BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated College)
Level-1 Term-II, Final Examination-2017

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) What is a report? Describe different types of business report.
    (b) Both 'Upward' and 'Downward' channel plays vital role in organizational communication.

    [8+4=12]

2. (a) Define and discuss different types communication with examples.
    (b) Briefly discuss the significance of 'Agenda' and 'Minutes' in organizational settings.

    [8+4=12]

3. (a) Why are the four skills (listening, speaking, reading, writing) important for the learners? Describe.
    (b) Write some differences between spoken and written language.

    [8+4=12]

4. (a) Define Intrapersonal Communication and Interpersonal Communication. Show differences between them.
    (b) Discuss the 7C'^{s} communication.

    [7+5=12]

Part : B
(Answer any three questions)

5. (a) Differentiate between business letter and personal letter.
    (b) Suppose you are the student of Level-1, Term-II. You want to go on a study tour after your final exam. Now, write an application to the principal seeking permission to go on a study tour following full block style.

    [4+8=12]

6. (a) What is CV?
    (b) Write a CV with cover letter for the post of a production officer.

    [2+10=12]

7. (a) Suppose, you are the Branch Manager of a reputed Hotel in Dhaka city. Write an apology letter to one of your regular customers who made a list of complaints against the last service you provided.
    (b) How non-verbal form facilitates effective communication?

    [8+4=12]

8. (a) Discuss some 'Micro Functions of Language' according to the technologists.
    (b) "Communication rests upon the heart of organizational productivity". Elaborate.

    [8+4=12]

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BANGLADESH UNIVERSITY OF TEXTILES
B. Sc. in Textile Engineering (For Affiliated College)
Level-1 Term-II, Final Examination-2017

Subject: Polymer Science & 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)

1. (a) Define polymer and monomer with appropriate illustration.
   (b) Compare between polymer and macromolecule.
   (c) Classify polymer from different considerations.
   (d) What is copolymer? Give an example.

   [2+3+5+2=12]

2. (a) Describe various types of step polymerization reaction.
   (b) Why liquid phase polymerization is preferred most?
   (c) Discuss about bulk polymerisation technique with its merits and demerits.

   [4+4+4=12]

3. (a) Define initiator with an example.
   (b) Give the salient features of free radical polymerisation.
   (c) Why free radical polymerisation is carried out under nitrogen atmosphere?
   (d) Explain anionic polymerisation with an example.

   [2+3+3+4=12]

4. (a) What is index of polydispersity? Show the comparison between polydispersity and monodispersity condition of a system.
   (b) Draw molecular weigth distribution curve of polymer and point out different molecular weight.
   (c) What would be the molecular weight, if 9 moles, molecular weight (M_w) = 50,000 & 5 moles molecular weight (M_w) = 70,000.
   (d) Write down the name of commonly used instrumental methods for determining the molecular weight of the polymer.

   [3+3+4+2=12]

Part : B
(Answer any three questions)

5. (a) What is polymer degradation? Why and when do polymers undergo degradation?
   (b) Write down the differences between chain end and random degradation.
   (c) Describe about oxidative degradation. How anti oxidant prevent oxidative degradation.

   [3+4+5=12]

6. (a) Define T_m. Mention the factors those influence melting temperature of a polymer.
   (b) Establish the relationship between T_g and T_m.
   (c) What is differential scanning colorimetry? How can it works?
   (d) Mention the T_g & T_m of PET, Nylon 6 and Nylon 6,6.

   [3+3+3+3=12]

7. (a) Illustrate the structure of polystyrene, PMMA, PET, Glyptal.
   (b) Write down the raw materials, formation reaction and uses of polyester polymer.
   (c) How its physical and chemical properties make Nylon 6,6 suitable for its uses?

   [4+4+4=12]

8. (a) What are the applications of Carbon Nanotube?
   (b) What is hydrogel? Describe the characteristic of hydrogel.
   (c) Describe the features of conductive polymers.
   (d) Compare between Rayon, Lyocell & Cellulose Acetate fiber.

BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated College)
Level-1 Term-II, Final Examination-2017

Subject: Physics-II (Code: PHY 103)

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) State Gausses law? Obtain the coulomb's law from Gauss's law?
    (b) Calculate the electric field due to a dipole at a point p at a distance r along the perpendicular bisector of the line joining the charges.
    (c) An electric dipole consists of two opposite charges of 2×10^{-6} coul. seperated by a distance 1 cm. It is placed in an external electric field of 2×10^5 N/coul. Calculate the maximum torque on the dipole.

    [4+5+3=12]

2. (a) What is hall effect? Show that the hall voltage is inversely proportional to the number of charge carrier per unit volume.
    (b) State faraday's law of electromagentic induction.
    (c) Show that the lenze law obeys the principle of conservation energy.

    [6+3+3=12]

3. (a) Define potential difference. Give an expression for the energy stored per unit volume of a capacitor.
    (b) Show the nature of the decay curve in L-R series circuit after deducing the decay of current equation for that circuit.
    (c) Discuss the charging and discharging of a capacitor through a resistance.

    [3+6+3=12]

4. (a) Is there an upper limit to the magnetization of a ferromagnet? Explain.
    (b) What is electromagnetic oscillations? Show L-C oscillations & its analogy to simple harmonic motion.
    (c) In an L-R circuit at 2 sec, the current reached to its maximum value. Find the time constant of the circuit.

    [2+7+3=12]

Part : B
(Answer any three questions)

5. (a) Define mean free path? Deduce the equation of mean free path.
    (b) Find the equation of critical temperature constant from the vander-woal's equation.
    (c) Define root mean square velocity.

    [5+5+2=12]

6. (a) State Newton's law of cooling.
    (b) Prove that the pressure exerted by an ideal gas is equal to two third of the average translation kinetic energy of the gas molecules per unit volume.
    (c) Calculate the number of molecules in one liter of an ideal gas at 127°C and 2 atmospheric pressure.

    [2+7+3=12]

7. (a) Show that the sum of the heat absorbed is equal to the total external work performance.
    (b) What is heat engine? Give the efficiency of heat engine interms of temperature of the source and sink.
    (c) State the second law of thermodynamics.

    [3+7+2=12]

8. (a) Distinguish between isothermal & adiabatic process.
    (b) Show that entropy remains constant in a reversible adiabatic process and increase in an irreversible one.
    (c) Find the difference of entropy between 1 gm of water at 0°C and 1 gm of water at 100°C. Specific heat of water to be constant throughout and to be equal to 1.

B. Sc. in Textile Engineering (For Affiliated College)
Level-1 Term-II, Final Examination-2017
Subject: Chemistry-II (Code: CHEM 103)

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 are carbonium ions? Discuss the relative stabilities of primary, secondary and tertiary carbonium ions.
   (b) Explain about SN^2 reaction.
   (c) What are grignard reagents? Describe the laboratory synthesis of different types of alcohol from carbonyl compounds and grignard reagents.
   (d) Write short note on organo-zinc compound.

   [3+3+4+2=12]

2. (a) Prepare following compounds from phenol (i) P-hydroxy toluene (ii) Anisol
   (b) Phenol shows Friedel craft alkylation reaction but benzoic acid is not- Explain.
   (c) Differentiate 1°, 2° and 3° alcohol by oxidation method.

   [4+4+4=12]

3. (a) Explain why aldehydes are more reactive than ketones?
   (b) How does acetaldehyde react with followings: (i) HCN (ii) $NaHSO_3$ (iii) NH_2OH
   (c) Write the mechanism of aldol condensation.
   (d) How will you distinguish between aldehyde and ketone?

   [3+3+3+3=12]

4. (a) Write two general methods for the preparation of monocarboxylic acids.
   (b) Arrange the following compounds in order of increasing acidity and explain your answer: HCOOH, $ClCH_2COOH$, CH_3COOH
   (c) Complete the following reactions:

   (i) $CH3COOH \xrightarrow{PCl5}$?

   (ii) $CH_3COOH + C_2H_5OH \xrightarrow{Cone. H_2SO_4}$?

   (iii) $CH_3COOH \xrightarrow[ether]{LiAlH_4}$?

   (d) Mention a reagent that can be used to identify the presence of carboxylic acid group in an organic compound. Show the chemical reaction.

   [3+3+3+3=12]

Part : B
(Answer any three questions)

5. (a) Classify carbo hydrate according to number of sugar unit.
   (b) Mention Ruff Degradation reaction in case of shortening aldose chain.
   (c) Synthesize the following textile fibers from cellulose (i) Rayon (ii) Acetate Rayon.

   [4+4+4=12]

6. (a) What is aryl diazonium salt? Give an example.
   (b) Explain why ethyla mine is a stronge base than ammonia?
   (c) How is aniline obtained from Nitrobenzene? How does aniline react with $CHCl_3$ in presence of alc. KOH ?
   (d) Explain about (i) Hofmann degradation (ii) Sandmeyer reaction.

   [2+3+4+3=12]

7. (a) Compare acidity between following compounds
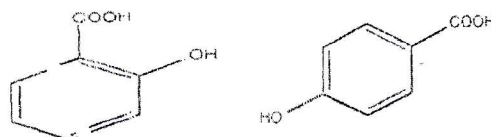
   (b) Illustrate the reactivity of acid derivatives.
   (c) Propanoic acid shows Hell-Volhard-Zelinsky reaction but benzoic acid is not-explain with necessary reaction.
   (d) Mention a coupling reaction for the synthesis of yellow azo compound.

BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated College)
Level-1 Term-II, Final Examination-2017

Subject: Engineering Materials (Code: IPE 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 engineering materials? Write down the properties of engineering materials.
   (b) What is meant by elasticity and Young's modulus of elasticity?
   (c) A steel rod 1m long and 20 mm × 20 mm in cross-section is subjected to a tensile force of 40 KN. Determine the elongation of the rod, if modulus of elasticity for the rod material is 200 Gpa.

   [5+3+4=12]

2. (a) Define brass and bronze.
   (b) Explain the outstanding characteristics and applications of aluminium.
   (c) Discuss about gun metal and muntaz metal.

   [3+5+4=12]

3. (a) What is corrosion? Describe different types of corrosion protection methods.
   (b) What is season cracking? Describe the mechanism and protection methods of season cracking.
   (c) Write the names of different useful carbides with characteristics and application.

   [4+4+4=12]

4. (a) What is alloying? Classify steels based on carbon contents with their properties and uses.
   (b) What is heat treatment? How can change the properties of material by heat treatment?
   (c) What is quenching? Describe heat removal methods during quenching process.

   [4+4+4=12]

Part : B
(Answer any three questions)

5. (a) What is cast Iron? Write down the properties and uses of cast Iron in engineering materials.
   (b) Define alloy steels. Why alloying elements are added to steel.
   (c) Describe stainless steel.

   [5+4+3=12]

6. (a) What is composite? What are the properties of composite material?
   (b) What are the contribution of fillers, plasticizers and solvents in manufacturing of plastics?
   (c) What is vulcanization? Describe the manufacturing of natural rubber.

   [3+4+5=12]

7. (a) What is blast furnace? Describe cast iron manufacturing using blast furnace process.
   (b) Write down the effects of the following alloying elements-
       i. Titanium
       ii. Chromium
       iii. Magnesium
       iv. Silicon.
   (c) Write short note on commercial glass.

   [5+4+3=12]

8. (a) Define thermoplastic with examples.
   (b) Write down the uses of thermosets.
   (c) Write short note on fatigue and creep.

BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated College)
Level-1 Term-II, Final Examination-2017

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;

   [3+4+2+3=12]

2. (a) What are the differences between while and do while loop in c programming language?
   (b) How does *if else* statement work? Explain with an example.
   (c) What will be the output of the following program?
   int i;
   for(i=0;i<10;i++){
   if(i>4 && i<8)
   continue;
   printf("%d",i);
   }
   (d) Write down a program with c programming which shows all the odd numbers from 1 to 100.

   [2+3+3+4=12]

3. (a) State function. How to declare function in C?
   (b) Explain the switch statement with syntax and example.
   (c) Write a program in C to find the area of Circle.

   [4+5+3=12]

4. (a) What is an operator? Explain the conditional operator in C.
   (b) State variable. Give the condition for variables.
   (c) Write down the fundamental data types in C.
   (d) Explain the different types of string function in C.

   [3+3+2+4=12]

Part : B
(Answer any three questions)

5. (a) Define structure. Explain the syntax of structure declaration with example.
   (b) Write a C program to read a year as an input and find whether it is leap year or not.
   (c) State recursion. Write down the advantage of recursive function.
   (d) Distinguish between structure and union.

   [4+4+2+2=12]

6. (a) What is compiler and interpreter?
   (b) What is file? Write down the different types of file operation.
   (c) Write down the advantage of function in C.
   (d) Distinguish between variable and constant.

   [2+4+4+2=12]

7. (a) What are the differences between 'a' and "a" in c programming language?
   (b) Write down a program to take 2 inputs from a file, add them and show the result with another file with c programming language.
   (c) Define 2-dimention array. If we declare *int a [2][4];* how many variables will be declared and what are they?

   [3+6+3=12]

8. (a) What is OOP? Write down the some feature in OOP.
   (b) Distinguish between OOP and POP.
   (c) What is the primary pillar of object oriented programming.
   (d) Write the short note:

BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated College)
Level-1 Term-II, Final Examination-2017

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) Classify natural textile fibres with example.
   (b) What are the basic requirements to be a textile fibre?
   (c) Write the differences between natural fibres and man-made fibres.

   [4+4+4=12]

2. (a) Define the terms: Ginning, Lint and Linters.
   (b) Show the American cotton grading system.
   (c) State the microscopic view of cotton fibre.
   (d) Write down the chemical properties of cotton fibre.

   [3+3+3+3=12]

3. (a) Show the chemical composition of jute fibre.
   (b) State the geographical distribution of jute fibre.
   (c) Describe the up-gradation process of jute fibre.
   (d) Establish the end uses of jute fibre.

   [2+3+3+4=12]

4. (a) Write down the physical properties of silk.
   (b) What do you mean by asbestos fibre?
   (c) What are the compositions of asbestos?
   (d) Establish the manufacturing process of asbestos.

   [4+2+2+4=12]

Part : B
(Answer any three questions)

5. (a) Show the chemical structure of wool fibre.
   (b) Illustrate the morphological structure of wool.
   (c) Discuss the sources and types of any four animal's hair fibre.

   [2+6+4=12]

6. (a) Why silk is called the "Queen of fibres"?
   (b) Shortly describe the silk production and processing.
   (c) Write down the differences between wool and silk fibre.

   [2+6+4=12]

7. (a) What is "Cottonized Flax"? Why flax fibre is cottonized?
   (b) Shortly describe the "Dressing of the flax fibre".
   (c) What are the end uses of flax fibre?

   [3+6+3=12]

8. (a) Write down the short notes of any three following fibres-
       i)   Hemp
       ii)   Banana fibre
       iii) Kapok
       iv)   Coir fibre.

   [3 × 4=12]

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BANGLADESH UNIVERSITY OF TEXTILES
B. Sc. in Textile Engineering (For Affiliated College)
Level-1 Term-II, Final Examination-2017

Subject: Mathematics-II (Code: MS 103)

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 order and degree of differential equation.
   (b) Solve: $y\sqrt{x^2 - 1}\,dx + x\sqrt{y^2 - 1}\,dx = 0$.
   (c) Solve the equation $(1 + xy)y\,dx + (1 - xy)x\,dy = 0$ using the exact differential equation method.

   [4+4+4=12]

2. (a) Solve the differential equation $(D^2 - 6D + 9)y = 1 + 2x + x^2$.
   (b) Using the method of variation of parameters solve the equation $\frac{d^2y}{dx^2} + 4y = 4\tan 2x$.
   (c) Solve the equation $(D^2 + 4)y = 4\sin 2x$ by the method of undetermined coefficient.

   [4+4+4=12]

3. (a) State Green theorem.
   (b) Evaluate: $\vec{a} \times (\vec{b} \times \vec{c}) + \vec{b} \times (\vec{c} \times \vec{a}) + \vec{c} \times (\vec{a} \times \vec{b})$ where $\vec{a}, \vec{b}$ and $\vec{c}$ are three vectors.
   (c) Verify stoke's theorem for the vector $F = 2y\hat{\imath} + 3x\hat{\jmath} - z^2\hat{k}$, where S is the upper half surface of the sphere $x^2 + y^2 + z^2 = 9$ and C is its boundary.

   [3+4+5=12]

4. (a) State Gauss's divergence theorem.
   (b) If $\hat{A} = 3xy\hat{\imath} - y^2\hat{\jmath}$, Evaluate $\int_c \hat{A}.\,d\vec{r}$ where c is the curve in the xy plane $y = 2x^2$ from $(0, 0)$ to $(1, 2)$.
   (c) If the vector field is given $\vec{F} = (2x - y + z)\hat{\imath} + (x + y - z^2)\hat{\jmath} + (3x - y + 4z)\hat{k}$. Evaluate the line integral over a circular path given by $x^2 + y^2 = a^2$, $z = 0$.

   [2+4+(1+5)=12]

Part : B
(Answer any three questions)

5. (a) Define complex line integral.
   (b) State and prove Cauchy integral formula for the derivative of an analytic function.
   (c) State Cauchy integral formula. Evaluate $\oint_c \frac{e^{2z}}{(z+1)^4}\,dz$, c: $|z| = 3$, using Cauchy integral formula.

   [2+5+5=12]

6. (a) Define Laplace transform. Find the Laplace transform of $(2\cos 5t - 3\sin 5t)$.
   (b) Prove that $L\{\cos hat\} = \frac{s}{s^2 - a^2}$.
   (c) Find the Laplace transform of sin at using the change of scale property.

   [5+4+3=12]

7. (a) State the convolution theorem.
   (b) Prove that $6\mathcal{L}\{\sin at\} = \frac{a}{s^2 + a^2}$ if $s > 0$.
   (c) Evaluate: $\mathcal{L}^{-1}\left\{\frac{s}{(s^2 + a^2)^2}\right\}$ by using the convolution theorem.

   [4+4+4=12]

8. (a) Find $\mathcal{L}^{-1}\left\{\frac{s^2 - 4}{(s + 1)(s - 2)(s-3)}\right\}$ by partial fractions.
   (b) Find the general solution of $Y''' - 3Y'' + 3Y' - Y = t^2 e^t$; where $Y(0) = 1$, $Y'(0) = 0$, $Y''(0) = -2$.

   [6+6=12]

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BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated College)
Level-1 Term-II, Final Examination-2017

Subject: Introduction to Apparel Engineering (Code: AE 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) Briefly discuss on the historical development and present scenerio of knit and woven garment industry in Bangladesh.
    (b) Write down the importance of Apparel Industry in Bangladesh.
    (c) Describe the contribution of RMG in national economy of Bangladesh.
    (d) Explain Grain Line and its importance.

    [4+3+2+3=12]

2. (a) Write down the flow process of Apparel Manufacturing.
    (b) Differentiate between tailoring and industrial production system for Apparel Production.
    (c) Discuss about backward linkage in apparel industry.
    (d) Define (i) Approved Sample (ii) Counter Sample.

    [3+3+3+3=12]

3. (a) Briefly state about the function of various sections in apparel industry related to production.
    (b) Explain the process of sample apparel development in industry.
    (c) Narrate the role of a textile Engineer in apparel industry.

    [4+4+4=12]

4. (a) Show the Organogram of different sections in Apparel Industry.
    (b) Write the names of present RMG markets in the world of Bangladesh.
    (c) Draw a polo shirt and show its components.

    [5+2+5=12]

Part : B
(Answer any three questions)

5. (a) What is meant by Quota and category system in Apparel industry?
    (b) Mention the objectives and importance of CAD/CAM system in Apparel Industry.
    (c) Define Pattern and Pattern Grading.
    (d) Discuss the challenges for the apparel industry in Bangladesh.

    [3+4+2+3=12]

6. (a) Discuss about standard body measurement?
    (b) Mention a Standard body measurement chart for adult man.
    (c) Write the basic types of fabrics used in Apparel Industry.
    (d) Differentiate between interlining and interfacing.

    [3+4+2+3=12]

7. (a) Describe Trimmings.
    (b) Make a list of Trims and accessories used in Apparel Industry of Bangladesh.
    (c) Draw and mention different components of a T-shirt.
    (d) Make difference between Dart and pleate.

    [2+3+4+3=12]

8. (a) What is AQL?
    (b) Write down the procedure of Final inspection for Apparel industry based on AQL.
    (c) Mention the name of some important international buyer working in Bangladesh based on their Order Volume.
    (d) Describe 'inspection loop' for apparel quality control.