

Registration Number

--	--	--	--	--	--	--	--

INDIAN INSTITUTE OF HANDLOOM TECHNOLOGY

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

Diploma in Handloom & Textile Technology
APR/MAY-2025 SEMESTER EXAMINATION
(Regulation-2021)

Semester : **I**

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 $\sin 22^\circ \cos 23^\circ + \cos 22^\circ \sin 23^\circ$, by using trigonometric formulae.
2. If $A + B + C = 180^\circ$ then find the value of $\cos(A + B)$.
3. Write the definition of limit of a function.
4. If $y = \frac{1}{x^{3/2}}$ then find $\frac{dy}{dx} = ?$
5. Find the number of ways of arrangement of the letters from the word “BINOMIAL”.
6. Find the value of ${}^{50}C_{49}$.
7. Write any two axioms of probability.
8. Define probability of an event.
9. Write the difference between defects and defectives.
10. The following data gives the measurements of 10 samples each of size 5 in a production process. Find the sample range values

Sample Number	1	2	3	4	5	6	7	8	9	10
Measurements:	47	52	48	49	50	55	50	54	49	53
	55	50	49	55	53	49	53	55	51	54
	54	54	50	47	51	49	48	50	53	52
	49	47	44	56	50	53	52	53	46	54
	53	51	45	50	53	45	47	57	50	56

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Verify that $\frac{\sin 3A - \sin A}{\cos A - \cos 3A} = \cot 2A$ (6)
B. If $A+B+C = 180^\circ$, Prove that $\cot A \cot B + \cot B \cot C + \cot C \cot A = 1$. (10)

(OR)

C. Prove that $\frac{\sin(A+B) + \sin(A-B)}{\cos(A+B) + \cos(A-B)} = \tan A$. (6)

D. Prove that $\sin 3A = 3\sin A - 4\sin^3 A$. (10)

12. A. Evaluate: $\lim_{t \rightarrow -3} \frac{t^2 - 9}{2t^2 + 7t + 3}$ (6)

B. Find $\frac{dy}{dx}$, If $y = (x^2 + 1)(x^2 - 1)$ (10)

(OR)

C. Find $\frac{dy}{dx}$: (i). $y = 3\cos x + x^3$ (ii). $y = 2\sqrt{x} + \frac{1}{x^2}$ (6)

D. Differentiate $y = \frac{\sqrt{x}-1}{\sqrt{x}+1}$ with respect to x (10)

13. A. If $nC_4 = 495$, find the value of 'n'. (6)

B. Find the middle term in the expansion of $(2x + y)^7$. (10)

(OR)

C. Find the co-efficient of x^6 in the expansion of $(3 + 2x)^{10}$ (6)

D. An exam paper contains 10 questions, 5 in part A and 5 in part B. Examiners are required to answer 6 questions. In how many ways can this be done. (i). There are no restrictions of choosing a number of questions in either parts, (ii). At least two questions from part A must be answered. (10)

14. A. Define random variable and explain about its types. (6)

B. A bag contains 6 green balls, some black balls and red balls. Number of black balls are twice as number of red balls and the probability of getting green ball is thrice the probability of getting red ball. Find (i). Number of black balls, (ii). Total number of balls. (10)

(OR)

C. State and prove Addition theorem of probability. (6)

D. In a bolt manufacturing factory there are three machines used A, B and C. 0.25, 0.35 and 0.4 are the probability of bolt manufactured by machine A, B and C respectively. In their output the probability for defective is 0.05, 0.04 and 0.02 respectively. A bolt is drawn from the product and it found to be defective. What is the probability that it was manufactured by machine A. (10)

15. A. Explain about Variable data and attribute data with examples. (6)
- B. A textile unit produces special cloths and packed in rolls. The number of defects found in 20 rolls are given that 12,14,7,6,10,10,11,12,5,18,12,4,4,9,21,14,8,9,13,21. Find whether the process is in control. (10)

(OR)

- C. In a factory 1000 belts are examined daily for defectiveness. The number of defectives in 15 days are 9,10,12,8,7,15,10,12,10,8,7,13,14,15 and 16. Calculate the control limit values for np – chart. (6)
- D. The following data are sample mean and range for 10 samples each of size 5. (10)
Construct the control chart for mean and state about process of control.

Sample No.	1	2	3	4	5	6	7	8	9	10
Sample Mean	12.1	13.2	15.5	13.1	12.8	14.2	12.9	14.1	13.5	13.9
Sample Range	1.9	2.1	2.1	3.1	3.9	2.8	2.0	2.5	3.0	2.5

Table : Quality Control - Chart Constants

Sample size <i>n</i>	Chart for average \bar{X} -chart				σ-chart — Chart for Standard Deviations				Chart for Ranges — R-chart				
	Factors for Control Limits				Factors for Control Limits				Factors for Control Limits				
	A	A ₁	A ₂	C ₂	B ₁	B ₂	B ₃	B ₄	d ₂	D ₁	D ₂	D ₃	D ₄
2	2.121	3.760	1.880	0.5642	0	1.843	0	3.267	1.128	0	3.686	0	3.262
3	1.732	2.394	1.023	0.7236	0	1.858	0	2.568	1.663	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	0.342	1.596	0.577	7.8407	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	0.711	0.030	1.970	2.534	0	5.078	0	2.004
7	1.134	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	1.094	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	0.285	0.9300	0.299	1.561	0.321	1.679	3.173	0.812	5.534	0.256	1.744
12	0.866	0.925	0.266	0.9359	0.331	1.541	0.354	1.646	3.258	0.924	5.592	0.284	1.716
13	0.832	0.884	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	0.445	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	0.491	1.433	0.510	1.490	3.735	1.544	5.922	0.418	1.586

Registration Number

--	--	--	--	--	--	--	--

INDIAN INSTITUTE OF HANDLOOM TECHNOLOGY

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

Diploma in Handloom & Textile Technology

APR/MAY-2025 SEMESTER EXAMINATION

(Regulation-2021)

Semester : **I**

Time:3 Hours

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

Maximum Marks:100

PART-A

(10×2=20 Marks)

Answer all the questions within two to three sentences

1. Write the formula for calculating the mass and volume percentage of a solution.
2. What is Aufbau principle? Write the electronic configuration of Aluminium.
3. What are the causes of poor lathering of soap in hard water?
4. Define coagulation and sterilization.
5. What are composite materials? Give an example.
6. Name any two ores of Iron and Copper.
7. What is the chemical composition of producer gas and biogas?
8. Differentiate between Octane number and Cetane number.
9. What is redox reaction? Give one example.
10. Define oxidation and reduction with one example of each.

PART-B

((6+10)×5=80 Marks)

Answer all the questions in detail

11. A. Explain any three methods to express the concentration of a solution. (6)
B. What is hydrogen bonding? Describe the anomalous properties of ammonia (NH₃) and water (H₂O) due to hydrogen bonding. (10)
- (OR)
- C. Define Hund's rule of maximum multiplicity with one example. Represents the s, p, d, f electronic configuration of Fe (Z=26). (6)
D. Describe the experimental setup, observation and conclusion of Rutherford atomic model. (10)
12. A. Why hard water is softened before using it in boiler? What are the differences (6)

between Scale and Sludge?

- B. Explain the soda lime process used in water softening. Differentiate between Hot and Cold lime soda process. (10)

(OR)

- C. Explain the problems caused by use of hard water in boiler. (6)
D. Explain the process of softening of water using Zeolite process with neat diagram? (10)

13. A. What are alloys? What are ferrous and non-ferrous alloys? Give any two examples of each. (6)

- B. Give a brief account of general principles and processes used in extraction of metals. (10)

(OR)

- C. What is vulcanization of rubber? Differentiate between thermoplastic and thermosetting plastics. (6)

- D. What is degree of polymerization? Distinguish between homopolymers and copolymers with suitable examples. (10)

14. A. What are the functions and characteristics of good lubricants? (6)

- B. Elaborate the physical properties of lubricants. (10)

(OR)

- C. Define Calorific Value of fuel. How will you calculate HCV and LCV using Dulong's formula? (6)

- D. Explain how proximate analysis is used in determining the coal quality? (10)

15. A. Differentiate between primary cell and secondary cell. (6)

- B. Explain the factors affecting rate of corrosion. What is the difference between dry and wet corrosion. (10)

(OR)

- C. State Faradays first and second law of electrolysis with mathematical equation. (6)

- D. Explain the principle and working of Lead storage battery. (10)

Registration Number

--	--	--	--	--	--	--	--

INDIAN INSTITUTE OF HANDLOOM TECHNOLOGY

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

Diploma in Handloom & Textile Technology

APR/MAY-2025 SEMESTER EXAMINATION

(Regulation-2021)

Semester : **I**

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. Define communication.
2. What is Soft Skill?
3. Explain 'feedback' in a communication process.
4. Write any one difference between soft skill and hard skill.
5. Who is the writer of the story 'The Room on the Roof'?
6. What is précis writing?
7. **Identify the following lines and name the poem from which these lines have been taken:-**
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.
8. Write any one advantage of using E-mail.
9. **Fill in the blanks with appropriate verb forms:**
a) Cheetahs ___ very fast. (run/ran)
b) The cat ___ the snake. (catch/caught)
10. **Fill in the blanks with suitable prepositions:**
a) He is suffering.....fever. (for/from/in)
b) The cat jumped.....the table. (on/upon/under)

PART-B

(6+10)×5=80 Marks)

Answer all the questions in detail

11. **A** Describe verbal and non-verbal types of communication. **(6)**
 - B** Elaborate the art of effective communication. **(10)**
- (OR)**
- C** Explain different barriers to effective communication. **(6)**

- D Explain 7C's for effective communication. (10)
12. A Explain the importance of soft skills. (6)
- B Write a short note on following life skills: (10)
- a) Time Management
- b) Leadership Skill
- (OR)
- C Describe 'Self-Awareness' and 'Emotional Intelligence' as important life skills. (6)
- D How soft skill is different from hard skill? Explain. (10)

13. A **I watched the flame feeding on my mother.** (6)

I watched the holy man perform his rites to tame the poison with an incantation. After twenty hours it lost its sting.

- a) Write the name of the poem from which the above lines have been taken.
- b) Who is 'I' in the above passage?
- c) After how many hours did the bite lost its sting?
- B **Read the passage given below and answer the questions that follow:-** (10)

One dollar and eighty-seven cents. That was all. And sixty cents of it was in pennies. Pennies saved one and two at a time by bulldozing the grocer and the vegetable man and the butcher until one's cheeks burned with the silent imputation of parsimony that such close dealing implied. Three times Della counted it. One dollar and eighty-seven cents. And the next day would be Christmas.

There was clearly nothing left to do but flop down on the shabby little couch and howl. So Della did it. Which instigates the moral reflection that life is made up of sobs, sniffles and smiles, with sniffles predominating?

- a) Write the name of the story from which the above passage has been taken.
- b) Write the name of the writer of the passage.
- c) Why Della was sad?
- d) Write the meaning of the word 'sniffles'.
- e) Identify the proper noun in the above passage.
- (OR)
- C **Where words come from the depth of truth;** (6)
- Where tireless striving stretches its arm towards perfection;**
- Where the clear stream of reasons has not lost its way**
- Into the dreary sand of dead habit;**

- a) Who is the poet of the above-mentioned lines?
- b) What does the line 'Where words come out from the depth of truth' mean?
- c) What has the poet compared reason and dead habit with?

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

R.K. Narayan is one of the most widely read and appreciated Indian writers of the 20th century. His creation of the fictitious town of Malgudi and the adorable prankster Swami has earned him many accolades. His stories hold up a mirror to his readers. R.K. Narayan was born on 10 October, 1906 in Madras (now Chennai). His father was a school teacher and his initial years were spent with his grandmother. He studied Tamil and English during the early years of his schooling and later moved to Mysore (now Mysuru) with his parents. He graduated from Maharaja College of Mysore.

As a writer R.K.Narayan started his literary career with the publication of short stories in the newspaper, The Hindu. His first novel was Swami and Friends which won the approval and patronage of another celebrated author, Graham Greene, who got it published. A succession of novels and stories followed in the wake of the success of Narayan's first novel. The most important of R.K. Narayan's novels are The Bachelor of Arts, The Financial Expert, The Guide, which was made into a blockbuster Hindi movie, The Man-Eater of Malgudi and The Talkative Man. The most famous collection of his stories include Malgudi days, An Astrologer's Day and other Stories, Under the Banyan Tree and other Stories and Grandmother's Tale and Selected Stories. R.K.Narayan received the Sahitya Akademi Award in 1958, the Padma Bhushan in 1964 and the Padma Vibhushan in 2000. He passed away on 13 May, 2001.

- a) When and where R.K. Narayan was born?
- b) From where R.K.Narayan did his schooling?
- c) Which was R.K.Narayan's first novel?
- d) Name the awards that were given to Narayan for his literary achievements.
- e) Where did R.K.Narayan die?

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

Man first appeared on earth half a million years ago. Then he was little more

than an animal. Even so, early man had certain advantages over animals. He had a large brain; he had an upright body with quick-moving hands. He invented a language to communicate with his fellow men. This ability to speak was of supreme value because it allowed men to share ideas and plan together: speech enabled ideas to be passed on from generation to generation. These special advantages put men far ahead of all other living creatures. Since those far-off times, when he first made his appearance, man has achieved a great deal.

B Write a letter to a bookseller for ordering the books. (10)

(OR)

C Write an email to your friend congratulating him/her on getting a new job. (6)

D Write a letter to a friend inviting him to attend your birthday party. (10)

15. A Pick out Nouns in the following sentences:- (6)

- a) He went to Kanpur.
- b) Army marched forward.
- c) Cows are grazing.

B Change the following sentences into their negative forms:- (10)

- a) She speaks Hindi.
- b) I saw a dog in the street.
- c) She has written an article.
- d) Radha danced well.
- e) Mohan plays cricket.

(OR)

C Pick out Pronouns in the following sentences:- (6)

- a) They are good boys.
- b) Trees shed their leaves in autumn.
- c) She has completed her work.

D Convert the following sentences into Passive Voice:- (10)

- a) Shershah Suri defeated Humayun.
- b) She is cooking food.
- c) They will write a letter.
- d) My sister painted that picture.
- e) The teacher beat the mischievous boys.
