



DMRC Electrical Engineering Paper-1 2014

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DMRC Electrical Engineering Paper-1 2014

Instructions

For the following questions answer them individually

Question 1

Who became the first Indian to win three medals in successive ISSF shooting world cup held recently?

- A Abhinav Bindra
- B Gagan Narang
- C Jitu Rai
- D Vijay Kumar

Answer: C

Question 2

Recently, the plan to build the world most powerful and largest telescope 'ATLAST' to analyse the environment of other planets and to track the existence of aliens life, was unveiled. This is planned by:

- A FKA & RKA
- B ESA
- C ISRO
- D NASA

Answer: D

Question 3

Who bagged the FIDE World Rapid Chess Championship title recently held in Dubai?

- A Fabiani Caruana
- B Vishwanathan Anand
- C Magnus Carlsen
- D Vladimir Kramnik

Answer: C

Question 4

Who won the world food prize for the year 2014?

- A Dr. Sanjaya Rajaram
- B Dr. Aditi Mukherji
- C Dr. Charity Kawira Mutegi
- D Dr. Norman Borlaug

Answer: A

Question 5

India's first 'one stop crisis centre' for women who are victims of violence named 'Gauravi' was launched recently by in

- A Film Actor Amir Khan, Bhopal
- B Film Actor Shahrukh Khan, Mumbai
- C Film Actor Amitabh Bachhan, Allhabad
- D Film Actor Hema Malini, Agra

Answer: A

Question 6

The world first electric plane named E-Fan first flight was carried successfully recently in:

- A U.S.A
- B U.K
- C Germany
- D France

Answer: D

Question 7

Which one of the following plants yield bio diesel or bio fuels?

- A Hevea brasiliensis
- B Jatropha Curcas
- C Juniperus Verginiana
- D Parthenium orgenatum

Answer: B

Question 8

'The Argumentative Indian' is a book written by

- A Amartya Sen
- B Chetan Bhagat
- C Vikram Seth
- D Arundhati Roy

Answer: A

Question 9

Nanda Devi Biosphere Reserve is located in which Indian state?

- A Arunachal Pradesh

- B Assam
- C Manipur
- D Uttarakhand

Answer: D

Question 10

Which of the following is wrongly matched:

- A Hirakud - Mahanadi
- B Pochampad - Godavari
- C Nagarjun Sagar - Cauvery
- D Bhakra Nagal - Sutlej

Answer: C

Question 11

Who has recently won 2014 Pulitzer prize in the poetry category:

- A Gobind Beharilal
- B Jhumpa Lahiri
- C Vijay Seshadri
- D Siddharath Mukherjee

Answer: C

Question 12

Clean water would have BOD value of less than:

- A 5 ppm
- B 10 ppm
- C 25 ppm
- D 50 ppm

Answer: A

Question 13

Identify the Shakespearean play in which we have a death by poisoning:

- A As You Like it
- B Hamlet
- C The Merchant of Venice
- D None of these

Answer: B

Question 14

Who will have its leader elected as leader of opposition and given the status & facilities to the rank of cabinet ministers?

- A The opposition party with the largest number of MPs
- B The opposition party with the largest number of MPs and whose number is at least $\frac{1}{10}$ of the total house
- C The opposition party with the largest number of MPs and whose number is at least $\frac{1}{5}$ of the total house
- D None of the above is correct

Answer: B

Question 15

Which one of the following is most likely to occur if the Reserve bank of India lowers the Cash Reserve Ratio?

- A An Increase in aggregate savings
- B A rise in Budget Deficit
- C A rise in aggregate money supply
- D A rise in the use of credit cards

Answer: C

Question 16

The Reports of the comptroller and auditor General of India relating to the accounts of the Union shall be submitted to:

- A The President of India
- B The Prime minister of India
- C The Speaker of the Lok Sabha
- D The Finance Minister of India

Answer: A

Question 17

One star is going away from the Earth. Then the observer on the Earth will experience:

- A Decrease in wave length
- B Increase in wave length
- C No change in wave length
- D None of these

Answer: B

Question 18

Which one of the following seismic wave is the fastest?

- A P Wave

B S Wave

C L Wave

D R Wave

Answer: A

Question 19

Who among the British Generals defeated Peshwa Baji Rao II:

A Autram

B Malcom

C Elphinstone

D Kitchner

Answer: B

Question 20

Which one is not written by Munshi Prem Chand:

A Rangbhoomi

B Prem Pachisi

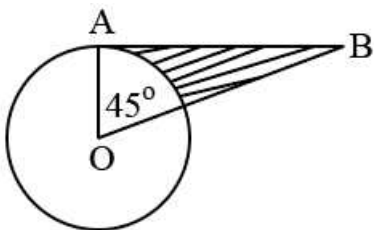
C Vishkanya

D Kayakalp

Answer: C

Question 21

A B is a tangent to the circle. The radius of the circle is 2 cm. Then the area of the shaded portion is:



A $2 - \frac{\pi}{2}$

B $\frac{\pi}{2} - 2$

C $4 - \frac{\pi}{2}$

D None of these

Answer: A

Question 22

Two cylinders have the same volume. The heights are in the ratio of 1 : 2, then the ratio of the radii will be:

A 2 : 1

- B 1 : 2
- C $1 : \sqrt{2}$
- D $\sqrt{2} : 1$

Answer: D

Question 23

If the a^{th} part of 49 is 7 and b^{th} part of 63 is 9 and c^{th} part of 112 is 16. Then which of the following is true:

- A $abc = \frac{1}{7}$
- B $abc = a^3$
- C $abc = \frac{1}{49}$
- D None of these

Answer: C

Question 24

$x\%$ of x is the same as 10% of:

- A $\frac{x^2}{10}$
- B $\frac{x}{10}$
- C $\frac{x^3}{10}$
- D None of these

Answer: A

Question 25

P Q R S T are five boys. Given that P is taller than Q, R is shorter than P, S is taller than T but shorter than Q, the tallest boy is:

- A P
- B Q
- C R
- D None of these

Answer: A

Question 26

Five persons are standing in a queue. One of the two person at the extreme end is a professor and the other is a businessman. An advocate is standing to the right of the student. An author is to the left of the businessman. The student is standing between the professor and the advocate. Counting from the left the author is at which place:

- A 1st
- B 2nd

C 3rd

D 4th

Answer: D

Question 27

P is standing to the east of Q at a distance of 4 km. P stands still while Q goes north for 4 km. In which direction must Q now look to see P:

A East

B South East

C South

D South West

Answer: B

Question 28

If AM = 3, ARE = 4, and NEVER = 8, then "INDIA IS A GREAT NATIN" =:

A 32

B 29

C 28

D None of these

Answer: C

Question 29

Complete the following series.

A Z B Z _ A B A _ A _ B _ B A

A A Z B Z

B B Z A Z

C B Z Z Z

D Z A Z Z

Answer: C

Question 30

If one side and one diagonal of a rhombus are 5 cm and 8 cm respectively, then its area (in cm^2) is:

A 22

B 20

C 24

D 25

Answer: C

Question 31

One acute angle of a right angled triangle is double the other. If the length of its hypotenuse is 10 cm, then its area is :

- A $\frac{75}{2} \text{ cm}^2$
- B 25 cm^2
- C $\frac{75}{2} \sqrt{3} \text{ cm}^2$
- D None of these

Answer: C

Question 32

The average age of the boys in class of 30 boys is 14.5 years. What will be the average age if 10 new boys come whose average is 15.2 years, and joins them?

- A 15.5 years
- B 14.68 years
- C 16.25 years
- D None of these

Answer: B

Question 33

In a certain code language "PROPORTION" is written as "PORPRNOIT". How is "CONVERSION" written in that code language?

- A VNOCERONIS
- B VNCORENOIS
- C VNOCRENOIS
- D VNOCREIONS

Answer: C

Question 34

Three men or eight boys can do a piece of work in 17 days. How many days will two men and six boys together take to finish the same work?

- A 11 days
- B 17 days
- C 12 days
- D None of these

Answer: C

Question 35

Twelve solid spheres of the same size are made by melting a solid metallic cylinder of base diameter 2 cm and height 16 cm. The diameter of each sphere is :

- A 2 cm
- B 3 cm
- C 4 cm
- D 6 cm

Answer: A

Question 36

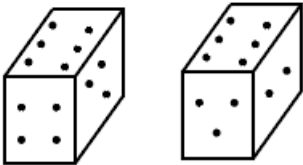
There are some girls and buffalos at a place. If total number of heads is 15 and total number of legs is 46, then how many girls and how many buffalos are there?

- A 8 girls and 7 buffalos
- B 9 girls and 6 buffalos
- C 7 girls and 8 buffalos
- D 6 girls and 9 buffalos

Answer: C

Question 37

Given two positions of the dice as being.



When 2 is at the bottom which number is at the top:

- A 5
- B 4
- C 1
- D 6

Answer: B

Question 38

Simplify : $2^{65} \times 2^{70} - 2^{97} \times 2^{38}$

- A 1
- B 0
- C -1
- D None of these

Answer: B

Question 39

The average of 5 consecutive numbers A, B, C, D and E is 48. What is the product of A and D?

- A 2300
- B 2204
- C 2208
- D 2254

Answer: D

Question 40

Among five friends - Brijesh, Feroz, Jai, Kamal and Vinod each having a different weight. Feroz is heavier than only Jai. Brijesh is heavier than Feroz and Vinod but not as heavy as Kamal. Who is the third heaviest among them?

- A Kamal
- B Brijesh
- C Vinod
- D Data inadequate

Answer: C

Question 41

Select the suitable alternative to complete the series.
2401, 49, 7; ..., 36, 6:

- A 1296
- B 216
- C 7778
- D 1378

Answer: A

Instructions

In a certain code language -

- i. 'Cod dex nom' stands for 'banana is sweet'
- ii. 'Zip dex nux' stands for 'apple is good'
- iii. 'Cod nux elp' stands for 'banana and apple' and
- iv. 'pa reb nom' stands for 'oranges are sweet'.

Question 42

Which word in that language stands for 'apple'.

- A Elp
- B Nux
- C Zip
- D None of these

Answer: B

Question 43

What does 'Zip' stand for?

- A Apple
- B And
- C Good
- D None of these

Answer: C

Instructions

For the following questions answer them individually

Question 44

How many times from 4 AM to 4 PM the hands of clock are at right angles?

- A 24
- B 20
- C 22
- D 18

Answer: C

Question 45

If in a certain code language 'BALE' is written as '+ ÷ & x' and 'SKIP' is written as How is 'LIFE' written in that code?

- A @ + ÷ √
- B √ % T &
- C \$\$ \times \& \% \$\$\$
- D @ & × +

Answer: C

TECHNICAL (APTITUDE)

Instructions

For the following questions answer them individually

Question 46

In a three-phase induction motor, the rotor field runs at the following speed with respect to the stator structure:

- A At synchronous speed in the direction of stator field
- B At a slip speed in the direction of stator speed
- C At synchronous speed in a direction opposite to that of stator field

D At zero speed

Answer: A

Question 47

V/f is maintained constant in the following case of speed control of induction motor:

A Below base speed with voltage control

B Below base speed with frequency control

C Above base speed with frequency control

D None of these

Answer: B

Question 48

In a double-cage induction motor, which of the following is not true:

A Resistance of outer bar is less

B Leakage inductance of outer cage is less

C Outer bar has smaller cross section

D None of these

Answer: A

Question 49

The voltage regulation of a transformer at full load 0.9 p.f. lagging is 5%. For a full load at 0.9 p.f. leading, it will :

A Remain the same

B Become negative

C Reduce and may even become negative

D Increase

Answer: C

Question 50

For which of the following pair of machines, the stator and its winding can be of the same type:

A Universal motor and stepper motor

B D.C. motor and hysteresis motor

C Hysteresis motor and reluctance motor

D Induction motor and D.C. motor

Answer: C

Question 51

In which of the following amplifier configurations, the power gain is the largest?

- A Common-Emitter
- B Common - Collector
- C Common - Base
- D None of these

Answer: A

Question 52

Transformer core is laminated in order to:

- A Decrease copper losses
- B Decrease entire core losses
- C Decrease only eddy current losses
- D Decrease only hysteresis losses

Answer: C

Question 53

For increasing the range of voltmeter, one should connect a:

- A High value resistance in series with voltmeter
- B Low value resistance in series with voltmeter
- C High value resistance in parallel with voltmeter.
- D Low value resistance in parallel with voltmeter.

Answer: A

Question 54

To conduct Sumpners test on a transformer:

- A Only one transformer is sufficient
- B Two identical transformers are needed
- C Two un-identical transformers are needed
- D At least three transformers are necessary

Answer: B

Question 55

Unit of reactive power is:

- A Watt
- B Kilo Watt
- C Var

D Volt ampere

Answer: C

Question 56

Synchronous Generator is a source of:

A Real Power

B Reactive power

C Apparent power

D Both real and reactive power

Answer: B

Question 57

In an induction motor, if the air gap is increased;

A Speed will reduce

B Efficiency will improve

C Power factor will be lowered

D Breakdown torque will reduce

Answer: C

Question 58

A DC shunt motor is running at 1200 rpm, when excited with 220V dc. Neglecting the losses and saturation, the speed of the motor when connected to a 175 V supply is:

A 70 rpm

B 900 rpm

C 1050 rpm

D None of these

Answer: D

Question 59

The function of oil in a transformer is to provide:

A Insulation and cooling

B Protection against lightning

C Protection against short circuit

D Lubrication

Answer: A

Question 60

The ratio of starting torque to running torque in a synchronous motor is:

- A Zero
- B One
- C Two
- D Infinity

Answer: A

Question 61

A Q-meter measures:

- A Loss in a capacitor
- B Frequency
- C Accurate value of electrical quantity
- D Properties of the coils

Answer: D

Question 62

The hysteresis Motor:

- A Has a D.C. winding on the rotor
- B Rotor is made out of hard magnetic material
- C Has squirrel-cage winding on the rotor
- D Is not-self starting

Answer: B

Question 63

Counterpoise is used for:

- A Transformer earthing
- B Reducing transmission tower footing resistance
- C Generator earthing
- D Motor earthing

Answer: B

Question 64

A single-phase ac regulator is used to convert:

- A Fixed ac voltage to variable magnitude ac voltage of same frequency
- B Fixed ac voltage to variable frequency ac voltage of same magnitude
- C Fixed ac voltage to variable frequency ac voltage through dc link

D Fixed ac voltage to variable magnitude variable frequency ac voltage

Answer: A

Question 65

In a 3-phase voltage source inverter used for speed control of induction motor, anti-parallel diodes are used across each switching device. The main purpose of diodes is to:

- A Protect the switching device against over voltage
- B Provide path for freewheeling current
- C Allow the motor to return energy during regeneration
- D Help in switching off the devices.

Answer: C

Question 66

The pressure coil of a wattmeter consists of:

- A More number of turns of fine wire
- B Less number of turns of fine wire
- C Less number of turns of thick wire.
- D More number of turns of thick wire.

Answer: A

Question 67

Electrostatic instruments are suitable for the measurement of:

- A ac and dc voltages
- B ac voltage and current
- C dc voltage and current
- D ac and dc currents

Answer: A

Question 68

Schering bridge is used to measure.

- A Dielectric loss
- B The inductance
- C Low resistance
- D Mutual inductance

Answer: A

Question 69

The ratio error in current transformer is due to:

- A Power factor of primary.
- B Wattless component of the current in the primary.
- C Exciting current
- D Leakage flux.

Answer: C

Question 70

The major cause for creeping in energymeter is:

- A Over compensation for friction
- B Vibrations
- C Stray magnetic fields
- D Excessive voltage across the potential coil.

Answer: A

Question 71

A 3-phase synchronous motor, connected to infinite bus, is operating at no load at normal excitation. The field excitation of the motor is first decreased to zero and then increased in the reverse direction. The armature current of the synchronous motor will:

- A Remain constant.
- B First decrease and then increase
- C Increase continuously.
- D First increase and then decrease.

Answer: C

Question 72

If a resistance is inserted in the rotor circuit of a slip ring induction motor, then compared to direct line starting:

- A Both the starting current and torque reduce
- B Both the starting current and torque increase
- C The starting current reduces but starting torque increases
- D The starting current reduces but starting torque remains same.

Answer: C

Question 73

Starting torque can be obtained in the case of a single phase induction motor with identical main and auxiliary windings by connecting:

- A A capacitor across the mains
- B A capacitor in series with the machine

- C A capacitor in series with the auxiliary winding
- D Equal value capacitors in series with the main and the auxiliary windings

Answer: C

Question 74

Armature shunting method of speed control of dc shunt motor is preferred over armature resistance method due to:

- A Better speed regulation
- B Less loss in external resistance
- C Simplicity in control circuit
- D Reduced cost of controller

Answer: A

Question 75

Distribution transformers have core losses;

- A More than full load copper losses
- B Equal to full load copper losses
- C Less than full load copper losses
- D Negligible compared to full load copper losses

Answer: C

Question 76

Hollow conductors are used in the transmission lines to:

- A Improve heat dissipation
- B Reduce corona loss
- C Reduce skin effect
- D Reduce the line inductance

Answer: B

Question 77

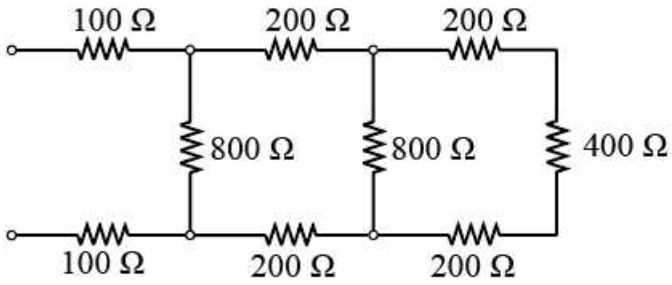
In a junction transistor, the doping level of collector region is:

- A Higher than emitter region
- B Lower than base region
- C Is higher base region but lower than emitter region
- D Independent of the doping of base and emitter regions.

Answer: C

Question 78

The equivalent resistance of the circuit is:



- A 200 Ω
- B 400 Ω
- C 600 Ω
- D 1600 Ω

Answer: C

Question 79

The purpose of a coupling capacitor in an amplifier is to :

- A Control the output
- B Provide impedance matching
- C Provide DC isolation between amplifier and load
- D Increase the bandwidth

Answer: C

Question 80

A circuit requires a capacitor of $100\mu f$, 25V. The capacitor can be:

- A Paper capacitor
- B Electrolytic capacitor
- C Ceramic capacitor
- D Any type of capacitor

Answer: B

Question 81

A static memory stores its data in:

- A Flip-flops
- B Inductors
- C Capacitors
- D Resistors

Answer: A

Question 82

Which of the statements about the force between two charge is true?

- A Unlike charges repel each other
- B Like charges attract each other
- C No force exists between two unlike charges
- D A force of repulsion exists between two like charges

Answer: D

Question 83

With the increase in the cross sectional area of the conductor, the value of resistance:

- A Increase
- B Remain same
- C Decrease
- D None of these

Answer: C

Question 84

With the increase in the temperature the resistance of copper:

- A Increase
- B Become zero
- C Remain constant
- D Decrease

Answer: D

Question 85

The unit of electric energy is:

- A Watt
- B Kilo-watt
- C Kilo-watt-hour
- D Joule

Answer: C

Question 86

In Series LCR circuit, at resonance:

- A Current is maximum and power factor is zero
- B Current is maximum and power factor is unity
- C Current is minimum and power factor is unity
- D None of these

Answer: B

Question 87

To neglect a current source, the terminal across the sources are:

- A Open-circuited
- B Short-circuited
- C Replaced by some resistance
- D Replaced by capacitance

Answer: A

Question 88

The generator which gives dc supply to the rotor is called:

- A Converter
- B Exciter
- C Inverter
- D Rectifier

Answer: B

Question 89

The deflection torque can be produced by:

- A Gravity control
- B Spring control
- C Air friction
- D Magnetically

Answer: D

Question 90

Carbon brushes are used in electric motors to:

- A Brush off carbon deposit on the commutator
- B Provide a path for flow of current
- C Prevent overheating of armature windings

D Prevent sparking during commutation

Answer: B

Question 91

LVDT is a:

A Displacement transducer

B Velocity transducer

C Acceleration transducer

D Pressure transducer

Answer: A

Question 92

Base impedance of the power system is given by:

A $\frac{(BaseKV)^2 \times 1000}{BaseKVA}$

B $\frac{(BaseKVA)^2 \times 1000}{BaseKV}$

C $\frac{(BaseKVA)^2}{BaseKV}$

D None of these

Answer: A

Question 93

The process of converting a.c. into d.c. is called:

A Amplification

B Modulation

C Rectification

D Factorization

Answer: C

Question 94

One advantage of transformer coupling in transistor amplifier is that:

A It provides excellent frequency response

B It is simple and less expensive than others

C Low power supply may be used

D High efficiency and high power output is obtained

Answer: D

Question 95

A single binary digit is called:

- A Byte
- B Bit
- C Data
- D Logic

Answer: B

Question 96

Kelvin is the SI unit of:

- A Time
- B Current
- C Temperature
- D Light intensity

Answer: C

Question 97

Which of the following is a vector quantity:

- A Volume
- B Speed
- C Density
- D Acceleration

Answer: D

Question 98

According to Ohm's law:

- A The voltage is constant to current
- B The voltage is proportional to current
- C Voltage is inversely proportional to current
- D The voltage is proportional to resistance

Answer: B

Question 99

The unit of reluctance is :

- A Ampere-turn
- B Ampere-turn/meter

- C Ampere-turn/weber
- D It is dimensionless

Answer: C

Question 100

The minus sign in the expression, $e = -\frac{Nd\phi}{dt}$ is due to:

- A Fleming's rule
- B Thumb's rule
- C Faraday's law
- D Lenz's law

Answer: D

Question 101

When X_L is equal to X_C then:

- A $Z = R$
- B $Z = X_c$
- C $Z = X_L$
- D None of these

Answer: E

Question 102

The following statements associated with Buchholtz relays is not true.

- A It is a gas actuated device
- B It is a current operative device
- C It is placed between the transformer tank and the conservator
- D It causes alarm for minor fault and tripping for major fault

Answer: B

Question 103

Electrical fault between two windings of same phase of a generator having double star winding can be detected by the following protection in a generator:

- A Short circuit protection
- B Earth fault protection
- C Inter turn Fault protection
- D Over voltage protection

Answer: C

Question 104

Induction generator is stable at a:

- A Speed below synchronous speed
- B Speed above synchronous speed
- C Speed equal to synchronous speed
- D None of these

Answer: B

Question 105

Corona loss is less when the shape of conductor is :

- A Circular
- B Flat
- C Oval
- D Independent of shape

Answer: A

Question 106

Which of the following combination of 3 - phase transformers can be successfully operated in parallel:

- A $\Delta - Y$ and $\Delta - Y$
- B $Y - Y$ and $\Delta - Y$
- C $\Delta - \Delta$ and $\Delta - Y$
- D $Y - \Delta$ and $\Delta - \Delta$

Answer: A

Question 107

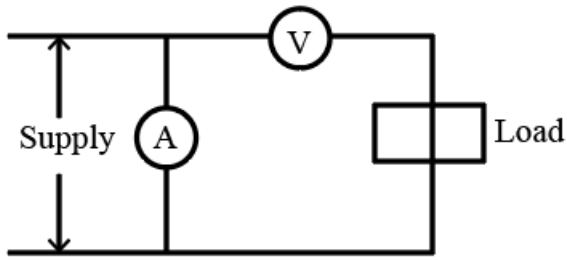
For very low speed and high power applications, the best suited ac motor is :

- A Slip-ring induction motor
- B Squirrel cage induction motor
- C AC commutator motor
- D Synchronous motor

Answer: D

Question 108

By mistake voltmeter and Ammeter are connected as shown in the figure below:



- A Only voltmeter will burn away
- B Only ammeter will burn away
- C Both voltmeter and ammeter will burn away
- D None will burn away

Answer: B

Question 109

A 100 turn coil has inductance of 6 mH. If the number of turns is increased to 200, all other quantities remaining the same, the inductance will be:

- A 24 mH
- B 12 mH
- C 3 mH
- D None of these

Answer: A

Question 110

A light emitting diode (L.E.D.) can be made from:

- A Phosphorescent material
- B Germanium
- C Silicon
- D Gallium arsenid

Answer: D

Question 111

A radio transmitter is an equipment:

- A For receiving R.F. signals
- B For generating modulated radio frequency waves
- C For amplifying R.F. signals
- D For generating carrier waves

Answer: B

Question 112

Negative feed back :

- A Increases the gain of amplifier
- B Decreases the gain of amplifier
- C Increase the gain and band width of the amplifier
- D Decreases the gain and increases the band width of the amplifier

Answer: D

Question 113

Three phase step-up transformer installed at power house, just before commencement of transmission line, have:

- A DELTA-DELTA connection
- B STAR-STAR connections
- C STAR-DELTA connections
- D DELTA-STAR connections

Answer: C

Question 114

When biased correctly, a zener diode:

- A Acts as a fixed resistance
- B Has a constant voltage across it
- C Has a constant current passing through it
- D Never overheats

Answer: B

Question 115

Induced draft fans are located at:

- A The top
- B The bottom
- C In the middle part
- D Can be anywhere, in the cooling tower

Answer: A

Question 116

In a thyristor, the magnitude of anode current will:

- A Increase if gate current is increased
- B Decrease if gate current is decreased
- C Increase if gate current is decreased
- D Not change with any variation in gate current

Answer: D

Question 117

Brass is an alloy of :

- A Copper and Zinc
- B Lead and Zinc
- C Zinc and Tin
- D Tin and Lead

Answer: A

Question 118

When cells are arranged in parallel:

- A Current capacity increases
- B Current capacity decreases
- C The e.m.f. increases
- D The e.m.f. decreases

Answer: A

Question 119

A capacitor opposes:

- A Change in current
- B Change in voltage
- C Both change in current and voltage
- D None of these

Answer: B

Question 120

AC supply system compared to DC supply system has the advantage:

- A Power factor
- B Reactive elements
- C Voltage drop

D Low cost of switching

Answer: D

