1. Differentially compound D.C. motors can find applications requiring
   ✔ high starting torque   ✔ low starting torque

2.

Projector	Angle of Beam Spread	Distance of Projection
Narrow Beam Projectors	The angle of the Beam spread ranges from 12° to 25°.	These are used for distances more than 70 meters.
Medium Angle Projectors	The angle of Beam spread ranges from 25° to 40°.	These are used for distances between 30 to 70 meters.
Wide Angle Projectors	The angle of Beam spread ranges from 40° to 90°.	These are used for distances below 30 meters.

BIS Symbol	Equipment
	Distribution fuse board without switches
	Distribution fuse board with switches
	Main fuse board without switches
	Main fuse board with switches

3. Effect of change in Mechanical load: (excitation is constant)

4.

Lagging pf Region	Leading pf Region
pf $\propto$ (1/load)	pf $\propto$ load
$Q_{abs} \propto$ Load	$Q_{del} \propto$ (1/Laod)
$I_a \propto$ Load	$I_a \propto$ Load
load angle $\propto$ Load	load angle $\propto$ Load
P $\propto$ Load	P $\propto$ Load

Carbon electrodes are used in:

1. GLS lamps
2. Dry cells
3. Arc furnace

     1, 2 and 3

✓ 2 and 3

5. Summation of all the degree of nodes gives the total number of branches in a given graph

6. The magnetic field line is a straight line inside a solenoid. Hence, it remains **uniform along its length.**
   The magnetic field inside a solenoid is the sum of magnetic fields due to all loops. So, on **increasing the number of loops, the number of electrons causing current increases**. Thus magnetic field strength increases.

7. The magnetic field outside the solenoid is zero.

8. To construct the dual of a four-mesh network how many nodes are required?   5

9. Measurement of resistance

4 terminals are required for measurement	Only two terminal is required for measurement	Three terminal is required for measurement

10. **The safety factor used for the current rating in a power installation is 2.**

11. Block rate tariff is calculated and charged for domestic consumers.

12. Which of the following is a variable area type flowmeter? Rotameter
13. **Fleming's** left-hand rule used to find the direction of force acting on the winding of motor.
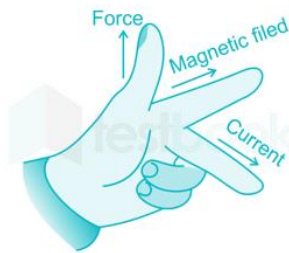
Dual Elements			
Resistance	$R\Omega$	Conductance	$G = R\mho$
Capacitance	C F	Inductance	L = C H
Inductance	L H	Capacitance	C = L F
Open Circuit		Short Circuit	
Short Circuit		Open Circuit	
Voltage Source	V_s	Current Source	$I = V_s$
Current Source	I_s	Voltage Source	$V = I_s$
Series Connection		Parallel Connection	
Parallel Connection		Series Connection	

14. The direction of the magnetic field lines of force **around a conductor** is given by **Maxwell's** right-hand rule.
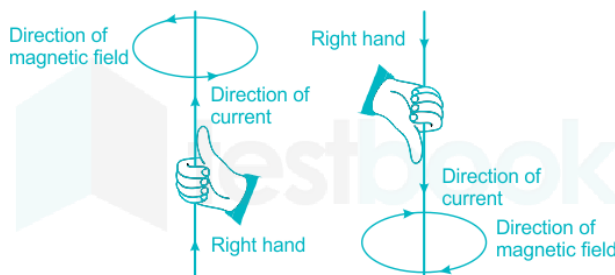
15. E= V/d
    Where d = distance between the parallel plates of the capacitor.
    As we can see that the potential difference is proportional to the distance between the plates of the capacitors.
   Que. If the distance between the plates of a parallel plate capacitor is increased. Which of the following will change?
    Ans. ✘ Charge on the capacitor   ✔ Potential difference across the capacitor
16. Power is expressed as the product of current and voltage.
    In a purely inductive circuit, instantaneous power may be **positive or negative** as instantaneous power in an inductor is proportional to the product of instantaneous current and rate of change of current through it.
    So **instantaneous value of power in a purely inductive circuit is changing.**
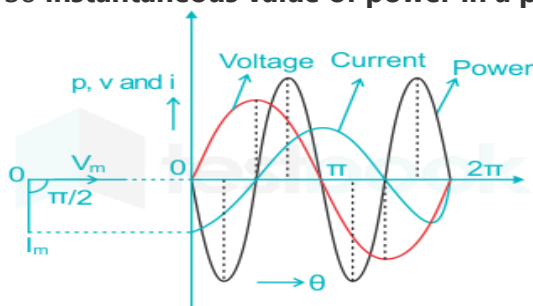
    ⚠ **Mistake Points**
   The average power in the purely inductive and purely capacitive circuits is always zero.
    Instantaneous power in the purely inductive and purely capacitive circuits is *changing* in nature and can't be zero.
    The instantaneous power in a single-phase circuit varies sinusoidally with double the supply frequency.
    The instantaneous power in a three-phase system is constant i.e. At any instant of time, the total of these three instantaneous power waves is a constant.
    In a balanced three-phase circuit, the total instantaneous power is equal to the average power.

17. For V ≤ 220 kV, selection of conductor done based on the current-carrying capacity.
    For V > 220 kV, the selection of conductor is done based on the concept of corona or electric field intensity.

18. **Que**. If the charge on each of the capacitors in the given figure is 4500 μC, what is the total capacitance in μF?
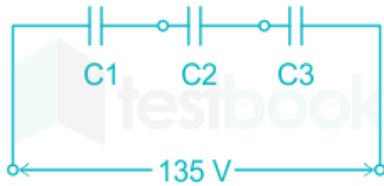
Ans.

Charge on each of the capacitor (Q) = 4500 μC

As all the capacitors are **connected in series**, the charge in the circuit is 4500 μC

Voltage across the series combination (V) = 135 V

Let the equivalent capacitance of series combination is C_{eq}

$Q = C_{eq} V$

$4500 = C_{eq} \times 135$

C_{eq} = 33.33 μF

19. Please note that **the charge across a series circuit of capacitors will be equal**. This is similar to the fact that the current across a series circuit is the same. irrespective of the value of resistances in it.

20. **Different Type of Tower Design:**

    1. Three Phase Single circuit two ground wire Tower:
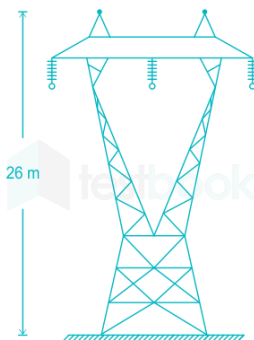
    2. Three Phase Single circuit one ground wire Tower:
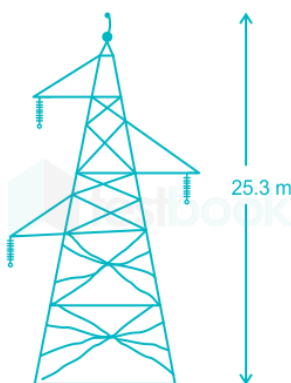
    2. Double Three Phase Single circuit one ground wire Tower:

4. HVDC Bipolar Tower:

21. Norton's theorem is applied to the **DC circuits**, it will result in a current source with resistance in parallel.
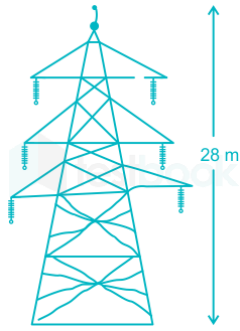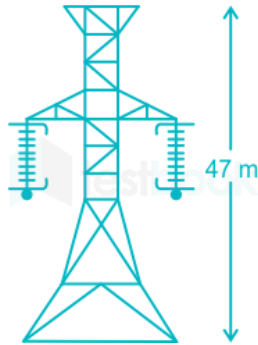
22. **Dynamically induced EMF:** When the conductor is rotating and the field is stationary, then the emf induced in the conductor is called dynamically induced EMF.

    Ex: DC Generator, AC generator

    Static induced EMF: When the conductor is stationary and the field is changing (varying) then the emf induced in the conductor is called static induced EMF.

    Ex: Transformer

23.

To improve power factor and feeder voltage controller, which compensation is required:

✓ Shunt capacitor

↻ Synchronous condensers

Resistivity of a wire depends upon

✓ Material

Area

Length

✗ All of these

24. When the circuit breaker is closed, it acts as short switch; Thus, before interruption ideal circuit breaker should offer zero impedance   normally CB is closed for current flow.
    When the circuit breaker is open, it acts as open switch; Thus, after interruption ideal circuit breaker should offer infinite impedance

25. **Surge tanks** are usually **provided in high or medium - head** hydroelectric power plants when there is a considerable distance between the water source and the power unit, necessitating a **long penstock**.

26. Wave winding is actually called **incomplete winding** because after completion of winding some slots are left empty.
    These empty slots are generally filled with some extra coils namely called dummy coils.
    Dummy coils are **not** connected in series with other coils of the machine.
    They physically exist but not electrically connected.

27. **Que**. The phase difference between the sinusoidal quantities 100 cos (ωt – 30°) and 200 sin (ωt + 30°) is:

    Ans. Since, <mark>sin (θ + 90°) = cos θ</mark>, the given sinusoidal quantities can be written as:

    E1 = 100 cos (ωt – 30°) = 100 sin (90° + ωt – 30°)

    E1 = 100 sin (ωt + 60°)

    E2 = 200 sin (ωt + 30°)

    Hence phase difference is given as (60° - 30°) = 30°

28. During the **on-load** conditions, the differentially compounded DC generator has the poorest voltage regulation

    During the **no-load** condition, the DC series generator has the poorest voltage regulation.

    Voltage regulation of

    o   For **series generator**, it is **negative** (**Poorest negative voltage regulation among all**)

    o   For over compound generator it is negative

    o   For under compound it is positive

    o   For **flat compound generator** it is **zero** (**lowest Voltage regulation among all**)

    o   For **differential compound generator** it is **positive** (**Poorest positive regulation among all**)

    o   For shunt generator is positive

29. In order to improve the power factor semi-closed slots or totally closed slots are used in induction motors.

30. If a **voltage source** is connected between **two non-reference nodes**, then we combine the two nodes as to yield **super node**.

    If a **current source** is present at the **common boundary of two meshes**, then we create a **super mesh** by avoiding the current source and any element connected to it in series.

31. The most economical method of electrical braking is regenerative braking.

32. Both AC and DC motors can be used as servo motors.

    a)   Synchronous AC motors are also referred to as **permanent magnet AC (PMAC) or brushless AC (BLAC)** motors. **they're often used in servo systems.**

    b)   Stepper motor are used for servomotors.

    c)   Brushless DC (BLDC) motors are well-suited for servo applications.

    d)   AC induction motor are not be suitable for use as servo motors.

    e)   AC motor is used as servomotor.

    f)   DC motor is used as servomotor.

33. The voltage at which corona occurs can be raised by increasing conductor size. Hence, the corona effect may be reduced. This is one of the reasons that ACSR conductors which have a larger cross-sectional area are used in transmission lines.

34. **Strip Earthing: used in transmission lines**

    - In this method of earthing, strip electrodes of cross-section not less than 25 mm × 1.6 mm (1in × 0.06in) is buried in a horizontal trench of a minimum depth of 0.5m
    - If copper with a cross-section of 25mm × 4mm (1in × 0.15in) is used and a dimension of 3.0mm^2 if it's a galvanized iron or steel
    - The length of the conductor buried in the ground would give enough earth resistance and this length should not be less than 15 m

35.

Fundamental torque Equation:

The fundamental torque equation is given as:

$$T_M - T_L = \frac{d}{dt}(j\omega) = J\frac{d\omega}{dt} + \omega\frac{dJ}{dt}$$

When the drive is of constant inertia,

$$\Rightarrow \frac{dJ}{dt} = 0$$

$$\therefore T_M = T_L + \frac{Jd\omega}{dt}$$

Case I:

When $T_M > T_L$

In this case $\frac{d\omega}{dt} > 0$, so the drive accelerates.

Case II:

When $T_M < T_L$

In this case $\frac{d\omega}{dt} < 0$, so the drive **decelerates.**

Case III:

When $T_M = T_L$

In this case $\frac{d\omega}{dt} = 0$, so the motor runs at the same speed.

36.

Which of the following motors is the most suitable for urban and sub urban services of electric traction?

for sub-urban we use DC 1500v .

Separately excited D. C. motor

✓ D. C. series motor

✗ Three phase Induction motor

37. Sulphur hexafluoride gas dielectric strength is 2.5 times that of air and 30% less than that of the dielectric oil.

38. Megger:
    a) Generally, megger is the combination of DC generator and series type ohmmeter.
    b) Series type ohmmeter is used due to the measurement of a high range of resistance i.e. insulation resistance in (0 - infinity) Ω range.
    c) The Megger has three coils two pressure coils (control coil) and one current coil. The pressure coil rotates the moving coil in the anticlockwise direction, whereas the current coil rotates it in the clockwise direction.

39. The disadvantage of a typical MOSFET as compared to BJT is
    ✔ Reduced **power**-handling levels   ✗ Reduced voltage-handling levels

40. Electric field intensity E varies with distance r **for a point charge** as

✓ $E \propto \frac{1}{r^2}$ ✗ $E \propto \frac{1}{r}$

41. The primary reason why an open-circuit test is performed on the low-voltage winding of a transformer is that it:

    ✔ draws sufficiently large on-load current for convenient reading ✘ requires least voltage to perform the test

42. The magnetic field inside the solenoid is uniform and outside is non-uniform.
    Magnetic field lines outside the solenoid are straight and parallel to the axis.

43.

Scientific Instruments	Uses
Thermostat	To regulate the temperature at a particular point
Sonometer	to measure the frequency of the tuning fork
Salinometer	To determine the salinity of the solution

For what purpose the stroboscope instruments used:

    To synchronize synchronous motors

✘ To synchronize synchronous generators

✓ To synchronize induction motors

    To synchronize induction generators

44. The size of the earth wire is determined by the ampere capacity of the service wires.

45. Schrage motor can run on positive, negative, and unity slip. Schrage motor can work on all power factors and above and below synchronous speed.
    Speed control is obtained by injecting a variable voltage to secondary windy.
    By varying the brush position the speed of the charging motor can be obtained below and above synchronous speed

The principle of the operation of the Merz price protection system is:

    voltage balance

    power balance

    size balance

✓ current balance

46. The Power factor of a transformer on no load is poor due to the magnetizing reactance of the transformer.

47. **Electro-Mechanical Test**: This test is conducted only for suspension-type insulators.
    Mechanical Strength Test of Insulator: This test is conducted for all types of insulators.
    High Voltage Test:
    > **This test is usually carried out for pin insulators.**
    > In this test, the insulator is inverted and placed into the water up to the neck.
    > The spindle hole is also filled with water and a high voltage is applied for 5 minutes.
    > The insulator should remain undamaged after this test.

High voltage transmission lines use:

    Disc insulator

✘ Suspension insulator and Pin insulator

    Pin insulator

✓ Suspension insulator

48. Shackle insulator is usually used in a low voltage distribution network.
    Post type insulator used in areas with heavy pollution and risk of vandalism exhibit high resistance to puncture.

49. The **married joint** is an electrical joint used for jointing multi strand cables. If the wires are un-stranded, then interlaced with the wires of the other cable and married (twisted) together before finally being soldered.

Married joint

This type of joint is used in places where appreciable electrical conductivity is required along with compactness. The mechanical strength for this joint is less. This joint is used at places where tensile stress is not so more

Tee joint is an electrical connection used for joining a branch conductor to a main conductor where the main conductor continues beyond the branch.
This type of joint is used in overhead distribution lines where the electrical energy is to be tapped for service connection.

A **Britannia straight joint** is used to connect two wires where there is a need to maintain high tensile strength. Example: Overhead lines
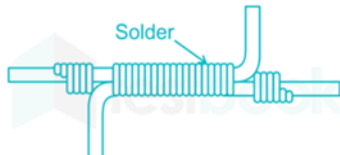
Britannia tee joint is used for overhead lines for tapping the electrical energy permanently to the service lines.

The **western union joint** is used when the connection must be strong enough to support long lengths of heavy wire. This splice was used to repair telegraph wires.

50. In an overcurrent relay, the minimum time is achieved by saturation of the magnetic circuit.

51.

For arc heating, the electrodes used are made of:

Copper

✓ Graphite

Tungsten

Aluminum

Nichrome, manganin and constantan are widely used in wire bound standard resistors because:

✗ Resistivity is independent of temperature

✓ Very weak dependence of resistivity with temperature

_____conductors are most suitable for indoor and outdoor wires and cables.

✗ Aluminium

↻ Hard drawn copper

✓ Annealed copper

52. *Que*. A single-phase 200/125 volt autotransformer delivers 40 kVA to a load at 0.8 power factor lagging. Neglect leakage reactance and magnetizing current. For this loading condition the transformed kVA is.

Ans.

Given that

kVA rating of autotransformer = 40 kVA

Transformation Ratio $k = \frac{V_2}{V_1} = \frac{125}{200} = 0.625$

Transformed kVA = (1 − k) kVA Rating of autotransformer

Transformed kVA = (1 − 0.625) 40 kVA = 15 kVA

Transformed kVA = 15 kVA

53. **Resistance grounding:** In this type of neutral grounding, the neutral of the system is connected to ground through one or more resistance. Resistance grounding limits the fault currents. *It protects the system from transient over voltages.*

    Reactance grounding: In this method, a reactance is inserted between the neutral and ground to limit the fault current. *This method has high transient voltages appear under fault conditions.*

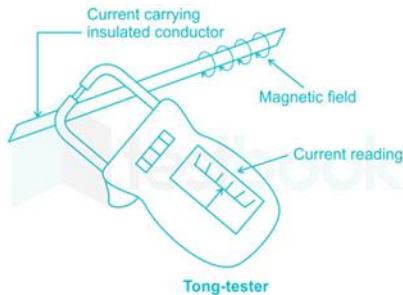   **Note**: In earthed neutral system, the transient voltage magnitude is ✓ very small ✗ zero

54.
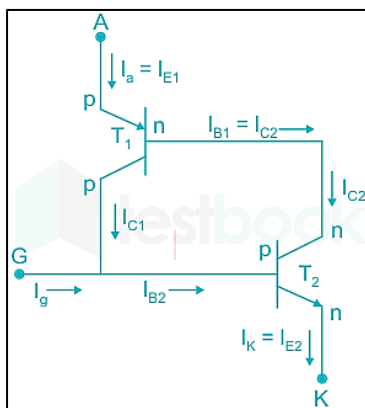
By two transistor model of SCR

$I_a = I_{E1} = \dfrac{\alpha_2 I_g}{1-(\alpha_1+\alpha_2)}$ (By neglecting Forward leakage currents)

55. An electrical tong tester is also known as clamp meter.

    It can measure large AC currents up to 1000 amperes

Tong-tester

56. **Types of Solar collectors:**
    a) Flat Plate Collector
    b) Line Focus Collector
    c) Point Focus Collector
    d) Evacuated Tube Collectors

57. Combination function of a synchronous motor and a DC generator which is more or less like a DC machine. Due to which the rotary converter **operates at high power factor**.

58. If the terminal voltage of a dc shunt motor is halved with the load torque varying as the square of speed, then

Speed of dc shunt motor

$$N \propto \frac{E_b}{\phi} \propto \frac{V - I_a R_a}{\phi}$$

But generally, R_a term is small, hence this term is neglected.

$$\Rightarrow E \propto V$$

now speed

$$\Rightarrow N \propto \frac{E_b}{\phi} \propto \frac{V}{\phi}$$

From data, as **V is half ϕ becomes half**, such that **speed becomes constant**. Also given that,

$$T \propto N^2, \ T \propto \phi I_a$$

Since speed is not changed even V is half, the torque also remains unchanged.

Hence to get constant torque with field flux fallen to half, armature current has to be doubled.

59. **Sub urban** railways system in India use voltage:

✓ 1500 V, DC

↻ 3.3 kV, 3ϕ A.C

60.

The symbol for different kinds of fuse is shown:

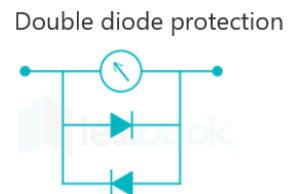**1. Fuse (Only):**

2. Fuse with strikes:

3. Slow blow fuse:

4. Fuse with separate alarm contact:

5. Fast blow fuse:

Double diode protection
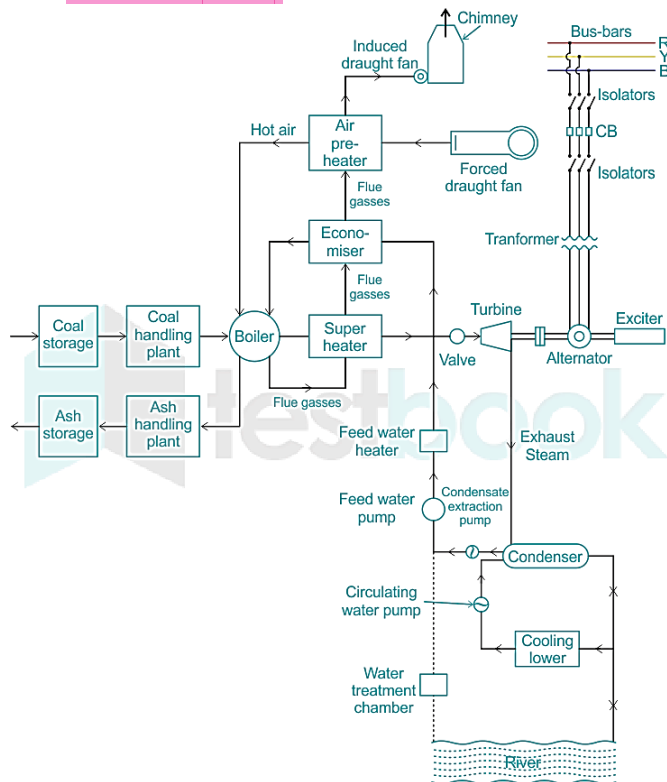

61. The optical instrument used for comparison of candle powers of different sources is called the:

Photometer

62. In a Lancashire boiler, the economiser is located: Before air preheater

63. **In group drive**, a single motor drives a number of machines through belts from a common shaft. It is also called line shaft drive

Application: Several machine tools perform their option by using a single motor in a belt or rope drive.

64. **In multi-motor drives**, separate motors are provided for actuating different parts of the driven mechanism.

Application: Cranes

65. Resistors across breaker contacts may be used
   a) To reduce the rate of rising of re-striking voltage (**RRRV**) and the **peak value of re-striking voltage**.
   b) To reduce the voltage surges due to current chopping and capacitive current breaking.

66. 51% of the incoming energy is absorbed by the earth's surface i.e. the land and oceans.
   30% is directly reflected back into space.
   70% of the sun's energy that is absorbed by the earth's surface, clouds, and atmosphere causes warming.

67. The main advantage of IGBT over SCR is its self-commutating capability i.e. it has a capability of being turned-on or turned-off at will by use of some form of low power (either voltage or current controlled) signal into a third (gate or base) terminal.
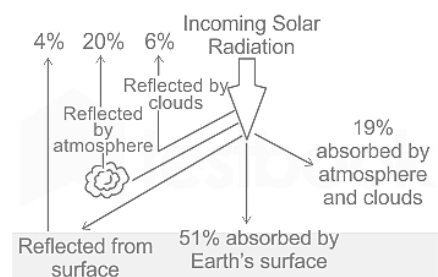
68.
   a) The largest hydroelectric power plant in India is Koyna Hydroelectric Project with a 1,960MW capacity.
   b) A project with a capacity of 130 kW installed at Sidrapong (Darjeeling, West Bengal) in the year 1897 was the first hydropower installation in India.

Hydral Project/Dam	River	State
Srisailam Dam, Nagarjunasagar	Krishna	Andhra Pradesh
Jayakwadi Hydroelectric Project	Godavari	Maharashtra
Nizamsagar Hydroelectric Project, Pochampad Hydroelectric Project	Godavari	Telangana
Penna Ahobilam Hydroelectric Project	Penner	Andhra Pradesh
Mettur Hydroelectric Project	Cauvery	Tamil Nadu

69. Various amplifier descriptions are based on the following factors:

1. As based on its input:

- Small-signal amplifier
- Large-signal amplifier

2. As based on its output:

- Voltage amplifier
- Power amplifier

3. As based on its frequency response:

- Audio-frequency (AF) amplifier
- Intermediate-frequency (IF) amplifier
- Radio-frequency (RF) amplifier

4. As based on its biasing conditions:

- **Class-A**
- **Class-AB**
- **Class-B**
- **Class-C**

5. As based on transistor configuration:

- Common-base (CB) amplifier
- Common-emitter (CE) amplifier
- Common-collector (CC) amplifier

70.

1. The modem is a network hardware device used to convert digital data for transmission in analog telephone lines and do reverse operation. It is not a part of the personal computer.
2. The four factors of production are land, labour, capital, and entrepreneurship.

Direct marketing	• **Direct marketing** is targeted towards a group of prospects and customers rather than a mass audience. • The goal of direct marketing is to generate sales and leads for sales representatives to pursue. • It allows a business to engage in one-way communication with its customers about product announcements, special promotions, bulletins, customer inquiries, and order confirmations.

Indirect marketing	• **When a company distributes its product to its potential customer through multiple channels, it is known as indirect marketing.** • Indirect marketing focuses on gaining the trust of its potential customers. • It is a more value-driven marketing type that focuses on promoting the brand, product, service without being promotional. • *Examples: SEO, content marketing, social media, PR, etc.*

Integrated marketing	• **Integrated marketing** refers to a strategy for delivering a unified, holistic message across all of the marketing channels that the brand uses. • It stresses the importance of a consistent, seamless, multi-dimensional brand experience for the customer. • This means that all branding efforts across TV, radio, print, etc. is presented in a similar manner that reinforces the brand's message.

Niche marketing	• **Niche marketing** is an advertising strategy that focuses on a specialized segment of the market. • It can be defined by its own unique needs, preferences, or identity that makes it different from the market at large. • For example, the market of women's shoes has different segments or niches. • It is a useful strategy for smaller companies that have limited budgets and products that are targeted toward the niche segment.

3. **Different Buses in the PLC are:**

   Data bus: The data bus carries the data used in the processing done by the CPU. A microprocessor termed as being 8-bit has an internal data bus that can handle 8-bit numbers. It can thus perform operations between 8-bit numbers and deliver results as 8-bit values.

   Address Bus: The address bus is used to carry the addresses of memory locations. So that each word can be located in memory, every memory location is given a unique address. Just like houses in a town are each given a distinct address so that they can be located, so each word location is given an address so that data stored at a particular location can be accessed by the CPU, either to read data located there or put, that is, write, data there. It is the address bus that carries the information indicating which address is to be accessed.

   Control Bus: The control bus carries the signals used by the CPU for control, such as to inform memory devices whether they are to receive data from input or output data and to carry timing signals used to synchronize actions.

       System Bus: The system bus is used for communications between the input/output ports and the input/output unit.

4. PLCs are classified into following the main categories based on the number of input and outputs they can handle:

   Nano PLC: PLC that has less than 32 input/output (I/O) functions.

   Micro PLC: PLC that has more than 32 Input/Output (I/O) points but not more than 128 input/output (I/O) functions.

   Small PLC: PLC that has more than 128 Input and Output (I/O) points but not more than 256 I/O functions. It does not include any I/O enhancements fitted along with the basic system.

   Hence according to options, the <mark>*maximum number* of inputs and outputs that are there in a small PLC is 100.</mark>

   Medium and Large PLC: PLC that controls a large number (>256) of discrete elements using very fast input/output (I/O) scan times.

5. There are four different types of SCADA systems from four generations which are following:
   a) Early or Monolithic SCADA Systems (First Generation)
   b) Distributed SCADA Systems (Second Generation)
   c) Networked SCADA Systems (Third Generation)
   d) IoT SCADA Systems (Fourth Generation)

6. **Components of SCADA:**

   A basic SCADA system consists of the following components:

   - Human Machine Interface
   - Supervisory System
   - Remote Terminal Units (RTU)
   - Programmable Logic Controllers (PLCs)
   - Communication Infrastructure
   - SCADA Programming
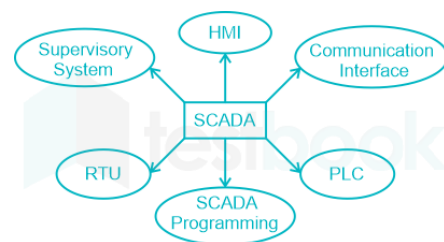
7.

COLORED NOTES

1.

भारत में स्थानान्तरी कृषि:

झूम	उत्तर-पूर्वी भारत
वेवर और दहियार	मध्य प्रदेश
दीपा	मध्य प्रदेश
ज़ारा और एर्का	दक्षिणी राज्य
बत्रा	दक्षिण-पूर्वी राजस्थान
पोडू	आंध्र प्रदेश
कुमारी	केरल के पश्चिमी घाट
कमान	ओडिशा

विश्व में स्थानान्तरी कृषि:

- दक्षिण पूर्व एशिया में लदान।
- मध्य अमेरिका में मिलपा।
- अफ्रीका में चिटेमीन या तावी।
- श्रीलंका में चेना।

• सिंधु घाटी सभ्यता के स्थल:

स्थल	पुरातात्विक खोज
कालीबंगा	जूते हुए खेत, अग्नि वेदियां
धोलावीरा	जल दोहन और जल निकासी व्यवस्था, विशाल जलाशय, स्टेडियम
बनवाली	खिलौना हल
लोथल	डॉकयार्ड, चावल की भूसी, अग्नि वेदियां, द्वैत दफन
हड़प्पा	6 अन्न भंडार, कब्रिस्तान, देवी माँ की मिट्टी की मूर्तियाँ, लिंगम और योनि के पत्थर के प्रतीक
मोहनजोदड़ो	महान स्नानागार, महान अन्न भंडार, प्रोटो शिव मुहर, महिला नर्तकी की एक कांस्य मूर्ति, दाढ़ी वाला आदमी शैलखटी से बना है

2.
3.

Name	Year of Establishment	Purpose
Ramsar Convention	1971	Conservation and sustainable utilization of wetlands
Stockholm Convention	2001	Persistent Organic Pollutants
CITES	1973	To protect endangered plants and animals.
Convention on Biological Diversity	1992	the conservation of biological diversity
Bonn Convention	1979	Convention on the Conservation of Migratory Species of Wild Animals
Montreal Protocol	1987	Phasing out the production of numerous substances that are responsible for ozone depletion.

रासायनिक यौगिक	सामान्य नाम	रासायनिक सूत्र
सोडियम बाइकार्बोनेट	बेकिंग सोडा	$NaHCO_3$
कैल्शियम क्लोरोहिपोक्लोराइट	ब्लीचिंग पाउडर	$Ca(ClO)_2$
सोडियम हाइड्रॉक्साइड	कास्टिक सोडा	$NaOH$
सोडियम कार्बोनेट	धावन सोडा	$Na_2CO_3 . 10 H_2O$
कार्बन डाइआक्साइड	सूखी बर्फ	CO_2
कॉपर सल्फेट	नीला विट्रियल	$CuSO_4$
फेरस सल्फेट	हरा विट्रियल	$FeSO_4$
सल्फ्यूरिक एसिड	विट्रियल का तेल	H_2SO_4
कैल्शियम सल्फेट हेमीहाइड्रेट	प्लास्टर ऑफ पेरिस	$(CaSO_4 . 1/2H_2O$
कैल्शियम सल्फेट डाइहाइड्रेट	जिप्सम	$CaSO_4 . 2H_2O$
कैल्शियम हाइड्रॉक्साइड	कास्टिक चूना	$Ca(OH)_2$
चिली साल्टपीटर	सोडियम नाइट्रेट	$NaNO_3$
शोरा	पोटेशियम नाइट्रेट	KNO_3
मुरिएटिक एसिड	हाइड्रोक्लोरिक एसिड	HCl

4.