

INDIAN INSTITUTE OF HANDLOOM TECHNOLOGY

Bargarh/Julia/Guwahati/Dudhpur/Salem/Varanasi/Champa/Kannur/KHII-Gadag/SPKM-Venkatagiri

Diploma in Handloom & Textile Technology

SEMESTER EXAMINATION - November/December-2021

(Regulation-2021)

Year / Semester : 1 / 1

Time : 90 Minutes

Subject Code & Name : BS101 : Mathematics - I

Maximum Marks: 40

PART-A

(4×2=8 marks)

Answer any four questions. The answer shall be within 2 or 3 sentences:-

1. Find the value of  $\cos 75^\circ$  (2)
2. Find the value of  $\lim_{x \rightarrow -2} (3x^4 + 2x^2 + x - 1)$  (2)
3. If  ${}^n P_r = 11880$ ,  ${}^n C_r = 495$ , Find the value of  $r$ . (2)
4. Write the Statement of Baye's theorem. (2)
5. Find the mean value of 120,127,152,157,160,134,137,123,140,144. (2)

PART-B

(4 X 8 = 32 marks)

Answer any four questions from Q.No 6 to 10 in detail. Either A or B has to be answered in each question.

6. A. If  $A+B = 45^\circ$  Prove that  $(1 + \tan A)(1 + \tan B) = 2$ , Then find the value of  $\tan(22\frac{1}{2})^\circ$  (8)

(Or)

- B. Prove that  $\sin 3A = 3 \sin A - 4 \sin^3 A$  (8)

7. A. Find  $\frac{dy}{dx}$ , when  $y = \frac{\sqrt{x}-1}{\sqrt{x}+1}$  with respect to  $x$ . (8)

(Or)

- B. Differentiate,  $y = \frac{e^x + \cos x}{1 - \sin x}$  with respect to  $x$ . (8)

8. A. Find the expansion of  $(2x + 3)^5$  by using Binomial theorem. (8)

(Or)

- B. Find the middle term in the expansion of  $(x + y)^6$ . (8)

9. A. State and Prove addition theorem of probability.

(8)

(Or)

B. Suppose there are three boxes, First box containing 2 white and 3 black balls, Second box containing 3 white and 2 black balls and Third box containing 4 white and 1 black balls. There is equal probability of each box. One ball is drawn at random. What is the probability that a white ball is drawn? What is the probability that white ball is drawn from first box? (8)

10. A. Given below are the values of sample mean  $\bar{X}$  and sample range R for 10 samples, each of size 5. Draw the mean chart and comment on the state of control of process. (8)

(Or)

B. A textile unit produces special clothes and pack them in rolls. The number of defect found in 20 rolls is given below. Find whether the process is in control by using "C -Chart". Defects in 20 rolls are 12,14,7,6,10,10,11,12,5,18,12,4,4,9,21,14,8,9,13,21. (8)

Table : Quality Control - Chart Constants

Sample Size	Chart for average $\bar{X}$ -chart			$\sigma$ -chart — Chart for Standard Deviations					Chart for Ranges — R-chart				
	Factors for Control Limits			Factors for Central line	Factors for Control Limits				Factors for Central line	Factors for Control Limits			
$n$	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	0.9686	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

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Diploma in Handloom & Textile Technology

SEMESTER EXAMINATION- Nov/Dec-2021

(Regulation-2021)

Year/Semester: I<sup>st</sup> Semester

Time: 90 Minutes

Subject code & Name: BS105: Applied Chemistry

Max. Marks: 40

PART-A

(4×2=8 marks)

Answer any four questions. The answer shall be within 2 or 3 sentences:-

- 1) Write the value of  $n$ ,  $l$  and  $m$  for  $3p$  orbital. (2)
- 2) What are the causes of poor lathering in soap in hard water? (2)
- 3) Expand the term PVC and PTFE. Write their structures. (2)
- 4) What is calorific value of fuel? What is its unit? (2)
- 5) What is Corrosion? What it is called in case of iron? (2)

PART-B

(4 X 8 = 32 marks)

Answer any four questions from Q.No 6 to 10 in detail. Either A or B has to be answered in each question.

- 6) A. Explain Rutherford model of atom .What are the conclusions and drawbacks of Rutherford model. (8)  
OR  
B) Explain the types of Quantum numbers and their significance .What designation is given to an orbital having  $n=5$  and  $l=3$ . (8)
- 7) A. Explain the process of softening of water using Zeolite process with neat diagram? (8)  
OR  
B. Explain the soda lime process used in water softening .Differentiate between Hot and Cold lime soda process. (8)
- 8) A. What are plastics? Differentiate between molecular structure and behavior of Thermoplastic and Thermosetting plastic with examples. (8)  
OR  
B. Give a brief account of general principles of metallurgy. How aluminium is extracted from bauxite? (8)
- 9) A. What are the functions of lubricants? Explain the physical properties of Lubricants. (8)  
OR  
B. What are the Characteristics of good lubricants? What is the difference between Hydrodynamic and Boundary lubrication? (8)
- 10) A. Explain the types of corrosion. What are the factors affecting corrosion? (8)  
OR  
B. Differentiate between primary cell and secondary cell. Explain in brief about lead storage battery. (8)

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Diploma in Handloom & Textile Technology

**SEMESTER EXAMINATION- Nov/Dec-2021**

(Regulation-2021)

**Year/Semester: 1<sup>st</sup> Sem.**

**Time: 90 Minutes**

**Subject Code & Name: HS101: English & Communication Skills**

**Max. Marks: 40**

**PART-A**

**(4×2=8 marks)**

Answer any **four** questions within **two** or **three** sentences.

- 1) What is 'verbal communication'?
- 2) Explain 'emotional intelligence' as an important life skill.
- 3) What is E-mail?
- 4) Write one word for each of the sentences given below:
  - a) People working together in the same office or department
  - b) Study of environment
- 5) Identify the following lines and name the poem from which these 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

**PART-B**

**(4 X 8 = 32 marks)**

Answer **any four** questions from Q.No 6 to 10 in detail. **Either A or B** has to be answered in each question.

- 6). A. Define communication. Mention its factors and explain the process of communication.

**OR**

B. Explain the 7 Cs for effective communication.

- 7). A Define soft skills . Describe five soft skills in one sentence, each.

**OR**

B. Explain the importance of 'Time management' and 'Leadership skill' as soft skills.

- 8). A Read the lines given below and answer the questions that follow:

Where tireless striving stretches its arms towards perfection;

Where the clear stream of reason has not lost its way 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

- i. Write the name of the poem from which the above lines have been taken.

- ii. What is the meaning of the word 'striving' in the above lines?

**OR**

B Read the passage given below and answer the questions that follow:

Swami is a small child in Malgudi living with his family and grandmother. Once while reading a newspaper, his father reads an article about bravery shown by an 8-year old boy and feels that Swami should do something like that. Swami has the habit of sleeping with his grandmother after listening a story told by her. This irritates Swami's father. Swami's father then challenges, or rather forces, him to sleep in his office. When Swami tells his friends of the ordeal, his friends warn him about a ghost living near the office. When Swami sleeps in his father's office he has nightmares about the ghost and wakes up with a start. At the same time, Swami spots an intruder breaking into the office. Mistaking him for the ghost, Swami grabs the intruder's leg and yells for help. The rest of the villagers rush inside the office and catch the intruder. The police tell Swami that the intruder was a thief wanted by the police and congratulate him. The incident is published in the Malgudi times but little Swami is so scared after the incident that he starts sleeping with his grandmother again.

- i. Who is the author of "Malgudi Days"?
- ii. Who is Swami?
- iii. What challenge did Swami's father give him?
- iv. After the nightmare with whom Swami started sleeping?

9). A Read the passage given below and summarise it by giving appropriate title:

Letters are invaluable means of keeping our friendship with those who are away. Without the interchange of letters our absent friends and relations would be practically dead to us. We might learn from books, the surroundings in which they dwell or hear from travellers about the prosperity or failure, but it is through letters that we can converse with them as often as we want and obtain a clear picture of what they are doing or thinking and of everything in the distant lands in which they live.

**OR**

B. Write a letter to your friend asking him to visit your place during summer vacation.

10). A Pick out the Nouns in the following sentences:

- i. Cows are grazing.
- ii. He went to Kanpur.
- iii. Army marched forward.
- iv. We attended the party.

**OR**

B Change the following sentences into their Negative forms:

- i. He speaks Hindi.
- ii. Mohan plays cricket.
- iii. I saw a dog in the street.
- iv. Radha danced well.

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