Registration Number | | | | | | | |

INDIAN INSTITUTE OF HANDLOOM TECHNOLOGY

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

Diploma in Handloom & Textile Technology

NOV/DEC-2022 SEMESTER EXAMINATION

(Regulation-2021)

Semester : I — Time:3 Hours

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

PART-A (2×10=20 Marks)

Answer all the questions within two to three sentences

1. Find the value of cos 15°
2. Find $\frac{\tan 20° + \tan 25°}{1 - \tan 20° \tan 25°} = ?$
3. Find, $\lim_{x \to \infty} (1 + \frac{1}{n})^n = ?$
4. If $y = 8x^2 + 2$, find $\frac{dy}{dx}$
5. Find the total number of ways strings arranging by using letters of the word "RAMANUJAN".
6. Find the value of $15C_{13}$
7. A die is rolled and a coin is tossed simultaneously, find the probability that the die shows odd number and coin shows head.
8. Write the axioms of probability.
9. If the mean of 15, 13, 10,6,18, x, 21, 9, 20, 11 is 13. Find the value of x.
10. If $n\bar{p} = 59.12$, find the upper and lower control limits of np - chart.

PART-B (6+10) ×5=80 Marks

Answer all the questions in detail

11. A. Find the value of sin 50° cos 40° + cos 50° sin 40° (6)

B. If A+B+C = 180° , Prove that cot A cot B + cot B cot C + cot C cot A =1. (10)

(OR)

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

D. Prove that $\cos(3x) = 4\cos^3 x - 3\cos x$ (10)

12. A. Evaluate : $\lim_{x \to 0} \frac{1-\sqrt{1-x^2}}{x^2}$ (6)

B. If $y = (x+5)(2x-7)(x^2-1)$, find $\frac{dy}{dx}$ (10)

(OR)

C. If $y = 2x^{5/2} + 2\sqrt{x} - \frac{1}{x^2}$, find $\frac{dy}{dx}$ (6)

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

13. A. A Maths club has 15 members. In that 8 are girls students. 6 members are to be selected for a competition and half of them should be girls. How many ways this selection is possible. (6)

B. Expand $(2x + \frac{1}{2x})^4$ by using Binomial Theorem. (10)

(OR)

C. How many different selections of 5 books can be made from 12 different books . If two particular books are always selected. (6)

D. Find the middle term in the expansion of $(x^2 + \frac{1}{x})^5$ (10)

14. A. In a box there are 20 non – defective and defective bulbs. If the probability of a bulb is selected at random and found to be a defective is $\frac{3}{8}$. Find the number of defective bulbs? (6)

B. 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 C. (10)

(OR)

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

D. A box contains 2 Red, 3 Blue & 4 Black Balls. 3 balls are drawn from the box at random. What is the probability that, (i). 3 Balls are of different colours, (ii). 2 Balls are of same colour and the third is different colour. (10)

15. A. Calculate fractional defectives and control limits of P – chart for the following data : (6)

Sample number :	1	2	3	4	5	6	7	8	9	10
Number of items :	90	65	85	70	80	80	70	95	90	75
Number of defectives :	9	7	3	2	9	5	3	9	6	7

B. The following are the sample mean and range for 10 samples of size 5. Construct the control chart for mean & range and command the process of control: (10)

Sample number :	1	2	3	4	5	6	7	8	9	10
Mean $\overline{X}$:	52	50	50	51	47	52	49	54	51	54
Range R :	6	7	6	5	6	9	8	7	7	4

(OR)

C. Define statistical quality control and write the types of control charts. (6)

D. A plant produces paper for news print and roll of papers are inspected for defects. A result of inspection of 10 rolls are given below. Draw the C – Chart & comment on the state of control. (10)

Roll Number :	1	2	3	4	5	6	7	8	9	10
Number of Defects :	19	10	8	12	15	22	7	12	18	13

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Diploma in Handloom & Textile Technology

NOV/DEC-2022 SEMESTER EXAMINATION

(Regulation-2021)

Semester : FIRST — 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. What is Heisenberg's uncertainty principle?
2. Define the term solution. How many types of solutions are formed with example?
3. What is difference between Hard water and Soft water? Write any four points.
4. What is Coagulant with example?
5. Write four Purpose of making alloy?
6. What is PVC? Write any three uses of PVC.
7. Mention the functions of a lubricant
8. Define Octane Number of petrol.
9. Define Corrosion of metal, give any two examples.
10. Write any four uses of Solar cell.

PART-B

(6+10) ×5=80 Marks

Answer all the questions in detail

11. A. Define Quantum number. What are the types of Quantum Numbers? (6)

    B. Explain the Rutherford atomic model and it's limitations. (10)

(OR)

    C. What is the Hybridization of B in BF_3, Be in $BeCl_2$, C in CCl_4 and N in NH_3. (6)

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

12. A. Write short notes on Sedimentation and filtration process. (6)

    B. Draw a suitable diagram and describe the Ion exchange process for the softening of hard water. (10)

(OR)

C. What are sludge and scale in boilers? How they are formed suggest any two methods to prevent their formation? (6)

D. How is the softening of water carried out using Zeolite process? (10)

13. A. Discuss the composition, properties and uses of Nichrome. (6)

B. Explain the extraction of Iron from Haematite ore. (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 CNG. (6)

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

(OR)

C. Calculate the HCV and LCV using Dulong's formula. (6)
The coal having the following composition C=85%, H=8%, S=1%, N=2% and Ash=4%.

D. Write a short note on physical properties of lubricant. (10)

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

B. Explain the construction and working of Lead Storage battery. (10)

(OR)

C. Define the terms Electrolyte and non-electrolyte with suitable example (6)

D. Mention the important factors which influence the rate of corrosion of metal. (10)

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Diploma in Handloom & Textile Technology

NOV/DEC-2022 SEMESTER EXAMINATION

(Regulation-2021)

Semester : FIRST SEMESTER — Time:3 Hours

Course Code &Title : **HS101: COMMUNICATION SKILLS IN ENGLISH** — Maximum Marks:100

PART-A(2×10=20 Marks)

Answer all the questions within two to three sentences

1. What is 'Feedback' in process of communication?
2. Explain 'emotional intelligence' as an important life skill.
3. Define non-verbal communication.
4. Write any two importance of Soft Skill.
5. How many stories are there in R.K.Narayana's Malgudi Days?
6. Identify the following lines and name the poem from which these lines have been taken:-

   My little horse must think it queer
   To stop without a farmhouse near
   Between the woods and frozen lake
   The darkest evening of the year.

7. Write any one use of précis writing?
8. What is E-mail?
9. Write one word for each of the sentences given below:-
   a) One who is qualified for election
   b) One who is all powerful
10. Fill in the blanks with suitable words given in the bracket:-
   a) The Sun sets ……. The West. (in/into/to)
   b) He resigned his post……..his friend. (for/in favor of)

PART-B (6+10) ×5=80 Marks

Answer all the questions in detail

11. **A.** Explain the process of communication. (6)
    B. Elaborate art of effective communication. (10)

(OR)

C. What are the different barriers to effective communication? (6)

D. Explain the 7 Cs for effective communication (10)

12. A. Define Soft Skills. Differentiate between soft skill and hard skill. (6)

B. Explain the importance of 'Time Management' and 'Leadership Skill' as life skills. (10)

(OR)

C. Explain the importance of soft skills. (6)

D. Write a short note on the following Life Skills:- (10)

a) Self-awareness

b) Empathy

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)

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 Nararyan for his literary achievements.

e) Where did R.K.Narayan died?

(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)

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.

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 the Director of your Institute requesting permission to go on an Industrial visit. (10)

(OR)

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

D. Write a letter to your brother advising him to work hard at his studies so that he may get a first class. (10)

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

a) Delhi is the capital of India.

b) Mohan plays cricket.

c) Indira Gandhi was a brave lady.

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

a) She has written an article.

b) We will go tomorrow.

c) Ravi had gone to Delhi.

d) I saw a dog in the street.

e) Radha danced well.

(OR)

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

a) He joined the university.

b) Somebody entered the room.

c) Each of the boys is given a pen.

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.

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Diploma in Handloom & Textile Technology

NOV/DEC-2022 SEMESTER EXAMINATION

(Regulation-2021)

Semester : SECOND SEMESTER Time:3 Hours

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

PART-A (2×10=20 Marks)

Answer all the questions within two to three sentences

1. Find the adjoint of the matrices $A = \begin{bmatrix} -3 & 4 \\ 6 & 2 \end{bmatrix}$.
2. Find the values of x, y, z and w Which satisfy the matrix equation $\begin{bmatrix} x+3 & 2y+x \\ z-1 & 4w-6 \end{bmatrix} = \begin{bmatrix} 0 & -7 \\ 3 & 2w \end{bmatrix}$.
3. Evaluate $\int e^{\sqrt{2x}} dx$.
4. Integrate $\int (x+1)(x+2) dx$.
5. Find the centre and radius of the circle $x^2 + (y+2)^2 = 4$.
6. Find the slope of the straight line passing through the points (5,7)and (7,5).
7. Find the difference of vectors $\vec{b} = \vec{\imath} - 2\vec{\jmath} + \vec{k}$ and $\vec{a} = -2\vec{\imath} + 4\vec{\jmath} \mp 5\vec{k}$.
8. Are the vectors $\vec{a} = 2\vec{\imath} - \vec{\jmath} \mp \vec{k}$ and $\vec{b} = -\vec{\imath} + \vec{\jmath} \mp 3\vec{k}$ are perpendicular.
9. Find the mean of 5 numbers 8,2,4,5 and 6.
10. Write any two application of Chi-square test.

PART-B (6+10) ×5=80 Marks

Answer all the questions in detail

11. A. If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ show that $A^2 - 5A + 7I = 0$. (6)

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

(OR)

C. Verify that $(AB)^T = B^T A^T$ Where $A = \begin{bmatrix} 1 & 2 \\ 2 & 3 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 3 & 0 \\ 1 & 2 & 3 \end{bmatrix}$. (6)

D. Solve the equations by Crammer's Rule (10)

$3x + y + 2z = 3, 2x - 3y - z = -3, x + 2y + z = 4.$

12. A. Evaluate $\int \frac{x^2}{1+x^6}\, dx$ (6)

B. Integrate $\int x^2 cosax\, dx$ (10)

(OR)

C. Evaluate $\int \frac{2x-3}{x^2+4x-12}\, dx$ (6)

D. Integrate $\int_0^{\pi/2} cos^6 x\, dx.$ (10)

13. A. Find the equation of the Parabola with Focus $(4,0)$ and directix $x = -4.$ (6)

B. Find the equation of the Circle with centre $(2,3)$ and passing through the intersection of the lines $3x - 2y - 1 = 0$ and $4x + y - 27 = 0.$ (10)

(OR)

C. Show that the points $\left(0, -\frac{3}{2}\right), (1, -1)$ and $(2, \frac{-1}{2})$ are collinear. (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 $(\vec{a} + \vec{b}).(\overrightarrow{b - \vec{a}})$ if $\vec{a} = \vec{\imath} + \vec{\jmath} + 2\vec{k}$ and $\vec{b} = 3\vec{\imath} + 2\vec{\jmath} - \vec{k}.$ (6)

B. Find the angle between the vectors $2\vec{\imath} + 3\vec{\jmath} - 6\vec{k}$ and $6\vec{\imath} - 3\vec{\jmath} + 2\vec{k}.$ (10)

(OR)

C. Find the magnitude of $\vec{a} \times \vec{b}$ if $\vec{a} = 2\vec{\imath} + \vec{\jmath} + 3\vec{k}$ and $\vec{b} = 3\vec{\imath} + 5\vec{\jmath} - 2\vec{k}.$ (6)

D. A force $\vec{F} = 3\vec{\imath} + 2\vec{\jmath} - 4\vec{k}$ is applied at the point $(1, -1, 2)$. Find the moment of the force about the point $(2, -1, 3).$ (10)

15. A. Given the following information about two samples from two normal populations $n_1 = 9, S_1 = 1.97, n_2 = 7, S_2 = 3.21.$ Can it be concluded that the both the samples have come form populations having the same variability. (6)

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

Class	A	B	C	D
Observed Frequency	37	44	20	32
Expected Frequency	30	38	32	25

(OR)

C. The height of college students in a city are normally distributed with standard deviation 6cms. A sample of 100 students has mean height 158cms. Test the hypothesis that the mean height of college students in the city is 160cms. (6)

D. A Sample of 20 items has mean 42 units and standard deviation 5 units. Test the hypothesis that it is a random sample from a normal population with mean 45 units. (10)

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Diploma in Handloom & Textile Technology

NOV/DEC-2022 SEMESTER EXAMINATION

(Regulation-2021)

Semester : II

Time:3 Hours

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

Maximum Marks: 100

PART-A

(2×10=20 Marks)

Answer all the questions within two to three sentences

1. Define systems of units.
2. What is least count?
3. State the Hook's law.
4. Define friction.
5. Convert 37°C to kelvin.
6. Define coefficient of linear expansion.
7. What is resonance?
8. Define critical angle.
9. What is semi-conductor.
10. Define frequency and wavelength.

PART-B

(6+10) ×5=80 Marks

Answer all the questions in detail

11. A. Explain the errors in measurement and its types. (6)

    B. Check by dimensional analysis whether the equation is correct: $v^2 = u^2 + 2as$, where 'v' is the final velocity, 'u' is the initial velocity, 'a' is the acceleration & 's' is the displacement. (10)

(OR)

    C. Explain the limitations of dimensional analysis. (6)

    D. Find the dimensions of universal gravitation constant (G). (10)

12. A. State the Stoke's law. (6)

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

(OR)

C. Define the laws of limiting friction. (6)

D. A solid cylinder with a mass of 5 kg is rolling down a ramp. If it has a radius of 10 cm and an angular acceleration of 3 radian/s^2, what torque is operating on it? (10)

13. A. Define coefficient of thermal conductivity. (6)

B. Discuss about different modes of heat transfer in a body. (10)

(OR)

C. Derive a relationship between scales of temperature. (6)

D. A rod is 2m long and has a cross sectional area of $2\times10^{-3}m^2$. One end is at 15°C and the other is at 30°C. The material has a coefficient of thermal conductivity of 4 J/°C ms. How much energy conducts along the rod in 4 min? (10)

14. A. Define transverse and longitudinal waves with examples. (6)

B. Describe free and damped vibrations. (10)

(OR)

C. Describe energy levels in laser and its characteristics. (6)

D. Describe simple microscope with a neat sketch. (10)

15. A. Summarize about intrinsic semiconductors. (6)

B. Derive an expression for equivalent resistance when the resistors are connected in series and parallel. (10)

(OR)

C. Explain Kirchhoff's current law with an example. (6)

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

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NOV/DEC-2022 SEMESTER EXAMINATION

(Regulation-2021)

Semester : SECOND SEMESTER — 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 website?
2. Define Keywords in C Language.
3. How volatile memory is different from non-volatile memory?
4. What are ALU, CU, and MU?
5. Define Bourne Shell.
6. Explain Unix command.
7. What is portal?
8. Give four examples of hardware used in Computer System.
9. Differentiate between software and hard ware.
10. What are linker and loader?

PART-B

(6+10) ×5=80 Marks

Answer all the questions in detail

11. A. How input device is different from output device? Explain with example. (6)

    B. What is Solid state drive (SSD)? Differentiate between hard disk drive (HDD) and solid state drive (SSD). (10)

(OR)

    C. Explain memory in detail. Also discuss its types. (6)

    D. How internet is different from intranet? Discuss search engine and web browser with example. (10)

12. A. Define operating system? Discuss its function. (6)

    B. What is Windows? Discuss in detail. (10)

(OR)

C. Differentiate between Linux and Unix. (6)

D. Explain Unix Shell. (10)

13. A. Discuss HTML in Detail. (6)

B. Why CSS is used in HTML? Write the features and advantages of CSS. (10)

(OR)

C. Discuss the features and versions of HTML. (6)

D. Explain table tag? Design a form using different HTML tags and place the form in Center using CSS script. (10)

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

B. How MS word is different from MS Excel? Explain. Design and prepare a resume (10)

(OR)

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

D. Describe and discuss MS office. (10)

15. A. What is C language? Explain the structure of C program with example. (6)

B. Explain different data types used in C language. (10)

(OR)

C. What is Language Compiler? Differentiate between high level language and low level language. (6)

D. What are the conditional statements used in C language? Explain. (10)

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Diploma in Handloom & Textile Technology

NOV/DEC-2022 SEMESTER EXAMINATION

(Regulation-2021)

Semester : Second Semester — Time:3 Hours

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

PART-A

(2×10=20 Marks)

Answer all the questions within two to three sentences

1. State De-Morgan's law.
2. Draw the symbol of FET and MOS.
3. Define CMRR with suitable equation.
4. Draw the circuit diagram of op-amp as integrator and write an expression for its output voltage.
5. What is hysteresis loop?
6. State Lenz's law.
7. Define Form Factor.
8. Write down the voltage and current equation for Star Connected A.C circuits.
9. What is transformation ratio of transformer?
10. Write down the different types of D.C Motors?

PART-B

(6+10) ×5=80 Marks

Answer all the questions in detail

11. A. Write short notes on Analog and Digital signal. (6)

    B. Explain the working principle and applications of CMOS with suitable diagram. (10)

(OR)

    C. Briefly explain about JK flip flop with appropriate diagram. (6)

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

12. A. An inverting amplifier has R_f=500kΩ and R_1 = 5kΩ. Determine the amplifier circuit voltage gain. Input resistance and output resistance. Determine also the (6)

output voltage and input current if the input voltage is 0.1V. Assume op-amp to be ideal one.

B. Define op-amp as an inverting amplifier and drive an expression for its output voltage. (10)

(OR)

C. Compare the ideal and practical op-amp. (6)

D. Derive an expression for output voltage of op-amp as differentiator and mention its applications. (10)

13. A. Define the following terms Energy, MMF & Permeability (6)

B. Analogy between electric and magnetic circuits. (10)

(OR)

C. Explain Faraday's Laws of Electromagnetic Induction with appropriate diagram. (6)

D. Write a short note about i) Statically and Dynamically Induced Emf (10)
ii) Self and Mutual inductance

14. A. Write short note on Power factor. (6)

B. Give the Phasor representation of A.C circuit with resistor, inductor & capacitor. (10)

(OR)

C. A circuit consisting of resistor in series with a capacitor takes 80W at PF of 0.4 from a 100V, 50Hz supply. Find the resistance and capacitance. (6)

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

15. A. Briefly explain about Auto transformers. (6)

B. Explain the construction and working principle of Transformer and also mention different types of Transformers. (10)

(OR)

C. Differentiate squirrel cage and slip ring induction motor. (6)

D. Explain the construction and working principle of DC motors with relevant characteristics curves. (10)

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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-2022 SEMESTER EXAMINATION

(Regulation-2021)

Semester : SECOND SEMESTER Time:3 Hours

Course Code & Title : **ES106-ENGINEERING MECHANICS** Maximum Marks: 100

PART-A (2×10=20 Marks)

Answer all the questions within two to three sentences

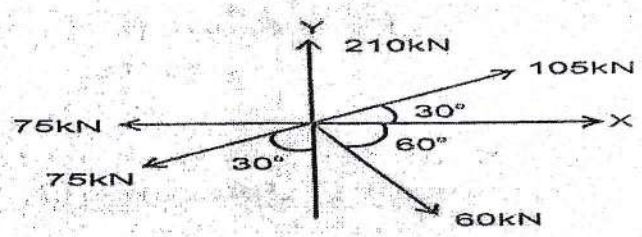
1. Two forces 30N and 40N act at a point 'O' the included angle between them is 60°. Find the magnitude and the direction of the resultant?
2. State Varignon's Theorem?
3. What are the different types of supports and their reactions?
4. Write the equation of equilibrium of a rigid body in two dimensions?
5. What is Angle of Repose?
6. Differentiate static and dynamic friction?
7. Define Centre of Gravity?
8. When will the Centroid and Centre of mass coincides?
9. Define efficiency of machine?
10. What are the types of screw of jack?

PART-B (6+10) ×5=80 Marks

Answer all the questions in detail

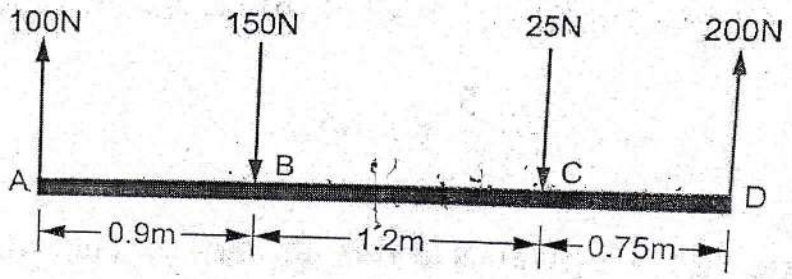
11. A. Determine the cross product of vectors **A**=3i-5j-4k and **B**=3i+4j-2k and the angle between them? (6)

B. If five forces acts on a particle as shown in fig. Determine the magnitude and direction of the resultant? (10)

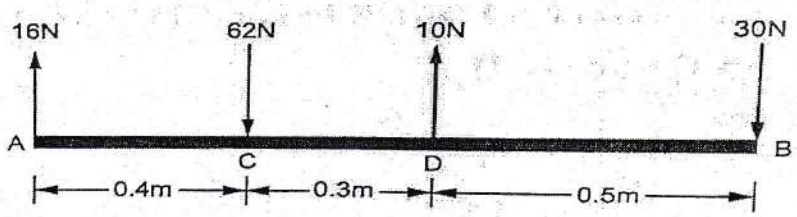


(OR)

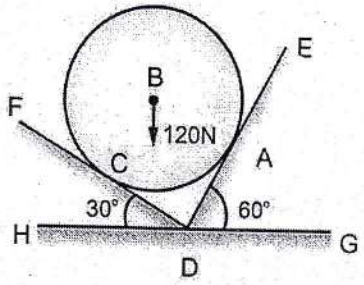
C. Four parallel forces of magnitudes 100N, 150N, 25N and 200N are shown in fig .Determine the magnitude of the resultant and also the distance of the resultant from point A. (6)



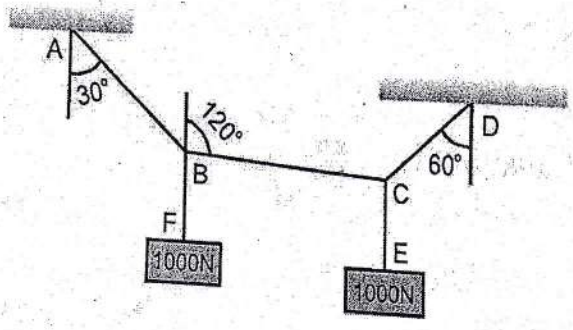
D. A rigid bar is subjected to a system of parallel forces as shown in fig .Reduce this system to 1) A single forces. 2) A single forces and a couple at A (An equivalent force - couple system at A). 3) A single force and a couple at B (An equivalent force – couple system at B) (10)



12. A. A ball of weight 120N rests in a right-angled groove, as shown in fig. The sides of the groove are inclined to an angle of 30° and 60°to the horizontal.If all the surfaces are smooth, then determine the reactions R_A and R_C at the points of contact. (6)

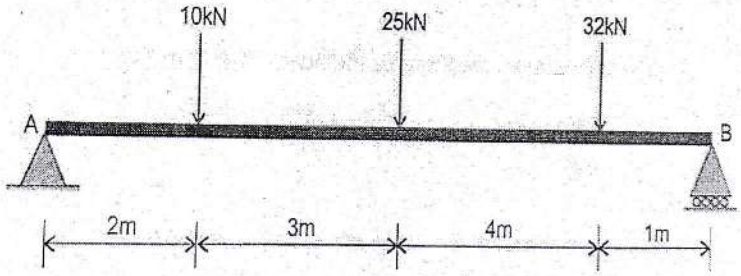


B. A string ABCD, attached to two fixed points A and D has two equal weights of 1000 N attached to it at B and C. The weights rest with the portions AB and CD inclined at angles of 30° and 60° respectively, to the vertical as shownin fig. Find the tensions in the portions AB, BC and CD of the string, if the inclination of the portion BC with the vertical is 120° (10)

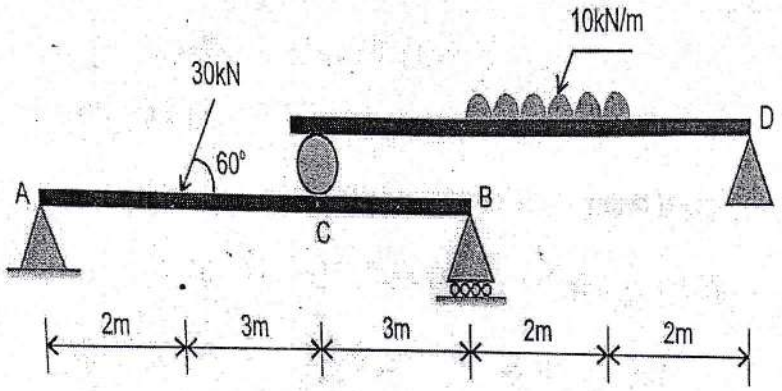


(OR)

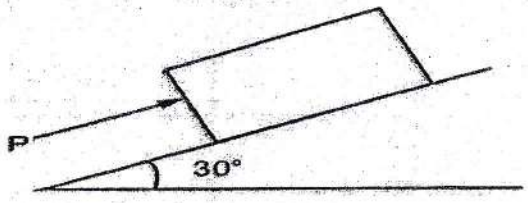
C. Find the reactions at supports A and B of the beam shown in fig . (6)



D. Determine the reactions at supports A, B , C and D for the beam shown in fig (10)



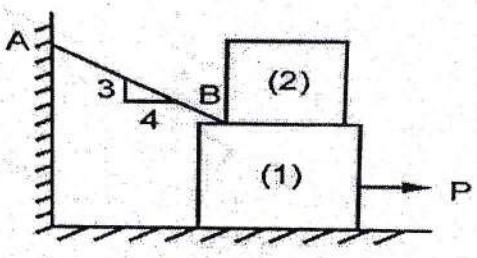
13. A. Determine the minimum force required to prevent the 100N body from sliding down the plane. (Take μ=0.2). (6)



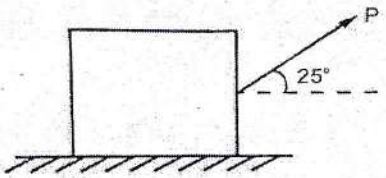
B. A block of weight W_1 = 1290N rests on a horizontal surface and supports another block of weight W_2 = 570N on top of it as shown in fig. Block of weight W_2 is attached to a vertical wall by an inclined string AB. Find the force 'P' applied to the lower block that will be necessary to cause the slipping to impend. (10)

Coefficient of friction between blocks (1) and (2) = 0.25

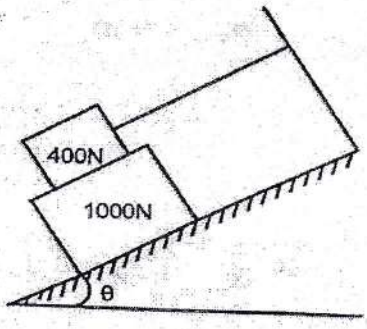
Coefficient of friction between block (1) and horizontal surface = 0.40



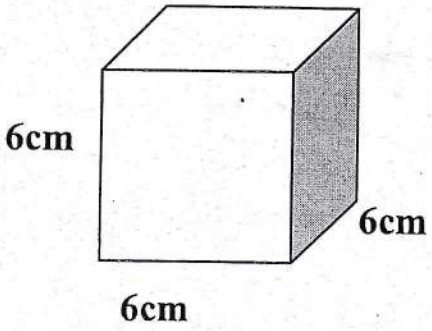
C. A body of weight 400N is lying on a rough horizontal plane having a Co-efficient of Friction as 0.3. Find the magnitude of the force, which can move the body, while acting at an angle of 25° with the horizontal. (6)



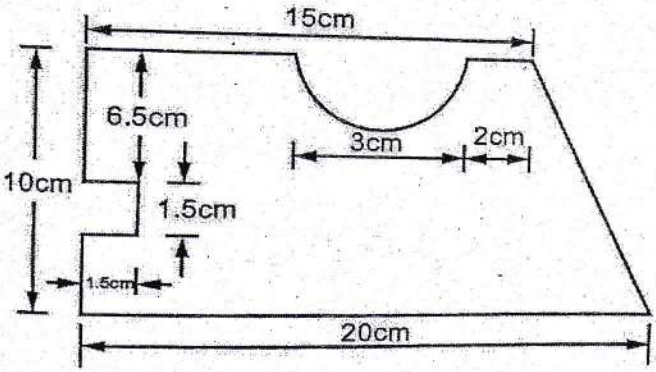
D. What should be the value of the angle Θ so those motions of the 1000N block impends down the plane? The Coefficient of Friction μ for all surfaces is1/4. (10)



14. A. Find the Centre of Gravity for shown fig. (6)

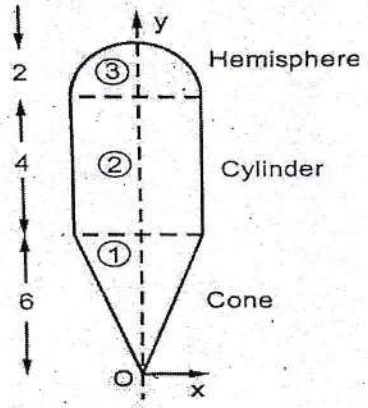


B. Locate the Centroid of the area shown in fig (10)

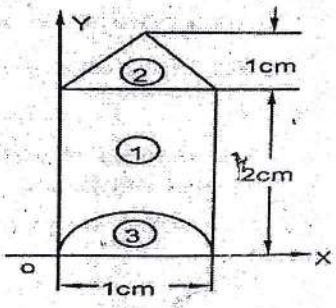


(OR)

C. Locate centroid for the volume shown in fig. All dimensions are in cm (6)



D. Locate the centre of gravity of a bullet , 1cm diameter with a cone in the front and a hemisphere cut from the back as shown in fig. Assume the material tobe homogenous. (10)



15. A. In a Simple screw- jack, the screw threads have pitch of 10mm and 7mm. If the efficiency of the machine is 28%, find the effort required at the end of an arm 36 cm long to lift a load of 5kN. (6)

B. A screw - jack is used to lift a load of 3kN. The screw of the screw - jack is square threaded with two threads to 1.2 cm. If the Co – efficient of friction between the nut and screw is 0.09 and the outer diameter of the screw is 6cm, find the force required at the end of the handle of length 60 cm to lift the load. (10)

(OR)

C. The efficiency of a lifting machine is 70% when an effort of 10N is required to raise a load of 500N. Determine the mechanical advantages and velocity ratio of the machine. (6)

D. The velocity ratio of a machine is 15 and the efficiency is 60%. Determine the effort required to lift a load of 100N. What is law of the machine if the frictional resistance of the machine is constant? Determine the effort required to run this machine at (i) a load of 140N and (ii) no load. (10)

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INDIAN INSTITUTE OF HANDLOOM TECHNOLOGY

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Diploma in Handloom & Textile Technology

NOV/DEC-2022 SEMESTER EXAMINATION

(Regulation-2021)

Semester : 3rd Semester — Time:3 Hours

Course Code &Title : **HTPC201 Textile Fibers** — Maximum Marks:100

PART-A

(2×10=20 Marks)

Answer all the questions within two to three sentences

1. What is DP?
2. What are the post spinning operations in manmade fiber production?
3. Which natural fiber is called (i) Golden Fiber and (ii) Cool Fiber
4. What is spun yarn and filament yarn?
5. Name any two regenerated cellulose fibers
6. Write chemical compassion of cotton fiber.
7. Di-sulfide cross-linked cystines are present in which natural fiber?
8. Draw the longitudinal and cross section view of silk fiber
9. Write the full form of PAN and the raw materials required for PAN?
10. Which synthetic fiber having lease density?

PART-B

(6+10) ×5=80 Marks

Answer all the questions in detail

11. A. Classify polymers. (6)

    B. Classify the Texturising process. Brief about Draw Texturising with neat diagram and principles. (10)

(OR)

    C. What is Tacticity?. Write about different types of Tacticity. (6)

    D. Write the types of spinning techniques available for manmade fiber production. With neat diagram brief the Wet Spinning technique and its advantages and disadvantages. (10)

12. A. Write the difference between POY and FDY Yarns and its full form (6)

B. Draw the flow chart of classification of textile fibers (10)

(OR)

C. Define the following : (i) Dope dyed (ii) Mono and Multi filament yarn (iii) Textured yarn (6)

D. Write about the essential and desirable properties of textile fibers (10)

13. A. Write any four important physical properties of hemp fibers. (6)

B. Write the following properties of Cotton (a) Fiber length (b) Tensile strength (c) Moisture Regain % (d) Effect of Acid (e) Effect of Alkaline. (10)

(OR)

C. Write the morphological structure of cotton Fiber (6)

D. Explain the manufacturing process of Viscose Rayon with process flow chart. (10)

14. A. Write the life cycle of silk worm (6)

B. Explain the production of Woollen and Worsted yarn manufacturing process with process flow chart. (10)

(OR)

C. Write the chemical composition of wool and silk. (6)

D. Explain the manufacturing process of Nylon 6 6 fiber. (10)

15. A. Write any two Physical properties, one chemical property and melting point of Polyethylene fiber. (6)

B. Explain the manufacturing process of Polyester. (10)

(OR)

C. What is aromatic polyamide fiber?. Write any one Physical, chemical and thermal property of aromatic polyamide fiber. (6)

D. Explain the manufacturing process of Acrylic. (10)

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Diploma in Handloom & Textile Technology

NOV/DEC-2022 SEMESTER EXAMINATION

(Regulation-2021)

Semester : Third Semester — Time:3 Hours

Course Code & Title : **HTPC202 : Yarn Manufacturing Technology** — Maximum Marks: 100

PART-A (2×10=20 Marks)

Answer all the questions within two to three sentences

1. State the objectives of Ginning process.
2. Write the advantages of chute feed system.
3. State the objectives of carding machine.
4. List the different types of autoleveller employed in draw frame machines.
5. What are the different types of hooks present in the card sliver.
6. Write the functions of top-comb in combing machines.
7. State the objectives of drawframe machines.
8. Calculate the total draft applied on drawframe machine. If the count of drawframe silver and card slivers are 0.17 and 0.14 respectively and the number of doubling adopted in the drawframe machine is 6.
9. State the relation between twist per unit length and twist multiplier
10. List the functions of traveller in ringframe.

PART-B (6+10) ×5=80 Marks

Answer all the questions in detail

11. A. Write the process flow chart of carded yarn manufacturing system. (6)

    B. With neat diagram, explain the working mechanism of any type of ginning machine. (10)

(OR)

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

    D. Calculate the blowroom machine production in lbs/hour. Scutcher speed is 300 rpm, delivery roller diameter is 8" and m/c efficiency is 80%. [Lap Hank = 0.0012 Ne] (10)

12. A. Compare carding action and stripping action in carding machine. (6)

B. With neat diagram, explain the passage of material through high production carding machine. (10)

(OR)

C. Write the functions of mote knives and flats in carding machine (6)

D. Discuss the functions and working principle of two types of autoleveller with line diagram. (10)

13. A. Discuss the different methods of comber preparatory process. (6)

B. With neat diagram, explain the passage of material through modern combing machines. (10)

(OR)

C. Draw the diagram of sliver lap machine and mention the important functional part in the diagram. (6)

D. With neat diagram, explain the process cycle of combing process. (10)

14. A. Calculate the production in lbs per shift of 8 hours of drawframe machine with the following particulars. (6)
Front Roller Dia - 1.1 inch, Front Roller Speed = 480 rpm, Efficiency = 90%
Sliver Hank = 0.16 Ne

B. With neat diagram, explain the passage of material through drawframe machine with technical specifications. (10)

(OR)

C. Write short notes on mechanical draft and actual draft. (6)

D. With neat diagram, explain the passage of material through speedframe machine with technical specifications. (10)

15. A. Write short notes on reeling machine. (6)

B. In a Ring Frame 40 Ne carded yarn is to be spun in which spindle speed is 16000 rpm and there are 504 working spindles. The efficiency of the machine is 96% and twist multiplier is 4.2. Find out its production in lbs per shift of 8 hour. (10)

(OR)

C. Write short notes on bundling and baling press. (6)

D. With neat diagram, explain the passage of material through ring spinning machine with technical specifications (10)

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Diploma in Handloom & Textile Technology

NOV/DEC-2022 SEMESTER EXAMINATION

(Regulation-2021)

Semester : 3rd Semester — Time:3 Hours

Course Code &Title : **HTPC203 Handloom Weaving Technology** — Maximum Marks:100

PART-A

(2×10=20 Marks)

Answer all the questions within two to three sentences

1. Write any two advantages of cone over hank form of yarn package.
2. What are the objectives of winding?
3. What are the main difference between throw shuttle handloom and fly shuttle handloom?
4. Write the advantages of centre closed shed over bottom closed shed.
5. Name the different types of shuttle used in the handloom.
6. Write the main functions of the temple used in handloom.
7. Define the count 20^s Ne cotton of yarn numbering.
8. How many hanks are contained in 45 pounds of 15^s cotton yarn.
9. Calculate the count of a 2 fold yarn, which is madpe of two 40^s single yarn.
10. What will be the number of ends per inch in a $3/80^s$ stockport reed?

PART-B

(6+10) ×5=80 Marks

Answer all the questions in detail

11. A Differentiate the essential characteristics of warp and weft. (6)

    B What are the different methods of warping and explain the method of preparation of warp on a sectional warping machine? (10)

(OR)

    C What are the sizing ingredients used in size mixture and write the main function of any two ingredients? (6)

    D What are the various forms of sizing?. Explain briefly the process of street warp sizing. (10)

12. A Write the main functions of reed. (6)

    B Classify and explain the different motions in handloom weaving. (10)

(OR)

    C Illustrating a suitable weave explain shortly the shedding mechanism of a handloom using roller heald revering motion and treadle. (6)

D Discuss the different types of shed with suitable sketch.. (10)

13. A Write the essential features of a pit loom. (6)

B Explain the working principle of lattice dobby with a neat diagram. (10)

(OR)

C Differentiate between closed shed beating and cross shed beating. (6)

D Name the different types of let-off motions used in handloom. Describe rope-lever and weight let-off motion with suitable diagram. (10)

14. A Find out the count in New French system (Nf) of 960 meters of cotton yarn, which weighs 20 grams. (6)

B (i) Calculate the count of a linen yarn measuring 21600 yards and weighing 12 pounds. (10)

(ii) The count of 300 yards of worsted yarn was found to be 60^s worsted. Calculate the weight in grain.

(OR)

C Convert 20 Tex count to Denier metric system. (6)

D Derive the conversion factor to convert from New English system to metric system and Convert 60^s Ne cotton count to metric system. (10)

15. A Calculate the resultant count of the three fold cotton yarn composed of 20^s, 15^s and 12^s single yarn. (6)

B Calculate the count of the corkscrew yarn produced twisting together one thread of $2/40^s$ cotton and the other of 10^s cotton. By actual measurement it was found that 20 inches of 10^s thread and 10 inches of $2/40^s$ are contained in 10 inches of the corkscrew yarn. (10)

(OR)

C A warp contains yarns of the following particulars: (6)

4 ends of 30 Tex yarn

16 ends of 40 Tex yarn

Calculate the average count. (1 end = 1 km)

D Calculate the total number of ends in the reed from the following particulars: (10)

Count of the reed : 48^s ST

Denting : 2 ends per dent for body & 4 ends per dent in selvedge

Reed width : 52 inch (including ½ inch selvedge on each side)

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Diploma in Handloom & Textile Technology

NOV/DEC-2022 SEMESTER EXAMINATION

(Regulation-2021)

Semester : 3rd Semester Time:3 Hours

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

PART-A (2×10=20 Marks)

Answer all the questions within two to three sentences

1. Write the classification of woven fabric.
2. Name the different types of draft.
3. How can we alter the angle of twill?
4. Differentiate between wavy twill across and wavy twill along the cloth.
5. Determine the possible moves for a 9-thread satin weave.
6. Name the draft order used for weaving Diamond weave?
7. Why a Huck-a-back cotton towel is more durable than a honeycomb towel?
8. Which weave create a diagonal rib effect?
9. What type of weave and the colour pattern of warp and weft is used to produce hound's tooth design?
10. Why two separate beams are used for producing warp distorted thread effect?

PART-B (6+10) ×5=80 Marks

Answer all the questions in detail

11. A. Compare between woven, knitted and non-woven fabrics. (6)

    B. Construct design, draft, peg plan and tie-up for an irregular weft rib on rib pattern of 4,2,2,4 (repeat 12 x 2). (10)

(OR)

    C. What are the different types of ornamentation technique used for plain woven fabric? (6)

    D. Construct the design, draft, peg-plan for the following weaves (i) regular hopsack (ii) irregular hopsack weave on 8 x 8. (10)

12. A. Classification of twill weave with suitable examples. (6)

    B. Construct the design, draft, peg-plan for herringbone twill weave take 4 up 4 down twill as a base. (10)

(OR)

C. Make design for the following weaves: (6)
(i) Jeans (ii) Serge (iii) Denim

D. Construct the design, draft, peg-plan for a combined twill based on (a) 2 up 1 down 1 up 2 down twill and (b) 3 up 3 down twill weave. (10)

13. A. Differentiate between Diamond and Diaper. (6)

B. Construct the design, draft, peg-plan for (i) 3 up 3 down Diaper weave (ii) 1 up 4 down and 4 up 1 down twill dice check. (10)

(OR)

C. Differentiate between (i) Regular and Irregular Satin (ii) Satin and Sateen. (6)

D. Construct the design, draft, peg-plan for (i) 8 Thread sateen weave (ii) 2/2 twill base Diamond weave on 6x6. (10)

14. A. Construct the design, draft, peg-plan & tie-up for simplest Huck-a-back weave on 4 heald shaft. (6)

B. Construct the design, draft, peg-plan for Double Stitched honey comb weave on 12 x 12 repeat size. (10)

(OR)

C. Construct the design, draft, peg-plan & tie-up for a Mock-leno weave using 4 heald shaft in 10 x 10 repeat size. (6)

D. Construct the design, draft, peg-plan for (i) Weft corkscrew weave in 9 x 9 repeat size (ii) Warp corkscrew weave in 5 x 5 repeat size. (10)

15. A. Show the weave along with the colour pattern of warp and weft to produce the Hair line effect. (6)

B. Briefly Explain different methods adapted to produce a crepe fabric. (10)

(OR)

C. Construct Warp distorted thread effect on 18 x 18. (6)

D. Construct the design, draft, peg-plan by combining honeycomb and plain weave to produce a check fabric. (10)

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Diploma in Handloom & Textile Technology

NOV/DEC-2022 SEMESTER EXAMINATION

(Regulation-2021)

Semester : Third Semester — Time:3 Hours

Course Code & Title : HTPC 205 CHEMICAL PROCESSINGOF TEXTILES I — Maximum Marks: 100

PART -A

(2X10= 20 Marks)

Answer all the questions within two to three sentences

1. What is antichlor treatment?
2. Define cropping.
3. Define souring process.
4. What kind of bonding takes place in vat dyes? Write pH required for dyeing.
5. What is the role of wetting agent used in scouring process of cotton fabric?
6. Define auxochrome and chromophore with example.
7. What precaution should take during vat dye process?
8. Write any two reasons for cause of csv in jigger dyeing.
9. Write the chemical formula of cellulose.
10. What is Diazotization?

PART B

(6+10) ×5=80 Marks

Answer all the questions in details

11 A. What is saponification and Emulsification? 6

B. Explain bleaching process of cotton by using hydrogen peroxide with suitable recipe. 10

OR

C. Why enzymatic desizing is most preferable than other methods of desizing. 6

D. Explain the working of gas singeing machine with neat sketch & why it is most popular than other method of singeing. 10

12 A. Explain the working of jigger dyeing machine with neat sketch. 6

B. Explain scouring process by using kier machine with neat line diagram 10

OR

C. Explain the working of cabinet hank dyeing machine with neat sketch. 6

D. Explain the working of HTHP Beam dyeing machine with neat sketch. 10

13 A. Classify the reactive dye based on their reactive system. 6

B. What are the factors affecting dyeing with Reactive dye on cotton? Elaborate 10

OR

C. Why Reactive dyes are called so? Brief on their classification. 6

D. Explain the effect of pH, Temperature, time, and Electrolyte during dyeing of cotton with reactive dyes 10

14 A. Explain the conversion of insoluble vat dyes to soluble vat dyes with the help of proper chemical reaction. 6

B. Explain in details the application of vat dyes on cotton materials. 10

OR

C. Define tendering and bronziness defect of Sulphur dyes. 6

D. Explain in details the dyeing of cotton material using azoic dyes. 10

15 A. Write advantages of 1:2 metal complex dyes. 6

B. Explain the dyeing of silk with acid dye and write the function of used chemicals. 10

OR

C. Mention briefly the setting process for woolen 6

D. Write the process of dyeing silk with premetallized dye and also write recipe process condition and function of chemicals used. 10

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