NSRIT

AUTONOMOUS

ANSWER KEY & SCHEME OF EVALUATION

Supplementary Examinations (Sem.I)

First Year B. Tech.

ACADEMIC REGULATION 2020

Academic Year
2020 - 2021

NSRIT

Semester End Supplementary Examination, October, 2021

Degree	B. Tech. (U. G.)	**Program**	CSE/CSM/CSD			**Academic Year**	2020 - 2021
Course Code	20CS101	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	I
Course	**FUNDAMENTALS OF COMPUTER SCIENCE**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List any two memory types	20CS101.1	L1
2	Write the Difference between Compiler and Interpreter	20CS101.2	L2
3	What is an operating System	20CS101.3	L1
4	Define Database view	20CS101.4	L1
5	What is Artificial Intelligence? Give an example of where AI is used on a daily basis	20CS101.5	L4

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 10)	Marks	Learning Outcome (s)	DoK
6 (a)	Discuss input and output devices with examples	6M	20CS101.1	L2
6 (b)	How the Communication between the CPU and Input/output devices? Explain	6M	20CS101.1	L2
	OR			
7 (a)	How the Hardware, Software, and people are involved in effective usage of a computer. Justify in your observations	6M	20CS101.1	L3
7 (b)	Illustrate Data Preparation? Discuss the factors that are to be considered while selecting input device	6M	20CS101.1	L3
8 (a)	List all conditional control statements used in C. Explain any two with syntax and example	6M	20CS101.2	L1
8 (b)	Write a C program to find the factorial of a number using do-while, where the number n is entered by user	6M	20CS101.2	L1
	OR			
9 (a)	Define Algorithm. Write an algorithm to find the area and perimeter of a circle	6M	20CS101.2	L1
9 (b)	What are basic data types available in "C"? Write the significance of each data type	6M	20CS101.2	L1
10 (a)	With a neat diagram, explain OSI reference model	12M	20CS101.3	LI3
	OR			
11 (a)	Write any four functionalities of an operating system	4M	20CS101.3	L2
11 (b)	Explain star and ring topologies	8M	20CS101.3	L2
12 (a)	Write the advantages & Disadvantages of Database approach over File-oriented approach	6M	20CS101.4	L2
12 (b)	Explain Object-oriented Data Mode	6M	20CS101.4	L1
	OR			
13 (a)	What is a Database Management System? Explain various components of it	8M	20CS101.4	L2
13 (b)	Explain Network model Vs Relational model	4M	20CS101.4	L2
14 (a)	Explain the current trends in AI	6M	20CS101.5	L4
14 (b)	Write the various Applications of machine learning	6M	20CS101.5	L4
	OR			
15 (a)	Discuss the developments of AI languages	6M	20CS101.5	L3
15 (b)	What are the ingredients of machine learning? Explain	6M	20CS101.5	L2

SEMESTER Question Paper

Degree	B. Tech. (U. G.)	**Program**	Common to cse,cse(ai&ml),cse(ds)	Test	I/I	**Academic Year**	2020 - 2021
Course Code	20CS101	**Test Duration**	180Min.	Max. Marks	70	**Semester**	I
Course	**FUNDAMENTALS OF COMPUTERSCIENCE**						

Key and Scheme of Evaluation

No.	Questions (1 through 5)	Marks
	List any two memory types	
1	Primary memory Secondary memory	Content 2M Each 1M
	Write the Difference between Compiler and Interpreter	
2	Interpreter: Translates program one statement at a time. Interpreters usually take less amount of time to analyze the source code. However, the overall execution time is comparatively slower than compilers. No Object Code is generated, hence are memory efficient. Compiler: Scans the entire program and as a whole into machine code. Compilers usually take a large time to analyze the source co However, the overall executio comparatively faster than int Generates Object Code whic requires linking, hence require memory.	Content 2M
3	**What is an operating System** An **operating system** (OS) is system software that manages computer hardware, software resources, and provides common services for computer programs.	Content 2M
4	**Define Database view** A database view is a searchable object in a database that is defined by a query. Though a view doesn't store data, some refer to a views as "virtual tables," you can query a view like you can a table. A view can combine data from two or more table, using joins, and also just contain a subset of information	Content 2M Each 1M
5	**What is Artificial Intelligence? Give an example of where AI is used on a daily basis** Artificial intelligence (AI) is the ability of a computer program or a machine to think and learn. It is also a field of study which tries to make computers "smart". ... In general use, the term "artificial intelligence" means a programme which mimics human cognition. • Self-Driving And Parking Vehicles. Self-driving and parking cars use deep learning, a subset of AI, to recognize the space around a vehicle. ... • Digital Assistants. ... • Vehicle Recognition Identification. ... • Robots. ... • Transportation.	Definition 1M Example 1M

No.	Questions (6 through 11)	
6 (a)	**Discuss input and output devices with examples** **INPUT DEVICES:** Following are some of the important input devices which are used in a computer – 1. Keyboard 2.Mouse 3.Joy Stick 4.Light pen 5.Track Ball 6.Scanner 7.Graphic Tablet 8.Microphone 9.Magnetic Ink Card Reader(MICR) 10.Optical Character Reader(OCR) 11.Bar Code Reader 12.Optical Mark Reader(OMR) **Light Pen** Light pen is a pointing device similar to a pen. It is used to select a displayed menu item or draw pictures on the monitor screen. It consists of a photocell and an optical system placed in a small tube. **Track Ball** Track ball is an input device that is mostly used in notebook or laptop computer, instead of a mouse. This is a ball which is half inserted and by moving fingers on the ball, the pointer can be moved. ball is an input device that is mostly used in notebook or laptop computer, instead of a mouse. **Magnetic Ink Card Reader (MICR)** MICR input device is generally used in banks as there are large number of cheques to be processed every day. The bank's code number and cheque number are printed on the cheques with a special type of ink that contains particles of magnetic material that are machine readable. **OUTPUT DEVICES:** Following are some of the important output devices used in a computer. • Monitors • Graphic Plotter • Printer **Monitors** Monitors, commonly called as Visual Display Unit (VDU), are the main output device of a computer. It forms images from tiny dots, called pixels that are arranged in a rectangular form. The sharpness of the image depends upon the number of pixels.	Each device Explanation 1M
6 (b)	**How the Communication between the CPU and Input/output devices? Explain** • The communication between the IOP and the devices is similar to the program control method of transfer. And the communication with the memory is similar to the direct memory access method. • In large scale computers, each processor is independent of other processors and any processor can initiate the operation. • The CPU can act as master and the IOP act as slave processor. The CPU assigns the task of initiating operations but it is the IOP, who executes the instructions, and not the CPU. CPU instructions provide operations to start an I/O transfer. The IOP asks for CPU through interrupt. • Instructions that are read from memory by an IOP are also called *commands* to distinguish them from instructions that are read by CPU. Commands are prepared by programmers and are stored in memory. Command words make the program for IOP. CPU informs the IOP where to find the commands in memory.	Explanation 6M
	OR	
7 (a)	**How the Hardware, Software, and people are involved in effective usage of a computer. Justify in your observations**	Explanation 6M
7 (b)	**Illustrate Data Preparation? Discuss the factors that are to be considered while selecting input device**	Explanation 6M

Data can arise from a variety of sources. For example, when students sit examinations, the grades obtained make up the data to be processed by the computer. When customers make withdrawals or deposits at a bank, the slips filled out are the sources of the data. When people fill out questionnaires, the answers to the questions are the data. In the majority of cases, the original data is not in a form which can be readily processed by the computer. For instance, the computer cannot 'read' the answers directly from the questionnaires. The data must first be converted into machine-readable form. A large proportion (30% to 50%) of computing costs is spent on this conversion, which is called **data preparation.**

For a typical application, the following steps need to be performed:

(1) The data from the source documents is entered on the chosen medium (for example disk, tape or cards) by a **data entry operator.**

(2) The data entered is then **verified.** The usual procedure is for another operator to re-enter the same data. The operator is told of any mismatch between the first and second entry. The errors noted are then corrected. Verification can also be done by the original operator, who **keys in** the data twice; only if the two entries match is the data recorded. Otherwise, the data has to be re-entered until there is no mismatch.

(3) The result of step 2 is that the data is now in machine-readable form. The data is then input to the computer using an appropriate input device. For instance, if the data is stored on a magnetic disk, a disk drive is used to read the data from the disk; if the data is recorded on punched cards, a card-reader is used to read the cards and transmit the data to the computer.

(4) Usually, the first attempt at processing the data uncovers errors which escaped detection at the verification stage. For example, suppose the answer to a question should have been either 1 (for YES) or 2 (for NO); because of poor handwriting an answer 2 may have looked like a 3; the data-entry operator (who does not need to read the question) sees a 3 and keys in a 3. However, the computer program 'knows' that the answer to the question can only be 1 or 2. It can **validate** the data read, that is, it can check to make sure that the answer supplied is 1 or 2. If any other answer (3, in this case) is given, the program can print a message that the data supplied is invalid. The errors detected at this stage must be corrected and step 3 repeated.

As another example of

List all conditional control statements used in C. Explain any two with syntax and example

8 (a)

In C, we have 32 standard keywords and out of them 12 (the keywords in the second column of the following table) are control statements.

These statements control the flow of the program and out of them some are selection statements, some are iterative statements and some other are jumping statements.

If Statements

If statement enables the programmer to choose a set of instructions, based on a condition. When the condition is evaluated to true, a set of instructions will be executed and a different set of instructions will be executed when the condition is evaluated to false. We have 4 types of if Statement which are:

Definition 1M
explanation 5M

1. If..else
2. Nested if
3. Else if ladder
4. Simple if or null else
5. Null else or Simple else

f...else Statement

In this statement, there are two types of statements execute. First, if the condition is true first statement will execute if the condition is false second condition will be executed.

Syntax:

```
If(condition)
{
Statement(s);
}
else
{
Statement(s)
}
Statement
```

Nested if

If the condition is evaluated to true in the first if statement, then the condition in the second if statement is evaluated and so on.

Syntax:

```
If(condition)
{
If(condition)
{
Statement(s);
}
Else
{
Statement(s)
}
}
```

Write a C program to find the factorial of a number using do-while, where the number n is entered by user

```
#include<stdio.h>
#include<conio.h>
void main()
{
  int n,i=1,f=1;
  clrscr();

  printf("\n Enter The Number:");
  scanf("%d",&n);

  //LOOP TO CALCULATE THE FACTORIAL OF A NUMBER
  do
  {
    f=f*i;
    i++;
  }while(i<=n);

  printf("\n The Factorial of %d is %d",n,f);
  getch();
}
```

8 (b) Program 6M

OR

9 (a) **What are basic data types available in "C"? Write the significance of each data type**

Main types. The C language provides the four basic arithmetic type specifiers char, int, float and Explanation 6M

double, and the modifiers signed, unsigned, short, and long. The following table lists the permissible combinations in specifying a large set of storage size-specific declarations

Data type	Range
int	
signed int	−32,768 to 32,767
unsigned int	0 to 65,535
short int	
signed short int	-2,147,483,648 to 2,147,483,647 (4 bytes)
unsigned short int	0 to 4,294,967,295 (4 bytes)
long int	
signed long int	-2,147,483,648 to 2,147,483,647 (4 bytes)
unsigned long int	0 to 4,294,967,295 (4 bytes)

9 (b)

Define Algorithm. Write an algorithm to find the area and perimeter of a circle

The definition of an algorithm is a specific and logical procedure to be followed in order to achieve specific results, or to solve a math problem

Area of Circle Algorithm:

Step 1: Start
Step 2: Input radius
Step 3: let pi = 3.14
Step 4: area = pi * radius * radius
Step 6: print area
Step 7: stop

Algorithm 1M
Explanation 5M

With a neat diagram, explain OSI reference model

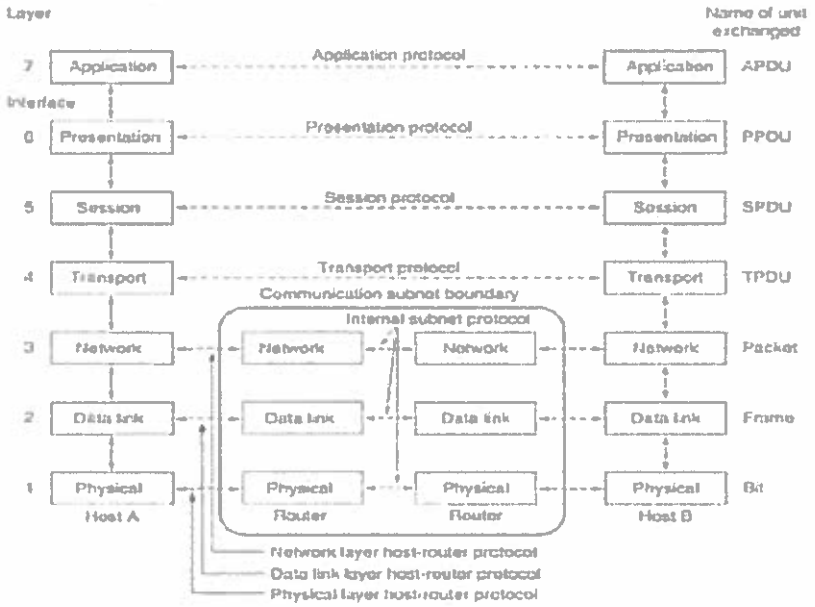
10 (a)

The Physical Layer:

The lowest layer of the OSI reference model is the physical layer. It is responsible for the actual physical connection between the devices. The physical- layer contains information in the form of bits.

Diagrams- (4M) Explanation –(8M)

The OSI Reference Model:



OR

Write any four functionalities of an operating system

Important functions of an operating System:

1. Security – The operating system uses password protection to protect user data and similar other techniques. it also prevents unauthorized access to programs and user data.

2. Control over system performance – Monitors overall system health to help improve performance. records the response time between service requests and system response to having a complete view of the system health. This can help improve performance by providing important information needed to troubleshoot problems.

11 (a)

3. Job accounting – Operating system Keeps track of time and resources used by various tasks and users, this information can be used to track resource usage for a particular user or group of users.

Explanation 4M

4. Error detecting aids – The operating system constantly monitors the system to detect errors and avoid the malfunctioning of a computer system.

5. Coordination between other software and users – Operating systems also coordinate and assign interpreters, compilers, assemblers, and other software to the various users of the computer systems.

Explain star and ring topologies

Star Topology:

11 (b) In a star topology, each device has a dedicated point-to-point link only to a central controller, usually called a hub. The devices are not directly linked toone another. Unlike a mesh topology, a star topology does not allow directtraffic between devices. The controller acts as an exchange: If one device wantsto send data to another, it sends the data to the controller,

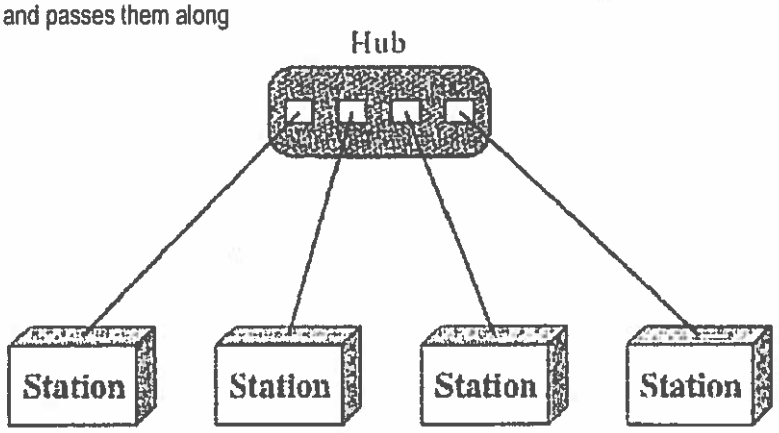
Explanation (8M)
Each topology(4M)

which then relays the data to the other connected device .

Ring topology

In a ring topology, each device has a dedicated point-to point connection with only the two devices on either side of it. A signal is passed along the ring in one direction, from device to device, until it reaches its destination. Each device in the ring incorporates a repeater.

When a device receives a signal intended for another device, its repeater regenerates the bits and passes them along



Write the advantages & Disadvantages of Database approach over File-oriented approach

12(a)

Explanation 6M

S.NO.	File System	DBMS
1.	File system is a software that manages and organizes the files in a storage medium within a computer.	DBMS is a software for m database.
2.	Redundant data can be present in a file system.	In DBMS there is no redu
3.	It doesn't provide backup and recovery of data if it is lost.	It provides backup and re even if it is lost.
4.	There is no efficient query processing in file system.	Efficient query processing DBMS.
5.	There is less data consistency in file system.	There is more data consi of the process of normali:
6.	It is less complex as compared to DBMS.	It has more complexity in compared to file system.
7.	File systems provide less security in comparison to DBMS.	DBMS has more security compared to file system.

	8.	It is less expensive than DBMS.	It has a comparatively higher cost than a file system.

Explain Object-oriented Data Mode

12(b)

object oriented data model is based upon real world situations. These situations are represented as objects, with different attributes. All these object have multiple relationships between them.

Elements of Object oriented data model

Objects

The real world entities and situations are represented as objects in the Object oriented database model.

Attributes and Method

Every object has certain characteristics. These are represented using Attributes. The behaviour of the objects is represented using Methods.

Explanation 6M

Class

Similar attributes and methods are grouped together using a class. An object can be called as an instance of the class.

Inheritance

A new class can be derived from the original class. The derived class contains attributes and methods of the original class as well as its own.

What is a Database Management System? Explain various components of it

COMPONENTS OF DBMS

DBMS have several components, each performing very significant tasks in the database management system environment. Below is a list of components within the database and its environment.

Software

This is the set of programs used to control and manage the overall database. This includes the DBMS software itself, the Operating System, the network software being used to share the data among users, and the application programs used to access data in the DBMS.

13(a)

Each 2M
Total 8M

Hardware

Consists of a set of physical electronic devices such as computers, I/O devices, storage devices, etc., this provides the interface between computers and the real world systems.

Data

DBMS exists to collect, store, process and access data, the most important component. The database contains both the actual or operational data and the metadata.

Procedures

These are the instructions and rules that assist on how to use the DBMS, and in designing and running the database, using documented procedures, to guide the users that operate and manage it.

Database Access Language
This is used to access the data to and from the database, to enter new data, update existing data, or retrieve required data from databases. The user writes a set of appropriate commands in a database access language, submits these to the DBMS, which then processes the data and generates and displays a set of results into a user readable form.

Query Processor
This transforms the user queries into a series of low level instructions. This reads the online user's query and translates it into an efficient series of operations in a form capable of being sent to the run time data manager for execution.

Run Time Database Manager
Sometimes referred to as the database control system, this is the central software component of the DBMS that interfaces with user-submitted application programs and queries, and handles database access at run time. Its function is to convert operations in user's queries. It provides control to maintain the consistency, integrity and security of the data.

Data Manager
Also called the cache manger, this is responsible for handling of data in the database, providing a recovery to the system that allows it to recover the data after a failure.

Database Engine
The core service for storing, processing, and securing data, this provides controlled access and rapid transaction processing to address the requirements of the most demanding data consuming applications. It is often used to create relational databases for online transaction processing or online analytical processing data.

Data Dictionary
This is a reserved space within a database used to store information about the database itself. A data dictionary is a set of read-only table and views, containing the different information about the data used in the enterprise to ensure that database representation of the data follow one standard as defined in the dictionary.

Report Writer

Also referred to as the report generator, it is a program that extracts information from one or more files and presents the information in a specified format. Most report writers allow the user to select records that meet certain conditions and to display selected fields in rows and columns, or also format the data into different charts.

Explain Network model Vs Relational model

13(b)

Network Data Model	Relational Data Model
It organizes records to one another through links or pointers.	It organizes records in form of table and relationship between tables are set using common fields.
It organizes records in form of directed graphs.	It organizes records in form of tables.
In this relationship between various records is represented physically via linked list.	In this relationship between various records is represented logically via tables.

Explanation-4M

Explain the current trends in AI

14(a)

Greater Cloud and AI collaboration

Rico Burnett, the director of client innovation at legal services provider Exigent, says that Artificial Intelligence will play a significant role in the broad adoption of Cloud Solutions in 2021. Through the deployment of artificial intelligence, it will be possible to monitor and manage cloud resources and the vast amount of available data.

2. AI solutions for IT

The number of AI solutions that are being developed for IT will increase in 2021. Capgemini's Simion predicts that AI solutions that can detect common IT problems on its own and self-correct any small malfunctions or issues will see an increase in the upcoming years. This will reduce downtime and allow the teams in an organisation to work on high-complexity projects and focus elsewhere.

AIOps becomes more popular

Over the last few years, the complexity of IT systems has increased. Forrester recently said that vendors would want platform solutions that combine more than one monitoring discipline such as application, infrastructure, and networking. IT operations and other teams can improve their key processes, decision making, and tasks with AIOps solutions and improved analysis of the volumes of data coming its way. Forrester advised the IT leaders to find AIOps providers who will empower the cross-team collaboration through end-to-end digital experiences, data correlation, and integration of the IT operations management toolchain.

Explanation-6M

4. AI will help in structuring data

In the future, we will see more unstructured data is structured with natural language processing and machine learning processes. Organisations will leverage these technologies and create data that RPA or robotic process automation technology can use when they want to automate transactional activity in an organisation. RPA is one of the fastest-growing areas in the software industry. The only limitation that it faces is that it can only use structured data. With the help of AI, unstructured data can easily be converted into structured data, which can provide a defined output.

5. Artificial intelligence talent will remain tight

The supply of talent is expected to be an issue in adopting artificial intelligence in 2021. There has been a persistent gap in AI talent, and organisations have finally realised this potential. It is essential to address this gap and ensure that a wider group of people learn artificial intelligence. Ensuring that a broader set of users have access to artificial intelligence to focus on technology, learning strategies, and supporting a change in the

working environment is essential in 2021.

6. Large scale adoption of AI in the IT industry

We have seen continuous growth in adoption of AI within the IT industry. However, Simion predicts that organisations will use AI in production and start using them at a large scale. With the help of artificial intelligence, an organisation can get ROI in real-time. This means that organisations will see their efforts being paid off.

Write the various Applications of machine learning

Image Recognition:

Image recognition is one of the most common applications of machine learning. It is used to identify objects, persons, places, digital images, etc. The popular use case of image recognition and face detection is, Automatic friend tagging suggestion:

Facebook provides us a feature of auto friend tagging suggestion. Whenever we upload a photo with our Facebook friends, then we automatically get a tagging suggestion with name, and the technology behind this is machine learning's face detection and recognition algorithm. It is based on the Facebook project named "Deep Face," which is responsible for face recognition and person identification in the picture.

Programmer motivation (or how to stay motivated when learning to code)

2. Speech Recognition

While using Google, we get an option of "Search by voice," it comes under speech recognition, and it's a popular application of machine learning.

Speech recognition is a process of converting voice instructions into text, and it is also known as "Speech to text", or "Computer speech recognition." At present, machine learning algorithms are widely used by various applications of speech recognition. Google assistant, Siri, Cortana, and Alexa are using speech recognition technology to follow the voice instructions.

3. Traffic prediction:

If we want to visit a new place, we take help of Google Maps, which shows us the correct path with the shortest route and predicts the traffic conditions.

14(b) Explanation-6M

It predicts the traffic conditions such as whether traffic is cleared, slow-moving, or heavily congested with the help of two ways:

Real Time location of the vehicle form Google Map app and sensors

Average time has taken on past days at the same time.

Everyone who is using Google Map is helping this app to make it better. It takes information from the user and sends back to its database to improve the performance.

4. Product recommendations:

Machine learning is widely used by various e-commerce and entertainment companies such as Amazon, Netflix, etc., for product recommendation to the user. Whenever we search for some product on Amazon, then we started getting an advertisement for the same product while internet surfing on the same browser and this is because of machine learning.

Google understands the user interest using various machine learning algorithms and suggests the product as per customer interest.

As similar, when we use Netflix, we find some recommendations for entertainment series, movies, etc., and this is also done with the help of machine learning.

5. Self-driving cars:

One of the most exciting applications of machine learning is self-driving cars. Machine learning plays a significant role in self-driving cars. Tesla, the most popular car manufacturing company is working on self-driving car. It is using unsupervised learning method to train the car models to detect people and objects while driving.

filters used by Gmail:

Content Filter

Header filter

General blacklists filter

Rules-based filters
Permission filters
Some machine learning algorithms such as Multi-Layer Perceptron, Decision tree, and Naïve Bayes classifier are used for email spam filtering and malware detection.

Discuss the developments of AI languages

. Python

Python is considered to be in the first place in the list of all AI development languages due to the simplicity. The syntaxes belonging to python are very simple and can be easily learnt. Therefore, many AI algorithms can be easily implemented in it. Python takes short development time in comparison to other languages like Java, C++ or Ruby. Python supports object oriented, functional as well as procedure oriented styles of programming. There are plenty of libraries in python, which make our tasks easier. For example: Numpy is a library for python that helps us to solve many scientific computations. Also, we have Pybrain, which is for using machine learning in Python.

2. R

R is one of the most effective language and environment for analyzing and manipulating the data for statistical purposes. Using R, we can easily produce well-designed publication-quality plot, including mathematical symbols and formulae where needed. Apart from being a general purpose language, R has numerous of packages like RODBC, Gmodels, Class and Tm which are used in the field of machine learning. These packages make the implementation of machine learning algorithms easy, for cracking the business associated problems.

3. Lisp

15(a) Lisp is one of the oldest and the most suited languages for the development in AI. It was invented by John McCarthy, the father of Artificial Intelligence in 1958. It has the capability of processing the symbolic information effectively. Explanation-each 2M

It is also known for its excellent prototyping capabilities and easy dynamic creation of new objects, with automatic garbage collection. Its development cycle allows interactive evaluation of expressions and recompilation of functions or file while the program is still running. Over the years, due to advancement, many of these features have migrated into many other languages thereby affecting the uniqueness of Lisp.

4. Prolog

This language stays alongside Lisp when we talk about development in AI field. The features provided by it include efficient pattern matching, tree-based data structuring and automatic backtracking. All these features provide a surprisingly powerful and flexible programming framework. Prolog is widely used for working on medical projects and also for designing expert AI systems.

5. Java

Java can also be considered as a good choice for AI development. Artificial intelligence has lot to do with search algorithms, artificial neural networks and genetic programming. Java provides many benefits: easy use, debugging ease, package services, simplified work with large-scale projects, graphical representation of data and better user interaction. It also has the incorporation of Swing and SWT (the Standard Widget Toolkit). These tools make graphics and interfaces look appealing and sophisticated.

What are the ingredients of machine learning? Explain

Machine learning is purely mathematical. There are different fields of math involved, with the major ones being linear algebra, calculus, and statistics. ML deals heavily with matrix and vector manipulation since data can be easily represented in these formats.

15(b) Explanation-6M

The prime goal of all machine learning algorithms is to intake some data and adjust weights in an equation to best fit the data. It's not as complex

1. Tasks: the problems that can be solved with machine learning 2. Models: the output of machine learning 3. Features: the workhorses of machine learning

NSRIT

Semester End Supplementary Examination, October, 2021

Degree	B. Tech. (U. G.)	**Program**	CE/ME			**Academic Year**	2020 - 2021
Course Code	20BSX21	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	I
Course	**ENGINEERING CHEMISTRY**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define hard water and soft water	20BSX21.1	L1
2	What is electrochemical series?	20BSX21.2	L1
3	Write the Dulong's formula.	20BSX21.3	L2
4	What are the monomers of Thiokol?	20BSX21.4	L1
5	How does nanotechnology work?	20BSX21.5	L2

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Differentiate scale and sludge in boilers	6M	20BSX21.1	L4
6 (b)	Explain the desalination of brackish water by using electrodialysis process	6M	20BSX21.1	L2
	OR			
7 (a)	Distinguish the specifications for water by BIS and WHO	8M	20BSX21.1	L4
7 (b)	Explain Ion exchange process for demineralization of water	4M	20BSX21.1	L2
8 (a)	Explain the construction & working of calomel electrode	6M	20BSX21.2	L2
8 (b)	Explain the working of H_2O_2 fuel cell with a neat diagram	6M	20BSX21.2	L2
	OR			
9 (a)	How corrosion is controlled by using cathodic protection method	6M	20BSX21.2	L2
9 (b)	How nature of metal factors that influences the extent of corrosion	6M	20BSX21.2	L2
10 (a)	Discuss about the proximate analysis of coal. Give its significance	6M	20BSX21.3	L2
10 (b)	Define the following terms a. Calorific value b. Knocking c. Octane number	6M	20BSX21.3	L1
	OR			
11 (a)	Discuss about the Bergius process for the manufacture of the petrol with a neat diagram	8M	20BSX21.3	L2
11 (b)	List out the applications of bio diesel	4M	20BSX21.3	L1
12 (a)	Write the preparation, properties and applications of PVC and Buna-N	6M	20BSX21.4	L2
12 (b)	Differentiate thermoplastic and thermosets	6M	20BSX21.4	L4
	OR			
13 (a)	Explain the mechanism of lubrication	6M	20BSX21.4	L2
13 (b)	Distinguish the properties and engineering applications of composites and refractories	6M	20BSX21.4	L4

14 (a)	Explain the synthesis of colloids by using any method with example	6M	20BSX21.5	L2
14 (b)	Discuss the principle, instrumentation and applications of Transmission Electron Microscopy	6M	20BSX21.5	L2
	OR			
15 (a)	Write a brief note on applications of Nanomaterials	6M	20BSX21.5	L2
15 (b)	Discuss about the nano sensors. Write its applications	6M	20BSX21.5	L2

Semester End Supplementary Examination, October, 2021

Degree	B. Tech. (U. G.)	**Program**	CE/ME			**Academic Year**	2020 - 2021
Course Code	20BSX21	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	I
Course	**ENGINEERING CHEMISTRY**		Scheme of Valuation				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define hard water and soft water Hard water-1mark Soft water-1	20BSX21.1	L1
2	What is electrochemical series? Definition- 1 mark series -1 mark	20BSX21.2	L1
3	Write the Dulong's formula. Formula- 2 marks C,H,O,S	20BSX21.3	L2
4	What are the monomers of Thiokol? Ethyleneglycol+ sodium sulphite -1 mark	20BSX21.4	L1
5	How does nanotechnology work? Nanotechnology-1 mark Work-1	20BSX21.5	L2

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Differentiate scale and sludge in boilers Scale-2 marks with diagram Example-1mark Sludge -2 marks with diagram Example-1mark	6M	20BSX21.1	L4
6 (b)	Explain the desalination of brackish water by using electrodialysis process Desalination-2 marks Brackish water-2 marks Electrodialysis-2marks	6M	20BSX21.1	L2
	OR			
7 (a)	Distinguish the specifications for water by BIS and WHO Specifications table BIS- 4 Marks WHO -4 marks	8M	20BSX21.1	L4
7 (b)	Explain Ion exchange process for demineralization of water Cation ion exchange -2 marks Anion ion exchange-2 marks Process-2marks	4M	20BSX21.1	L2
8 (a)	Explain the construction & working of calomel electrode Constructions- 3 marks Working-2 marks cell representations-1 mark	6M	20BSX21.2	L2

8 (b)	Explain the working of H_2-O_2 fuel cell with a neat diagram Anode reaction-2marks Cathode-2marks Diagram with working -2 marks	6M	20BSX21.2	L2
	OR			
9 (a)	How corrosion is controlled by using cathodic protection method Tinning method-2 Process-2 Hot dipping-2	6M	20BSX21.2	L2
9 (b)	How nature of metal factors that influences the extent of corrosion Nature of the metal-3 marks Nature of Environmental – 3 marks	6M	20BSX21.2	L2
10 (a)	Discuss about the proximate analysis of coal. Give its significance % moisture -1 %voltile matter -1 %ash-1 %fixed carbon-1 Significance-2 mark	6M	20BSX21.3	L2
10 (b)	Define the following terms a. Calorific value -2 marks b. b. Knocking-breaking off -2marks c. c. Octane number-petrol rating-2 mark	6M	20BSX21.3	L1
	OR			
11 (a)	Discuss about the Bergius process for the manufacture of the petrol with a neat diagram Equations-4 marks Manufacture-2 mark Diagram-2 mark	8M	20BSX21.3	L2
11 (b)	List out the applications of bio diesel Natural diseal- 4 applications -4 marks	4M	20BSX21.3	L1
12 (a)	Write the preparation, properties and applications of PVC and Buna-N PVC-3 marks Buna-N- 3 marks	6M	20BSX21.4	L2
12 (b)	Differentiate thermoplastic and thermosets Thermoplastic-3 marks Thermosetting- 3 marks	6M	20BSX21.4	L4
	OR			
13 (a)	Explain the mechanism of lubrication Lubrications-3 marks Mechanism-3 mark	6M	20BSX21.4	L2
13 (b)	Distinguish the properties and engineering applications of composites and refractories	6M	20BSX21.4	L4

	Acid-2 Base-2 Neutral-2			
14 (a)	Explain the synthesis of colloids by using any method with example Synthesis-3 marks Method- 3 marks	6M	20BSX21.5	L2
14 (b)	Discuss the principle, -2 marks instrumentation -2mark and applications of Transmission Electron Microscopy-2 marks	6M	20BSX21.5	L2
	OR			
15 (a)	Write a brief note on applications of Nanomaterials Applications of nanomaterials -6 marks	6M	20BSX21.5	L2
15 (b)	Discuss about the nano sensors. Write its applications Nanosensors -3 marks Applications-3 marks	6M	20BSX21.5	L2

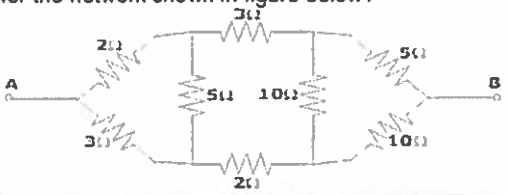
Semester End Supplementary Examination, October, 2021

Degree	B. Tech. (U. G.)	**Program**	ECE & EEE			**Academic Year**	2020 - 2021
Course Code	20ESX03	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	I
Course	**BASIC ELECTRICAL ENGINEERING**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is the difference between dependent and independent sources?	20ESX03.1	L1
2	What is the significance of back E.M.F in a D. C. motor?	20ESX03.2	L1
3	What do you mean by KVA rating of a transformer?	20ESX03.3	L1
4	Define voltage regulation of an alternator and also write the expression	20ESX03.4	L1
5	Write the applications of AC servo motor and single phase induction motor.	20ESX03.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain inductance element. Also derive the expression for energy stored in it	7M	20ESX03.1	L2
6 (b)	Four resistors of 5Ω, 7Ω, 9Ω and 12Ω are connected in series across a 100V source. Calculate the voltage drop across each resistor and power absorbed by each resistor	5M	20ESX03.1	L3
	OR			
7 (a)	Classify the different types of network elements	6M	20ESX03.1	L2
7 (b)	Calculate the voltage to be applied across AB in order to drive current of 5A In the circuit by using star-delta transformation for the network shown in figure below? 	6M	207ESX03.1	L3
8 (a)	Explain the principle and operation of a D. C. generator	6M	20ESX03.2	L2
8 (b)	Explain the construction of D.C. generators	6M	20ESX03.2	L3
	OR			
9	Explain the necessity of starter in a D. C. motor and explain the operation of a three point starter with a neat sketch	12M	20ESX03.2	L2
10 (a)	Explain the principle of operation of single phase transformer	5M	20ESX03.3	L2
10 (b)	A single phase 200/400 V, 6 KVA, 50 Hz transformer gave the following results. OC test(LV side) : 200 V, 0.8 A, 80 W SC test(HV side) : 25 V, 10 A, 90 W Determine (i) The circuit constants referred to L.V side (ii) The efficiency at full load with 0.8 lagging power factor	7M	20ESX03.3	L3

	OR			
11 (a)	Describe the parallel operation of a single phase transformer	6M	20ESX03.3	L2
11 (b)	Explain various losses that occur in a transformer	6M		
12 (a)	Describe the concept of rotating magnetic field.	5M	20ESX03.4	L2
12 (b)	A 10 MVA 6.6 kV, 3 phase star connected alternator gave open circuit and short circuit data as follows: Field current in amps : 25 50 75 100 125 150 OC voltage in kV (L-L) : 2.4 4.8 6.1 7.1 7.6 7.9 SC Current in Amps : 288 528 875 Find the voltage regulation at full load 0.8 pf lagging by e.m.f. method. Armature resistance per phase = 0.13 Ω	7M	20ESX03.4	L3
	OR			
13 (a)	Explain the Speed - Torque characteristics of three phase induction motor	7M	20ESX03.4	L2
13 (b)	Derive the E.M.F. equation of alternator	5M	20ESX03.4	L2
14 (a)	Explain the principle of operation and construction of shaded pole induction motor	6M	20ESX03.5	L2
14 (b)	Explain the working of capacitor-start type single phase induction motor	6M	20ESX03.5	L2
	OR			
15 (a)	Explain the working principle of A. C. servo motors with neat sketches	7M	20ESX03.5	L2
15 (b)	Differentiate between single phase and three phase induction motors	5M	20ESX03.5	L2

Semester End Supplementary Examination, October, 2021

Degree	B. Tech. (U. G.)	**Program**	ECE & EEE			**Academic Year**	2020 - 2021
Course Code	20ESX03	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	I
Course	**BASIC ELECTRICAL ENGINEERING**						

Scheme of evaluation

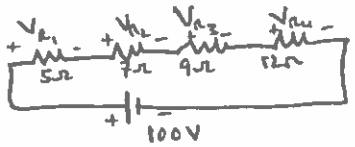
Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Marks
	What is the difference between dependent and independent sources?	
1	Independent source are those, whose value of either the **voltage or** the current to be delivered is independent of any other parameter of the network. Where as the dependent sources are those, whose value of either the voltage or the current to be delivered is dependent or controlled on other parameters of the network.	2
	What is the significance of back E.M.F in a D. C. motor?	
2	The makes the motor to draw as much armature current as is just sufficient to develop the torque required presence of back emf makes the d.c. motor a self-regulating machine i.e., it by the load.	2
	What do you mean by KVA rating of a transformer?	
3	kVA stands for **Kilovolt-Ampere** and is the rating normally used to rate a transformer. The size of a transformer is determined by the kVA of the load. ... The Current that passes through transformer windings will determine the Copper Losses, whereas Iron Losses, Core Losses or Insulation Losses depends on voltage.	2
	Define voltage regulation of an alternator and also write the expression	
4	voltage regulation of an alternator is defined as the rise in terminal voltage, when the load is reduced from full load rated value to zero. $$\text{Voltage Regulation} = \frac{E_0 - V}{V} \text{ per unit}$$ $$= \frac{E_0 - V}{V} \times 100 \text{ percent}$$	2
	Write the applications of AC servo motor and single phase induction motor.	
5	AC servo motors are used in a wide variety of applications where position control is critical and are frequently used in robotics, semiconductor equipment, machine tools, and aircrafts.	2

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks
	Explain inductance element. Also derive the expression for energy stored in it	
6 (a)	Definition & Symbol 4M  2M 2M	7M

6 (b) **Four resistors of 5Ω, 7Ω, 9Ω and 12Ω are connected in series across a 100V source. Calculate the voltage drop across each resistor and power absorbed by each resistor** 5M



$R_{eq} = 5+7+9+12 = 33\Omega$

$I = \frac{V}{R_{eq}} = \frac{100}{33} = 3.03A$

$V_{R1} = 3.03 \times 5 = 15.15V$

$V_{R2} = 3.03 \times 7 = 21.21V$

$V_{R3} = 3.03 \times 9 = 27.27V$

$V_{R4} = 3.03 \times 12 = 36.36V$

$P_{R1} = V_{R1} I = 15.15 \times 3.03 = 45.9W$

$P_{R2} = V_{R2} I = 21.21 \times 3.03 = 64.26W$

$P_{R3} = V_{R2} I = 27.27 \times 3.03 = 82.6W$

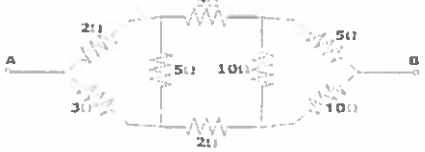
$P_{R4} = V_{R4} I = 36.36 \times 3.03 = 110.1W$

OR

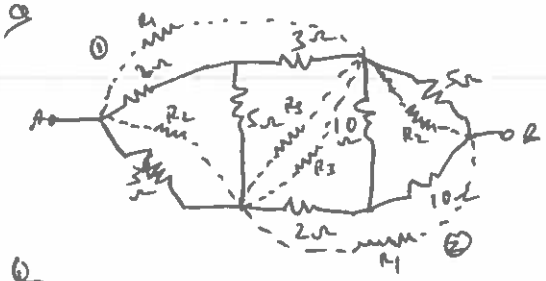
7 (a) **Classify the different types of network elements** 6M

Active elements, Passive elements, Linear elements, Non linear elements, Unilateral elements, Bilateral elements, Lumped elements, Distributed elements

Calculate the voltage to be applied across AB in order to drive current of 5A In the circuit by using star-delta transformation for the network shown in figure below?



7 (b) 6M



$R_1 = 2+3+\frac{2\times3}{5} = 6.2\Omega$

$R_2 = 2+5+\frac{2\times5}{2} = 10.5\Omega$

$R_3 = 3+5+\frac{3\times5}{2} = 15.5\Omega$

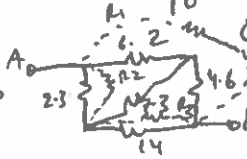
$R_1 = 2+10+\frac{2\times10}{10} = 14\Omega$

$R_2 = 10+10+\frac{10\times10}{2} = 70\Omega$

$R_3 = 10+2+\frac{10\times2}{10} = 14\Omega$

$R_{eq} = \frac{3\times10.5}{3+10.5} = \frac{30.9}{13.5} = 2.32\Omega$

$R_{eq} = \frac{15.5\times14}{15.5+14} = \frac{217}{29.5} = 7.35\Omega$

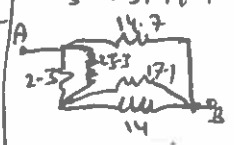


$R_1 = 6.2+4.6+\frac{6.2\times4.6}{7.3} = 14.72\Omega$

$R_2 = 6.2+7.3+\frac{6.2\times7.3}{4.6} = 23.3\Omega$

$R_3 = 7.3+4.6+\frac{7.3\times4.6}{6.2} = 17.13\Omega$

$R_{eq} = \frac{70\times5}{70+5} = \frac{350}{75} = 4.66\Omega$



$R_{eq} = \frac{2.3\times23.3}{2.3+23.3} = 2.09\Omega$

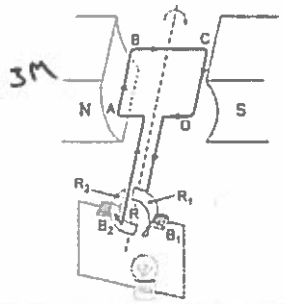
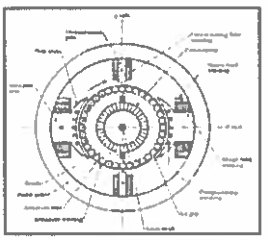
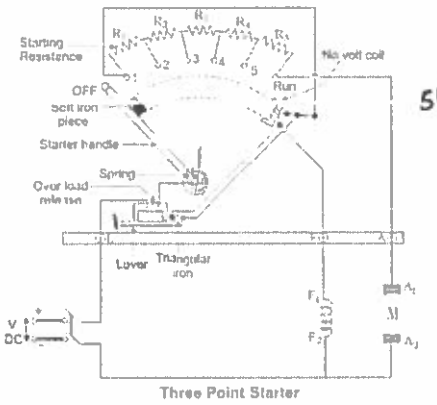
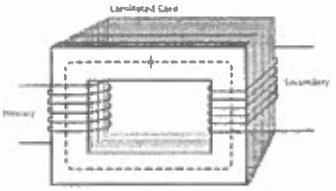
$R_{eq} = \frac{17.1\times14}{17.1+14} = 7.69\Omega$

$R_{eq} = 2.09+7.69 = 9.78\Omega$

$R_{eq} = \frac{14.7\times9.7}{14.7+9.7} = 5.84\Omega$

$\therefore V = IR_{eq} = 5\times5.84$

$= 29.21$ Volts

8 (a)	**Explain the principle and operation of a D. C. generator** principle and operation 3M  3M	6M
8 (b)	**Explain the construction of D.C. generators** construction of D.C. generators 3M  3M	6M
	OR	
9	**Explain the necessity of starter in a D. C. motor and explain the operation of a three point starter with a neat sketch** Three point starter is an electrical device, used for starting as well as maintaining the DC shunt motor speed. The connection of resistance in this circuit is in series which decreases the initial high current and guards the equipment against any electrical failures. 7M  5M	12M
	Explain the principle of operation of single phase transformer	
10 (a)	Principle ~~3M~~ 3M Figure ~~2M~~ 2M 	5M
10 (b)	**A single phase 200/400 V, 6 KVA, 50 Hz transformer gave the following results.** **OC test(LV side) : 200 V, 0.8 A, 80 W** **SC test(HV side) : 25 V, 10 A, 90 W** **Determine** **(i) The circuit constants referred to L.V side** **(ii) The efficiency at full load with 0.8 lagging power factor** $V_1 = 200\ V$ $W_0 = 80\ W$ $\cos\phi_0 = \frac{80}{200\times 0.8} = 0.5$ $V_2 = 400\ V$ $W_0 = V_1 I_0 \cos\phi_0$ $I_w = I_0 \cos\phi_0 = 0.4A$ $I_0 = 0.8A$ $80 = 200 \times 0.8 \times \cos\phi_0$ $I_M = I_0 \sin\phi_0 = 0.69A$	7M

i) $R_0 = \frac{V_1}{I_w} = \frac{200}{0.4} = 500\,\Omega$ $\quad X_0 = \frac{V_1}{I_\mu} = \frac{200}{0.09} = 289\,\Omega$

ii) Total Loss = 80 + 90 = 170W

O/P Power = x. kVA $\cos\phi = 1 \times 6 \times 10^3 \times 0.8 = 4800$W

$\therefore \eta = \frac{\text{o/p}}{\text{o/p + loss}} = \frac{4800}{4800 + 170} = \frac{4800}{4970} = 0.96$

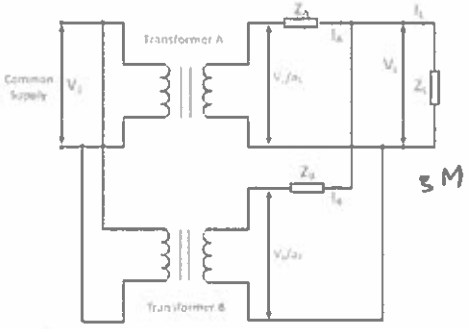
$\% \eta = 96.5\%$

OR

11 (a) **Describe the parallel operation of a single phase transformer** 6M

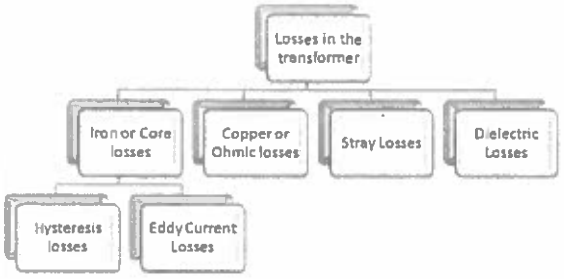
Parallel Operation of a Single Phase Transformer means that the two or more transformers having the same polarities, same turn ratios, same phase sequence and the same voltage ratio are connected in parallel with each other. The current I_A and I_B have two components.

2M



5M

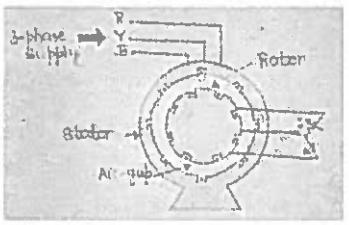
11 (b) **Explain various losses that occur in a transformer** 6M



12 (a) **Describe the concept of rotating magnetic field.** 5M

The rotating magnetic field is produced by the three-phase current of the stator in the actual three-phase induction motor. It can be replaced by permanent magnets in a permanent magnet synchronous motor. The three-phase windings of the inner stator are spaced 120° electrical degrees apart. In addition, the conductor of each winding is distributed such as a sinusoidal wave. Therefore, when the current flows into the three-phase windings, the magneto motive force (MMF) of the sinusoidal waveform is produced by the current.

3M



2M

12 (b)	A 10 MVA 6.6 kV, 3 phase star connected alternator gave open circuit and short circuit data as follows: Field current in amps : 25 50 75 100 125 150 OC voltage in kV (L-L) : 2.4 4.8 6.1 7.1 7.6 7.9 SC Current in Amps : 288 528 875 Find the voltage regulation at full load 0.8 pf lagging by e.m.f. method. Armature resistance per phase = 0.13 Ω	7M

Sol:- Given

10 MVA = 10×10^3 kVA

V_L = 6.6 kVA = 6.6×10^3

$\cos\phi = 0.8$

$\phi = \cos^{-1}(0.8)$

$\phi = 36.86$ $R_a = 0.13\,\Omega$

$\sin\phi = 0.6$

$S = \sqrt{3} V_L I_L = 10 \times 10^3 \times 10^3$

$I_L = \dfrac{10 \times 10^6}{\sqrt{3} \times 6.6 \times 10^3}$

$I_L = 874.77$ Amp

$V_L = \sqrt{3} V_{ph}$

$V_{ph} = \dfrac{V_L}{\sqrt{3}} = \dfrac{6.6 \times 10^3}{\sqrt{3}} = 3810.51$ volts

$Z_s = \dfrac{V_{oc}}{I_{sc}}$

$= \dfrac{6.1 \times 10^3/\sqrt{3}}{874.77}$

$Z_s = 4.02\,\Omega$

$X_s = \sqrt{(Z_s)^2 - (R_a)^2}$

$= \sqrt{(4.02)^2 - (0.13)^2}$

$= \sqrt{16.14}$

$= 4.01$

$E_0 = \sqrt{(V\cos\phi + I_a R_a)^2 + (V\sin\phi + I_a X_s)^2}$

$= \sqrt{((3810.5)(0.8) + (874.77 \times 0.13))^2 + ((3810.5)(0.6) + (874.77)(4.01))^2}$

$= \sqrt{9999003.5 + 33571891.1}$

$= \sqrt{43570874.85}$

$= 6600.8$ volts

% voltage regulation $= \dfrac{E_0 - V}{V} \times 100$

$= \dfrac{6600.8 - 3810.51}{3810.51} \times 100$

$= 0.732 \times 100$

$= 73.22\%$

OR

13 (a)	Explain the Speed - Torque characteristics of three phase induction motor	7M

Slip-Torque (or) Torque-speed characteristics:

We know, Torque equation is

$$T = \frac{k\phi sE_2R_2}{R_2^2 + (sX_2)^2}$$

Case-(i) : If s=0, T=0

Case-(ii): sX_2 is very small, $R_2 >> sX_2$

$$\therefore \quad T \propto \frac{s}{R_2}$$

or $\quad T \propto s$ if R_2 is constant

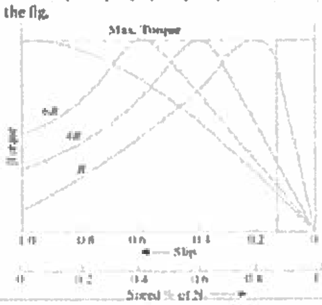
Hence, for low values of slip, the torque/slip curve is approximately a straight line. As slip increases (for increasing load on the motor), the torque also increases and becomes maximum when $s = R_2/X_2$. This torque is known as *'pull-out'* or *'breakdown'* torque T_b or stalling torque.

Case-(iii) : R_2 is very small, $R_2 << sX_2$

$$T \propto \frac{s}{(sX_2)^2} \propto \frac{1}{s}$$

Hence, the torque/slip curve is a rectangular hyperbola. So, we see that beyond the point of maximum torque, any further increase in motor load results in decrease of torque developed by the motor. The result is that the motor slows down and eventually stops.

Therefore, the slip-torque (or) torque-speed characteristics of an induction motor are shown in the fig.



Derive the E.M.F. equation of alternator

13 (b)

∴ Average e.m.f. induced per conductor $= \frac{d\Phi}{dt} = \frac{\Phi P}{60/N} = \frac{\Phi NP}{60}$

Now, we know that $f = PN/120$ or $N = 120f/P$

Substituting this value of N above, we get

Average e.m.f. per conductor $= \frac{\Phi P}{60} \times \frac{120 f}{P} = 2f\Phi$ volt

If there are Z conductors in series phase, then Average e.m.f./phase $= 2f\Phi Z$ volt $= 4f\Phi T$ volt

R.M.S. value of e.m.f. phase $= 1.11 \times 4f\Phi T = 4.44f\Phi T$ volt.

This would have been the actual value of the induced voltage if all the coils in a phase were (i) full-pitched and (ii) concentrated or bunched in one slot (instead of being distributed in several slots under poles). But this not being so, the actually available voltage is reduced in the ratio of these two factors.

∴ Actually available voltage/phase $= 4.44 k_p k_d f\Phi T = 4 k_c k_d f\Phi T$ volt.

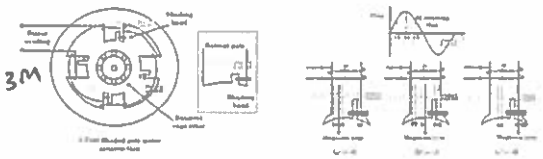
5M

Explain the principle of operation and construction of shaded pole induction motor

14 (a)

Shaded pole motors explanation 3m

Figure 3M



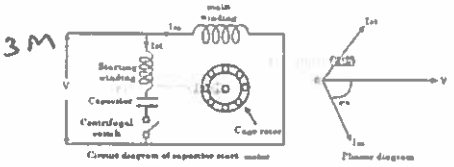
6M

Explain the working of capacitor-start type single phase induction motor

14 (b)

capacitor-start type motors explanation 3m

Figure 3M



6M

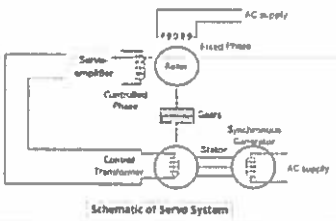
OR

Explain the working principle of A. C. servo motors with neat sketches

15 (a)

Working principle 3m

3M



7M

Differentiate between single phase and three phase induction motors

15 (b)

Single Phase Induction Motor	Three Phase Induction Motor
The AC asynchronous motor that runs on single phase AC power supply.	AC asynchronous motor that runs on three phase AC power supply.
It has 2 terminals thus it requires only two wires to power it up.	It has 3 terminals and requires three or four (including neutral) wires to operate.
It is not a self-start motor.	It is a self-start motor.
Their types include; Spilt phase, shaded pole, capacitor start, capacitor start capacitor run induction motor etc.	Their types are; squirrel cage induction motor and wound type induction motor.
It generates mechanical noise and vibration.	It operates smoothly with less noise.
Its efficiency is lower.	It has high efficiency.
It offers very limited starting torque.	It offers very high starting torque.
Its design is simple and easier to construct	It design is complex.
Its maintenance is very easy.	Its maintenance is relatively difficult.
It is cheaper.	It is expensive.

Any 5 Points

5M

NSRIT

Semester End Supplementary Examination, October, 2021

Degree	B. Tech. (U. G.)	**Program**	CSE/CSM/CSD			**Academic Year**	2020 - 2021
Course Code	20CS101	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	I
Course	**FUNDAMENTALS OF COMPUTER SCIENCE**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List any two memory types	20CS101.1	L1
2	Write the Difference between Compiler and Interpreter	20CS101.2	L2
3	What is an operating System	20CS101.3	L1
4	Define Database view	20CS101.4	L1
5	What is Artificial Intelligence? Give an example of where AI is used on a daily basis	20CS101.5	L4

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 10)	Marks	Learning Outcome (s)	DoK
6 (a)	Discuss input and output devices with examples	6M	20CS101.1	L2
6 (b)	How the Communication between the CPU and Input/output devices? Explain	6M	20CS101.1	L2
	OR			
7 (a)	How the Hardware, Software, and people are involved in effective usage of a computer. Justify in your observations	6M	20CS101.1	L3
7 (b)	Illustrate Data Preparation? Discuss the factors that are to be considered while selecting input device	6M	20CS101.1	L3
8 (a)	List all conditional control statements used in C. Explain any two with syntax and example	6M	20CS101.2	L1
8 (b)	Write a C program to find the factorial of a number using do-while, where the number n is entered by user	6M	20CS101.2	L1
	OR			
9 (a)	Define Algorithm. Write an algorithm to find the area and perimeter of a circle	6M	20CS101.2	L1
9 (b)	What are basic data types available in "C"? Write the significance of each data type	6M	20CS101.2	L1
10 (a)	With a neat diagram, explain OSI reference model	12M	20CS101.3	LI3
	OR			
11 (a)	Write any four functionalities of an operating system	4M	20CS101.3	L2
11 (b)	Explain star and ring topologies	8M	20CS101.3	L2
12 (a)	Write the advantages & Disadvantages of Database approach over File-oriented approach	6M	20CS101.4	L2
12 (b)	Explain Object-oriented Data Mode	6M	20CS101.4	L1
	OR			
13 (a)	What is a Database Management System? Explain various components of it	8M	20CS101.4	L2
13 (b)	Explain Network model Vs Relational model	4M	20CS101.4	L2
14 (a)	Explain the current trends in AI	6M	20CS101.5	L4
14 (b)	Write the various Applications of machine learning	6M	20CS101.5	L4
	OR			
15 (a)	Discuss the developments of AI languages	6M	20CS101.5	L3
15 (b)	What are the ingredients of machine learning? Explain	6M	20CS101.5	L2

SEMESTER Question Paper

Degree	B. Tech. (U. G.)	**Program**	Common to cse,cse(ai&ml),cse(ds)	Test	I/I	**Academic Year**	2020 - 2021
Course Code	20CS101	**Test Duration**	180Min.	Max. Marks	70	**Semester**	I
Course	**FUNDAMENTALS OF COMPUTERSCIENCE**						

Key and Scheme of Evaluation

No.	Questions (1 through 5)	Marks
1	**List any two memory types** Primary memory Secondary memory	Content 2M Each 1M
2	**Write the Difference between Compiler and Interpreter** Interpreter: Translates program one statement at a time. Interpreters usually take less amount of time to analyze the source code. However, the overall execution time is comparatively slower than compilers. No Object Code is generated, hence are memory efficient. Compiler: Scans the entire program and as a whole into machine code. Compilers usually take a large time to analyze the source co However, the overall executio comparatively faster than int. Generates Object Code whic requires linking, hence require memory.	Content 2M
3	**What is an operating System** An **operating system** (OS) is system software that manages computer hardware, software resources, and provides common services for computer programs.	Content 2M
4	**Define Database view** A database view is a searchable object in a database that is defined by a query. Though a view doesn't store data, some refer to a views as "virtual tables," you can query a view like you can a table. A view can combine data from two or more table, using joins, and also just contain a subset of information	Content 2M Each 1M
5	**What is Artificial Intelligence? Give an example of where AI is used on a daily basis** Artificial intelligence (AI) is the ability of a computer program or a machine to think and learn. It is also a field of study which tries to make computers "smart". ... In general use, the term "artificial intelligence" means a programme which mimics human cognition. • Self-Driving And Parking Vehicles. Self-driving and parking cars use deep learning, a subset of AI, to recognize the space around a vehicle. ... • Digital Assistants. ... • Vehicle Recognition Identification. ... • Robots. ... • Transportation.	Definition 1M Example 1M

No.	Questions (6 through 11)	
6 (a)	**Discuss input and output devices with examples** **INPUT DEVICES:** Following are some of the important input devices which are used in a computer – 1. Keyboard 2.Mouse 3.Joy Stick 4.Light pen 5.Track Ball 6.Scanner 7.Graphic Tablet 8.Microphone 9.Magnetic Ink Card Reader(MICR) 10.Optical Character Reader(OCR) 11.Bar Code Reader 12.Optical Mark Reader(OMR) **Light Pen** Light pen is a pointing device similar to a pen. It is used to select a displayed menu item or draw pictures on the monitor screen. It consists of a photocell and an optical system placed in a small tube. **Track Ball** Track ball is an input device that is mostly used in notebook or laptop computer, instead of a mouse. This is a ball which is half inserted and by moving fingers on the ball, the pointer can be moved. ball is an input device that is mostly used in notebook or laptop computer, instead of a mouse. **Magnetic Ink Card Reader (MICR)** MICR input device is generally used in banks as there are large number of cheques to be processed every day. The bank's code number and cheque number are printed on the cheques with a special type of ink that contains particles of magnetic material that are machine readable. **OUTPUT DEVICES:** Following are some of the important output devices used in a computer. ▪ Monitors ▪ Graphic Plotter ▪ Printer **Monitors** Monitors, commonly called as Visual Display Unit (VDU), are the main output device of a computer. It forms images from tiny dots, called pixels that are arranged in a rectangular form. The sharpness of the image depends upon the number of pixels.	Each device Explanation 1M
6 (b)	**How the Communication between the CPU and Input/output devices? Explain** • The communication between the IOP and the devices is similar to the program control method of transfer. And the communication with the memory is similar to the direct memory access method. • In large scale computers, each processor is independent of other processors and any processor can initiate the operation. • The CPU can act as master and the IOP act as slave processor. The CPU assigns the task of initiating operations but it is the IOP, who executes the instructions, and not the CPU. CPU instructions provide operations to start an I/O transfer. The IOP asks for CPU through interrupt. • Instructions that are read from memory by an IOP are also called *commands* to distinguish them from instructions that are read by CPU. Commands are prepared by programmers and are stored in memory. Command words make the program for IOP. CPU informs the IOP where to find the commands in memory.	Explanation 6M
	OR	
7 (a)	**How the Hardware, Software, and people are involved in effective usage of a computer. Justify in your observations**	Explanation 6M
7 (b)	**Illustrate Data Preparation? Discuss the factors that are to be considered while selecting input device**	Explanation 6M

Data can arise from a variety of sources. For example, when students sit examinations, the grades obtained make up the data to be processed by the computer. When customers make withdrawals or deposits at a bank, the slips filled out are the sources of the data. When people fill out questionnaires, the answers to the questions are the data. In the majority of cases, the original data is not in a form which can be readily processed by the computer. For instance, the computer cannot 'read' the answers directly from the questionnaires. The data must first be converted into machine-readable form. A large proportion (30% to 50%) of computing costs is spent on this conversion, which is called **data preparation.**

For a typical application, the following steps need to be performed:

(1) The data from the source documents is entered on the chosen medium (for example disk, tape or cards) by a **data entry operator.**

(2) The data entered is then **verified.** The usual procedure is for another operator to re-enter the same data. The operator is told of any mismatch between the first and second entry. The errors noted are then corrected. Verification can also be done by the original operator, who keys in the data twice; only if the two entries match is the data recorded. Otherwise, the data has to be re-entered until there is no mismatch.

(3) The result of step 2 is that the data is now in machine-readable form. The data is then input to the computer using an appropriate input device. For instance, if the data is stored on a magnetic disk, a disk drive is used to read the data from the disk; if the data is recorded on punched cards, a card-reader is used to read the cards and transmit the data to the computer.

(4) Usually, the first attempt at processing the data uncovers errors which escaped detection at the verification stage. For example, suppose the answer to a question should have been either 1 (for YES) or 2 (for NO); because of poor handwriting an answer 2 may have looked like a 3; the data-entry operator (who does not need to read the question) sees a 3 and keys in a 3. However, the computer program 'knows' that the answer to the question can only be 1 or 2. It can validate the data read, that is, it can check to make sure that the answer supplied is 1 or 2. If any other answer (3, in this case) is given, the program can print a message that the data supplied is invalid. The errors detected at this stage must be corrected and step 3 repeated.

As another example of

List all conditional control statements used in C. Explain any two with syntax and example

8 (a)

In C, we have 32 standard keywords and out of them 12 (the keywords in the second column of the following table) are control statements.

These statements control the flow of the program and out of them some are selection statements, some are iterative statements and some other are jumping statements.

If Statements

If statement enables the programmer to choose a set of instructions, based on a condition. When the condition is evaluated to true, a set of instructions will be executed and a different set of instructions will be executed when the condition is evaluated to false. We have 4 types of if Statement which are:

Definition 1M
explanation 5M

1. If..else
2. Nested if
3. Else if ladder
4. Simple if or null else
5. Null else or Simple else

f...else Statement

In this statement, there are two types of statements execute. First, if the condition is true first statement will execute if the condition is false second condition will be executed.

Syntax:

```
If(condition)
{
Statement(s);
}
else
{
Statement(s)
}
Statement
```

Nested if

If the condition is evaluated to true in the first if statement, then the condition in the second if statement is evaluated and so on.

Syntax:

```
If(condition)
{
If(condition)
{
Statement(s);
}
Else
{
Statement(s)
}
}
```

Write a C program to find the factorial of a number using do-while, where the number n is entered by user

```
#include<stdio.h>
#include<conio.h>
void main()
{
  int n,i=1,f=1;
  clrscr();

  printf("\n Enter The Number:");
  scanf("%d",&n);
```

8 (b)

```
  //LOOP TO CALCULATE THE FACTORIAL OF A NUMBER
  do
  {
    f=f*i;
    i++;
  }while(i<=n);

  printf("\n The Factorial of %d is %d",n,f);
  getch();
}
```

Program 6M

OR

9 (a) **What are basic data types available in "C"? Write the significance of each data type**

Main types. The C language provides the four basic arithmetic type specifiers char, int, float and

Explanation 6M

double, and the modifiers signed, unsigned, short, and long. The following table lists the permissible combinations in specifying a large set of storage size-specific declarations

Data type	Range
int	
signed int	−32,768 to 32,767
unsigned int	0 to 65,535
short int	
signed short int	-2,147,483,648 to 2,147,483,647 (4 bytes)
unsigned short int	0 to 4,294,967,295 (4 bytes)
long int	
signed long int	-2,147,483,648 to 2,147,483,647 (4 bytes)
unsigned long int	0 to 4,294,967,295 (4 bytes)

9 (b)

Define Algorithm. Write an algorithm to find the area and perimeter of a circle

The definition of an algorithm is a specific and logical procedure to be followed in order to achieve specific results, or to solve a math problem

Area of Circle Algorithm:

Step 1: Start
Step 2: Input radius
Step 3: let pi = 3.14
Step 4: area = pi * radius * radius
Step 6: print area
Step 7: stop

Algorithm 1M
Explanation 5M

10 (a)

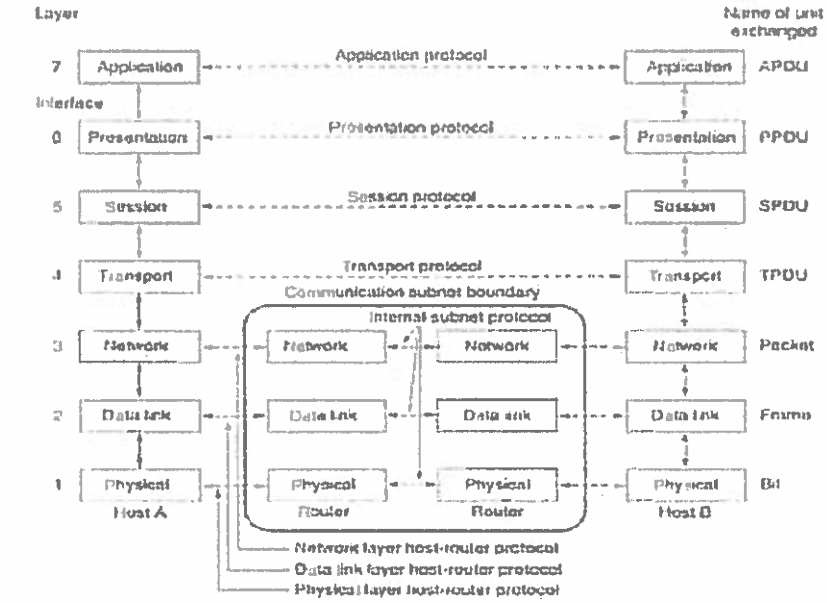
With a neat diagram, explain OSI reference model

The Physical Layer:

The lowest layer of the OSI reference model is the physical layer. It is responsible for the actual physical connection between the devices. The physical layer contains information in the form of bits.

Diagrams-(4M)
Explanation –(8M)

The OSI Reference Model:



OR

Write any four functionalities of an operating system

Important functions of an operating System:

1. Security – The operating system uses password protection to protect user data and similar other techniques. it also prevents unauthorized access to programs and user data.

2. Control over system performance – Monitors overall system health to help improve performance. records the response time between service requests and system response to having a complete view of the system health. This can help improve performance by providing important information needed to troubleshoot problems.

11 (a)

3. Job accounting – Operating system Keeps track of time and resources used by various tasks and users, this information can be used to track resource usage for a particular user or group of users.

Explanation 4M

4. Error detecting aids – The operating system constantly monitors the system to detect errors and avoid the malfunctioning of a computer system.

5. Coordination between other software and users – Operating systems also coordinate and assign interpreters, compilers, assemblers, and other software to the various users of the computer systems.

Explain star and ring topologies

Star Topology:

11 (b) In a star topology, each device has a dedicated point-to-point link only to a central controller, usually called a hub. The devices are not directly linked toone another. Unlike a mesh topology, a star topology does not allow directtraffic between devices. The controller acts as an exchange: If one device wantsto send data to another, it sends the data to the controller,

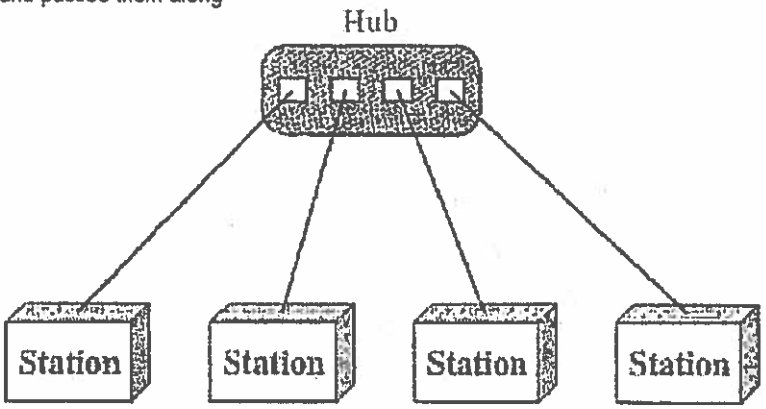
Explanation (8M)
Each topology(4M)

which then relays the data to the other connected device .

Ring topology

In a ring topology, each device has a dedicated point-to point connection with only the two devices on either side of it. A signal is passed along the ring in one direction, from device to device, until it reaches its destination. Each device in the ring incorporates a repeater.

When a device receives a signal intended for another device, its repeater regenerates the bits and passes them along



Write the advantages & Disadvantages of Database approach over File-oriented approach

12(a)

Explanation 6M

S.NO.	File System	DBMS
1.	File system is a software that manages and organizes the files in a storage medium within a computer.	DBMS is a software for m database.
2.	Redundant data can be present in a file system.	In DBMS there is no redu
3.	It doesn't provide backup and recovery of data if it is lost.	It provides backup and re even if it is lost.
4.	There is no efficient query processing in file system.	Efficient query processing DBMS.
5.	There is less data consistency in file system.	There is more data consi of the process of normali
6.	It is less complex as compared to DBMS.	It has more complexity in compared to file system.
7.	File systems provide less security in comparison to DBMS.	DBMS has more security compared to file system.

	8.	It is less expensive than DBMS.	It has a comparatively higher cost than a file system.

Explain Object-oriented Data Mode

object oriented data model is based upon real world situations. These situations are represented as objects, with different attributes. All these object have multiple relationships between them.

Elements of Object oriented data model

Objects

The real world entities and situations are represented as objects in the Object oriented database model.

12(b) **Attributes and Method**

Every object has certain characteristics. These are represented using Attributes. The behaviour of the objects is represented using Methods. Explanation 6M

Class

Similar attributes and methods are grouped together using a class. An object can be called as an instance of the class.

Inheritance

A new class can be derived from the original class. The derived class contains attributes and methods of the original class as well as its own.

What is a Database Management System? Explain various components of it

COMPONENTS OF DBMS

DBMS have several components, each performing very significant tasks in the database management system environment. Below is a list of components within the database and its environment.

Software

This is the set of programs used to control and manage the overall database. This includes the DBMS software itself, the Operating System, the network software being used to share the data among users, and the application programs used to access data in the DBMS.

13(a)  Each 2M Total 8M

Hardware

Consists of a set of physical electronic devices such as computers, I/O devices, storage devices, etc., this provides the interface between computers and the real world systems.

Data

DBMS exists to collect, store, process and access data, the most important component. The database contains both the actual or operational data and the metadata.

Procedures

These are the instructions and rules that assist on how to use the DBMS, and in designing and running the database, using documented procedures, to guide the users that operate and manage it.

Database Access Language
This is used to access the data to and from the database, to enter new data, update existing data, or retrieve required data from databases. The user writes a set of appropriate commands in a database access language, submits these to the DBMS, which then processes the data and generates and displays a set of results into a user readable form.

Query Processor
This transforms the user queries into a series of low level instructions. This reads the online user's query and translates it into an efficient series of operations in a form capable of being sent to the run time data manager for execution.

Run Time Database Manager
Sometimes referred to as the database control system, this is the central software component of the DBMS that interfaces with user-submitted application programs and queries, and handles database access at run time. Its function is to convert operations in user's queries. It provides control to maintain the consistency, integrity and security of the data.

Data Manager
Also called the cache manger, this is responsible for handling of data in the database, providing a recovery to the system that allows it to recover the data after a failure.

Database Engine
The core service for storing, processing, and securing data, this provides controlled access and rapid transaction processing to address the requirements of the most demanding data consuming applications. It is often used to create relational databases for online transaction processing or online analytical processing data.

Data Dictionary
This is a reserved space within a database used to store information about the database itself. A data dictionary is a set of read-only table and views, containing the different information about the data used in the enterprise to ensure that database representation of the data follow one standard as defined in the dictionary.

Report Writer

Also referred to as the report generator, it is a program that extracts information from one or more files and presents the information in a specified format. Most report writers allow the user to select records that meet certain conditions and to display selected fields in rows and columns, or also format the data into different charts.

Explain Network model Vs Relational model

13(b) Explanation-4M

Network Data Model	Relational Data Model
It organizes records to one another through links or pointers.	It organizes records in form of table and relationship between tables are set using common fields.
It organizes records in form of directed graphs.	It organizes records in form of tables.
In this relationship between various records is represented physically via linked list.	In this relationship between various records is represented logically via tables.

Explain the current trends in AI

14(a) Explanation-6M

Greater Cloud and AI collaboration

Rico Burnett, the director of client innovation at legal services provider Exigent, says that Artificial Intelligence will play a significant role in the broad adoption of Cloud Solutions in 2021. .Through the deployment of artificial intelligence, it will be possible to monitor and manage cloud resources and the vast amount of available data.

2. AI solutions for IT

The number of AI solutions that are being developed for IT will increase in 2021. Capgemini's Simion predicts that AI solutions that can detect common IT problems on its own and self-correct any small malfunctions or issues will see an increase in the upcoming years. This will reduce downtime and allow the teams in an organisation to work on high-complexity projects and focus elsewhere.

AIOps becomes more popular

Over the last few years, the complexity of IT systems has increased. Forrester recently said that vendors would want platform solutions that combine more than one monitoring discipline such as application, infrastructure, and networking. IT operations and other teams can improve their key processes, decision making, and tasks with AIOps solutions and improved analysis of the volumes of data coming its way. Forrester advised the IT leaders to find AIOps providers who will empower the cross-team collaboration through end-to-end digital experiences, data correlation, and integration of the IT operations management toolchain.

4. AI will help in structuring data

In the future, we will see more unstructured data is structured with natural language processing and machine learning processes. Organisations will leverage these technologies and create data that RPA or robotic process automation technology can use when they want to automate transactional activity in an organisation. RPA is one of the fastest-growing areas in the software industry. The only limitation that it faces is that it can only use structured data. With the help of AI, unstructured data can easily be converted into structured data, which can provide a defined output.

5. Artificial intelligence talent will remain tight

The supply of talent is expected to be an issue in adopting artificial intelligence in 2021. There has been a persistent gap in AI talent, and organisations have finally realised this potential. It is essential to address this gap and ensure that a wider group of people learn artificial intelligence. Ensuring that a broader set of users have access to artificial intelligence to focus on technology, learning strategies, and supporting a change in the

working environment is essential in 2021.

6. Large scale adoption of AI in the IT industry

We have seen continuous growth in adoption of AI within the IT industry. However, Simion predicts that organisations will use AI in production and start using them at a large scale. With the help of artificial intelligence, an organisation can get ROI in real-time. This means that organisations will see their efforts being paid off.

Write the various Applications of machine learning

Image Recognition:

Image recognition is one of the most common applications of machine learning. It is used to identify objects, persons, places, digital images, etc. The popular use case of image recognition and face detection is, Automatic friend tagging suggestion:

Facebook provides us a feature of auto friend tagging suggestion. Whenever we upload a photo with our Facebook friends, then we automatically get a tagging suggestion with name, and the technology behind this is machine learning's face detection and recognition algorithm. It is based on the Facebook project named "Deep Face," which is responsible for face recognition and person identification in the picture.

Programmer motivation (or how to stay motivated when learning to code)

2. Speech Recognition

While using Google, we get an option of "Search by voice," it comes under speech recognition, and it's a popular application of machine learning.

Speech recognition is a process of converting voice instructions into text, and it is also known as "Speech to text", or "Computer speech recognition." At present, machine learning algorithms are widely used by various applications of speech recognition. Google assistant, Siri, Cortana, and Alexa are using speech recognition technology to follow the voice instructions.

3. Traffic prediction:

If we want to visit a new place, we take help of Google Maps, which shows us the correct path with the shortest route and predicts the traffic conditions.

14(b) Explanation-6M

It predicts the traffic conditions such as whether traffic is cleared, slow-moving, or heavily congested with the help of two ways:

Real Time location of the vehicle form Google Map app and sensors

Average time has taken on past days at the same time.

Everyone who is using Google Map is helping this app to make it better. It takes information from the user and sends back to its database to improve the performance.

4. Product recommendations:

Machine learning is widely used by various e-commerce and entertainment companies such as Amazon, Netflix, etc., for product recommendation to the user. Whenever we search for some product on Amazon, then we started getting an advertisement for the same product while internet surfing on the same browser and this is because of machine learning.

Google understands the user interest using various machine learning algorithms and suggests the product as per customer interest.

As similar, when we use Netflix, we find some recommendations for entertainment series, movies, etc., and this is also done with the help of machine learning.

5. Self-driving cars:

One of the most exciting applications of machine learning is self-driving cars. Machine learning plays a significant role in self-driving cars. Tesla, the most popular car manufacturing company is working on self-driving car. It is using unsupervised learning method to train the car models to detect people and objects while driving.

filters used by Gmail:

Content Filter

Header filter

General blacklists filter

Rules-based filters
Permission filters
Some machine learning algorithms such as Multi-Layer Perceptron, Decision tree, and Naïve Bayes classifier are used for email spam filtering and malware detection.

Discuss the developments of AI languages

. Python

Python is considered to be in the first place in the list of all AI development languages due to the simplicity. The syntaxes belonging to python are very simple and can be easily learnt. Therefore, many AI algorithms can be easily implemented in it. Python takes short development time in comparison to other languages like Java, C++ or Ruby. Python supports object oriented, functional as well as procedure oriented styles of programming. There are plenty of libraries in python, which make our tasks easier. For example: Numpy is a library for python that helps us to solve many scientific computations. Also, we have Pybrain, which is for using machine learning in Python.

2. R

R is one of the most effective language and environment for analyzing and manipulating the data for statistical purposes. Using R, we can easily produce well-designed publication-quality plot, including mathematical symbols and formulae where needed. Apart from being a general purpose language, R has numerous of packages like RODBC, Gmodels, Class and Tm which are used in the field of machine learning. These packages make the implementation of machine learning algorithms easy, for cracking the business associated problems.

15(a)

3. Lisp

Lisp is one of the oldest and the most suited languages for the development in AI. It was invented by John McCarthy, the father of Artificial Intelligence in 1958. It has the capability of processing the symbolic information effectively. It is also known for its excellent prototyping capabilities and easy dynamic creation of new objects, with automatic garbage collection. Its development cycle allows interactive evaluation of expressions and recompilation of functions or file while the program is still running. Over the years, due to advancement, many of these features have migrated into many other languages thereby affecting the uniqueness of Lisp.

Explanation-each 2M

4. Prolog

This language stays alongside Lisp when we talk about development in AI field. The features provided by it include efficient pattern matching, tree-based data structuring and automatic backtracking. All these features provide a surprisingly powerful and flexible programming framework. Prolog is widely used for working on medical projects and also for designing expert AI systems.

5. Java

Java can also be considered as a good choice for AI development. Artificial intelligence has lot to do with search algorithms, artificial neural networks and genetic programming. Java provides many benefits: easy use, debugging ease, package services, simplified work with large-scale projects, graphical representation of data and better user interaction. It also has the incorporation of Swing and SWT (the Standard Widget Toolkit). These tools make graphics and interfaces look appealing and sophisticated.

What are the ingredients of machine learning? Explain

Machine learning is purely mathematical. There are different fields of math involved, with the major ones being linear algebra, calculus, and statistics. ML deals heavily with matrix and vector manipulation since data can be easily represented in these formats.

15(b)

The prime goal of all machine learning algorithms is to intake some data and adjust weights in an equation to best fit the data. It's not as complex

Explanation-6M

1. Tasks: the problems that can be solved with machine learning 2. Models: the output of machine learning 3. Features: the workhorses of machine learning

Semester End Supplementary Examination, October, 2021

Degree	B. Tech. (U. G.)	**Program**	ECE			**Academic Year**	2020 - 2021
Course Code	20BSX23	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	I
Course	**APPLIED CHEMISTRY**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define Polymer	20BSX23.1	L1
2	Differentiate primary cell from secondary cell?	20BSX23.2	L2
3	Give the molecular orbital electronic configuration of O_2 molecule	20BSX23.3	L2
4	What is electromagnetic spectrum and give its range?	20BSX23.4	L1
5	What is molecular modeling?	20BSX23.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Differentiate addition polymerization from condensation polymerization	6M	20BSX23.1	L2
6 (b)	Write the preparation properties and applications of i. Nylon 6, 6 ii. urea formaldehyde	6M	20BSX23.1	L1
	OR			
7 (a)	Write the mechanism of free radical chain polymerization	6M	20BSX23.1	L2
7 (b)	What are conducting polymers? Write about conducting polymerization of polypyrrole?	6M	20BSX23.1	L1
8 (a)	Explain the construction & working of Lithium-ion battery	6M	20BSX23.2	L2
8 (b)	Derive the Nernst equation for a single electrode potential	6M	20BSX23.2	L2
	OR			
9 (a)	Explain construction, working and applications of methanol-oxygen fuel cell	6M	20BSX23.2	L2
9 (b)	Define conductometric titrations? Discuss conductometric titrations of strong acid Vs strong base and explain the nature of the graphs between conductance and volume of titrant used	6M	20BSX23.2	L2
10 (a)	Explain the energy level diagrams of CO and NO molecule. Explain their magnetic nature and bond order	7M	20BSX23.3	L2
10 (b)	Give the postulates of plank's quantum theory	5M	20BSX23.3	L2
	OR			
11 (a)	What is crystal field theory? Explain the crystal field splitting in tetrahedral complexes	6M	20BSX23.3	L2
11 (b)	Draw the band diagrams of conductors, semiconductors and insulators	6M	20BSX23.3	L2
12 (a)	Write a short note on Nuclear magnetic resonance	5M	20BSX23.4	L2
12 (b)	Explain principle and instrumentation of UV-visible spectroscopy with neat diagram	7M	20BSX23.4	L2
	OR			
13 (a)	Explain the principle and instrumentation of High performance liquid Chromatography	6M	20BSX23.4	L2
13 (b)	Explain the pH metric methods help to determine the endpoint in acid-base titration	6M	20BSX23.4	L2
14 (a)	Write about supra molecular reactivity and catalysis, Self-assembly in biological systems	7M	20BSX23.5	L1
14 (b)	What is basic lock and key principle?	5M	20BSX23.5	L2
	OR			
15 (a)	List any four applications of Catenands	4M	20BSX23.5	L1
15 (b)	Discuss about cation binding, anion binding and simultaneous cation and anion binding	8M	20BSX23.5	L2

Semester End Supplementary Examination, October, 2021

Degree	B. Tech. (U. G.)	Program	ECE			Academic Year	2020 - 2021
Course Code	20BSX23	Test Duration	3 Hrs.	Max. Marks	70	Semester	I
Course	APPLIED CHEMISTRY	Scheme of Valuation					

Part A (Short Answer Questions 5 x 2 = 10 Marks)		Learning Outcome (s)	DoK
No.	Questions (1 through 5)		
1	Define Polymer- 2 marks	20BSX23.1	L1
2	Differentiate primary cell from secondary cell? Primary cell-1 mark secondary cell- 1 mark	20BSX23.2	L2
3	Give the molecular orbital electronic configuration of O_2 molecule Energy level diagram and configuration with order -2 marks	20BSX23.3	L2
4	What is electromagnetic spectrum and give its range? VIBGYOR- 200-800 nm	20BSX23.4	L1
5	What is molecular modeling? Mathematical description and design from MOPAC and Gaussion	20BSX23.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)				
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Differentiate addition polymerization from condensation polymerization addition polymerization-3 marks condensation polymerization - 3 marks	6M	20BSX23.1	L2
6 (b)	Write the preparation properties and applications of i. Nylon 6, 6 – 3marks ii. ii. urea formaldehyde- marks	6M	20BSX23.1	L1
	OR			
7 (a)	Write the mechanism of free radical chain polymerization Catylast-2 3 STEPS-3 marks equation-1	6M	20BSX23.1	L2
7 (b)	What are conducting polymers? Write about conducting polymerization of polypyrrole? Defination-2 marks Mechanism-4 marks	6M	20BSX23.1	L1
8 (a)	Explain the construction & working of Lithium-ion battery Construction- 2marks Working – 2 marks chemical equations-2 marks	6M	20BSX23.2	L2
8 (b)	Derive the Nernst equation for a single electrode potential E= E0-0.0591/n Log(P)/(R)-3 MARKS Derviation-3 marks	6M	20BSX23.2	L2
	OR			
9 (a)	Explain construction, working and applications of methanol-oxygen fuel cell Construction-2 Working-2 and applications of methanol-oxygen-2 marks	6M	20BSX23.2	L2
9 (b)	Define conductometric titrations? Discuss conductometric titrations of strong acid Vs strong base and explain the nature of the graphs between conductance and volume of titrant used Defination-2 marks Graph-2 marks Explanation-2	6M	20BSX23.2	L2
10 (a)	Explain the energy level diagrams of CO and NO molecule. Explain their magnetic nature and bond order CO MOT-2 marks NO MOT-2 marks Magnetic-1 mark bond order -2 mark	7M	20BSX23.3	L2

10 (b)	Give the postulates of plank's quantum theory E=hV -2 theory-3 marks	5M	20BSX23.3	L2
	OR			
11 (a)	What is crystal field theory? Explain the crystal field splitting in tetrahedral complexes Defination-2 marks Splitting- 2marks tetrahedral diagram-2 marks	6M	20BSX23.3	L2
11 (b)	Draw the band diagrams of conductors, semiconductors and insulators band diagrams of conductors- 2 marks semiconductors – 2 marks and insulators-2 marks	6M	20BSX23.3	L2
12 (a)	Write a short note on Nuclear magnetic resonance Instrumentation- 3 marks Spectrum-3 marks	5M	20BSX23.4	L2
12 (b)	Explain principle and instrumentation of UV-visible spectroscopy with neat diagram principle -2marks a instrumentation of UV-visible spectroscopy with neat diagram-3 marks working-2 marks	7M	20BSX23.4	L2
	OR			
13 (a)	Explain the principle and instrumentation of High performance liquid Chromatography principle -2marks a instrumentation of HPLC with neat diagram-3 marks working-1 mark	6M	20BSX23.4	L2
13 (b)	Explain the pH metric methods help to determine the endpoint in acid-base titration pH –instrumentaion-3 marks titration with graphs-3 marks	6M	20BSX23.4	L2
14 (a)	Write about supra molecular reactivity and catalysis, Self-assembly in biological systems supra molecular reactivity-2 marks and catalysis,-2 marks Self-assembly in biological systems- 3 marks	7M	20BSX23.5	L1
14 (b)	What is basic lock and key principle? Lock -3marks key -3 marks with principle	5M	20BSX23.5	L2
	OR			
15 (a)	List any four applications of Catenands Apllications of 4 Catenands-4 marks	4M	20BSX23.5	L1
15 (b)	Discuss about cation binding, anion binding and simultaneous cation and anion binding cation binding,- 2 marks anion binding- 2marks and simultaneous cation and anion binding- 4 marks	8M	20BSX23.5	L2

Semester End Supplementary Examination, October, 2021

Degree	B. Tech. (U. G.)	**Program**	Common to All			**Academic Year**	2020 - 2021
Course Code	20ESX02	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	II
Course	**PROGRAMMING FOR PROBLEM SOLVING USING 'C'**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define Algorithm	20ESX02.1	L1
2	Write the syntax of switch statement in C	20ESX02.2	L1
3	Define an array and give an example	20ESX02.3	L1
4	What are Preprocessor directives? Give examples	20ESX02.4	L1
5	List various text file opening modes	20ESX02.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Write the algorithm and corresponding flowchart to find the given number is Prime number or not	6M	20ESX02.1	L3
6 (b)	Explain all the data types with their ranges, examples	6M	20ESX02.1	L2
	OR			
7 (a)	Explain different categories of operators and their precedence	8M	20ESX02.1	L2
7 (b)	Write a program in C to find the prime numbers within a range of numbers. Sample Input/ Output: Input starting number of range: 1 Input ending number of range : 50 Expected Output : The prime number between 1 and 50 are :2 3 5 7 11 13 17 19 23 29 31 37 41 43 47	4M	20ESX02.2	L3
8 (a)	Write a program in C to display the multiplication table of a given integer	4M	20ESX02.2	L2
8 (b)	Describe the loop control statements in C	8M	20ESX02.2	L3
	OR			
9 (a)	Write a program to display week days for a given digit (1-7) using Switch case	6M	20ESX02.2	L3
9 (b)	Describe any three storage classes	6M	20ESX02.2	L1
10 (a)	Write C program that uses both recursive and non-recursive functions to find the sum of n natural numbers	6M	20ESX02.3	L2
10 (b)	Write C program to read a list of elements into an array and print the reverse of the list.	6M	20ESX02.3	L2
	OR			
11 (a)	Write a program in C to check whether a number is a prime number or not using the function. Example : Input a positive number : 5 Expected Output : The number 5 is a prime number	4M	20ESX02.3	L2
11 (b)	Explain built-in string handling functions	8M	20ESX02.3	L2
12 (a)	What are pointers? Describe pointer arithmetic with examples	6M	20ESX02.4	L2
12 (b)	Explain call by reference mechanism with an example program	6M	20ESX02.4	L2
	OR			
13	Compare the differences between structure and union. Explain usage of structure in terms of definition, declaration and accessing members with syntax and example	12M	20ESX02.4	L2

14 (a)	Describe file handling functions	8M	20ESX02.5	L2
	Write a C program to read a text file "sample.txt" and print the following. a) Substring of N characters from the position I b) Reverse order of substring of N characters produced in a	4M	20ESX02.5	L2
	OR			
15 (a)	Describe pre-processor directives	6M	20ESX02.5	L2
15 (b)	Write a program for adding two integers and display the sum by taking input through command line arguments	6M	20ESX02.5	L2

Scheme of valuation

Course: B.Tech(U.G) Test Duration: 3Hrs
Sub: Programming For Problem Solving using 'C' max.marks: 70m
Course Code: 20ESX02 Academic year: 2020-21 Sem-I

Part-A

(Short Answer Questions) 5X2=10m

1) Algorithm Definition — 2 marks.
2) Syntax of Switch Statement — 2 marks.
3) Array Definition with example — 2 marks.
4) Preprocessor directives & Examples — 2 marks.
   #include, #define, #if, #ifndef
5) Textfile opening modes — 2 marks.
   (r, r+, w, w+, a)

Part-B

5 X12 = 60 marks

6 (a) Algorithm — 3 m
flowchart — 3 m

6 (b) Datatypes — 3 marks.
(int, char, float, double)
etc
Ranges — 2 marks
example — 1 marks

(OR)

7 (a) operators — 6m
Arithmetic, Relational, Increment/Decrement, Assignment operators, Conditional operator, Bitwise operators.
precedence — 2 marks

7 (b) prime number between 1 to 50 — 4m
program

8 (a) Program to display multiplication table — 4m

8 (b) Loop control statement inc
while loop
for loop
do-while
— 8m

(or)

9 (a) Program to display week days for a given digit (1-7) using switch case — 6m

9 (b) Storge classes
Auto
register
extern
Static
— 6m.

10 (a) Program for sum of n natural numbers.
both recursive — 3m
non-recursive — 3m.

(b) Program to read a list of elements into an array & print the array in reverse order
— 6m

(or)

11 (a) Program for given number is a prime number or not using function — 4m.

11 (b) Built-in String handling functions.
Strlen()
strrevi)
strcmp()
Strlwr()
Strupr()
Strcat()
— 8m

12 (a) Pointer Definition — 2 marks.
Pointer Arithmetic — 3 marks
example — 1 marks

12 (b) Call by reference Explanation — 2m
Example program — 4m.

(or)

13) Difference Structure and Union — 4m
Structure definition, declaration — 5m
& accessing members with syntax
Example program. — 3m

14 (a) File Handling Functions
fopen(), fwrite(), fputc(), } - 8m
fread() fgetc(), fseek() }

14 (b) Program to read a text file "sample.txt"
& print
(a) substring of n characters from the position
→ 2m.
(b) Reverse order of substring of n character
produced & — 2m

(or)

15 (a) Pre-processor directives — 6m
#define, #include }
#if, #ifndef }
#else, #endif }

(b) program for adding 2 integers & display the sum by taking input through Command line
↳ 6m.

Prepared by:

N. Viswanadha Reddy.

Asst. professor. 1/11/21.

NSRIT

Semester End Supplementary Examination, October, 2021

Degree	B. Tech. (U. G.)	Program	CSE, CSM, CSD & EEE	Academic Year	2020 - 2021
Course Code	20BSX33	Test Duration	3 Hrs. Max. Marks 70	Semester	I
Course	APPLIED PHYSICS				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List any two difference between Interference and Diffraction	20BSX33.1	L2
2	Define population inversion	20BSX33.2	L1
3	Define Dielectric polarization	20BSX33.3	L1
4	Write a brief note on matter waves	20BSX33.4	L1
5	What are Intrinsic Semiconductors?	20BSX33.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Prove that the diameter of n^{th} dark ring in a newton's rings set-up is directly proportional to the square root of the ring number	9M	20BSX33.1	L2
6 (b)	Explain the concept of coherence	3M	20BSX33.1	L2
	OR			
7 (a)	Deduce conditions for central maxima and minims in Fraunhofer single slit experiment	8M	20BSX33.1	L2
7 (b)	Explain about Raleigh's criteria	4M	20BSX33.1	L2
8 (a)	Explain the construction and working of a He-Ne laser. What are the merits of this laser?	8M	20BSX33.2	L2
8 (b)	Interpret any four applications of lasers	4M	20BSX33.2	L2
	OR			
9 (a)	Explain numerical aperture and acceptance angle diagrammatically	9M	20BSX33.2	L2
9 (b)	Explain working principle of optical fibers	3M	20BSX33.2	L2
10 (a)	Explain in detail the classification of magnetic materials	8M	20BSX33.3	L1
10 (b)	Compare the differences between soft and hard magnetic materials	4M	20BSX33.3	L2
	OR			
11 (a)	Derive Clausius-Mosotti relation in dielectric subjected to static fields	8M	20BSX33.3	L1
11 (b)	Outline the applications of dielectric materials	4M	20BSX33.3	L2
12 (a)	Show that the energies of a particle in a potential box are quantized	10M	20BSX33.4	L2
12 (b)	An electron is confined to a potential box of length 2A⁰ calculate energies of second and fourth quantum states in eV	2M	20BSX33.4	L2
	OR			
13 (a)	Explain briefly drawbacks and success of classical free electron theory	10M	20BSX33.4	L2
13 (b)	Calculate the Fermi function for an energy $k_B T$ above the Fermi energy $1/1+e = \frac{1}{3.78} = 0.269$	2M	20BSX33.4	L2
14 (a)	Explain Bloch theorem	5M	20BSX33.5	L2
14 (b)	Describe the salient features of Kronig - Penny model	7M	20BSX33.5	L2
	OR			
15 (a)	Explain classification of materials in to conductors, semiconductors and insulators based on band theory	8M	20BSX33.5	L2
15 (b)	Write any four applications of Hall Effect	4M	20BSX33.5	L2

$n=2$ $E_2 = 37.69 eV$
$n=4$ $E_4 = 150.75 eV$

NSRIT
(Autonomous)

20BSX33 : Applied Physics (Supplementary) Oct 2021

Scheme of valuation

Part - A

(1) Any two differences between interference and diffraction (each 1M) — 2x1 = 2M

(2) Basic definition of population inversion — 2M

(3) Basic definition of dielectric polarization ($P = \frac{N}{V}$) — 2M

(4) Any two points regarding matter waves (each 1M) — 2M

(5) Basic definition of intrinsic semiconductors — 2M

Part - B

(6) (a) Concept of Newton's rings — 2M
Diagram — 2M
Expression for diameter of the nth dark ring $D^2 = 4n\lambda R$, $D \propto \sqrt{n}$ — 5M

(b) Definition of coherence and types of coherence — 3M

(OR)

(7) (a) Single slit diagram with the description (Path difference) — 4M
condition for central Maxima — 2M
Minima — 2M

(b) Statement of Rayleigh's criteria 1M

diagram 3M

(8) (a) Introduction & Principle of He-Ne LASER 2M

construction 2M

working 4M

(b) Any four applications of LASERS 4M

(OR)

(9) (a) Diagram with explanation & expression for acceptance angle $\sin\theta_{max} = \frac{\sqrt{n_1^2 - n_2^2}}{n_0}$ 5M

Diagram with explanation & expression for Numerical aperture $NA = n_1\sqrt{2\Delta}$ 4M

(b) Statement of Total Internal Reflection 1M

diagram 2M

(10) (a) Classification (Dia, Para, Ferro, Antiferro, Ferri) with description and diagrams 8M

(b) Any two differences between soft and hard magnetic materials. 4M

(OR)

(11) (a) Derivation of Clausius-Mosotti Relation (standard form) 8M

(b) Any four applications of dielectric materials (each 1M) 4M.

(12) (a) Introduction and concept of potential box — 2M

Diagram — 2M

Derivation of expression for energy of the particle ($E_n = \frac{n^2h^2}{8mL^2}$) — 6M

(b) $L = 2\text{Å} = 2\times10^{-10}$ m ; $n = 2$ and 4 — 1M

$h = 6.625\times10^{-34}$ J-s ; $m = 9.1\times10^{-31}$ kg

$E_2 = 37.69$ eV $\quad E_4 = 150.75$ eV — 1M

(OR)

(13) (a) Classical free electron theory Success — 4M

Drawbacks — 6M

(b) Given $E - E_F = k_BT$ — 1M

$F(E) = \frac{1}{1+e^{(E-E_F)/k_BT}} = \frac{1}{1+e} = 0.269$ — 1M

(14) (a) Bloch potential diagram — 2M

Bloch functions — 3M

(b) Kronig-Penny equation — 2M

Diagrams — 2M

Bound & free electron (features) — 3M

(OR)

(15) (a) classification based on band diagrams — 8M

(b) Any Four applications of Hall effect — 4M

(Each 1M)

26/10/21
HOD, FED

NSRIT

Semester End Supplementary Examination, October, 2021

Degree	B. Tech. (U. G.)	**Program**	Common to All			**Academic Year**	2020 - 2021
Course Code	20HSX01	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	I
Course	**COMMUNICATIVE ENGLISH**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What was Steve Jobs' contribution to mobile industry?	20HSX01.1	L1
2	List out any four techniques of effective writing	20HSX01.2	L1
3	How do listening and speaking contribute in communication?	20HSX01.3	L1
4	What is paraphrasing?	20HSX01.4	L1
5	What does it mean by "reading between the lines"?	20HSX01.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	List any five types of formal letters	6M	20HSX01.1	L1
6 (b)	Explain all the elements of an 'Enquiry Letter'	6M	20HSX01.1	L2
	OR			
7	How have you got influenced by the life of A. P. J Abdul Kalam? Elaborate	12M	20HSX01.1	L2
8 (a)	How does Satya Nadella of Microsoft try to motivate his employees in his email?	6M	20HSX01.2	L2
8 (b)	What did Nadella predict for the future of technology?	6M	20HSX01.2	L2
	OR			
9 (a)	What does this quote really mean: "Stay hungry, stay foolish"?	4M	20HSX01.2	L1
9 (b)	Steve Jobs frequently uses the words "drop out' and 'drop in' in his first story. How these words are closely related to his 'connecting dots theory'?	8M	20HSX01.2	L2
10 (a)	Write about the early life and education of Stephen Hawking	6M	20HSX01.3	L1
10 (b)	"Prof. Hawking's works are larger than his life." Comment briefly	6M	20HSX01.3	L2
	OR			
11 (a)	Fill in the blanks with appropriate prepositions: He worked on debugging the program _____ morning ____ evening. By dinner he had finished and was ready ___ upload his program. ____ the first three hours ____ uploading the program two hundred people had played the game ____ his surprise	6M	20HSX01.3	L2
11 (b)	Explain what you understand about racial discrimination after reading the poem. 'Telephonic conversation'	6M	20HSX01.3	L2
12 (a)	Explain in detail about Nehru's ideas and vision	6M	20HSX01.4	L2
12 (b)	What did Nehru expect from his daughter?	6M	20HSX01.4	L1

	OR			
13 (a)	What was Virginia wolf intention in writing the story 'Shakespeare's sister'?	8M	20HSX01.4	L2
13 (b)	Give the synonyms: (i) Candid (ii) Inspire (iii) Naive (iv) Acumen	4M	20HSX01.4	L1
14 (a)	Write a paragraph about a person influenced you	6M	20HSX01.5	L2
14 (b)	Fill in the blanks with correct verbs: a. There _____ (to be) a lot of software being deployed today b. One _____ (has) to be careful malicious viruses c. A security breach ____ (to be) a very dangerous thing to happen d. The inbox is filling up even as I ____ (to talk) to you e. Software developers _____ (to think) of hackers a long time ago f. Why _____ (has, not) you not replied to the mail as yet?	6M	20HSX01.5	L2
	OR			
15 (a)	Write a brief essay on "Life during the present pandemic"	6M	20HSX01.5	L2
15 (b)	Explain Kalam's views about the constitution	6M	20HSX01.5	L2

SEMESTER Question Paper

Degree	B. Tech. (U. G.)	**Program**	Common to All	Test	I/II	**Academic Year**	2020 - 2021
Course Code	20HSX01	**Test Duration**	90 Min.	Max. Marks	40	**Semester**	I
Course	**COMMUNICATIVE ENGLISH**						

Key and Scheme of Evaluation

No.	Questions (1 through 5)	Marks
1	What was Steve Jobs' contribution to mobile industry? carriers beefed up their network -KEYBOARDS FADED AWAY- PEOPLE'S VIEWING HABITS SHIFTED -POINT-AND-SHOOT CAMERAS BECAME (LARGELY) OBSOLETE- TOUCHSCREENS BECAME STANDARD- MOBILE GAMING BECAME A VIABLE INDUSTRY- THE INTERNET BECAME PORTABLE-MOBILE SOFTWARE DISTRIBUTION BECAME CENTRALIZED	Content 1.5M Grammar/Spelling check 0.5
2	List out any four techniques of effective writing Write from an outline. - One paragraph one idea- Write clear, punchy and compact sentences- Get to the point.- Avoid the passive voice - Use vivid nouns and verbs- Avoid using words that signal "dodges	Content 1.5M Grammar/Spelling check 0.5
3	How do listening and speaking contribute in communication? listening involves the ability to accurately receive and interpret messages in the communication process. Without the ability to listen effectively, which involves desire and awareness, messages are easily misunderstood or misinterpreted. ... It means paying attention, being aware of verbal and non-verbal messages.	Content 1.5M Grammar/Spelling check 0.5
4	What is paraphrasing? express the meaning of (something written or spoken) using different words, especially to achieve greater clarity.	Content 1.5M Grammar/Spelling check 0.5
5	What does it mean by "reading between the lines"? If you read between the lines, you understand what someone really means, or what is really happening in a situation, even though it is not said openly.	Content 1.5M Grammar/Spelling check 0.5
No.	**Questions (6 through 11)**	
6 (a)	List any five types of formal letters • The types of formal letters are mentioned below. • Letter of Enquiry. • Order Letter. • Letter of Complaint. • Reply to a Letter of Complaint. • Promotion Letter. • Sales Letters. • Recovery Letters. Can be elaborated	Content 4m Grammar & Spellings 1m; presentation 1m
6 (b)	Explain all the elements of an 'Enquiry Letter' what is enquiry letter? What are the features of an inquire letter?	Content 4m Grammar &

Spellings 1m; presentation 1m

In business enquiry occur a great deal of the daily correspondence. Ii is very important to a business firm. Enquiry letters are important because it ask for information that is needed to carry on business. An enquiry letter must be properly written, because it may bring valuable business information and the opportunity to save money or to make a profit. If the reply is effectively written , it may build goodwill and earns profit.
So enquiry letter should be simple, clear and business related.
Characteristics: The characteristics of an inquiry letter are given below.
1.Asking for any kinds of information.
2.Start with directly and politely.
3.Be more confidentiality.
4.Provide explanation for information.
5.Write language carefully.
6.Specific purpose.
7.Supported by replying letter.
8.Asking information within specific time.
9.Proper format on structure.
10.Formal language.
11. Mention proper causes.
12.Close cordially.

2.How man kinds of enquiry letter?
1. Personal status Enquiry.
2.Letters of financial status Enquiry.
3.Letter of trade enquiry.

OR

7 How have you got influenced by the life of A. P. J Abdul Kalam? Elaborate
Own way depending upon of how oneself got inspired

Content 5m Grammar & Spellings 2 m; presentation 1m

8 (a)

How does Satya Nadella of Microsoft try to motivate his employees in his email?

Nadella believes that Microsoft is a great place to work in because it believes in empowering its employees to innovate.

Nadella says that employees commonly underestimate their role in a company, and overestimate the role of others. He says that each employee must work towards innovating technology which will make people's lives better and easier, and this way, they can also find meaning and joy in their work.

Content 5m Grammar& Spellings 2 m ; presentation 1m

8 (b)

What did Nadella predict for the future of technology?

- Nadella forecasts cloud computing, machine learning, insights from big data and increasingly ubiquitous technology with connected devices as the future, and says that Microsoft will have to evolve to keep pace with these emerging technologies and trends.
- Microsoft's goal in its early years was to have a PC in every home and on every desk. This goal has largely been achieved in the developed world. Today, the world has more or less moved away from PCs and instead favors Mobile and Clouds-Computing devices.
- Nadella believes that going forward, Microsoft must focus on innovations which empower people to do more and improve their lives.

Nadella believes that Microsoft is uniquely situated to achieve its goal of being a tech leader in the coming decades as well, because it can harness the power of

I M for one blank

software as well as hardware, through its acquisition of Nokia.

OR

What does this quote really mean: "Stay hungry, stay foolish"?

The phrase uses adjectives considered as negatives and flips them to be used in a positive connotation, hence the intrigue. I knew the words were meant for motivational purposes but wasn't sure how I would prescribe to the notion of 'staying hungry and staying foolish' in real life. Obviously the idea is not to go without food and making rash decisions.

I tried to analyse my work style and pattern and compare with what I thought the words meant. Staying hungry seemed to imply a search for 'food'. Food can be used as a metaphor for any objective or goal so that would insinuate that I should keep searching for my goal; note that there is a difference between working towards a goal and continuous searching.

Similar to the above, I analysed this in context to my personal work style and pattern.What I interpreted was to be foolish. Though it may sound silly, a quick read through history and inventions show that most of the big names and discoveries were made by 'foolish' people. Foolish referring to those who had dared to think a little different; think beyond what was being taught in schools and society. This, to me was the 'foolishness' being alluded to. It suggested I had to learn to be more be more risky than the usual 'risky' related to any business. Some would call it crazy and say they are calculated risks, and maybe they are, but calculations give reasons not to take action whilst foolishness seems the opposite.

9 (a)

Content 3m
Grammar& Spellings 2 m ; presentation 1m

Needless to say, there has to be some limitations to this and only you would know what they are. Personally, I have been blessed to have tried and learnt a lot along the way with some successes and some not. The one thing I can say is I won't look back in 20 years and think 'I should have tried that'. With each experience comes a lesson and though it may sound like a cliché — it's reality.

THE REAL MEANING

The above is my interpretation of what the phrase means but in an interview for the Guardian, Brand shares his thoughts behind it:

"...for some reason the image I had in my mind was of a hitchhiker at dawn on a road somewhere and the sun comes up and there are trains going by. The frame of mind of the young hitchhiker is one of the freest frames of mind there is. You're always a little bit hungry and you know you are being completely foolish."

I guess my interpretation wasn't far off, but one can learn an important lesson here. Every word or phrase is open to interpretation on your skill, knowledge, situation, and an array of other variables. The benefit comes from how we analyse the given phrase or speech and use it to grow, and that's the goal. To Grow.

Steve Jobs frequently uses the words "drop out' and 'drop in' in his first story. How these words are closely related to his 'connecting dots theory'?

Steve Jobs uses the words of drop out and drop in because his concept or theory of connecting the dots aims at looking at things backwards. For instance, he stated in his theory that a person must have faith or trust in the fact that one way or another the dots in his/her life will be connected.He means that you will never know in what ways certain experiences will bring great benefits later in life. That you should follow your true interests even if you think that it will bring you no other benefit than satisfying your curiosity. Because down the road you never know how those experience could end up being extremely valuable to you, in

9 (b)

Content 3m
Salutation and subject & Spellings 2 m ; presentation 1m

ways you never imagined, at just the right time in your life.

So your experiences are like dots on paper. If you follow a rigid tight path through life you look back and get a straight line. If you have diverse experiences in life you look back and have enough dots in random places to connect them and form a picture

Write about the early life and education of Stephen Hawking

10 (a)	Stephen William Hawking was born on January 8, 1942, in Oxford, England. His father, a well-known researcher in tropical medicine, urged his son to seek a career in medicine, but Stephen found biology and medicine were not exact enough. Therefore, he turned to the study of mathematics and physics. Hawking was not an outstanding student at St. Alban's School, nor later at Oxford University, which he entered in 1959. He was a social young man who did little schoolwork because he was able to grasp the essentials of a mathematics or physics problem quickly. At home he reports, "I would take things apart to see how they worked, but they didn't often go back together." His early school years were marked by unhappiness at school, with his peers and on the playing field. While at Oxford he became increasingly interested in physics (study of matter and energy), eventually graduating with a first class honors in physics (1962). He immediately began postgraduate studies at Cambridge University.	Content 5m Grammar& Spellings 2 m ; presentation 1m
10 (b)	"Prof. Hawking's works are larger than his life." Comment briefly With the Oxford mathematician Roger Penrose, he showed that if there was a Big Bang, it must have started from an infinitely small point - a singularity Black holes radiate energy known as Hawking radiation, while gradually losing mass. This is due to quantum effects near the edge of the black hole, a region called the event horizon He predicted the existence of mini-black holes at the time of the Big Bang. These tiny black holes would have been incredibly hot, shedding mass until they vanished - potentially ending their lives in a powerful explosion.In the 70s, Hawking considered whether the particles and light entering a black hole were destroyed if the black hole evaporated. Hawking initially thought this "information" was lost from the Universe. But US physicist Leonard Susskind disagreed. These ideas became known as the information paradox. In 2004, Hawking conceded that the information must be conserved.	1m for one sentence
	OR	
11 (a)	Fill in the blanks with appropriate prepositions: He worked on debugging the program _from____ morning ___to_ evening. By dinner he had finished and was ready __to_ upload his program. _for___ the first three hours ___of_ uploading the program two hundred people had played the game _at___ his surprise	Content 5m Grammar& Spellings 2 m ; presentation 1m
11 (b)	Explain what you understand about racial discrimination after reading the poem. 'Telephonic conversation' "Telephone Conversation" is a 1963 poem by the Nigerian writer Wole Soyinka that satires racism. The poem describes a phone call between a landlady and the speaker, who is black, about renting an apartment. The landlady is pleasant until she learns that the speaker is "African," at which point she demands to know how "light" or "dark" the speaker's skin is. In response, the speaker cleverly mocks the landlady's ignorance and prejudice, demonstrating that characterizing people by their skin color diminishes their humanity.	1M for each answer

12(a)	Explain in detail about Nehru's ideas and vision Nehru was convinced that Science and Technology were crucial to the solution of India's problems. 1938 he said that it was science alone that could solve the problems of hunger and poverty, of sanitation and illiteracy, of superstition and deadening custom and tradition of vast resources running to waste, of a rich country inhibited by starving people.	Content 5m Grammar& Spellings 2 m ; presentation 1m
12(b)	What did Nehru expect from his daughter? Nehru advises his daughter to be open in all matters of freedom movement and never to do anything secretly. - He asks his daughter to work in the sun and in the light. Because things that are done in the dark, that is in secret will cause fear and destroy the braveness.	Content 2m Grammar& Spellings 1m ; presentation 1m
13(a)	What was Virginia wolf' intention in writing the story 'Shakespeare's sister'? Woolf sheds light on the reality of women's life during this time and illustrates the effects of social structures on the creative spirit of women. In the society they lived in, women were halted to explore and fulfill their talent the same way men were able to, due to the gender role conventions that prevailed during this era. Through a theoretical setting in which it is it is imagined that William Shakespeare had a sister (Judith), Virginia Woolf personifies women during the sixteenth century in order to reflect the hardships they had to overcome as aspiring writers.	Content 5m Grammar& Spellings 2 m ; presentation 1m
13(b)	Give the synonyms: (i) Candid-Natural,Open,truthful (ii) Inspire-motivate,encourage,influence (iii) Naïve-simple,sincere,innocent (iv) Acumen-awareness,judgement,understanding	1 mark for the correct sentence, with minimum mistake 0-5m
14(a)	Write a paragraph about a person influenced you Own way depending upon of how oneself got influenced	Content 5m Grammar& Spellings 2 m ; presentation 1m
14(b)	Fill in the blanks with correct verbs: a. There ___has been__ (to be) a lot of software being deployed today b. One __have___ (has) to be careful malicious viruses c. A security breach _is___ (to be) a very dangerous thing to happen d. The inbox is filling up even as I __am talking__ (to talk) to you e. Software developers ___thought___ (to think) of hackers a long time ago Why _have____ (has, not) you not replied to the mail as yet?	Content 2m Grammar& Spellings 1 m ; presentation 1m
15(a)	Write a brief essay on "Life during the present pandemic" Own way depending upon of how oneself got experienced	Content 3m Grammar& Spellings 2 m ; presentation 1m
15(b)	Explain Kalam's views about the constitution He said he would give top priority to eradicating poverty in the country, and also focus on health and equity among all sections of the society. President Kalam took his Presidency seriously from Day 1. He was as comfortable with constitutional and legal issues as he was with school children. He was committed to nation-building and created a vision document to make India a developed nation by 2020.	Content 3m Grammar& Spellings 2 m ; presentation 1m

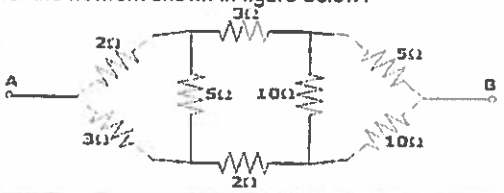
Semester End Supplementary Examination, October, 2021

Degree	B. Tech. (U. G.)	**Program**	ECE & EEE			**Academic Year**	2020 - 2021
Course Code	20ESX03	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	I
Course	**BASIC ELECTRICAL ENGINEERING**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is the difference between dependent and independent sources?	20ESX03.1	L1
2	What is the significance of back E.M.F in a D. C. motor?	20ESX03.2	L1
3	What do you mean by KVA rating of a transformer?	20ESX03.3	L1
4	Define voltage regulation of an alternator and also write the expression	20ESX03.4	L1
5	Write the applications of AC servo motor and single phase induction motor.	20ESX03.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain inductance element. Also derive the expression for energy stored in it	7M	20ESX03.1	L2
6 (b)	Four resistors of 5Ω, 7Ω, 9Ω and 12Ω are connected in series across a 100V source. Calculate the voltage drop across each resistor and power absorbed by each resistor	5M	20ESX03.1	L3
	OR			
7 (a)	Classify the different types of network elements	6M	20ESX03.1	L2
7 (b)	Calculate the voltage to be applied across AB in order to drive current of 5A In the circuit by using star-delta transformation for the network shown in figure below? 	6M	207ESX03.1	L3
8 (a)	Explain the principle and operation of a D. C. generator	6M	20ESX03.2	L2
8 (b)	Explain the construction of D.C. generators	6M	20ESX03.2	L3
	OR			
9	Explain the necessity of starter in a D. C. motor and explain the operation of a three point starter with a neat sketch	12M	20ESX03.2	L2
10 (a)	Explain the principle of operation of single phase transformer	5M	20ESX03.3	L2
10 (b)	A single phase 200/400 V, 6 KVA, 50 Hz transformer gave the following results. OC test(LV side) : 200 V, 0.8 A, 80 W SC test(HV side) : 25 V, 10 A, 90 W Determine (i) The circuit constants referred to L.V side (ii) The efficiency at full load with 0.8 lagging power factor	7M	20ESX03.3	L3

	OR			
11 (a)	Describe the parallel operation of a single phase transformer	6M	20ESX03.3	L2
11 (b)	Explain various losses that occur in a transformer	6M		
12 (a)	Describe the concept of rotating magnetic field.	5M	20ESX03.4	L2
12 (b)	A 10 MVA 6.6 kV, 3 phase star connected alternator gave open circuit and short circuit data as follows: Field current in amps : 25 50 75 100 125 150 OC voltage in kV (L-L) : 2.4 4.8 6.1 7.1 7.6 7.9 SC Current in Amps : 288 528 875 Find the voltage regulation at full load 0.8 pf lagging by e.m.f. method. Armature resistance per phase = 0.13 Ω	7M	20ESX03.4	L3
	OR			
13 (a)	Explain the Speed - Torque characteristics of three phase induction motor	7M	20ESX03.4	L2
13 (b)	Derive the E.M.F. equation of alternator	5M	20ESX03.4	L2
14 (a)	Explain the principle of operation and construction of shaded pole induction motor	6M	20ESX03.5	L2
14 (b)	Explain the working of capacitor-start type single phase induction motor	6M	20ESX03.5	L2
	OR			
15 (a)	Explain the working principle of A. C. servo motors with neat sketches	7M	20ESX03.5	L2
15 (b)	Differentiate between single phase and three phase induction motors	5M	20ESX03.5	L2

Semester End Supplementary Examination, October, 2021

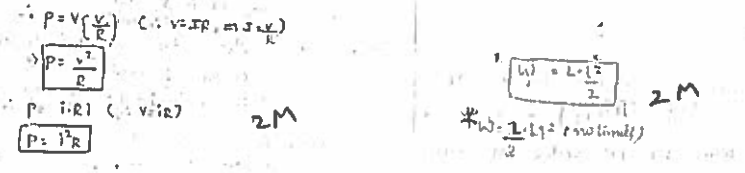
Degree	B. Tech. (U. G.)	**Program**	ECE & EEE			**Academic Year**	2020 - 2021
Course Code	20ESX03	**Test Duration**	3 Hrs.	**Max. Marks**	70	**Semester**	I
Course	BASIC ELECTRICAL ENGINEERING						

Scheme of evaluation

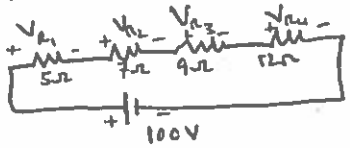
Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Marks
	What is the difference between dependent and independent sources?	
1	Independent source are those, whose value of either the voltage or the current to be delivered is independent of any other parameter of the network. Where as the dependent sources are those, whose value of either the voltage or the current to be delivered is dependent or controlled on other parameters of the network.	2
	What is the significance of back E.M.F in a D. C. motor?	
2	The makes the motor to draw as much armature current as is just sufficient to develop the torque required presence of back emf makes the d.c. motor a self-regulating machine i.e., it by the load.	2
	What do you mean by KVA rating of a transformer?	
3	kVA stands for **Kilovolt-Ampere** and is the rating normally used to rate a transformer. The size of a transformer is determined by the kVA of the load. ... The Current that passes through transformer windings will determine the Copper Losses, whereas Iron Losses, Core Losses or Insulation Losses depends on voltage.	2
	Define voltage regulation of an alternator and also write the expression	
4	voltage regulation of an alternator is defined as the rise in terminal voltage, when the load is reduced from full load rated value to zero. $$\text{Voltage Regulation} = \frac{E_o - V}{V} \text{ per unit}$$ $$= \frac{E_o - V}{V} \times 100 \text{ percent}$$	2
	Write the applications of AC servo motor and single phase induction motor.	
5	AC servo motors are used in a wide variety of applications where position control is critical and are frequently used in robotics, semiconductor equipment, machine tools, and aircrafts.	2

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks
	Explain inductance element. Also derive the expression for energy stored in it	
6 (a)	Definition & Symbol 4M  2M 2M	7M

6 (b) **Four resistors of 5Ω, 7Ω, 9Ω and 12Ω are connected in series across a 100V source. Calculate the voltage drop across each resistor and power absorbed by each resistor** 5M



$R_{eq} = 5+7+9+12 = 33\Omega$

$I = \frac{V}{R_{eq}} = \frac{100}{33} = 3.03A$

$V_{R_1} = 3.03 \times 5 = 15.15V$

$V_{R_2} = 3.03 \times 7 = 21.21V$

$V_{R_3} = 3.03 \times 9 = 27.27V$

$V_{R_4} = 3.03 \times 12 = 36.36V$

$P_{R_1} = V_{R_1} I = 15.15 \times 3.03 = 45.9W$

$P_{R_2} = V_{R_2} I = 21.21 \times 3.03 = 64.26W$

$P_{R_3} = V_{R_2} I = 27.27 \times 3.03 = 82.6W$

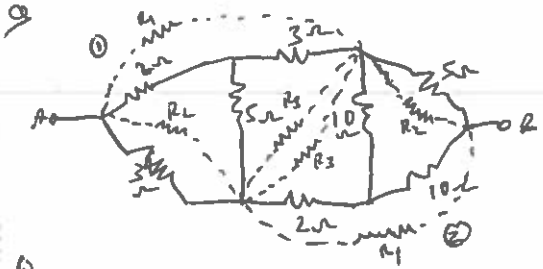
$P_{R_4} = V_{R_4} I = 36.36 \times 3.03 = 110.1W$

OR

7 (a) **Classify the different types of network elements** 6M

Active elements,Passive elements,Linear elements,Non linear elements,Unilateral elements,Bilateral elements,Lumped elements,Distributed elements

Calculate the voltage to be applied across AB in order to drive current of 5A In the circuit by using star-delta transformation for the network shown in figure below?



7 (b) 6M

① $R_1 = 2+3+\frac{2\times3}{5} = 6.2\Omega$

$R_2 = 2+5+\frac{2\times5}{3} = 10.3\Omega$

$R_3 = 3+5+\frac{3\times5}{2} = 15.5\Omega$

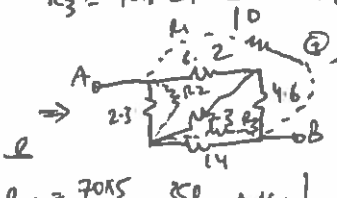
② $R_1 = 2+10+\frac{2\times10}{10} = 14\Omega$

$R_2 = 10+10+\frac{10\times10}{2} = 70\Omega$

$R_3 = 10+2+\frac{10\times2}{10} = 14\Omega$

$R_{eq} = \frac{3\times10.3}{3+10.3} = \frac{30.9}{13.3} = 2.32\Omega$

$R_{eq} = \frac{15.5\times14}{15.5+14} = \frac{217}{29.5} = 7.35\Omega$



$R_1 = 6.2+4.6+\frac{6.2\times4.6}{7.3} = 14.7\Omega$

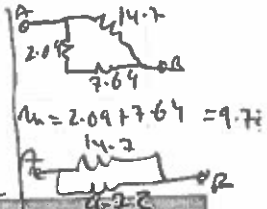
$R_2 = 6.2+7.3+\frac{6.2\times7.3}{4.6} = 23.3\Omega$

$R_3 = 7.3+4.6+\frac{7.3\times4.6}{6.2} = 17.13\Omega$

$R_{eq} = \frac{70\times5}{70+5} = \frac{350}{75} = 4.16\Omega$

$R_{eq} = \frac{2.3\times23.3}{2.3+23.3} = 2.09\Omega$

$R_{eq} = \frac{17.1\times14}{17.1+14} = 7.69\Omega$



$R_{eq} = 2.09+7.69 = 9.7\Omega$

$\therefore R_{eq} = \frac{14.7\times9.7}{14.7+9.7} = 5.84\Omega$

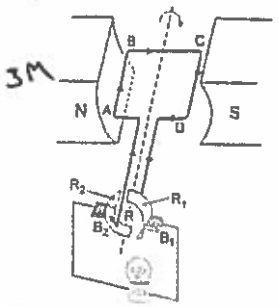
$\therefore V = IR_{eq} = 5\times5.84$

$= 29.21$ Volts

Explain the principle and operation of a D. C. generator

8 (a)

principle and operation 3M



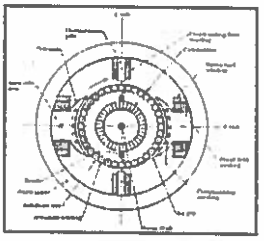
6M

Explain the construction of D.C. generators

8 (b)

construction of D.C. generators 3M

3M



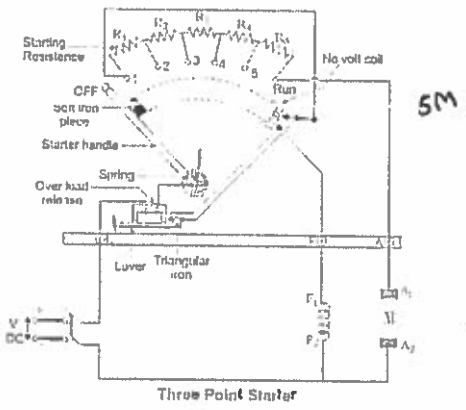
6M

OR

9

Explain the necessity of starter in a D. C. motor and explain the operation of a three point starter with a neat sketch

Three point starter is an electrical device, used for starting as well as maintaining the DC shunt motor speed. The connection of resistance in this circuit is in series which decreases the initial high current and guards the equipment against any electrical failures. 7M



5M

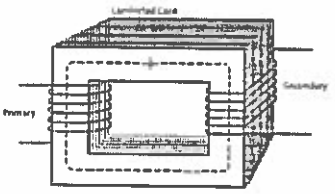
12M

Explain the principle of operation of single phase transformer

10 (a)

Principle ~~3 5M~~ 3M

Figure ~~2M~~ 2M



5M

A single phase 200/400 V, 6 KVA, 50 Hz transformer gave the following results.

OC test(LV side) : 200 V, 0.8 A, 80 W

SC test(HV side) : 25 V, 10 A, 90 W

Determine

(i) The circuit constants referred to L.V side

10 (b)

(ii) The efficiency at full load with 0.8 lagging power factor

7M

$V_1 = 200\ V$ $\quad W_0 = 80\ W$

$V_2 = 400\ V$ $\quad W_0 = V_1 I_0 \cos\phi_0$

$I_0 = 0.8A$ $\quad 80 = 200 \times 0.8 \times \cos\phi_0$

$\text{ckt } R_1 = \frac{80}{200 \times 1.8} = 0.5$

$I_w = I_0 \cos\phi_0 = 0.4A$

$I_\mu = I_0 \sin\phi_0 = 0.69A$

i) $R_0 = \frac{V_1}{I_w} = \frac{200}{0.4}$ $= 500\,\Omega$ $X_0 = \frac{V_1}{I_\mu} = \frac{200}{0.09}$ $X_0 = 289\,\Omega$

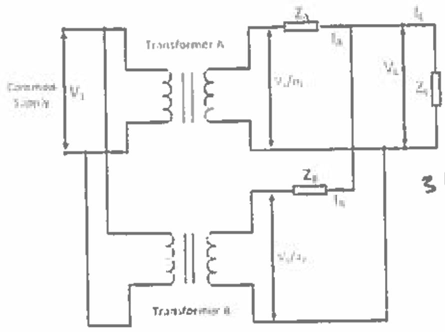
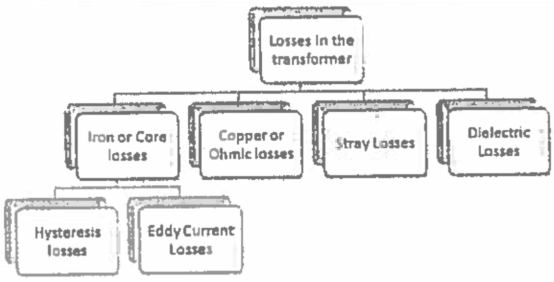
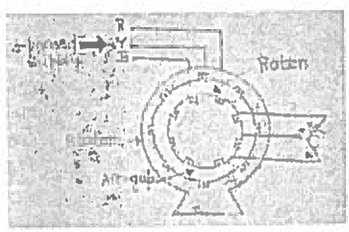
ii) Total loss = $80 + 90 = 170W$

O/P Power = $x \cdot KVA \cos\phi = 1 \times 6 \times 10^3 \times 0.8 = 4800W$

$\therefore \eta = \frac{O/P}{O/P + losses} = \frac{4800}{4800 + 170} = \frac{4800}{4970} = 0.96$

$\% \eta = 96.5\%$

OR

11 (a)	**Describe the parallel operation of a single phase transformer** Parallel Operation of a Single Phase Transformer means that the two or more transformers having the same polarities, same turn ratios, same phase sequence and the same voltage ratio are connected in parallel with each other. The current I_A and I_B have two components. 2M  3M	6M
11 (b)	**Explain various losses that occur in a transformer** 	6M
12 (a)	**Describe the concept of rotating magnetic field.** The rotating magnetic field is produced by the three-phase current of the stator in the actual three-phase induction motor. It can be replaced by permanent magnets in a permanent magnet synchronous motor. The three-phase windings of the inner stator are spaced 120° electrical degrees apart. In addition, the conductor of each winding is distributed such as a sinusoidal wave. Therefore, when the current flows into the three-phase windings, the magneto motive force (MMF) of the sinusoidal waveform is produced by the current. 3M  2M	5M

12 (b) A 10 MVA 6.6 kV, 3 phase star connected alternator gave open circuit and short circuit data as follows: 7M

Field current in amps :	25	50	75	100	125	150
OC voltage in kV (L-L) :	2.4	4.8	6.1	7.1	7.6	7.9
SC Current in Amps :	288	528	875			

Find the voltage regulation at full load 0.8 pf lagging by e.m.f. method. Armature resistance per phase = 0.13 Ω

Sol:- Given

10 MVA = 10×10^3 kVA

$V_L = 6.6$ kVA $= 6.6 \times 10^3$

$\cos\phi = 0.8$

$\phi = \cos^{-1}(0.8)$

$\phi = 36.86$, $R_a = 0.13\,\Omega$

$\sin\phi = 0.6$

$S = \sqrt{3} V_L I_L = 10 \times 10^3 \times 10^3$

$I_L = \frac{10 \times 10^6}{\sqrt{3} \times 6.6 \times 10^3}$

$I_L = 874.77$ Amp

$V_L = \sqrt{3} V_{ph}$

$V_{ph} = \frac{V_L}{\sqrt{3}} = \frac{6.6 \times 10^3}{\sqrt{3}} = 3810.51$ volts

$Z_s = V_{oc}/I_{sc}$

$= \frac{6.6 \times 10^3/\sqrt{3}}{874.77}$

$Z_s = 4.02\,\Omega$

$X_s = \sqrt{(Z_s)^2 - (R_a)^2}$

$= \sqrt{(4.02)^2 - (0.13)^2}$

$= \sqrt{16.14}$

$= 4.01$

$E_0 = \sqrt{(V\cos\phi + I_a R_a)^2 + (V\sin\phi + I_a X_s)^2}$

$= \sqrt{((3810.5)(0.8) + (874.77 \times 0.13))^2 + ((3810.5)(0.6) + (874.77)(4.01))^2}$

$= \sqrt{9919002.5 + 33571831.1}$

$= \sqrt{43510814.63}$

$= 6600.8$ volts

% voltage regulation $= \frac{E_0 - V}{V} \times 100$

$= \frac{6600.8 - 3810.51}{3810.51} \times 100$

$= 0.732 \times 100$

$= 73.22\%$

OR

13 (a) Explain the Speed - Torque characteristics of three phase induction motor 7M

Slip-Torque (or) Torque-speed characteristics :

We know, Torque equation is

$$T = \frac{k \phi s E_2 R_2}{R_2^2 + (sX_2)^2}$$

Case-(i) : If s=0, T=0

Case-(ii): sX_2 is very small, $R_2 >> sX_2$

$$T \propto \frac{s}{R_2}$$

or $T \propto s$ if R_2 is constant

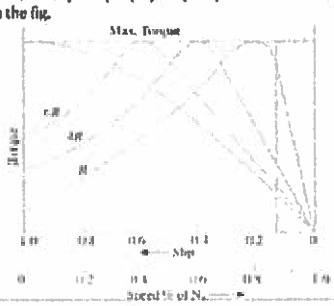
Hence, for low values of slip, the torque/slip curve is approximately a straight line. As slip increases (for increasing load on the motor), the torque also increases and becomes maximum when $s = R_2/X_2$. This torque is known as 'pull-out' or 'breakdown' torque T_b or stalling torque.

Case-(iii) : R_2 is very small, $R_2 << sX_2$

$$T \propto \frac{s}{(sX_2)^2} \propto \frac{1}{s}$$

Hence, the torque/slip curve is a rectangular hyperbola. So, we see that beyond the point of maximum torque, any further increase in motor load results in decrease of torque developed by the motor. The result is that the motor slows down and eventually stops.

Therefore, the slip-torque (or) torque-speed characteristics of an induction motor are shown in the fig.



13 (b) **Derive the E.M.F. equation of alternator** 5M

$$\therefore \text{ Average e.m.f. induced per conductor} = \frac{d\Phi}{dt} = \frac{\Phi P}{60/N} = \frac{\Phi NP}{60}$$

Now, we know that $f = PN/120$ or $N = 120f/P$

Substituting this value of N above, we get

$$\text{Average e.m.f. per conductor} = \frac{\Phi P}{60} \times \frac{120f}{P} = 2f\Phi \text{ volt}$$

If there are Z conductors in series/phase, then Average e.m.f./phase $= 2f\Phi Z$ volt $= 4f\Phi T$ volt

R.M.S. value of e.m.f./phase $= 1.11 \times 4f\Phi T = 4.44f\Phi T$ volt.

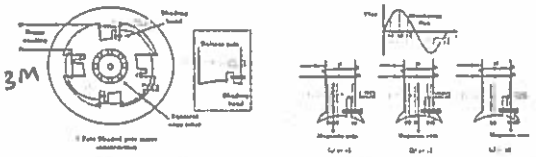
This would have been the actual value of the induced voltage if all the coils in a phase were (i) full-pitched and (ii) concentrated or bunched in one slot instead of being distributed in several slots under poles). But this not being so, the actually available voltage is reduced in the ratio of these two factors.

$\therefore$ Actually available voltage/phase $= 4.44 k_c k_d f\Phi T = 4 k_c k_d f\Phi T$ volt.

14 (a) **Explain the principle of operation and construction of shaded pole induction motor** 6M

Shaded pole motors explanation 3M

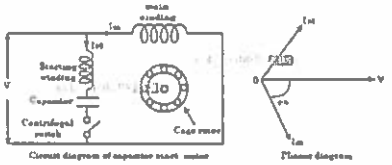
Figure 3M



14 (b) **Explain the working of capacitor-start type single phase induction motor** 6M

capacitor-start type motors explanation 3M

Figure 3M

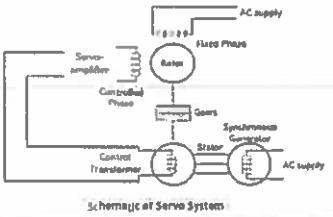


OR

15 (a) **Explain the working principle of A. C. servo motors with neat sketches** 7M

Working principle 3M

3M



Schematic of Servo System

15 (b) Differentiate between single phase and three phase induction motors 5M

Any 5 Points

Single Phase Induction Motor	Three Phase Induction Motor
The AC asynchronous motor that runs on single phase AC power supply.	AC asynchronous motor that runs on three phase AC power supply.
It has 2 terminals thus it requires only two wires to power it up.	It has 3 terminals and requires three or four (including neutral) wires to operate.
It is not a self-start motor.	It is a self-start motor.
Their types include; Spilt phase, shaded pole, capacitor start, capacitor start capacitor run induction motor etc.	Their types are; squirrel cage induction motor and wound type induction motor.
It generates mechanical noise and vibration.	It operates smoothly with less noise.
Its efficiency is lower.	It has high efficiency.
It offers very limited starting torque.	It offers very high starting torque.
Its design is simple and easier to construct	It design is complex.
Its maintenance is very easy.	Its maintenance is relatively difficult.
It is cheaper.	It is expensive.

NSRIT

Semester End Supplementary Examination, October, 2021

Degree	B. Tech. (U. G.)	**Program**	Common to All			**Academic Year**	2020 - 2021
Course Code	20HSX01	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	I
Course	**COMMUNICATIVE ENGLISH**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What was Steve Jobs' contribution to mobile industry?	20HSX01.1	L1
2	List out any four techniques of effective writing	20HSX01.2	L1
3	How do listening and speaking contribute in communication?	20HSX01.3	L1
4	What is paraphrasing?	20HSX01.4	L1
5	What does it mean by "reading between the lines"?	20HSX01.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	List any five types of formal letters	6M	20HSX01.1	L1
6 (b)	Explain all the elements of an 'Enquiry Letter'	6M	20HSX01.1	L2
	OR			
7	How have you got influenced by the life of A. P. J Abdul Kalam? Elaborate	12M	20HSX01.1	L2
8 (a)	How does Satya Nadella of Microsoft try to motivate his employees in his email?	6M	20HSX01.2	L2
8 (b)	What did Nadella predict for the future of technology?	6M	20HSX01.2	L2
	OR			
9 (a)	What does this quote really mean: "Stay hungry, stay foolish"?	4M	20HSX01.2	L1
9 (b)	Steve Jobs frequently uses the words "drop out' and 'drop in' in his first story. How these words are closely related to his 'connecting dots theory'?	8M	20HSX01.2	L2
10 (a)	Write about the early life and education of Stephen Hawking	6M	20HSX01.3	L1
10 (b)	"Prof. Hawking's works are larger than his life." Comment briefly	6M	20HSX01.3	L2
	OR			
11 (a)	Fill in the blanks with appropriate prepositions: He worked on debugging the program _____ morning ____ evening. By dinner he had finished and was ready ___ upload his program. ____ the first three hours ____ uploading the program two hundred people had played the game ____ his surprise	6M	20HSX01.3	L2
11 (b)	Explain what you understand about racial discrimination after reading the poem. 'Telephonic conversation'	6M	20HSX01.3	L2
12 (a)	Explain in detail about Nehru's ideas and vision	6M	20HSX01.4	L2
12 (b)	What did Nehru expect from his daughter?	6M	20HSX01.4	L1

	OR			
13 (a)	What was Virginia wolf' intention in writing the story 'Shakespeare's sister'?	8M	20HSX01.4	L2
13 (b)	Give the synonyms: (i) Candid (ii) Inspire (iii) Naive (iv) Acumen	4M	20HSX01.4	L1
14 (a)	Write a paragraph about a person influenced you	6M	20HSX01.5	L2
14 (b)	Fill in the blanks with correct verbs: a. There _____ (to be) a lot of software being deployed today b. One _____ (has) to be careful malicious viruses c. A security breach ____ (to be) a very dangerous thing to happen d. The inbox is filling up even as I ____ (to talk) to you e. Software developers _____ (to think) of hackers a long time ago f. Why _____ (has, not) you not replied to the mail as yet?	6M	20HSX01.5	L2
	OR			
15 (a)	Write a brief essay on "Life during the present pandemic"	6M	20HSX01.5	L2
15 (b)	Explain Kalam's views about the constitution	6M	20HSX01.5	L2

SEMESTER Question Paper

Degree	B. Tech. (U. G.)	**Program**	Common to All	Test	I/II	**Academic Year**	2020 - 2021
Course Code	20HSX01	**Test Duration**	90 Min.	Max. Marks	40	**Semester**	I
Course	**COMMUNICATIVE ENGLISH**						

Key and Scheme of Evaluation

No.	Questions (1 through 5)	Marks
1	What was Steve Jobs' contribution to mobile industry? carriers beefed up their network -KEYBOARDS FADED AWAY- PEOPLE'S VIEWING HABITS SHIFTED -POINT-AND-SHOOT CAMERAS BECAME (LARGELY) OBSOLETE- TOUCHSCREENS BECAME STANDARD- MOBILE GAMING BECAME A VIABLE INDUSTRY- THE INTERNET BECAME PORTABLE-MOBILE SOFTWARE DISTRIBUTION BECAME CENTRALIZED	Content 1.5M Grammar/Spelling check 0.5
2	List out any four techniques of effective writing Write from an outline. - One paragraph one idea- Write clear, punchy and compact sentences- Get to the point.- Avoid the passive voice - Use vivid nouns and verbs- Avoid using words that signal "dodges	Content 1.5M Grammar/Spelling check 0.5
3	How do listening and speaking contribute in communication? listening involves the ability to accurately receive and interpret messages in the communication process. Without the ability to listen effectively, which involves desire and awareness, messages are easily misunderstood or misinterpreted. ... It means paying attention, being aware of verbal and non-verbal messages.	Content 1.5M Grammar/Spelling check 0.5
4	What is paraphrasing? express the meaning of (something written or spoken) using different words, especially to achieve greater clarity.	Content 1.5M Grammar/Spelling check 0.5
5	What does it mean by "reading between the lines"? If you read between the lines, you understand what someone really means, or what is really happening in a situation, even though it is not said openly.	Content 1.5M Grammar/Spelling check 0.5
No.	**Questions (6 through 11)**	
6 (a)	List any five types of formal letters • The types of formal letters are mentioned below. • Letter of Enquiry. • Order Letter. • Letter of Complaint. • Reply to a Letter of Complaint. • Promotion Letter. • Sales Letters. • Recovery Letters. Can be elaborated	Content 4m Grammar & Spellings 1m; presentation 1m
6 (b)	Explain all the elements of an 'Enquiry Letter' what is enquiry letter? What are the features of an inquire letter?	Content 4m Grammar &

Spellings 1m; presentation 1m

In business enquiry occur a great deal of the daily correspondence. Ii is very important to a business firm. Enquiry letters are important because it ask for information that is needed to carry on business. An enquiry letter must be properly written, because it may bring valuable business information and the opportunity to save money or to make a profit. If the reply is effectively written , it may build goodwill and earns profit.
So enquiry letter should be simple, clear and business related.
Characteristics: The characteristics of an inquiry letter are given below.
1.Asking for any kinds of information.
2.Start with directly and politely.
3.Be more confidentiality.
4.Provide explanation for information.
5.Write language carefully.
6.Specific purpose.
7.Supported by replying letter.
8.Asking information within specific time.
9.Proper format on structure.
10.Formal language.
11. Mention proper causes.
12.Close cordially.

2.How man kinds of enquiry letter?
1. Personal status Enquiry.
2.Letters of financial status Enquiry.
3.Letter of trade enquiry.

OR

7 How have you got influenced by the life of A. P. J Abdul Kalam? Elaborate Own way depending upon of how oneself got inspired

Content 5m Grammar & Spellings 2 m; presentation 1m

8 (a)

How does Satya Nadella of Microsoft try to motivate his employees in his email?

Nadella believes that Microsoft is a great place to work in because it believes in empowering its employees to innovate.

Nadella says that employees commonly underestimate their role in a company, and overestimate the role of others. He says that each employee must work towards innovating technology which will make people's lives better and easier, and this way, they can also find meaning and joy in their work.

Content 5m Grammar& Spellings 2 m ; presentation 1m

8 (b)

What did Nadella predict for the future of technology?

- Nadella forecasts cloud computing, machine learning, insights from big data and increasingly ubiquitous technology with connected devices as the future, and says that Microsoft will have to evolve to keep pace with these emerging technologies and trends.
- Microsoft's goal in its early years was to have a PC in every home and on every desk. This goal has largely been achieved in the developed world. Today, the world has more or less moved away from PCs and instead favors Mobile and Clouds-Computing devices.
- Nadella believes that going forward, Microsoft must focus on innovations which empower people to do more and improve their lives.

Nadella believes that Microsoft is uniquely situated to achieve its goal of being a tech leader in the coming decades as well, because it can harness the power of

I M for one blank

software as well as hardware, through its acquisition of Nokia.

OR

What does this quote really mean: "Stay hungry, stay foolish"?

The phrase uses adjectives considered as negatives and flips them to be used in a positive connotation, hence the intrigue. I knew the words were meant for motivational purposes but wasn't sure how I would prescribe to the notion of 'staying hungry and staying foolish' in real life. Obviously the idea is not to go without food and making rash decisions.

I tried to analyse my work style and pattern and compare with what I thought the words meant. Staying hungry seemed to imply a search for 'food'. Food can be used as a metaphor for any objective or goal so that would insinuate that I should keep searching for my goal; note that there is a difference between working towards a goal and continuous searching.

Similar to the above, I analysed this in context to my personal work style and pattern.What I interpreted was to be foolish. Though it may sound silly, a quick read through history and inventions show that most of the big names and discoveries were made by 'foolish' people. Foolish referring to those who had dared to think a little different; think beyond what was being taught in schools and society. This, to me was the 'foolishness' being alluded to. It suggested I had to learn to be more be more risky than the usual 'risky' related to any business. Some would call it crazy and say they are calculated risks, and maybe they are, but calculations give reasons not to take action whilst foolishness seems the opposite.

9 (a)

Content 3m
Grammar& Spellings 2 m ; presentation 1m

Needless to say, there has to be some limitations to this and only you would know what they are. Personally, I have been blessed to have tried and learnt a lot along the way with some successes and some not. The one thing I can say is I won't look back in 20 years and think 'I should have tried that'. With each experience comes a lesson and though it may sound like a cliché — it's reality.

THE REAL MEANING

The above is my interpretation of what the phrase means but in an interview for the Guardian, Brand shares his thoughts behind it:

"...for some reason the image I had in my mind was of a hitchhiker at dawn on a road somewhere and the sun comes up and there are trains going by. The frame of mind of the young hitchhiker is one of the freest frames of mind there is. You're always a little bit hungry and you know you are being completely foolish."

I guess my interpretation wasn't far off, but one can learn an important lesson here. Every word or phrase is open to interpretation on your skill, knowledge, situation, and an array of other variables. The benefit comes from how we analyse the given phrase or speech and use it to grow, and that's the goal. To Grow.

Steve Jobs frequently uses the words "drop out' and 'drop in' in his first story. How these words are closely related to his 'connecting dots theory'?

Steve Jobs uses the words of drop out and drop in because his concept or theory of connecting the dots aims at looking at things backwards. For instance, he stated in his theory that a person must have faith or trust in the fact that one way or another the dots in his/her life will be connected.He means that you will never know in what ways certain experiences will bring great benefits later in life. That you should follow your true interests even if you think that it will bring you no other benefit than satisfying your curiosity. Because down the road you never know how those experience could end up being extremely valuable to you, in

9 (b)

Content 3m
Salutation and subject & Spellings 2 m ; presentation 1m

ways you never imagined, at just the right time in your life.

So your experiences are like dots on paper. If you follow a rigid tight path through life you look back and get a straight line. If you have diverse experiences in life you look back and have enough dots in random places to connect them and form a picture

Write about the early life and education of Stephen Hawking

Stephen William Hawking was born on January 8, 1942, in Oxford, England. His father, a well-known researcher in tropical medicine, urged his son to seek a career in medicine, but Stephen found biology and medicine were not exact enough. Therefore, he turned to the study of mathematics and physics.

10 (a) Hawking was not an outstanding student at St. Alban's School, nor later at Oxford University, which he entered in 1959. He was a social young man who did little schoolwork because he was able to grasp the essentials of a mathematics or physics problem quickly. At home he reports, "I would take things apart to see how they worked, but they didn't often go back together." His early school years were marked by unhappiness at school, with his peers and on the playing field. While at Oxford he became increasingly interested in physics (study of matter and energy), eventually graduating with a first class honors in physics (1962). He immediately began postgraduate studies at Cambridge University.

Content 5m Grammar& Spellings 2 m ; presentation 1m

"Prof. Hawking's works are larger than his life." Comment briefly

10 (b) With the Oxford mathematician Roger Penrose, he showed that if there was a Big Bang, it must have started from an infinitely small point - a singularity Black holes radiate energy known as Hawking radiation, while gradually losing mass. This is due to quantum effects near the edge of the black hole, a region called the event horizon He predicted the existence of mini-black holes at the time of the Big Bang. These tiny black holes would have been incredibly hot, shedding mass until they vanished - potentially ending their lives in a powerful explosion.In the 70s, Hawking considered whether the particles and light entering a black hole were destroyed if the black hole evaporated. Hawking initially thought this "information" was lost from the Universe. But US physicist Leonard Susskind disagreed. These ideas became known as the information paradox. In 2004, Hawking conceded that the information must be conserved.

1m for one sentence

OR

Fill in the blanks with appropriate prepositions:

11 (a) He worked on debugging the program _from____ morning ___to_ evening. By dinner he had finished and was ready __to_ upload his program. _for___ the first three hours ___of_ uploading the program two hundred people had played the game _at___ his surprise

Content 5m Grammar& Spellings 2 m ; presentation 1m

Explain what you understand about racial discrimination after reading the poem. 'Telephonic conversation'

11 (b) "Telephone Conversation" is a 1963 poem by the Nigerian writer Wole Soyinka that satires racism. The poem describes a phone call between a landlady and the speaker, who is black, about renting an apartment. The landlady is pleasant until she learns that the speaker is "African," at which point she demands to know how "light" or "dark" the speaker's skin is. In response, the speaker cleverly mocks the landlady's ignorance and prejudice, demonstrating that characterizing people by their skin color diminishes their humanity.

1M for each answer

12(a)	Explain in detail about Nehru's ideas and vision Nehru was convinced that Science and Technology were crucial to the solution of India's problems. 1938 he said that it was science alone that could solve the problems of hunger and poverty, of sanitation and illiteracy, of superstition and deadening custom and tradition of vast resources running to waste. of a rich country inhibited by starving people.	Content 5m Grammar& Spellings 2 m ; presentation 1m
12(b)	What did Nehru expect from his daughter? Nehru advises his daughter to be open in all matters of freedom movement and never to do anything secretly. - He asks his daughter to work in the sun and in the light. Because things that are done in the dark, that is in secret will cause fear and destroy the braveness.	Content 2m Grammar& Spellings 1m ; presentation 1m
13(a)	What was Virginia wolf' intention in writing the story 'Shakespeare's sister'? Woolf sheds light on the reality of women's life during this time and illustrates the effects of social structures on the creative spirit of women. In the society they lived in, women were halted to explore and fulfill their talent the same way men were able to, due to the gender role conventions that prevailed during this era. Through a theoretical setting in which it is it is imagined that William Shakespeare had a sister (Judith), Virginia Woolf personifies women during the sixteenth century in order to reflect the hardships they had to overcome as aspiring writers.	Content 5m Grammar& Spellings 2 m ; presentation 1m
13(b)	Give the synonyms: (i) Candid-Natural,Open,truthful (ii) Inspire-motivate,encourage,influence (iii) Naïve-simple,sincere,innocent (iv) Acumen-awareness,judgement,understanding	1 mark for the correct sentence, with minimum mistake 0-5m
14(a)	Write a paragraph about a person influenced you Own way depending upon of how oneself got influenced	Content 5m Grammar& Spellings 2 m ; presentation 1m
14(b)	Fill in the blanks with correct verbs: a. There ___has been__ (to be) a lot of software being deployed today b. One __have___ (has) to be careful malicious viruses c. A security breach _is___ (to be) a very dangerous thing to happen d. The inbox is filling up even as I __am talking__ (to talk) to you e. Software developers ___thought___ (to think) of hackers a long time ago Why _have_____ (has, not) you not replied to the mail as yet?	Content 2m Grammar& Spellings 1 m ; presentation 1m
15(a)	Write a brief essay on "Life during the present pandemic" Own way depending upon of how oneself got experienced	Content 3m Grammar& Spellings 2 m ; presentation 1m
15(b)	Explain Kalam's views about the constitution He said he would give top priority to eradicating poverty in the country, and also focus on health and equity among all sections of the society. President Kalam took his Presidency seriously from Day 1. He was as comfortable with constitutional and legal issues as he was with school children. He was committed to nation-building and created a vision document to make India a developed nation by 2020.	Content 3m Grammar& Spellings 2 m ; presentation 1m

NSRIT

Semester End Supplementary Examination, October, 2021

Degree	B. Tech. (U. G.)	**Program**	CE/ME			**Academic Year**	2020 - 2021
Course Code	20BSX21	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	I
Course	**ENGINEERING CHEMISTRY**						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define hard water and soft water	20BSX21.1	L1
2	What is electrochemical series?	20BSX21.2	L1
3	Write the Dulong's formula.	20BSX21.3	L2
4	What are the monomers of Thiokol?	20BSX21.4	L1
5	How does nanotechnology work?	20BSX21.5	L2

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Differentiate scale and sludge in boilers	6M	20BSX21.1	L4
6 (b)	Explain the desalination of brackish water by using electrodialysis process	6M	20BSX21.1	L2
	OR			
7 (a)	Distinguish the specifications for water by BIS and WHO	8M	20BSX21.1	L4
7 (b)	Explain Ion exchange process for demineralization of water	4M	20BSX21.1	L2
8 (a)	Explain the construction & working of calomel electrode	6M	20BSX21.2	L2
8 (b)	Explain the working of H_2O_2 fuel cell with a neat diagram	6M	20BSX21.2	L2
	OR			
9 (a)	How corrosion is controlled by using cathodic protection method	6M	20BSX21.2	L2
9 (b)	How nature of metal factors that influences the extent of corrosion	6M	20BSX21.2	L2
10 (a)	Discuss about the proximate analysis of coal. Give its significance	6M	20BSX21.3	L2
10 (b)	Define the following terms a. Calorific value b. Knocking c. Octane number	6M	20BSX21.3	L1
	OR			
11 (a)	Discuss about the Bergius process for the manufacture of the petrol with a neat diagram	8M	20BSX21.3	L2
11 (b)	List out the applications of bio diesel	4M	20BSX21.3	L1
12 (a)	Write the preparation, properties and applications of PVC and Buna-N	6M	20BSX21.4	L2
12 (b)	Differentiate thermoplastic and thermosets	6M	20BSX21.4	L4
	OR			
13 (a)	Explain the mechanism of lubrication	6M	20BSX21.4	L2
13 (b)	Distinguish the properties and engineering applications of composites and refractories	6M	20BSX21.4	L4

Semester End Supplementary Examination, October, 2021

Degree	B. Tech. (U. G.)	Program	CE/ME			Academic Year	2020 - 2021
Course Code	20BSX21	Test Duration	3 Hrs.	Max. Marks	70	Semester	I
Course	ENGINEERING CHEMISTRY		Scheme of Valuation				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define hard water and soft water Hard water-1mark Soft water-1	20BSX21.1	L1
2	What is electrochemical series? Definition- 1 mark series -1 mark	20BSX21.2	L1
3	Write the Dulong's formula. Formula- 2 marks C,H,O,S	20BSX21.3	L2
4	What are the monomers of Thiokol? Ethyleneglycol+ sodium sulphite -1 mark	20BSX21.4	L1
5	How does nanotechnology work? Nanotechnology-1 mark Work-1	20BSX21.5	L2

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Differentiate scale and sludge in boilers Scale-2 marks with diagram Example-1mark Sludge -2 marks with diagram Example-1mark	6M	20BSX21.1	L4
6 (b)	Explain the desalination of brackish water by using electrodialysis process Desalination-2 marks Brackish water-2 marks Electrodialysis-2marks	6M	20BSX21.1	L2
	OR			
7 (a)	Distinguish the specifications for water by BIS and WHO Specifications table BIS- 4 Marks WHO -4 marks	8M	20BSX21.1	L4
7 (b)	Explain Ion exchange process for demineralization of water Cation ion exchange -2 marks Anion ion exchange-2 marks Process-2marks	4M	20BSX21.1	L2
8 (a)	Explain the construction & working of calomel electrode Constructions- 3 marks Working-2 marks cell representations-1 mark	6M	20BSX21.2	L2

8 (b)	Explain the working of H_2-O_2 fuel cell with a neat diagram Anode reaction-2marks Cathode-2marks Diagram with working -2 marks	6M	20BSX21.2	L2
	OR			
9 (a)	How corrosion is controlled by using cathodic protection method Tinning method-2 Process-2 Hot dipping-2	6M	20BSX21.2	L2
9 (b)	How nature of metal factors that influences the extent of corrosion Nature of the metal-3 marks Nature of Environmental – 3 marks	6M	20BSX21.2	L2
10 (a)	Discuss about the proximate analysis of coal. Give its significance % moisture -1 %voltile matter -1 %ash-1 %fixed carbon-1 Significance-2 mark	6M	20BSX21.3	L2
10 (b)	Define the following terms a. Calorific value -2 marks b. b. Knocking-breaking off -2marks c. c. Octane number-petrol rating-2 mark	6M	20BSX21.3	L1
	OR			
11 (a)	Discuss about the Bergius process for the manufacture of the petrol with a neat diagram Equations-4 marks Manufacture-2 mark Diagram-2 mark	8M	20BSX21.3	L2
11 (b)	List out the applications of bio diesel Natural diseal- 4 applications -4 marks	4M	20BSX21.3	L1
12 (a)	Write the preparation, properties and applications of PVC and Buna-N PVC-3 marks Buna-N- 3 marks	6M	20BSX21.4	L2
12 (b)	Differentiate thermoplastic and thermosets Thermoplastic-3 marks Thermosetting- 3 marks	6M	20BSX21.4	L4
	OR			
13 (a)	Explain the mechanism of lubrication Lubrications-3 marks Mechanism-3 mark	6M	20BSX21.4	L2
13 (b)	Distinguish the properties and engineering applications of composites and refractories	6M	20BSX21.4	L4

	Acid-2 Base-2 Neutral-2			
14 (a)	Explain the synthesis of colloids by using any method with example Synthesis-3 marks Method- 3 marks	6M	20BSX21.5	L2
14 (b)	Discuss the principle, -2 marks instrumentation -2mark and applications of Transmission Electron Microscopy-2 marks	6M	20BSX21.5	L2
	OR			
15 (a)	Write a brief note on applications of Nanomaterials Applications of nanomaterials -6 marks	6M	20BSX21.5	L2
15 (b)	Discuss about the nano sensors. Write its applications Nanosensors -3 marks Applications-3 marks	6M	20BSX21.5	L2

HOD, FED

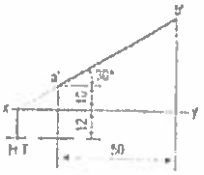
Semester End Supplementary Examination, October, 2021

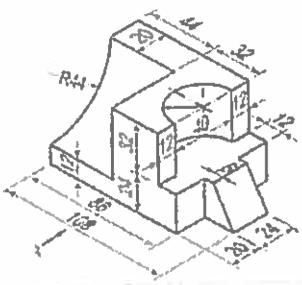
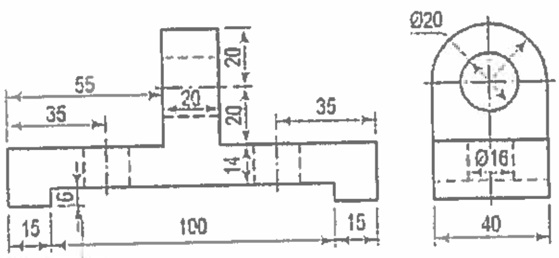
Degree	B. Tech. (U. G.)	**Program**	Common to CE/ME			**Academic Year**	2020 - 2021
Course Code	20ESX01	**Test Duration**	3 Hrs.	**Max. Marks**	70	**Semester**	I
Course	**ENGINEERING DRAWING**						

Part A (Short Answer Questions 2 x 5 = 10 Marks)

No.	Questions (1 through 2)	Learning Outcome (s)	DoK
1	Define first angle projection and draw the projections of the conventional indicator/symbol for first angle projection with complete dimensions	20ESX01.2	L2
2	A thin circular plate of 100 mm diameter is resting on its circumference such that its plane is inclined 30° to the H.P. and 60° to the V.P. Draw the projections of the plate	20ESX01.3	L3

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (3 through 12)	Marks	Learning Outcome (s)	DoK
3 (a)	A fixed point is 75 mm from a fixed straight line. Draw the locus of a point P moving such a way that its distance from the fixed straight line is (i) twice its distance from the fixed point; Name the curve	6M	20ESX01.1	L3
3 (b)	Draw a parabola having 75 mm base and 100 mm axis using rectangular method	6M	20ESX01.1	L2
	OR			
4 (a)	Construct a scale of R.F. = 1/84480 to show miles and furlongs and long enough to measure upto 6 miles	6M	20ESX01.1	L2
4 (b)	The area of a field is 50,000 sq m. The length and the breadth of the field, on the map is 10 cm and 8 cm respectively. Construct a diagonal scale which can read upto one metre. Mark the length of 235 metre on the scale. What is the R.F. of the scale?	6M	20ESX01.1	L3
5 (a)	A point P is in the first quadrant. Its shortest distance from the intersection point of H.P., V.P. and Auxiliary vertical plane, perpendicular to the H.P. and V.P. is 70 mm and it is equidistant from principal planes (H.P. and V.P.). Draw the projections of the point and determine its distance from the H.P. and V.P	6M	20ESX01.2	L2
5 (b)	A line AB, inclined at 40° to the V.P., has its ends 50 mm and 20 mm above the H.P. The length of its front view is 65 mm and its V.T. is 10 mm above the H.P. Determine the true length of AB, its inclination with the H.P. and its H. T	6M	20ESX01.2	L3
	OR			
6 (a)	A point P is 15 mm above the H.P. and 20 mm in front of the V.P. Another point Q is 25 mm behind the V.P. and 40 mm below the H.P. Draw projections of P and Q keeping the distance between their projectors equal to 90 mm. Draw straight lines joining (i) their top views and (ii) their front views	6M	20ESX01.2	L2
6 (b)	The front view a'b' and the H.T. of a line AB, inclined at 23° to the H.P. are given in figure. Determine the true length of AB, its inclination with the V.P. and its V. T 	6M	20ESX01.2	L3

7 (a)	Draw the projections of a regular hexagon of 35 mm side, having one of its sides in the H.P. and inclined at 60° to the V.P., and its surface making an angle of 45° with the H.P	6M	20ESX01.3	L2
7 (b)	A circular plate of negligible thickness and 50 mm diameter appears as an ellipse in the front view, having its major axis 50 mm long and minor axis 30 mm long. Draw its top view when the major axis of the ellipse is horizontal	6M	20ESX01.3	L3
	OR			
8 (a)	Draw the projections of a circle of 60 mm diameter resting in the H.P. on a point A on the circumference, its plane inclined at 45° to the H.P. and the top view of the diameter AB making 30° angle with the V.P	6M	20ESX01.3	L2
8 (b)	A pentagonal plate of 50 mm side has a circular hole of 40 mm diameter in its centre. The plane stands on one of its sides on the H.P. with its plane perpendicular to V.P. and 45° inclined to the H.P. Draw the projections	6M	20ESX01.3	L3
9 (a)	Draw the projections of a cone, base 75 mm diameter and axis 100 mm long, lying on the H.P. on one of its generators with the axis parallel to the V.P	6M	20ESX01.4	L2
9 (b)	A square prism, base 40 mm side and height 65 mm, has its axis inclined at 45° to the H.P. and has an edge of its base, on the H.P and inclined at 30° to the V.P. Draw its projections	6M	20ESX01.4	L3
	OR			
10 (a)	Draw the projections of a pentagonal prism, base 25 mm side and axis 50 mm long, resting on one of its rectangular faces on the H.P., with the axis inclined at 45° to the V.P	6M	20ESX01.4	L2
10 (b)	A square pyramid, base 38 mm side and axis 50 mm long, is freely suspended from one of the corners of its base. Draw its projections, when the axis as a vertical plane makes an angle of 45° with the V.P. When a pyramid is suspended freely from a corner of its base, the imaginary line joining that corner with the centre of gravity of the pyramid will be vertical	6M	20ESX01.4	L3
11	Draw the front view, top view and both sides view from the isometric view. All dimensions are in mm 	12M	20ESX01.5	L4
	OR			
12	Draw the isometric view of figure, all dimensions are in mm 	12M	20ESX01.5	L4

Semester End Supplementary Examination

Course :- Engineering Drawing A.Y :- 2020-21

Course Code :- 20ESX01 Degree :- B.Tech

PART-A

(1) First Angle projection — 2 M

Conventional Indicator — 2 M

Dimension — 1 M.

(2) Drawing F.V & T.V On

Parallel to One plane — 2M

Inclined to both — 3M.

PART-B

(3) (a) Drawing Ellipse — 1M.

Dimensions — 2M

Indication — 1M

(b) Parabola Image Using — 5M

general method

Dimensions — 1M

(4) (a) finding Length of Scale — 2M

Using Diagonal method — 4M

(b) finding Length of Scale — 2M

Diagonal Scale — 3M

Dimensions — 1M

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(5) (a) Determination of HP & VP — 2M

finding F.V & T.V — 3M

Dimensions — 1M

(5) (b) finding Inclinations with H.P — 2M

Traces — 1M

final F.V & T.V — 2M

Dimensions — 1M

(6) (a) finding F.V & T.V — 4M

Dimensions — 2M

(6) (a) Determination of true Length — 2M

F.V & T.V — 4M

(7) (a) Hexagon by using General — 2M

Surface parallel to both — 2M

final F.V & T.V — 2M

(7) (b) final F.V & T.V — 4M

dimensions — 2M

(8) (a) Circle Surface parallel to both — 4M

final images with Dimensions — 2M

(8) (b) Pentagonal plate with general — 2M

Surface parallel to both — 2M

final F.V & T.V — 2M

(9) (a) Drawing Circle & triangle - 2M

final F.V & T.V - 3M

Dimension - 1M

(9) (b) Drawing Square & triangle - 2M

final F.V & T.V - 3M

Dimension - 1M

(10) (a) Pentagon using General method - 2M

final F.V & T.V - 3M

Dimension - 1M

(11) Front View Image - 5M

Top View - 4M

Left Side View - 3M

(12) Isometric final View - 10M

Dimension - 2M

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