Relative humidity?
4. State the impact of moisture on fiber properties.
5. List the importance of the term "Micronaire" in fiber fineness.
6. Differentiate between the term Maturity ratio and Maturity index with respect to cotton fiber.
7. What is the constant rate of specimen elongation?
8. Mention the working principle of lea strength tester.
9. Illustrate the effect of yarn twist on the yarn strength.
10. Distinguish the term unevenness with the term imperfection in yarn faults.

PART-B   ((6+10)×5=80 Marks)
Answer all the questions in detail

11. A. What do you mean by bias sampling? How will you avoid it? (6)

     B. Outline the cotton fiber sampling with squaring technique. (10)

(OR)

     C. List the various yarn sampling methods used for fabric and cone. (6)

     D. Illustrate and explain the sampling of wool fiber with zoning technique. (10)

12. A. Elucidate the importance of standard atmospheric condition in textile testing. (6)

     B. Explain in detail the working of wet and dry bulb hygrometer with neat illustration. (10)

<div align="center">**(OR)**</div>

   C.   Outline the factors influencing the moisture regain of the textile material.   (6)

   D.   Outline following methods of measuring moisture regain.   (10)

      i) Rapid regain dryer   ii) Conditioning oven

13. A.   List the merits and demerits of existing fiber length measurement methods.   (6)

     B.   With suitable illustration, outline the method of measuring fiber fineness using Baer sorter.   (10)

<div align="center">**(OR)**</div>

   C.   How will you estimate the cotton fiber maturity using microscope?   (6)

   D.   Enlighten the working of Shirley fiber maturity tester with its illustration.   (10)

14. A.   Outline the factors influencing the results of the tensile strength testing of fiber and yarn.   (6)

     B.   Evaluate the working of Stelometer used in fiber strength measurement.   (10)

<div align="center">**(OR)**</div>

   C.   How the stain gauge principle is used in lea strength tester? Analyse with its purpose.   (6)

   D.   State and explain the working of single yarn strength tester with sketch.   (10)

15. A.   Differentiate the term twist factor and twist multiplier with example.   (6)

     B.   Analyse the use of fixed weight and length system in measuring thread count with neat sketch.   (10)

<div align="center">**(OR)**</div>

   C.   Illustrate and explain the various yarn faults in detail.   (6)

   D.   How will you measure the yarn twist? Explain in detail the working of tension type twist tester.   (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	: **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 (6) process.

    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 (10) sequence of the compound needle.

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

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

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 (10) knitting machines.

(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	:	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)

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NOV/DEC-2023 SEMESTER EXAMINATION
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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   (10)
High Performance Carbon fibres.

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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(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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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 : 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   (6)
    Jacquard with that of Single Lift Single Cylinder Jacquard weaving.

     B. With a suitable sketch explain the working mechanism of single lift single   (10)
    cylinder Jacquard weaving.

(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   (10)
    Jacquard.

(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 ½ inches wide on a 72^s Stockport reed, is woven with 32^s warp and 40^s weft and 64 picks per inch. Selvedges ¼ 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- (10)
        1. Total no. of ends in the warp.
        2. Total length of warp yarn in hanks.
        3. Total weight of warp yarn in the piece.
        4. Total weight of weft yarn in the piece.
        5. Total weight of yarn in the piece.

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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   (6)

     samples.

     B. Why sampling is important in the textile industry. Discuss in detail the   (10)

     random and Bias sampling techniques.

(OR)

     C. Calculate the Mean, Median and Mode calculating with given readings taken   (6)

     for yarn count.

     40, 39, 38, 38, 39, 39, 41, 42

     D. List the basic construction parameters of a fabric and explain the importance   (10)

     of testing these parameters.

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 (10)
   suitable diagrams.

(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 (10)
   diagram.

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 (6)
   examples.
   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 (10)
   department.

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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. Whrit 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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