



BANGLADESH TECHNICAL EDUCATION BOARD
Agargaon, Dhaka-1207

4-YEAR DIPLOMA-IN-ENGINEERING PROGRAM
SYLLABUS (PROBIDHAN-2016)

COMPUTER SCIENCE & TECHNOLOGY

TECHNOLOGY CODE: **685**

6th SEMESTER

DIPLOMA IN ENGINEERING
PROBIDHAN-2016

COMPUTER SCIENCE & TECHNOLOGY

6th SEMESTER

Sl. No	Subject Code	Name of the subject	T	P	C	Marks				Total
						Theory		Practical		
						Cont. assess	Final exam	Cont. assess	Final exam	
1	68561	MVC Framework Development	0	6	2	00	00	50	50	100
2	68562	Software Testing	0	3	1	00	00	25	25	50
3	66678	Advanced Database Management System	2	3	3	40	60	25	25	150
4	66668	Multimedia & Animation	2	6	4	40	60	50	50	200
5	66669	Programming in Advanced Java	2	3	3	40	60	25	25	150
6	66672	Network Administration & Services	2	6	4	40	60	50	50	200
7	65852	Industrial Management	2	0	2	40	60	00	00	100
Total			10	27	19	200	300	225	225	950

Objectives:

- To acquire transparent knowledge on MVC Design Pattern.
- To able to implement application in MVC Framework.
- To understand various aspects of MVC Framework and how it works.

1. Introducing MVC Framework

1.1 Define MVC Framework

1.2 Discuss the features of MVC

1.3 Demonstrate MVC Architecture.

1.4 Identify Popular MVC frameworks

ASP.NET, Django, Laravel, CodeIgniter, Rails etc.

1.5 Advantages and Disadvantages of using MVC Framework.

[Instructions of instructor: As students learned the languages like Python, C#, Java and PHP in previous semesters (3rd, 4th, 5th), instructor may allow various MVC framework like ASP.NET, Django, Laravel etc. according to student's interest.

ASP.NET MVC framework is demonstrated in this course as an example.]

2. Explore ASP.NET MVC

[Objective of this Practice: To be familiar with MVC Pattern and basic understanding on Purpose of Controller, Model, View and how a request is handled by ASP.NET MVC Application]

[This is an instructor driven practice, Instructor should provide a sample project and help student to identify various component as per objective of this practice module]

2.1 Review how web works with client and server relationship and understand what is GET and POST Request in Web application.

2.2 Demonstrate MVC Design Pattern

2.3 Identify and interpret what is Controller and what the responsibility of Controllers in ASP.NET MVC Application is.

2.4 Identify and interpret what is Model and what the responsibility of Models in ASP.NET MVC Application is.

2.5 Identify and interpret what View is and what the responsibility of Views in ASP.NET MVC Application is.

2.6 Identify and interpret an overview idea of Request Life Cycle of ASP.NET MVC Application, Get a basic idea on how a request URL is identified by ASP.NET MVC default routing and request is redirected to a particular Controller and response occurred to client.

3. Practice to Implement Controller

[Practice Objective: Implementing Controller and Action, to familiar with Controller and Action also Action Parameter]

[Instructor should brief about Controller and Action (what and why) in ASP.NET MVC]

3.1 Create a Controller and output a sample string from the default Action.

For an example, create a Hello World Controller with proper naming convention and return a string "Hello Welcome to ASP.NET MVC" run and see from browser the output.

3.2 Create a Controller and create an Action in that Controller and output a sample string from that Action.

For an Example, Create a Student Controller and create an Action for Entry and return string "Welcome to Student Entry Page" from the Entry Action.

- 3.3 Create a Controller and Create two or more Actions in that Controller and get output of different action on the basis of URL request for that Action.

For Example, Create Action named Search and Entry in Student Controller and return string "Welcome to Student Search" from Search Action and "Welcome to Entry Page" from Entry Action.

- 3.4 Create a Controller and Create Action with some parameters and request to the Action with sending data from URL by query string and output the parameter data as string from Action. For Example, On Entry Action use parameter (Name, RegNo, Address) for Entry Action, request using query string and return string Student Name, RegNo, Address as output.

4. Practice For Model Creating

[Practice Objective: To able to create Models and establish association relationship between models.]

[Instructor Note: Review Object Oriented Programming C# - class, properties and association relationship between two objects]

- 4.1 Create a class with at least 5 properties in Models folder.

4.2 Create a class with Properties and implement Data Annotation on Properties as per relevance on data fields of Model.

4.3 Create two classes in Models folder and implement one to one association relationship between those Models.

4.4 Create two classes in Models folder and implement one to many association relationship between those Models.

For an Example. Create a Student class in Models folder with Properties (Id:int, Name:string, RegNo:string, Address:string), use Required Data Annotation for Name and RegNo. Create a Department class in Models Folder with Properties (Id:int, Name:string, Location:string, Students:List<Student>) use Required Data Annotation on Name.

4.5 Create two classes in Models folder and implement one to many association relationship between those models.

5. Practice To Implement Controller Action Parameter and Model Binding

[Practice Objective: To able to acquire knowledge on Action and Action Parameter binding, Requesting to a action with query string data, using action parameter data in controller]

- 5.1. Create a Controller, create an Action in that Controller with Action Parameter with a Model and request for that action from browser URL and return output of that Models property as string.

For Example, Create a Student Controller with Entry Action with Action parameter with Student Model, i.e. Entry (Student student) and request for Entry action with query string and output the properties of Student models as string.

- 5.2 Create a Model with data annotation and use that Model as Action Parameter in a Controller and request on that Action with query string, use Model State. Is Valid in Action and check if Model bound properly and return output "Success" while Model State. Is Valid true and "Failed" when Model State. Is Valid false?
- 5.3 Create a Controller and Action with Action parameter as List of Model and bind the model by request URL.
For an Example, in Entry Action of Student Controller use List of Student i.e. Entry (List<Student> students) and bind students model from request URL.
- 5.4 Use Bind Attribute for Model Binding in Action.

6. Practice for Anonymous Type in C#.

[Practice Objective: To acquire clear understanding on Anonymous Type, Declaring Anonymous typed variable, using anonymous typed variable]

[Further Application of this topic: While in ASP.NET data needed to be passed from HTML Helper, data is sent as anonymous type object, also for various attribute declaration on HTML Helper anonymous type is used]

- 6.1 Create a C# variable with var keyword.
- 6.2 Create a Model class and create an instance of that model with var keyword.
For example, var student = new Student ();
- 6.3 Create an instance variable of an Anonymous type and output the properties of Anonymous Type. For example, create an anonymous type with properties (Name, Price, Item Type etc) and use var keyword to that anonymous object.
- 6.4 Create a instance variable of array of Anonymous typed object and use for each to traverse each element of that array.

6. Practice for Lambda Expression in C#

[Instructor Note: Review delegate discussed in Object Oriented in C# 4th Semester]

- 6.1 Declare a delegate variable using delegate type Func<>.
- 6.2 Declare a delegate variable using delegate type Action.
- 6.3 Declare a delegate of Func<> and declare a Lambda Expression which will take a input and return input+1.
- 6.4 Declare a delegate of type Func<> and declare a Lambda Expression which will take two input and return sum result of that two input.
- 6.5 Declare a delegate of type Action and declare a Lambda Expression which will output a string on Console Screen.
- 6.6 Declare a delegate of type Func<> and declare a Lambda Expression which will take a instance of a class as input and output calculated data from the property of that instance.
For an Example, Func<Person, string> fullName = (person)=>person.FirstName+" "+person.MiddleName+" "+person.LastName.

7. Practice For writing Views in ASP.NET MVC

[Practice Objective: To be able to Create Views; GET, POST request handling against form submission in Views]

- 7.1 Create a Controller and Action and add a view in the Views folder for that action and add a <p> Hello World </p> in the body section of the view and output Hello World in your browser.

- 7.2 Create a <form> </form> tag and in that form tag use some input fields in view and bind the inputs in Model of Action Parameter in controller. (Hint: use name attribute for element to use)
- 7.3 Create a view and send a single instance object from controller to view by ViewBag and display the properties data using ViewBag
- 7.4 Create a View and send a collection of data (List, Array or any collection) to view by ViewBag and show the collection's data in table using foreach loop in view.
- 7.5 Create a <form method="POST"> </form> tag with some input text elements in the form tag and a submit button, on submit of the form handle the request in HttpPost Action. (hint: use [HttpPost] action on top of particular Action)
- 7.6 Identify and practice using [HttpPost] and [HttpGet] attribute for Action in Controller.
- 7.7 Demonstrate Model binding on posting a form in View.
- 7.8 Demonstrate GET Action and view representation on that action.
- 7.9 Demonstrate POST Action Model Binding on view and represent on that action.

8. Practice for using Views with Html Helpers.

- 8.1 Use specific model for a view and demonstrate using that model to represent using html helpers.
- 8.2 Create View for a Controller in Action Bind the relevant Model, use Html Helpers to create form, text field, label for a specific model and submit the form to get model in action.
- 8.3 Create View for a Controller Action and use Html Helpers for creating label, textbox in view and use bootstrap classes in html helpers.
- 8.4 Create View for a Controller Action and use Html Helper to demonstrate dropdown and bind the dropdown with data post a selected value of dropdown to Action Model.

9. Practice For creating Layouts

- 9.1 Demonstrate Layout and Design guideline of Layout in web application.
- 9.2 Create a Shared Folder in Views Folder and Create a Layout View where Layout related html tags will be organized.
- 9.3 In Layout Page Create a Render Section and implement Layout for View.
- 9.4 In Layout Page add Render Sections and implement Layout for View.
- 9.5 Demonstrate adding css external files in Layout View
- 9.6 Demonstrate adding js external files in Layout View

10. Practice For creating Partial Views

- 10.1 Demonstrate Partial View and Necessity for partial view.
- 10.2 Create a Partial View to demonstrate a portion of data and Render Partial View in View.
- 10.3 Demonstrate Render Action, Render Partial
- 10.4 Create a Partial View for Nav Menu and Render the Partial View in Layout Page.

11. Practice on Using LINQ

- 11.1 Demonstrate on what is LINQ and why LINQ should be used.
- 11.2 Create a List of Employee with Properties Id, Name, Designation, Salary and populate the list with various Name, Designation and Salary ranging from 10000-100000 and retrieve those employees who has salary more than 15000 and less than 50000 using LINQ with classical style (from-in syntax approach).
- 11.3 Do 11.2 with LINQ with Lambda Style.
- 11.4 Use LINQ Select to get a particular property list of data for a particular Model.
- 11.5 Use LINQ to Select a anonymous object from a list of data for a particular Model.

12. Practice for Database Creation with Entity Framework using Model in ASP.NET MVC

- 12.1 Interpret ORM Concept.
- 12.2 Interpret Entity Framework Code First Concept.

- 12.3 Design a Custom DbContext and create DbSet for Models.
- 12.4 Add Code First Migration DbContext and show migration file for that migration has been created.
- 12.5 Add Code First Migration File and Update Migration for the DbContext and show database and table has been created database system.
- 12.6 Add connection String for DbContext in Web.Config File in particular connection strings section and use code first migration for updating database for that connection string and show database and table has been created on that database.

13. Practice for Database Operation with Entity Framework using Model in ASP.NET MVC

- 13.1 Perform Insert Operation in Database for an Entity using Controller, Action and View and show Success/Fail Message through View.
- 13.2 Perform Update of an Entity by using Controller, Action and View using Entity Framework.
- 13.3 Perform Delete Operation of an Entity by using Controller, Action, View using Entity Framework.

14. Practice Loading Models from Database using Entity Framework in ASP.NET MVC

- 14.1 Load all data for a particular Model from Database using EF.
- 14.2 Demonstrate various approach for Loading Related Data – Lazy loading, Eager Loading, Explicit Loading.
- 14.3 Make a Student Class and Department Class with one to many association relationship in Models Folder keep a List<Student> property in Department Model, Load all Department with Related Students of that department using Lazy Loading.
- 14.4 Load all Department with Related Students using Eager Loading.
- 14.5 Add a Property IsDeleted to Student and Update some data for students to IsDeleted true in Database manually, Now Load All Department with Related Students only those students will be loaded who are not use Explicit Loading.
- 14.6 Demonstrate Difference Between IQueryable and IEnumerable
- 14.7 Demonstrate immediate execution and deferred execution in entity framework.
- 14.8 Make a Action StudentSearch and Bind a Model which has property to various search criteria on student, i.e. user can search by student's Name(partial) or/and student's Reg No or/and student's Address(partial) implement deferred execution to generate query using IQueryable and return relevant students by search criteria and show those students in StudentSearch view.

15. Configure Routing in ASP.NET MVC

- 15.1 Demonstrate default routing mechanism from Route.config file
- 15.2 Develop a Custom Route and see the action is called according your route configuration.
- 15.3 Implement how to Enable Attribute Routing in ASP.NET MVC
- 15.4 Declare a Attribute route with route parameter and constraint, confirm if request URL is calling the action as configured by attribute route.

16. Build Responsive web pages in ASP.NET MVC using javascript and jquery ajax

- 16.1 Demonstrate jquery selector and selecting html elements using jquery script.
- 16.2 Demonstrate jquery ajax calling approach for a particular action by clicking a button and show output html in a div.
- 16.3 Create two dropdownlist, while selecting first dropdown value, second dropdown value will be loaded, implement using jquery ajax in ASP.NET MVC View.
- 16.4 Demonstrate AjaxBeginForm in ASP.NET MVC and how it will be used to post data.

16.5 Suppose a Model Order contains a property of named OrderItems of type List<OrderItem>, implement this master child in a Entry View for Entry Action in Order Controller, while user will provide Order information user will provide as many Order items without loading the page and while submit the page Order Model will bind with Order information as well as OrderItems informations.

17. Optimizing ASP.NET MVC Project

- 17.1 Demonstrate Bundling and Minification through Bundle.config file.
- 17.2 Make js bundles in bundle.config file and use them in Layout Page.
- 17.3 Make js bundles and use them in View.
- 17.4 Make css bundles and use them in Layout Page.
- 17.5 Make CSS bundles and use them in View.
- 17.6 Demonstrate on OutputCache and usage of it.

18. Access Control in ASP.NET MVC Application

- 18.1 Implement Authentication and Authorization.
- 18.2 Create User and Roles in Database
- 18.3 Assign Authorization to Action in Controller.

19. Practice Application Development in ASP.NET MVC

- 19.1 Make a small application which will use ASP.NET MVC and Database.
- 19.2 Make a small application which will use Authentication and Authorization and Database
- 19.3 Make a small application which will consists of AJAX operation and Database.

REFERENCE BOOKS

- 1. Professional ASP.NET MVC 5 John Galloway, Brad Willson, K. Scott Allen, David Matson.
- 2. Pro ASP.NET Core MVC2 Adam Freeman
- 3. Achitecting Modern Web Application with ASP.NET Core and Microsoft Azure – Steve Smith (Download free from microsoft.com/net/learn/architecture)

ONLINE REFERENCES

- 1. ASP.NET MVC Official site – www.asp.net/mvc
- 2. Tutorials Point – www.tutorialspoint.com/asp.net_mvc/
- 3. ASP.NET Core MVC Official Site - <https://docs.microsoft.com/en-us/aspnet/core/mvc/>
- 4. Entity Framework - <https://docs.microsoft.com/en-us/ef/>

OBJECTIVE:

On completion of this course student will be able to-

- Work on Manual Software Testing
- Work on Selenium Script Generate for Software Testing

PRACTICES**1. Explore Software Testing**

- 1.1 Interpret Software Testing and Types of Software Testing.
- 1.2 Interpret Software Testing Seven Principles
- 1.3 Interpret and Illustrate SDLC (Software Development life cycle) and STLC (Software Test Life Cycle)

2. Test Scenario and Test Case Generate

- 2.1. Interpret Test Formality and Necessity of Documenting of Test
- 2.2. Identify Test Basis, Interpret Application under Test, System Under Test Terms
- 2.3. Design a Test Scenario and Document a Test Scenario.
- 2.4. Design Test Cases against a Test Scenario and Document those Test Cases.
- 2.5. Design and Document Test Steps under each Test Case.
- 2.6. Manual Test and Document Test Result Pass/Failed against Test Scenario, Test Case following its Test Steps.

3. Requirement Traceability Matrix (RTM) Generate

- 3.1. Interpret Requirement Traceability and Types of Requirement Traceability
- 3.2. Identify Parameters for RTM.
- 3.3. Create RTM on BRD (Business Requirement Definition), TR(Technical Requirement), Test Case

4. Black Box Testing

- 4.1. Illustrate and Interpret Black Box Testing and Black Box Testing Technique.
- 4.2. Write Test Cases for System Under Test (SUT) against its User Stories.
- 4.3. Identify some input to test SUT and provide inputs to SUT and see if expected output is correct.

5. White Box Testing

- 5.1. Illustrate and Interpret white Box Testing and white box testing types
- 5.2. Understand a Sample Source Code for an application and Design Test Cases to Test for the Code to Test.
- 5.3. Write Unit Test according to Test Case and run the Unit Test to identify if the source code is working correct.

6. Software Defects

- 6.1. Illustrate and Interpret Software Defects.
- 6.2. Demonstrate what a Defect Report should contain, Design a Bug Report for Software.
- 6.3. Illustrate Defect Management Cycle, Create some Defect and find the right category for the defect, document the defect with right format.

7. Software Testing using Selenium IDE

- 7.1. Install Selenium IDE and FireBug
- 7.2. Create Test Case and write script in Selenium IDE for testing the test case.
- 7.3. Use Locators in Selenium IDE.

8. Web Driver Installation and Using

- 8.1. Install Web Driver
- 8.2. Create Test Case and write script in Web Driver using Selenium.
- 8.3. Access Forms in Web Driver.
- 8.4. Accessing Links & Tables using Selenium Web driver, Keyboard Mouse Events , Uploading Files

9. Software Life Cycle Testing

9.1. Demonstrate SDLC

9.2. Create Test Case for Testing Life Cycle of Software using Black Box Testing implementing STLC.

9.3. Create Test Case for Testing Life Cycle of a Software using Selenium.

10. Performance Testing

10.1. Illustrate and Interpret performance Testing

10.2. Install and configure Jmeter

10.3. Familiarize with Jmeter, Create Test Plan, Work Bench, Add Element, Save Element

10.4. Create and Run a Test Plan in Jmeter.

10.5. Use Assertions in Jmeter.

10.6. Use Controller in Jmeter.

10.7. User Processor in Jmeter.

BOOK REFERENCES:

1. Software Testing Techniques (2nd Edition, Boris Beizner)

2. Lessons Learned in Software Testing: A Context-Driven Approach (Cem Kaner)

3. How to Break Software: A Practical Guide to Testing (James Whittaker)

4. The Art of Software Testing (2nd Edition, Glenford Myers)

5. Agile Testing: A Practice Guide for Testers and Agile Teams (1st Edition, Lisa Crispin)

ONLINE REFERENCES

1. Guru99 – www.guru99.com

2. <https://www.softwaretestinghelp.com/>

3. <https://www.testing-whiz.com/blog>

4. <https://www.cigniti.com/blog/>

5. <https://www.utest.com/>

AIMS

To provide the students with an opportunity to acquire knowledge, skill and attitude in the field of multimedia and applications with a special emphasis on:

- Basics of multimedia.
- Applications, benefits and problems of using multimedia.
- Multimedia hardware/software essentials.
- System components, development tools and image used in multimedia.
- Audio in multimedia.
- Video in multimedia.
- Basics of Graphics.
- Image Processing.
- Two & Three-dimensional transformation.
- Concept of Projection.
- Concept of Animation.
- Applications of animation.

SHORT DESCRIPTION

- Basics of multimedia; Application, benefits and problems of using multimedia; Multimedia hardware and software essentials; System components in developing multimedia; Development tools for multimedia application; Text & Image used in computer application; Techniques and processes of image conversion; Basics of sound in multimedia; Sound recording; Sound processing; Basics of video in multimedia; Video recording; Video processing; Basics of Graphics; Image Processing; Scan Converting Process; Two dimensional transformation; Concept of Projection, Concept of Animation, Types of animation Applications of animation, Techniques behind animation.

DETAIL DESCRIPTION**Theory:****1 Understand the basics of multimedia.**

- 1.1 State multimedia and multimedia systems.
- 1.2 Describe the history of multimedia.
- 1.3 Classify multimedia.
- 1.4 Mention the field of application of multimedia.
- 1.5 Describe the benefits of multimedia in key areas (Training, sales, communications, medical).
- 1.6 Describe the problems of multimedia (based on investment cost, technical barriers, social & psychological barriers and legal problems).

2 Understand the multimedia hardware/software.

- 2.1 List the Hardware & Software used in a Multimedia System.
- 2.2 Define multimedia studio.

- 2.3 Describe the industrial standards and specifications of a typical multimedia configuration.
- 2.4 Describe the importance of “Plug and Play” revolution and MMX (Multimedia extension) technology.
- 2.5 Describe the important features of different categories of multimedia Software.
- 2.6 Describe different types of development tools for multimedia applications.
- 2.7 Describe the architecture of a multimedia system
- 2.8 Describe the function of basic delivery system of multimedia platforms.
- 2.9 Describe the input subsystem functions with block diagram.
- 2.10 Describe the output processing subsystem with block diagram.

3 Understand different Media and media process system in multimedia.

- 3.1 Define discrete and continuous media.
- 3.2 Describe the discrete media process system in multimedia.
- 3.3 Define sampling, sampling interval, quantization and quantization error.
- 3.4 Describe the digitizing process of audio & video signal.
- 3.5 Define Vectorization.
- 3.6 Describe the steps of vectorization.

4 Understand the Text, images & processes of images used in Multimedia

- 4.1 Define Text & Image
- 4.2 Mention the general features of different types of images used in computer application.
- 4.3 Describe the image data representation in multimedia system
- 4.4 Describe RGB and CMY color model.
- 4.5 State compression & image compression.
- 4.6 Describe the lossless image compression technic (Run length coding)
- 4.7 Describe the lossy image compression technic (Cosine Transform based coding)
- 4.8 Describe Basic Computer Graphics Two-dimensional Geometric transformations,
- 4.9 Explain Matrix representations and Homogeneous coordinates,
- 4.10 Describe Two-Dimensional Composite Transformations and Other Two-Dimensional transformations.

5 Understand the basics of sound, sound processing and recording in multimedia.

- 5.1 Describe the file formats to store digital audio and MIDI data.
- 5.2 Describe the audio data representation in multimedia system
- 5.3 Describe the configuration of sound system with block diagram.
- 5.4 Describe the function of Musical Instrument Digital Interface (MIDI) in multimedia system.
- 5.5 Describe the important aspects of audio compression.
- 5.6 Mention the imperfections of sound processing.
- 5.7 State the important aspects of hardware and software for sound recording.
- 5.8 Differentiate between monophonic and stereo recording.
- 5.9 Mention the problems in digital recording process.
- 5.10 Describe the disk space requirements for digital recording.

6 Understand the basics of video in multimedia.

- 6.1 Mention the importance of video data in multimedia application.

- 6.2 Describe the planning stages for video incorporation into a multimedia project.
- 6.3 Describe the important aspects of converting video for the computer.
- 6.4 Describe the configuration for video system with block diagram.
- 6.5 Describe different types of video compression technic.
- 6.6 Mention the important features of MPEG.

7 Understand the video processing & video recording.

- 7.1 List the multimedia equipment for video processing.
- 7.2 Describe video capture and playback system.
- 7.3 List different video recording equipment & video recording software.
- 7.4 State the important features of hardware and software for video recording.
- 7.5 Describe the file formats for saving video information.

Animation

8 Understand Animation and techniques behind Animation.

- 8.1 Describe Computer Animation.
- 8.2 Describe primary types of animation.
- 8.3 Describe the history of animation.
- 8.4 Define Line Art and Animation.
- 8.5 Describe the difference between film and animation.
- 8.6 Describe the Principles of animation.
- 8.7 Define approaches of animation.
- 8.8 Describe the basic techniques of animation.

9 Understand classification of Animation.

- 9.1 Describe the classification of animation.
- 9.2 Describe the difference between conventional method of animation and digital animation.
- 9.3 Describe different types of animation such as 2D, 3D and stop motion.

10 Understand animation and file formats.

- 10.1 Describe animation file formats
- 10.2 Describe Hardware and software requirements for animation.
- 10.3 Describe the difference between 2D and 3D animation film, cartoon movie.

11 Understand authoring tool, presentations, applications, interaction.

- 11.1 Describe types of animation named after a software.
- 11.2 Describe about authoring tool.
- 11.3 Describe applications, interaction.

12 Understand 2D and 3D animation applications.

- 12.1 Describe uses of Video and Animation.
- 12.2 Describe complex presentations, applications.
- 12.3 Describe 2D and 3D animations- projects simple animations.
- 12.4 Describe terms of 3D animation.
- 12.5 Describe about 3D applications - pictures, sound, video, and special effects.

Practical:

- 1 Identify the hardware of multimedia systems.**
 - 1.1 Prepare the general specifications of a typical multimedia system.
 - 1.2 Identify the hardware with external features, settings and connections of sound equipment.
 - 1.3 Write a report.

- 2 Process Sound file.**
 - 2.1 Use software package to process sound file.
 - 2.2 Input and use sounds in multimedia application.
 - 2.3 Manipulate sound files.

- 3 Process Video file.**
 - 3.1 Work with digital video recording and editing from VCRs/Laser disk player/Video camera.
 - 3.2 Apply appropriate multimedia software.
 - 3.3 Work with digital video playbacks, recording and editing software for multimedia.
 - 3.4 Write a report.

- 4 Create a Motion Tween.**
 - 4.1 Open flash software and create a new document.
 - 4.2 Import Object.
 - 4.3 Inset key frame.
 - 4.4 Test animation.

- 5 Create a movie clip.**
 - 5.1 Open flash software and create a new document.
 - 5.2 Import Object.
 - 5.3 Convert into movie clip.

- 6 Create a Frame by Frame Animation.**
 - 6.1 Open flash software and create a new document.
 - 6.2 Draw an Object.
 - 6.3 Inset key frame.
 - 6.4 Test animation.

- 7 Create an animation to represent the growing moon.**
 - 7.1 Open flash software and create a new document with white background.
 - 7.2 Create a white circle and convert to movie clip.
 - 7.3 Use glow and adjust blur.
 - 7.4 Insert keyframe.
 - 7.5 Make animation.

- 8 Create an animation to indicate a ball bouncing.**
 - 8.1 Open flash software and create a new document.
 - 8.2 Draw the steps and color it.

8.3 Create circle from the tool fill the color.

8.4 Insert key frame.

8.5 Make animation.

9 Create a simulate movement of a cloud.

9.1 Open flash software and create a new document.

9.2 Create blue background with layer.

9.3 Draw the cloud and apply glowing effect.

9.4 Make animation.

10 Draw the fan blades and to give proper animation.

10.1 Open flash software and create a new document.

10.2 Create a background with layer.

10.3 Insert another layer and draw fan stand.

10.4 Insert key frames.

10.5 Select the fan blade's layer and rotate the circle a little bit.

10.6 Make animation.

11 Simulate a ball hitting another ball.

11.1 Open flash software.

11.2 Choose the circle option displayed in the toolbar.

11.3 Create two circles at the opposite ends.

11.4 Insert key frames.

11.5 Select the 1st ball and make it to move towards the other till it touches.

11.6 Change the shape of the ball as soon as the two ball touches each other.

11.7 Make them to move towards opposite direction.

12 Change a circle into a square using flash.

12.1 Open flash software and create a new document.

12.2 Draw a circle on the work area and color it.

12.3 Insert new key frame.

12.4 Draw a rectangle.

12.5 Click on the last frame.

12.6 change the option shape from none.

12.7 Make animation.

References:

1. Prabat K Andleigh and Kiran Thakrar, —Multimedia Systems and Design||, PHI, 2003. 2.
2. Digital Multimedia by Nigel Chapman
3. Multimedia Applications (X.media.publishing) by Ralf Steinmetz
4. Visual Thinking: for Design by Colin Ware
5. Real-Time Video Compression: Techniques and Algorithms By Raymond West water
Publisher: Springer 1997

OBJECTIVES

- To develop knowledge and skill on java language platform independence
- To develop knowledge and skill to differentiate between Java ME, Java SE and Java EE Platforms
- To develop knowledge and skill on Database Applications with JDBC

SHORT DESCRIPTION

Concept of java Platform Overview, Java Syntax Class & Sub Class, Nested Class, Overriding Methods, Encapsulation, Polymorphism, Interfaces and Lambda Expressions, Collections Generics, Streams and Filters, Lambda Built-in Functional Interfaces and Operations, Exceptions and Assertions, Java Date/Time API, Concurrency, Parallel Streams, Database Applications with JDBC, Localization.

DETAIL DESCRIPTION**Theory:****1. Understand the concept of java Platform Overview**

- 1.1 Define how the Java language achieves platform independence.
- 1.2 Distinguish between the Java ME, Java SE and Java EE Platforms.
- 1.3 Evaluate Java libraries, middle-ware and database options.
- 1.4 Describe how the Java language continues to evolve.

2. Java Syntax and Class Review

- 2.1 Define Java classes.
- 2.2 Describe primitive variables.
- 2.3 Classify operators.
- 2.4 Create and manipulate strings.
- 2.5 Use if-else and switch statements.
- 2.6 Use Iterative Constructs: while, do-while, for, enhanced for.
- 2.7 Create arrays.
- 2.8 Prepare programs using Java fields, constructors, and methods.

3. Multithreading

- 3.1 Define threads.
- 3.2 Describe Life cycle of thread.
- 3.3 Discuss Running and starting thread using Thread class.
- 3.4 Explain Thread priorities.
- 3.5 Show multiple threads.
- 3.6 Discuss Runnable interface.
- 3.7 Explain Synchronization and inter thread communication.

4. Applet& Servlet

- 4.1 Define Applet Life Cycle, Servlet Life Cycle, Viewer tool, HTML Tags.
- 4.2 Describe Passing parameters to Applet.
- 4.3 Explain repaint() and update() method.
- 4.4 Distinguish Servlet and Hierarchy of Servlet.
- 4.5 Describe Handling get and post request (HTTP).

- 4.6 Explain handling data from HTML to servlet.
- 4.7 Describe Retrieving a data from database to servlet.
- 4.8 Operate Session tracking – User Authorization, URL rewriting, hidden form fields.
- 4.9 Demonstrate Tomcat configuration (Note: Only for Lab Demonstration).

5. Interfaces and Lambda Expressions

- 5.1 Define a Java interface.
- 5.2 Distinguish between interface inheritance and class inheritance.
- 5.3 Extend an interface.
- 5.4 State Default methods.
- 5.5 Describe Anonymous inner classes.
- 5.6 Illustrate Lambda Expression.

6. Lambda Built-in Functional Interfaces and Operations

- 6.1 List the built-in interfaces included in java.util.function.
- 6.2 Illustrate Core interfaces - Predicate, Consumer, Function and Supplier.
- 6.3 Identify primitive & binary versions of base interfaces.
- 6.4 Extract data from an object using map.
- 6.5 Classify the types of stream operations.
- 6.6 Describe the Optional class & lazy processing.
- 6.7 Apply sorting a stream.
- 6.8 Calculate results to a collection using the collect method.
- 6.9 Categorize Grouping and partition data using the Collectors class.

7. Collections Generics, Streams and Filters

- 7.1 Identify the Collection framework.
- 7.2 Define pipelines in terms of lambdas and collections.
- 7.3 Create a collection by using generics.
- 7.4 Apply an Array List, Tree Set, Hash Map, Deque.
- 7.5 Illustrate through a collection using lambda syntax.
- 7.6 Describe the Stream interface.
- 7.7 Predict a collection using lambda expressions.
- 7.8 Explain–Array List, Linked List and Vector, Stack, Queue.
- 7.9 Illustrate Interfaces such as Comparator, Iterator, List Iterator and Enumeration.

8. Exceptions and Assertions

- 8.1 Define the purpose of Java exceptions.
- 8.2 Use the try and throw statements.
- 8.3 Use the catch, multi-catch and finally clauses.
- 8.4 Use Auto close resources with a try-with-resources statement.
- 8.5 Explain common exception classes and categories.
- 8.6 Create custom exceptions.
- 8.7 Test invariants by using assertions.

9. Java Date/Time API

- 9.1 Create and manage date-based events.
- 9.2 Create and manage time-based events.
- 9.3 Show date and time into a single object.
- 9.4 Work with dates and times across time zones.
- 9.5 Manage changes resulting from daylight savings.

9.6 Define and create timestamps, periods and durations.

9.7 Apply formatting to local and zoned dates and times.

10. Concurrency

10.1 Describe operating system task scheduling.

10.2 Create worker threads using Runnable and Callable.

10.3 Use an Executor Service to concurrently execute tasks.

10.4 Identify potential threading problems.

10.5 Use synchronized and concurrent atomic to manage atomicity.

10.6 Use monitor locks to control the order of thread execution.

10.7 Use the java.util.concurrent collections.

11. Parallel Streams

11.1 Review the key characteristics of streams.

11.2 Describe how to make a stream pipeline execute in parallel.

11.3 List the key assumptions needed to use a parallel pipeline.

11.4 Define reduction.

11.5 Describe why reduction requires an associative function.

11.6 Calculate a value using reduce.

11.7 Describe the process for decomposing and then merging work.

11.8 List the key performance considerations for parallel stream.

12. Database Applications with JDBC

12.1 Define the layout of the JDBC API.

12.2 Types of drivers.

12.3 Understand Metadata & Transaction such as Database Metadata, ResultSetMetadata, Commit(), rollback (), Save point.

12.4 Connect to a database by using a JDBC driver.

12.5 Submit queries and get results from the database.

12.6 Scrollable and updatable result sets.

12.7 Specify JDBC driver information externally.

12.8 Perform CRUD operations using the JDBC API.

13. Localization

13.1 Define what a locale represents.

13.2 Read and set the locale by using the Locale object.

13.3 Describe the advantages of localizing an application.

13.4 Build a resource bundle for each locale.

13.5 Call a resource bundle from an application.

13.6 Change the locale for a resource bundle.

14. Networking

14.1 Define The java.net package – InetAddress, URL, URLConnection class.

14.2 Explain Socket Server and Socket class.

14.3 Create a Socket to a remote host on a port (creating TCP client and server).

14.4 Perform Simple Socket Program Example.

PRACTICAL

1. Write a java program using generic classes & method.
2. Write a java program for controlling main thread.
3. Write a java program for creating new thread by extending thread class.
4. Write a java program for creating new thread by implementing runnable interface.
5. Write a java program for thread synchronization.
6. Write a java program to create following AWT components: Button, Checkbox, Choice and List.
7. Write a java program to create following AWT application using containers and layouts.
8. Write a java program to create a simple Applet and servlet.
9. Write a java program to create swing based Applet.
10. Write a java program to handle different types of events in a swing application.
11. Write a java program to create a swing application using swing components and layouts.
12. Write a java program to store and retrieve data from database using JDBC.
13. Write a java program using simple text editors (not IDE), compile and run from command prompt.
14. Write a java application using socket programming.

REFERENCE BOOKS AND URL.

- 1) Complete reference Java by Herbert Schildt(5th edition)
- 2) Java 2 programming black books, Steven Horlzner
- 3) Programming with Java, A primer, Forth edition, By E. Balagurusamy
- 4) Core Java Volume-I-Fundamentals, Eighth Edition, Cay S. Horstmann, Gary Cornell, Prentice Hall, Sun Microsystems Press
- 5) Core Java Volume-II-Advanced Features, Eighth Edition, Cay S. Horstmann, Gary Cornell, Prentice Hall, Sun Microsystems Press

Related URL links:

http://www.informit.com/library/content.aspx?b=STY_Java2_24hours&seqNum=24

<http://java.sun.com/developer/onlineTraining/JavaIntro/contents.html>

<http://www.homeandlearn.co.uk/java/java.html>

<http://java.sun.com/>: Java Development Kit, Development tools, Java Tutorial

<http://www.eclipse.org/>: A vendor-neutral open development platform and application frameworks for building software

<http://www.uml.org/>: UML resources

<http://www.bruceeckel.com/>: Free electronic version of the book

<http://www.javatpoint.com/java-tutorial>

AIMS

- To be able to design computer network system
- To be able to acquire the knowledge on Network Administration.
- To be able to provide the knowledge and to develop skill on Different routing protocol.
- To be able to acquire the knowledge on learning, forwarding and filtering decision.
- To be able to provide the knowledge and to develop skill on network Security.
- To be able to provide the knowledge and to develop skill on Router, Switch, NIC and Cabling.
- To be able to establish and implement Link Redundancy.

SHORT DESCRIPTION

Network Basics; Sub-netting, VLSM, Summarization; Internet Routing Protocol, Open Shortest Path First (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP), Spanning Tree Protocol (STP), VLANs and Inter-VLAN routing, network address translator (NAT), network security, Internet Protocol Version 6 (IPv6), Link and Gateway Redundancy.

DETAILS DESCRIPTION

Theory:

1. Review the network theories.

- 1.1. Describe OSI, TCP/IP model
- 1.2. Identify collision and broadcast domain.
- 1.3. Describe Ethernet cabling straight-through, crossover, and console.
- 1.4. Data encapsulation of TCP/IP layer
- 1.5. Understand three layer's Hierarchical model.

2. Understand Sub-netting, VLSMs, and Summarization.

- 2.1. Define Sub-netting Basics.
- 2.2. Define Classless inter domain routing (CIDR), including class A, class B, class C.
- 2.3. Define Variable length subnet mask (VLSMs)
- 2.4. Describe VLSM design and implementing VLSM Network
- 2.5. Define Summarization

3. Understand Internet Protocol Routing.

- 3.1. Define Routing basics
- 3.2. Configure IP Routing in network.
- 3.3. Define Static routing
- 3.4. Define default routing.
- 3.5. Define dynamic routing
- 3.6. Describe Routing information protocol.

4. Open Shortest Path First (OSPF).

- 4.1. Define OSPF basics.
- 4.2. Describe OSPF terminology.
- 4.3. Define OSPF operation

- 4.4. Describe Loopback interface
- 4.5. Describe OSPF areas
- 4.6. Describe virtual link
- 5. Enhanced Interior Gateway Routing Protocol (EIGRP)**
 - 5.1. Define Introduction to EIGRP
 - 5.2. State the configuration of EIGRP
 - 5.3. State EIGRP Neighbor Adjacency
 - 5.4. Describe EIGRP Neighbor and topology table
 - 5.5. Describe EIGRP Unequal Cost Load Balancing
 - 5.6. State EIGRP K values.
- 6. Understand Spanning Tree Protocol (STP).**
 - 6.1. Define Spanning Tree.
 - 6.2. Describe Spanning Tree cost calculation.
 - 6.3. Define Spanning Tree port states.
 - 6.4. Define Spanning Tree portfast.
 - 6.5. Define Rapid Spanning Tree.
 - 6.6. Define Spanning Tree BPDU Guard.
 - 6.7. Define Spanning Tree BPDU Filter.
 - 6.8. Define Spanning Tree Root guard.
 - 6.9. Define Ether-channel.
- 7. Understand VLANs and Inter-VLAN routing.**
 - 7.1. Define VLANs
 - 7.2. State 802.1Q and ISL Encapsulation.
 - 7.3. Define Trunk link
 - 7.4. Describe Router on a Stick.
 - 7.5. Describe Inter-VLAN routing by multilayer switch
 - 7.6. State the configuration of VLAN Trunking protocol (VTP)
- 8. Understand the network address translator (NAT).**
 - 8.1. State Network Address Translator (NAT).
 - 8.2. Distinguish static and Dynamic NAT.
 - 8.3. Demonstrate PAT (overloading).
- 9. Understand the network security**
 - 9.1. Define User security level, login security (SSH, Telnet).
 - 9.2. Demonstrate standard Access list.
 - 9.3. Define Extended Access list.
 - 9.4. State Port Security.
 - 9.5. State Protected port.
 - 9.6. Demonstrate DHCP Snooping.
 - 9.7. State Cyber Security.
- 10. Understand Internet Protocol Version 6 (IPv6).**
 - 10.1 Describe the benefits and uses of IPv6
 - 10.2 Define IPv6 addressing and expression
 - 10.3 State how IPv6 works in an Inter-network.
 - 10.4 Define IPv6 Routing protocol (RIP, EIGRP, OSPF).
- 11. Understand Link and Gateway Redundancy**
 - 11.1. Define Redundancy
 - 11.2. State Static Routing Redundancy
 - 11.3. Define Hot Standby Router Protocol (HSRP)
 - 11.4. Define Virtual Router Redundancy Protocol (VRRP)

11.5. Demonstrate Gateway Load Balancing Protocol (GLBP).

12. Understand Fourth Industrial Revolution (IR 4.0)

- a. State Internet of Things (IoT).
- b. Explain Big Data.
- c. State Cloud Computing.
- d. Explain System Integration.
- e. State Autonomous Vehicles System & Autonomous Robots
- f. Explain augmented reality.
- g. Explain 3D Printing
- h. Explain Additive Manufacturing.

Practical:

1. Perform the Design, Develop and Simulation of Enhanced Interior Gateway Routing Protocol (EIGRP)

- 1.1 Design network diagram using packet tracer
- 1.2 Design proper IP address with network devices.
- 1.3 Configure EIGRP as per requirement.
- 1.4 Ensure reachability

2. Perform the Design, Develop and Simulation of Open Shortest Path Routing Protocol (OSPF)

- 2.1 Design network diagram using packet tracer
- 2.2 Design proper IP address with network devices.
- 2.3 Configure OSPF as per Instruction.
- 2.4 Ensure reachability

3. Perform the Design, Develop and Simulation of Virtual Link.

- 3.1. Design network diagram using packet tracer
- 3.2. Design proper IP address with network devices.
- 3.3. Configure Virtual Link as per Instruction.
- 3.4. Ensure reachability

4. Perform the Design, Develop and Simulation of Routing Information Protocol (RIP)

- 4.1. Design network diagram using packet tracer
- 4.2. Design proper IP address with network devices.
- 4.3. Configure RIP as per requirement.
- 4.4. Ensure reachability

5. Perform the Design, Develop and Simulation of Static Routing

- 5.1. Design network diagram using packet tracer
- 5.2. Design proper IP address with network devices.
- 5.3. Configure Static Routing as per requirement.
- 5.4. Ensure reachability

6. Perform the Design, Develop and Simulation of Default Routing

- 6.1. Design network diagram using packet tracer
- 6.2. Design proper IP address with network devices.
- 6.3. Configure Default Routing as per requirement.
- 6.4. Ensure reachability

7. Perform the Design, Develop and Simulation of Hot Standard Router Protocol (HSRP)

- 7.1 Design network diagram using packet tracer
- 7.2 Design proper IP address with network devices.
- 7.3 Configure HSRP as per requirement.
- 7.4 Ensure reachability

8. Perform the Design, Develop and Simulation of Virtual Router Redundancy Protocol (VRRP)

- 8.1 Design network diagram using packet tracer
- 8.2 Design proper IP address with network devices.
- 8.3 Configure VRRP as per requirement.
- 8.4 Ensure reachability

9. Perform the Design, Develop and Simulation of Network Address Translator (NAT)

- 9.1 Design network diagram using packet tracer
- 9.2 Design proper IP address with network devices.
- 9.3 Configure NAT as per requirement.
- 9.4 Ensure reachability

10. Perform the Design, Develop and Simulation of Standard Access List (ACL)

- 10.1 Design network diagram using packet tracer
- 10.2 Design proper IP address with network devices.
- 10.3 Configure ACL as per requirement.
- 10.4 Ensure reachability

11. Perform the Design, Develop and Simulation of Extended Access List (ACL)

- 11.1 Design network diagram using packet tracer
- 11.2 Design proper IP address with network devices.
- 11.3 Configure ACL as per requirement.
- 11.4 Ensure reachability

12. Perform the Design, Develop and Simulation of Login using Telnet

- 12.1 Design network diagram using packet tracer
- 12.2 Design proper IP address with network devices.
- 12.3 Configure Telnet as per requirement.
- 12.4 Ensure Login operation by username and password.

13. Perform the Design, Develop and Simulation of Ether-channel

- 13.1 Design network diagram using packet tracer
- 13.2 Design proper IP address with network devices.
- 13.3 Configure Ether-channel as per requirement.
- 13.4 Ensure reachability by single link and group link

14. Perform the Design, Develop and Simulation of Portfast properties of Spanning Tree

- 14.1 Design network diagram using packet tracer
- 14.2 Design proper IP address with network devices.
- 14.3 Configure Portfast as per requirement.
- 14.4 Ensure reachability

15. Perform the Design, Develop and Simulation of Port Security properties of Spanning Tree

- 15.1 Design network diagram using packet tracer
- 15.2 Design proper IP address with network devices.
- 15.3 Configure Port Security as per requirement.
- 15.4 Ensure reachability

16. Perform the Design, Develop and Simulation of Router on a Stick of Inter- VLAN Routing

- 16.1 Design network diagram using packet tracer
- 16.2 Design proper IP address with network devices.
- 16.3 Configure Router on a Stick as per requirement.
- 16.4 Ensure reachability

17. Perform the Design, Develop and Simulation of Inter-VLAN Routing using Multilayer Switch

- 17.1 Design network diagram using packet tracer
- 17.2 Design proper IP address with network devices.
- 17.3 Configure Inter- **VLAN** routing as per requirement.
- 17.4 Ensure reachability

18. Perform EIGRP Load Balancing

- 18.1 Design network diagram using packet tracer
- 18.2 Design proper IP address with network devices.
- 18.3 Configure Load Balance as per requirement.
- 18.4 Ensure reachability

Project:

19. Establish a Computer Physical Network and Demonstrate Administrative Operation and Services (EIGRP, OSPF, NAT, Inter- VLAN Routing, Portfast).

REFERENCE BOOKS

- 1. Data communications and Networking – Behrouz A. Forouzan.
- 2. Fundamentals of Communication-M. Shamim Kaiser and associates
- 3. Data and Computer Communications-William Stallings
- 4. Local Area Networking – S. K Basandra.
- 5. MCSE Windows & Networking Essential – Joe Casad
- 6. CCNA Routing and Switching – Todd Lammle.
- 7. How to Master CCNA- Rene Molenaar
- 8. Principles of Network and System Administration - Mark Burgess

AIMS

- To be able to develop the working condition in the field of industrial or other organization.
- To be able to understand develop the labor management relation in the industrial sector.
- To be able to develop the management techniques in the process of decision making.
- To be able to manage the problems created by trade union.
- To be able to understand Planning
- To be able to perform the marketing.
- To be able to maintain inventory.

Course Outline

Basic concepts of management; Principles of management; Planning, Organization, Scientific management; Span of supervision; Motivation; Personnel management and human relation; Staffing and manpower planning ; Training of staff; Concept of leadership; Concepts and techniques of decision making; Concept of trade union; Inventory control; Economic lot size ; Break even analysis; Trade Union and industrial dispute, Marketing;

1 Basic concepts & principles of management.

- 1.1 Define management and industrial management.
- 1.2 State the objectives of modern management.
- 1.3 Describe the scope and functions of management.
- 1.4 State the principles of management.
- 1.5 State the activity level of industrial management from top personnel to workmen.
- 1.6 Describe the relation among administration, organization & management.

2. Concept of Planning

- 2.1 Define Planning
- 2.2 Discuss the importance of Planning
- 2.3 Discuss the Types of Planning.
- 2.4 Discuss the steps in Planning

3 . Concepts of organization and organization structure.

- 3.1 Define management organization.
- 3.2 State the elements of management organization.
- 3.3 Describe different forms of organization structure.
- 3.4 Distinguish between line organization and line & staff organization.
- 3.5 Distinguish between line organization and functional organization.
- 3.6 Describe the features, advantages and disadvantages of different organization structure.

4. Concept of scientific management.

- 4.1 Define scientific management.
- 4.2 Discuss the basic principles of scientific management.
- 4.3 Explain the different aspects of scientific management.
- 4.4 Discuss the advantages and disadvantages of scientific management.
- 4.5 Describe the difference between scientific management and traditional management..

5. Concept of span of supervision.

- 5.1 Define span of supervision and optimum span of supervision.
- 5.2 Discuss the considering factors of optimum span of supervision.
- 5.3 Discuss advantages and disadvantages of optimum span of supervision.
- 5.4 Define delegation of authority.
- 5.5 Explain the principles of delegation of authority.
- 5.6 Explain the terms: authority, responsibility and duties.

6 . Concept of motivation.

- 6.1 Define motivation.
- 6.2 Discuss the importance of motivation.
- 6.3 Describe financial and non-financial factors of motivation.
- 6.4 **Special Motivational Techniques.**
- 6.5 Discuss the motivation theory of Maslow and Harzberg.

6.6 Differentiate between theory-X and theory-Y.

7. Concept of leadership.

7.1 Define leadership.

7.2 Discuss the importance and necessity of leadership.

7.3 Discuss the functions of leadership.

7.4 Describe the qualities of a leader.

8. Basic concepts and techniques of decision making.

8.1 Define decision making.

8.2 Discuss the importance and necessity of decision making.

8.3 Discuss different types of decision making .

8.4 Describe the steps in decision making.

9 .Concept of personnel management and human relation.

.9.1 Define personnel management.

.9.2 Discuss the functions of personnel management.

9.3 Define staffing.

9.4 Define recruitment and selection of employees.

9.5 Describe various sources of recruitment of employees.

9.6 Describe the methods of selection of employees.

9.7 Define training and orientation of employee.

9.8 Discuss the importance and necessity of training.

9.9 Discuss the various methods of training of workmen, technicians and executive personnel.

10. Concept of inventory control & Economic lot size

10.1 Define inventory.& inventory control.

10.2 Describe the function of inventory control.

10.3 Define Economic lot size and the Method of determination of economic lot size.

10.4 Discuss the effects of over supply and under supply.

10.5 Explain the following terms :

- Bin card or Bin tag.
- Purchase requisition.
- Store requisition.
- Material transfer note.
- First in first out (FIFO).
- Last in first out(LIFO).
- Safety stock
- Lead time

11. Concept of Break Even Point(BEP)

11.1 Define Break Even Point and Break Even Chart.

11.2 Describe the method of determination of BEP

11.3 Explain the terms :

- Break even analysis.
- Fixed cost.
- Variable cost

12 . Concept of Marketing

12.1 Define marketing.

12.2 Discuss the function of marketing.

12.3 State the objectives of marketing.

12.4 Explain the terms :

- Purchase
- Brand
- Producer
- Consumer

- Customer
- Copyright
- Trade mark

12.5 Discuss product life -cycle and marketing strategies in different stages of a product life-cycle

13. Concept of trade union and industrial dispute

13.1 Define trade union.

13.2 Mention the objectives of trade union.

13.3 Discuss the function of trade union.

13.4 Describe different types of trade union.

13.5 Define industrial dispute

13.6 Discuss different type of industrial dispute

REFERENCE BOOKS

1. Dr. Md. Mainul Islam and Dr. Abdul Awal Khan-Principles of Management, Bangladesh Open University. 2. Mohammad Mohiuddin-Personnel Management and Industrial Relation, NIDS Publication Co. Dhaka. 3. সুফিয়া বেগম, মো: জাহেদুল হক ও সুপ্রিয়া ভট্টাচার্য্য-ব্যবস্থাপনা এর মৌলিক ধারণা, ব্যতিক্রম প্রকাশনী ঢাকা। Matz Usry-Cost Accounting: Planning & Control.