

BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated-Colleges)

Level-1 Term-1, Final Examination-2018

Subject: Computer Programming (Code: MDM 101)

Time: 3.0 Hrs.

Full Marks: 72

(Use separate answer script for Part: A and Part: B)
(All parts of a question must be answered consecutively)

Part: A

(Answer any three questions)

1. (a) What is computer programming? Write down the importance of algorithm in computer programming?
(b) Define flow chart. Draw a flow chart of calculating average of 10 integers.
(c) What is the difference between = and == operator? Explain with an example.
(d) If integer allocates 2 Bytes of memory, will the statement work? If answer is no, why?
int a = 32790;
2. (a) What is return data type of a function? Write down a program with function for adding two integers. [3+3+3+3=12]
(b) What will be the output of the following program? Explain.

```
int func(int n)
{
    if(n<=0)
        return 5;
    else
        return n+func(n-1);
}
int main()
{
    int x;
    x = func(4);
    printf("%d",x);
    return 0; }
```


(c) Give some short notes about the following function.
(i) sqrt() (ii) pow() (iii) sqr()
3. (a) Write down the rules for ++ and -- operators. [4+4+4=12]
(b) What is # define directive? Briefly explain the different form of main() function used in C.
(c) Why do we use return 0?
(d) Write about various data types of C.
4. (a) Compare among the three loops, for, while, do-while. [3+4+2+3=12]
(b) Find the output of the following part of a program:

```
for (i = 0; i < 10; i++) {
    printf("%d", i);
    if (i == 5)
        break;
}
```


(c) What are the differences between 'a' and "a" in C programming language?
(d) Give some short notes about:
(i) printf() (ii) scanf() (iii) getch(). [3+3+4+2=12]

Part : B

(Answer any three questions)

5. (a) Why do we use array in our program? Give the output of the following program:

```
int main(){
    int a [5] = {1,2,3,4,5}, i;
    for (i = 3; i >= 2; i--){
        printf ("%d", a[i+1]);
    }
    return 0;
}
```

- (b) Write a C program that will read an integer and display whether it is odd or even.
(c) What is meant by arrays? Write different types of arrays.

[4+4+4=12]

6. (a) Give some short notes about the following function.

(i)strupr() (ii)stricmp() (iii)strcpy() (iv)strrev()

- (b) Define string. What is the output of the following program? Explain.

```
main () {
    char str1[30] = "Bangladesh";
    int len ;
    len = strlen (str1);
    printf("%d", len);
}
```

- (c) Write a program with c programming language which can take a string and print it like sample output.

[4+4+4=12]

7. (a) What is a structure? Differentiate between structure and union with example.

- (b) How many kinds of function are there in c programming language? Explain them with example.

- (c) Describe these functions; fopen(), fclose(), fprintf(), fscanf().

[4+4+4=12]

8. (a) What is object Oriented Programming? What are the advantages of OOP?

- (b) Define following terms:

- i) Object and class
- ii) Data abstraction and encapsulation
- iii) Inheritance
- iv) Polymorphism

- (c) Describe the application of OOP technology.

[4+4+4=12]

BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated Colleges)

Level-1 Term-1, Final Examination-2018

Subject: Natural Textile Fibres (Code: YE 101)

Time: 3.0 Hrs.

Full Marks: 72

**(Use separate answer script for Part: A and Part: B)
(All parts of a question must be answered consecutively)**

Part: A

(Answer any three questions)

1. (a) Define textile fibre. Classify natural textile fibres with example.
(b) What are the basic properties of textile fibre?
(c) Write the differences between natural fibres and man-made fibres. [4+4+4=12]
2. (a) Define ginning, lint and linters.
(b) Write down the American cotton grading system.
(c) Illustrate the microscopic view of cotton fibre.
(d) Show the chemical structure of cotton. [3+3+4+2=12]
3. (a) Why jute is called the "Golden fibre of Bangladesh"?
(b) Write the physical and chemical properties of jute fibre.
(c) Describe the end uses of jute fibre. [2+6+4=12]
4. (a) What is meant by flax fibre?
(b) Mention the differences between Linen and Flax?
(c) Show the process flowchart of flax fibre.
(d) Discuss about cottonized flax fibre. [2+3+3+4=12]

Part : B

(Answer any three questions)

5. (a) Show the chemical structure of wool fibre.
(b) Describe the processing of wool fibre in briefly.
(c) Discuss the sources and types of any four animal's hair fibre. [2+6+4=12]
6. (a) What is meant by silk?
(b) State the physical and chemical properties of silk.
(c) Describe the life-cycle of silkworm with figure. [2+4+6=12]
7. (a) What are the key properties of asbestos fibre?
(b) Write short notes on any 03 (three) of the following fibres:
(i) Pine-apple leaf fibre (ii) Kapok fibre (iii) Coir fibre (iv) Ramie fibre (v) Banana fibre. [3+(3×3)=12]
8. (a) Differentiate between wool and silk.
(b) Define mineral fibre and asbestos.
(c) Show the chemical composition of asbestos.
(d) Briefly discuss the manufacturing process of asbestos. [4+2+2+4=12]

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BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated Colleges)

Level-1 Term-1, Final Examination-2018

Subject: Business and Communicative English (Code: HSS 101)

Time: 3.0 Hrs.

Full Marks: 72

(Use separate answer script for Part: A and Part: B)
(All parts of a question must be answered consecutively)

Part: A

(Answer any three questions)

1. (a) Define 'Encoding' and 'decoding' in a communication process.
(b) Define Intrapersonal and Interpersonal Communication with example. [5+7=12]

2. (a) What is effective communication? What are the requirements of effective communication?
(b) Describe the elements of communication process showing through a diagram. [(2+5)+5=12]

3. (a) What is meant by face to face conversation? Discuss the advantages and disadvantages of face to face conversation.
(b) Write some differences between Vertical Communication and Horizontal Communication. [(2+5)+5=12]

4. (a) Write an essay on 'The Role of Technology in Education'.
(b) Mention some techniques to improve your speaking skills. [8+4=12]

Part : B

(Answer any three questions)

5. (a) What is letter? Briefly explain the various types of letter.
(b) Discuss the functions of various paragraphs of a business letter. [(2+5)+5=12]

6. (a) Write down some significant purposes of Business letter.
(b) Why do you think 'Notice' is important for an organization? Explain. [8+4=12]

7. (a) Suppose, you have bought a Television from Walton Showroom in your locality. But after five days of the purchase date, the sound of the television is not functioning properly. Now, write a satisfactory complain letter to the General Manager of Walton Showroom for taking immediate action.
(b) What is meant by 'Industrial Report' and 'Progress Report'? [7+5=12]

8. (a) Write an essay on "Bangladesh Textile Industry and Challenges". [12]

Time: 3.0 Hrs.**Full Marks: 72**

**(Use separate answer script for Part: A and Part: B)
(All parts of a question must be answered consecutively)**

Part: A**(Answer any three questions)**

- (a) Illustrate the Heisenberg uncertainty principle for small particles and large objects.
(b) 2nd electron affinity of non-metal is endothermic process whereas 1st one is exothermic explain.
(c) Discuss following rules for electronic configuration of atom (i) Pauli Exclusion Principal
(ii) Hund's rule.

[5+3+4=12]
- (a) What is covalent bond? Discuss briefly the valence bond theory of covalent bond.
(b) Write the stability of N₂ and O₂ molecules on the basis of MOT.
(c) What is polarization? Explain Fajan's rule.

[4+4+4=12]
- (a) Discuss the basic postulates of Werner's theory of co-ordination.
(b) Calculate the EAN of following compounds: (i) Co(NH₃)₆]³⁺ (ii) [Pt Cl₆]²⁻.
(c) Write the basic assumptions of crystal field theory.
(d) Write some importance's of complex compound.

[4+3+3+2=12]
- (a) What is buffer solution? Calculate the pH of a 0.1M NaOH solution.
(b) Compare the relative strength of HF, HCl, HI and HBr in terms of effects of substituent.
(c) How can apply Lux Flood concept to identify acid and base from the reaction:
CaO + SO₃ ⇌ Ca²⁺ + SO₄²⁻.

[4+4+4=12]

Part: B**(Answer any three questions)**

- (a) Why the vapor pressure of solution is lower than that of pure solvent?
(b) Establish the *Vant Hoff* equation for osmotic pressure.
(c) 18.2 g of Urea is dissolved in 100 g of water at 50°C. The lowering of vapour pressure produced is 5 mm Hg. Calculate the molecular mass of urea. The vapour pressure of water at 50°C is 92 mm Hg.

[3+4+5=12]
- (a) Derive Raoull's law by using lowering of vapour pressure.
(b) What is osmosis? State Van't Hoff's law of osmotic pressure and deduce osmotic pressure equation $P = CRT$. The symbols have their usual significance.
(c) Calculate the osmotic pressure of a 5% solution of glucose (mol wt = 180) at 18°C.
(d) Explain the electro dialysis method of the purification of colloids.

[3+4+2+3=12]
- (a) Explain the following terms: (i) Law of mass action (ii) Heterogeneous equilibrium.
(b) Derive the relation between K_c and K_p.
(c) At 500°C, the reaction between N₂ and H₂ to form ammonia has K_c = 6.0 × 10⁻². What is the numerical value of K_p for the reaction?
(d) What is Le Chatelier's principle? Discuss its applications.

[3+3+2+4=12]
- (a) What are the main types of surfactants? Illustrate.
(b) Chlorophyll acts as a photosensitizer- explain.
(c) State a preparation process of colloids by association method.
(d) Distinguish between colloidal dispersion and suspensions.

[4+2+4+2=12]

BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated Colleges)

Level-1 Term-I, Final Examination-2018

Subject: Mathematics-I (Code: MS 101)

Time: 3.0 Hrs.

Full Marks: 72

(Use separate answer script for Part: A and Part: B)
(All parts of a question must be answered consecutively)

Part: A

(Answer any three questions)

- (a) Evaluate by using L' Hospital rule: $\lim_{x \rightarrow 0} (\cos x) \operatorname{cosec}^2 x$.

(b) State and prove mean value theorem.

(c) Differentiate the following: (i) $x^{\ln x} + x^{\cos^{-1} x}$ (ii) $y^n = \frac{x+y}{x-y}$.

[4+4+4=12]
- (a) State the Euler's theorem.

(b) If $u = \tan^{-1} \frac{x^3 - y^3}{x-y}$, then prove that $x \frac{\delta u}{\delta x} + y \frac{\delta u}{\delta y} = \sin 24$.

(c) Find the maximum and minimum values of the function, $f(x) = 2x^3 - 9x^2 + 12x - 3$.

[2+5+5=12]
- (a) Evaluate the following: (i) $\int \frac{(4x+3)dx}{3x^2+3x+1}$ (ii) $\int_0^a \sin^{-1} \frac{2t}{1+t^2} dt$.

(b) State and prove walli's formula.

(c) If $I_n = \int_0^{\pi/4} \tan^n \theta d\theta$, prove that $I_n = \frac{1}{n-1} - I_{n-2}$.

[4+4+4=12]
- (a) Write the properties of definite integral.

(b) Evaluate: $\int_0^{\pi/2} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}} dx$.

(c) Define Gamma and Beta function. Prove that $\beta(m, n) = \frac{\Gamma m \Gamma n}{\Gamma(m+n)}$.

[3+4+5=12]

Part: B

(Answer any three questions)

- (a) Define singular matrix, skew-symmetric matrix and rank of a matrix.

(b) Discuss the consistency of the following system of equations using rank of matrices:
$$\begin{aligned} 2x + 3y + 4z &= 11 \\ x + 5y + 7z &= 15 \\ 3x + 11y + 13z &= 25 \end{aligned}$$

(c) Solve the following system of linear equations using Gaussian elimination method.
$$\begin{aligned} x + y + 2z &= 9 \\ 2x + 4y - 3z &= 1 \\ 3x - 6y - 5z &= 0 \end{aligned}$$

[3+4.5+4.5=12]
- (a) Find A^{-1} using a row canonical form of a matrix where $A = \begin{bmatrix} 2 & 1 & 2 \\ 1 & 2 & -1 \\ 1 & 0 & 1 \end{bmatrix}$

(b) Express the vector $V=(2, -5, 3)$ as a linear combination of $v_1 = (1, -3, 2)$, $v_2 = (2, -4, -1)$ and $v_3 = (1, -5, 7)$ in \mathbb{R}^3 .

(c) Express (if possible) the matrix $A = \begin{bmatrix} 3 & -1 \\ 1 & -2 \end{bmatrix}$ as a linear combination of the matrices $A_1 = \begin{bmatrix} 1 & 1 \\ 0 & -1 \end{bmatrix}$, $A_2 = \begin{bmatrix} 1 & 1 \\ -1 & 0 \end{bmatrix}$ and $A_3 = \begin{bmatrix} 1 & -1 \\ 0 & 0 \end{bmatrix}$.

[4+4+4=12]
- (a) Prove that the equation $3y^2 - 8xy - 3x^2 - 29x + 3y - 18 = 0$ represents two straight lines. Also find their point of intersection.

(b) Determine the angle between the straight lines represented by $2x^2 + 6xy + 4y^2 - 3x - 7y = 0$.

(c) Transform the following equation $153x^2 - 192xy + 97y^2 - 30x - 40y - 200 = 0$ to the standard form and hence identify the conic.

[5+2+5=12]
- (a) Prove that the angle between two diagonals of a cube is $\cos^{-1} \left(\frac{1}{3} \right)$.

BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated Colleges)

Level-1 Term-I, Final Examination-2018

Subject: Polymer Science and Engineering (Code: WPE 101)

Time: 3.0 Hrs.

Full Marks: 72

(Use separate answer script for Part: A and Part: B)
(All parts of a question must be answered consecutively)

Part: A

(Answer any three questions)

- What is polymer? Why is the important of polymer science study for a textile engineer?
 - Differentiate repeat unit and structural unit of a polymer.
 - Define degree of polymerisation. Find the molecular weight of polypropylene (PP) with a DP of 5×10^4 .
 - Classify polymers with examples of each type.

[3+3+3+3=12]
- Define the term 'thermoplastic' and 'thermosetting'? Give the examples of them.
 - Classify the polymer on the basis of geometrical structure.
 - What are the monomers of polyester? Give the reactions for polyester making.
 - Define monomer residue and end group with examples.

[3+3+3+3=12]
- Discuss the mechanism of step-growth polymerisation with examples.
 - Compare between chain growth and step-growth polymerisation.
 - Write short note on ring opening polymerisation.
 - What do you mean by tacticity? List the examples of different types of tacticity.

[5+2+3+2=12]
- Define chain polymerisation. What are the steps of chain polymerisation? Describe briefly with examples.
 - What is polycondensation? Write the conditions of polycondensation.
 - Explain Initiators and Inhibitors with examples.
 - Describe the mechanism of free radical polymerisation.

[4+3+2+3=12]

Part: B

(Answer any three questions)

- Explain crystallinity and amorphousness of polymer.
 - Discuss the factors that controls crystallinity of polymer.
 - Why bakelite is a thermosetting polymer?
 - The fully amorphous density (P_a) and fully crystalline density (P_c) of polypropylene (PP) are 4.445 and 1.837 gm/cm³, respectively. If the experimental density of P.P is 1.57. Find the volume fraction crystallinity.

[3+4+2+3=12]
- State the fringed micelle model with figure showing the structure of polymers.
 - Describe the effects of crystallinity on the properties of polymer.
 - Explain the factors on which T_g of a polymer depends.
 - Mention the value of T_g and T_m of the following polymer: (i) Polyester (ii) Nylon 6.6

[4+3+3+2=12]
- What is polymer degradation? Discuss the unzipping mechanism of polymer degradation.
 - How can a polymer be protected from photo degradation?
 - Discuss the factors affecting the stability of C-C bond in a polymer chain.

[5+3+4=12]
- What do you mean by polydispersity index?
 - Why is polymer blending important? Classify polymer blends.
 - State the application of liquid crystal polymers.
 - Write short notes on LDPE and HDPE.

[2+4+3+3=12]

BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated Colleges)

Level-1 Term-1, Final Examination-2018

Subject: Physics-I (Code: PHY 101)

Time: 3.0 Hrs.

Full Marks: 72

(Use separate answer script for Part: A and Part: B)
(All parts of a question must be answered consecutively)

Part: A

(Answer any three questions)

- (a) Define: (i) Critical velocity (ii) Stream line motion.

(b) What is law of efflux? Obtain an expression for the velocity of efflux of a liquid from a tank.

(c) Calculate the speed at which the velocity head of a stream of water is equal 0.5 m of Hg.

[3+6+3=12]
- (a) Explain the term viscosity of a fluid and define co-efficient of viscosity.

(b) Describe Poiseuille's method for determining the co-efficient of viscosity of a liquid.

(c) A pressure of 84 Kpa decreases the volume of 2004 L of water by 0.004 percent. Compute the compressibility of water.

[3+7+2=12]
- (a) State the relation between torque and moment of inertia.

(b) Find the moment of inertia of a solid sphere about its diameter and a tangent.

(c) A circular disc of mass 100 gms and radius 10 cm is making 120 rpm about an axis passing through its centre and perpendicular to its plane.

[3+6+3=12]
- (a) Define the terms Poisson's ratio and flexural rigidity.

(b) Show that the work done per unit volume in straining a body is equal to $\frac{1}{2} \text{ stress} \times \text{strain}$.

(c) Explain for bending the strain in a layer is directly proportional to its distance from the neutral axis.

[2+7+3=12]

Part : B

(Answer any three questions)

- (a) Define capillarity and angle of contact.

(b) Derive an expression for the moment of inertia of a uniform circular disc about an axis passing through its center and perpendicular to its plane.

(c) A liquid of density 1.05 gm/cc and angle of contact 20° has a vertical capillary tube of 2 mm diameter dipping into it. If the surface tension of the liquid be 235 dynes/cm, find the rise of the liquid in the capillary tube.

[2+6+4=12]
- (a) What is interference of light? Give the condition of interference.

(b) Determine the wave length of monochromatic light by the theory of fringes.

(c) Define: Wave front and coherent source.

[4+6+2=12]
- (a) Show that the resolving power of a grating is the product of the number of line and the order of the spectra.

(b) What is zone plate? Establish theory of zone plate. Compare a convex lens with it.

(c) Parallel beam of monochromatic light is allowed to be incident normally on a plane grating having 1250 lines per cm and a 2nd order spectral line is observed to be deviated through 30° . Calculate the wavelength of the spectral line.

[3+6+3=12]
- (a) What is Newton's ring?

(b) Why the central point is dark at Newton's ring?

(c) Find the wave length of monochromatic light by Newton's ring.

[3+4+5=12]