



SSC JE Electrical Engineering 2012

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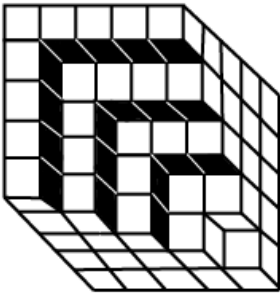
General Intelligence and Reasoning

Instructions

For the following questions answer them individually

Question 1

How many white cubes are there in the given structure?

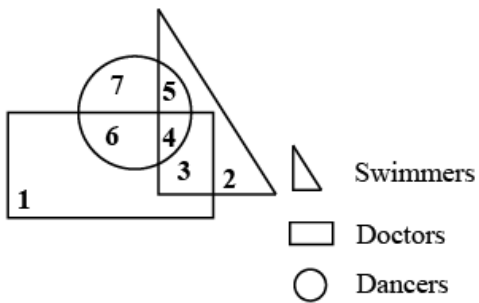


- A 40
- B 65
- C 16
- D 24

Answer: A

Question 2

In the following Venn diagram, identify the number which denotes Doctors who know both Swimming and Dancing.



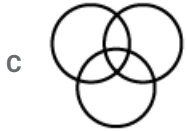
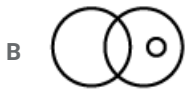
- A 6
- B 5
- C 3
- D 4

Answer: D

Question 3

Which one of the following diagrams best depicts the relationship among College Graduates, Professional Athletes and Great Scientists?





Answer: C

Instructions

Two statements are given followed by two conclusions I and II. You have to consider the statements to be true even if they seem to be at variance from commonly known facts. You are to decide which of the given conclusions, if any, follow from the given statements.

Question 4

Statements:

Mind is a stream of thoughts.

Mind is working all the time.

Conclusions:

I: If there is no thought, there is no mind.

II: Thoughtless people will not succeed.

- A Neither conclusions I nor II follows.
- B Both conclusion I and II follow.
- C Only conclusion I follows.
- D Only conclusion II follows.

Answer: A

Question 5

Statements:

Teachers should have empathy.

Students need empathetic approach from their teachers.

Conclusions:

I: Persons without empathy cannot become good teachers.

II: Good teachers understand the problems of their students.

- A Neither conclusion I nor II follows.
- B Both conclusion I and II follow.
- C Only conclusion I follows.
- D Only conclusion II follows.

Answer: C

Instructions

For the following questions answer them individually

Question 6

Which answer figure will complete the pattern in the question figure?

Question Figure:

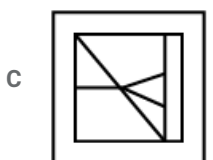
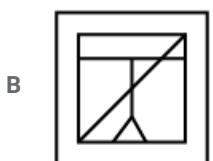
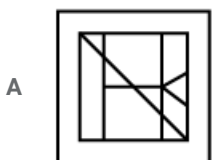
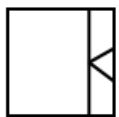


Answer: B

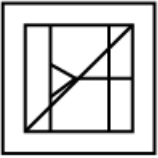
Question 7

Select the answer figure in which the question figure is hidden/embedded.

Question Figure:



D



Answer: A

Question 8

A piece of paper is folded and punched as shown below in the question figures. From the given answer figures, indicate how it will appear when opened?

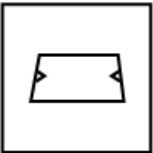
Question Figure:



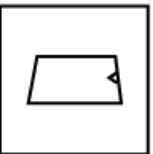
A



B



C



D

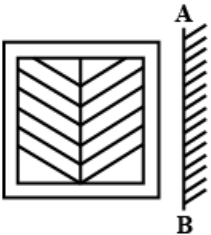


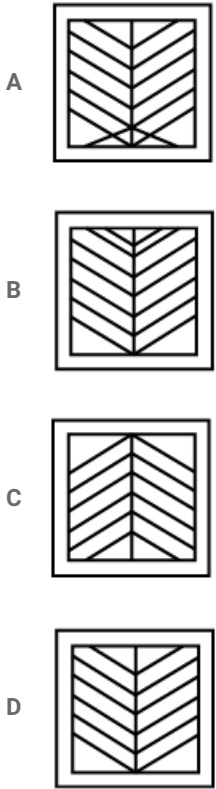
Answer: A

Question 9

Which of the answer figure is exactly the mirror image of the given figure, when the mirror is held on the line AB?

Question Figure:





Answer: D

Question 10

A word is represented by only one set of numbers as given in any one of the alternatives. The sets of numbers given in the alternatives are represented by two classes of alphabets as in two matrices given below. The columns and rows of matrix I and II are numbered from 0 to 4. A letter from these matrices can be represented first by its row and next by its column, e.g., 'A' can be represented by 24, 31 etc. and 'P' can be represented by 11, 32, etc. Identify the set for the letters AELO.

Matrix I

	0	1	2	3	4
0	A	E	C	B	D
1	C	D	A	E	B
2	B	E	D	C	A
3	D	A	C	B	E
4	B	E	D	A	C

Matrix II

	5	6	7	8	9
5	L	M	O	N	P
6	N	P	L	M	O
7	P	M	O	L	N
8	L	N	P	M	O
9	O	N	L	P	M

- A 31, 00, 23, 22
- B 43, 01, 12, 42
- C 12, 34, 30, 02
- D 12, 30, 42, 14

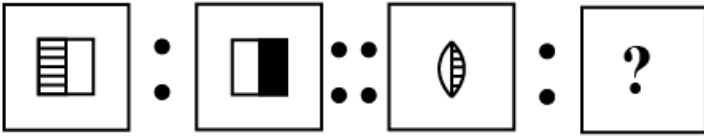
Answer: C

Instructions

Select the related word/letter /number/figure from the given alternatives.

Question 11

Question Figures:



A



B



C



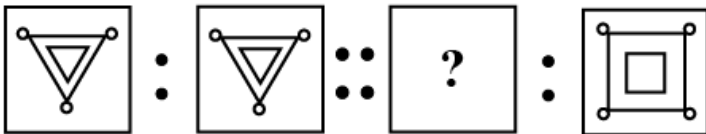
D



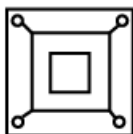
Answer: B

Question 12

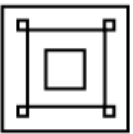
Question Figure:



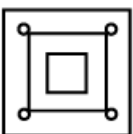
A



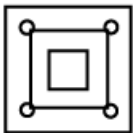
B



C



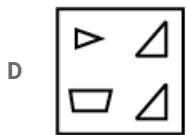
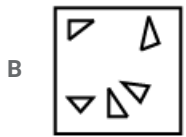
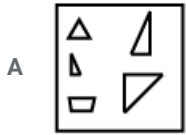
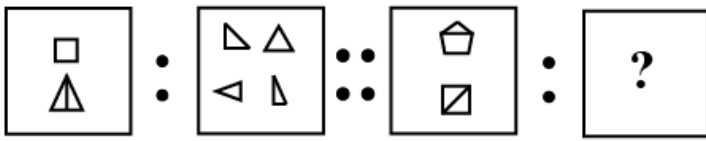
D



Answer: C

Question 13

Question Figures:



Answer: D

Question 14

? : JHKI :: TRUS : OMPN

A GEHF

B GEFH

C LOMP

D QMPN

Answer: A

Question 15

AEJO : ZVQL :: DINS : ?

A WRMH

B WSOJ

C WRNJ

D WSNI

Answer: A

Question 16

IRTH : HQSG :: ? : RQPO

- A QPON
- B PQRO
- C OPQR
- D SRQP

Answer: D

Question 17

16 : 64 :: 25 : ?

- A 83
- B 125
- C 55
- D 110

Answer: B

Question 18

5 : 15 :: 40 : ?

- A 60
- B 45
- C 120
- D 55

Answer: C

Question 19



- A 81
- B 196
- C 169
- D 324

Answer: B

Instructions

Select the one which is different from the other three responses.

Question 20

- A Aluminium
- B Tungsten
- C Copper
- D Diamond

Answer: D

Question 21

- A Customer
- B Hawker
- C Broker
- D Salesman

Answer: A

Question 22

- A Weaver
- B Spinner
- C Engineer
- D Potter

Answer: C

Question 23

- A Champaka
- B Hibiscus
- C Rose
- D Jasmine

Answer: B

Question 24

- A Cholera
- B Jaundice
- C AIDS
- D Typhoid

Answer: C

Question 25

- A RQFJ

B ODHR

C SRBH

D RHSN

Answer: A

Question 26

A 114 57 28

B 120 60 30

C 144 72 36

D 124 62 31

Answer: A

Question 27

A 8987

B 6354

C 7832

D 2398

Answer: B

Question 28

A 49 - 7

B 36 - 6

C 64 - 8

D 80 - 9

Answer: D

Instructions

For the following questions answer them individually

Question 29

Arrange the given words in the order in which they occur in the dictionary and find the last but one word:

A Faubourg

B Fatiscent

C Fauxbourdon

D Favonian

Answer: C

Question 30

Arrange the following words in the order in which they occur in the dictionary. Which will appear fourth in the dictionary ?

- A Nucleosynthesis
- B Nucleoprotein
- C Nucleonic
- D Nuclearize

Answer: A

Question 31

Arrange the following words in the order in which they occur in the Dictionary :

1. Interview
2. Inventory
3. Invention
4. Interval
5. Investment

- A 3, 5, 4, 1, 2
- B 2, 3, 5, 4, 1
- C 2, 5, 3, 1, 4
- D 4, 1, 3, 2, 5

Answer: D

Instructions

Choose the correct alternative from the given responses that will complete the series:

Question 32

xy, wy, xy, ut, xy, ?

- A xy
- B rs
- C yx
- D sr

Answer: D

Question 33

PQR, HIJ, DEF, ?

- A ABC
- B BCD
- C DEF
- D CDE

Answer: B

Question 34

NDB, LED, JGG, ?

- A LNP
- B HED
- C HJJ
- D HJI

Answer: C

Question 35

18, 54, 162, 486, 1458, ?

- A 39366
- B 4374
- C 2187
- D 13122

Answer: B

Question 36

20, 30, 42, 56, 72, ?

- A 87
- B 95
- C 85
- D 90

Answer: D

Instructions

For the following questions answer them individually

Question 37

Find the wrong number in the given series:

7, 15, 32, 65, 138

- A 65
- B 138
- C 7
- D 15

Answer: A

Question 38

A party consisted of a man, his wife, his three sons and their wives and three children in each son's family. How many were there in the party ?

- A 17

B 24

C 22

D 13

Answer: A

Question 39

₹ 6,500 were divided equally among a certain number of persons. Had there been 15 more persons, each would have got ₹ 30 less. Find the original number of persons.

A 50

B 55

C 40

D 45

Answer: A

Question 40

From the following alternatives, select the word which cannot be formed using the letters of the given word :
UNIVERSITY

A NEVER

B REST

C INVERT

D UNITE

Answer: A

Question 41

In a certain code MEN is written as MIN and WOMEN is written as WUMIN, then how will CHILD be written in the same code?

A CHOLD

B CHULD

C CHELD

D CHALD

Answer: A

Question 42

If Y = 2, PEN = 11 - 22 - 13, then 10 - 6 - 18 - 24 - 16 = ?

A QUICK

B QUITE

C JFRXP

D QUACK

Answer: A

Question 43

Find out the number which belongs to the given group of number from the four alternatives.
5, 25, 90, 35, 60

A 21

B 83

C 15

D 24

Answer: C

Question 44

If + stands for division

– stands for equal to

× stands for addition

÷ stands for greater than

= stands for less than

> stands for multiplication

< stands for subtraction

then of the given alternatives which one is correct?

A $5 \times 3 < 7 \div 8 + 4 < 2$

B $5 + 3 > 7 - 8 \times 4 + 2$

C $5 > 3 \times 7 = 8 > 4 + 2$

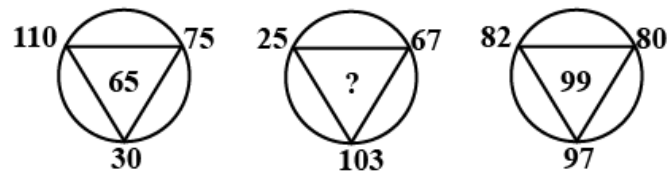
D $5 < 8 > 7 - 8 > 4 + 2$

Answer: A

Instructions

Select the missing number from the given responses.

Question 45



A 120

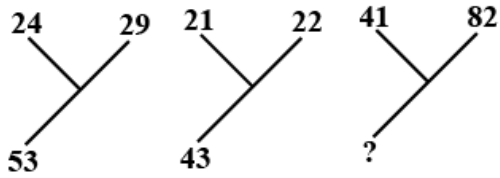
B 195

C 61

D 89

Answer: C

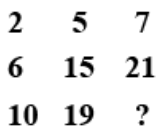
Question 46



- A 33
- B 123
- C 121
- D 63

Answer: B

Question 47



- A 28
- B 52
- C 29
- D 25

Answer: B

Instructions

For the following questions answer them individually

Question 48

Going 60 metres to the South of his house, Kiran turns left and goes another 20 metres then turning to the North, he goes 40 metres and then starts walking to his house. In which direction is his house. In which direction is his house from there ?

- A East
- B North West
- C North
- D South East

Answer: B

Question 49

Ram started walking towards East. After 1 km, he turned South and walked 5 km. Again he turned East and walked 2 km. Finally, he turns to the North and walked 9 km. How far is he from the starting point ?

- A 5 km
- B 7 km

C 3 km

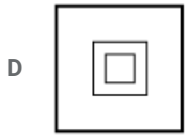
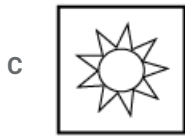
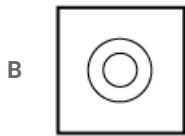
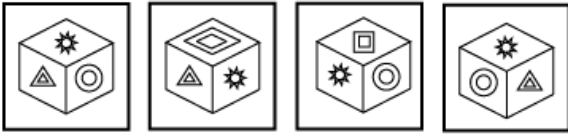
D 4 km

Answer: A

Question 50

Four positions of a cube are shown below. If symbol Sun is at the top, what symbol will be at the bottom ?

Question Figures:



Answer: C

General Awareness

Instructions

For the following questions answer them individually

Question 51

'Liver rot' is caused by

A Typhlops

B Trypanosoma

C Fasciola

D Taenia

Answer: C

Question 52

"Proconvertin" is an example of

- A Plasma protein
- B Proteolipid
- C Lipoprotein
- D Glycoprotein

Answer: A

Question 53

If the filament current of a coolidge tube is increased, X-rays emitted from it will be of greater

- A Velocity
- B Penetration power
- C Energy
- D intensity

Answer: D

Question 54

The idea of stationary orbit of electrons in an atom was first introduced by

- A Bohr
- B Thomson
- C Sommerfield
- D Rutherford

Answer: A

Question 55

Which of the following pairs of particles have equal and opposite charge ?

- A Proton-neutron
- B None of these
- C Electron-proton
- D Electron-neutron

Answer: D

Question 56

In 'isobaric process', which parameter remains constant ?

- A Temperature
- B Mass
- C Pressure

D Volume

Answer: C

Question 57

A prototype of a system is

- A The object code of a fully developed system
- B A complete system
- C A trial version of a system under development;
- D The source code of a fully developed system

Answer: C

Question 58

An example of a mathematical function in Structured Query Language (SQL) is

- A MIN
- B COS
- C AVG
- D MAX

Answer: B

Question 59

The intensity of sound is measured in dB-scale and the threshold of hearing is

- A 10 dB
- B 20 dB
- C 0 dB
- D 5 dB

Answer: C

Question 60

PAN is pollutant of air. The full name of PAN is

- A Peroxy Acetyl Nitrate
- B Peroxy Acidal Nitrate
- C Peroxy Alkyl Nitrate
- D Peroxy Aldehyal Nitrate

Answer: A

Question 61

Repeated exposure to small concentrations of a toxic agent results in accumulation of toxic substance over a period of time. This is known as

- A Bio accumulation
- B Chronic accumulation
- C Biomagnification
- D Chronic toxicity

Answer: B

Question 62

Which one of these element is NOT considered an essential trace element for the biosphere ?

- A Molybdenum
- B Sodium
- C Zinc
- D Selenium

Answer: B

Question 63

The term epicentre is associated with

- A Folding
- B Earth's interior
- C Faulting
- D Earthquakes

Answer: B

Question 64

How many countries participated in the first Twenty-20 World Cup in South Africa ?

- A 16
- B 22
- C 32
- D 28

Answer: A

Question 65

Which one among the following is the National Fruit ?

- A Apple
- B Mango
- C Banana

D Jack Fruit

Answer: B

Question 66

Which language is spoken by maximum number of people in the world?

A Spanish

B Urdu

C English

D Chinese

Answer: D

Question 67

Name the dome shaped monument used to keep Buddhist relics.

A Viharas

B Temples

C Stupa

D Chaityas

Answer: C

Question 68

'KIMONO' is a dressstyle of

A China

B Nepal

C Korea

D Japan

Answer: D

Question 69

Which one of the following famous monuments was built to honour the visit of King George V and Queen Mary to India ?

A Victoria Terminus

B War Memorial

C The Gateway of India

D India Gate

Answer: C

Question 70

Tulsidas was the author of

- A Adi Granth
- B Sursagar
- C Bhagavata Purana
- D Ramcharitmanas

Answer: D

Question 71

The study of coins is called

- A Historiography
- B Numismatics
- C Epigraphy
- D Archaeology

Answer: B

Question 72

Which among the following is not a classical Indian dance ?

- A Manipuri
- B Bharatanatyam
- C Rasleela
- D Odissi

Answer: C

Question 73

The colour of potassium flame through double blue glass is

- A Violet
- B Crimson red
- C Golden yellow
- D Green

Answer: B

Question 74

Precipitation takes place when product of concentration of ions

- A Is less than the solubility product
- B Is negligible
- C Equals the solubility product

D Exceeds the solubility product

Answer: D

Question 75

Dry ice is

A Liquified Nitrogen

B Liquified H_2

C Solid CO_2

D Ice dust

Answer: C

Question 76

Poisoning of drinking water is caused due to presence of

A Iron compound

B Magnesium compound

C Zinc compound

D Arsenic compound

Answer: D

Question 77

Which institute is known as apex body for development of agriculture ?

A NABARD

B IFCI

C Land Development Bank

D IDBI

Answer: A

Question 78

The duration for which a patent right is valid is known as

A Patent life

B Patent duration

C Patent time

D Patent right

Answer: A

Question 79

The concept of supply curve as it is used in economic theory is relevant only for the case of

- A Monopolistic competition
- B Oligopoly
- C Monopoly
- D Perfect or pure competition

Answer: D

Question 80

When the prices of two goods tend to vary inversely, they are said to be

- A Pure goods
- B Economic goods
- C Substitutes
- D Complements

Answer: D

Question 81

Purchase of cycle by a Household is treated as

- A Consumption
- B Asset creation
- C Capital formation
- D Savings

Answer: A

Question 82

In a Unitary Government, the States derive their powers from

- A Central Government
- B Judiciary
- C Constitution
- D Parliament

Answer: A

Question 83

The theory of natural rights was first enunciated by

- A Hobbes
- B Rousseau
- C John Locke

D Hugo Grotius

Answer: D

Question 84

Individualism is also known as

A Anarchism

B Communism

C Socialism

D Laissez-Faire

Answer: D

Question 85

Parliamentary Government is called

A Congressional executive

B Cabinet executive

C Fixed executive

D Non-responsible executive

Answer: B

Question 86

Fundamental Duties were laid down by

A The Original Constitution

B 42nd Amendment

C 39th Amendment

D 40th Amendment

Answer: B

Question 87

Simon Commission was boycotted because

A It did not visit India

B It was composed of conservatives

C It was composed of inexperienced men

D It was an all White Commission

Answer: D

Question 88

The Nayanars belonged to the

- A Shiva cult
- B Jain cult
- C Bhagavath cult
- D Vaishnava cult

Answer: A

Question 89

Name the Sufi Saint with whom Akbar, the Mughal Emperor, is associated:

- A Shaikh Nizamuddin Auliya
- B Shaikh Salim Chishti
- C Shaikh Farid
- D Shaikh Muinuddin Chishti

Answer: B

Question 90

The Vaisheshika School of Physics propounded the atomic theory during the period of

- A Harsha
- B Ashoka
- C Mauryas
- D Guptas

Answer: D

Question 91

Who set up a separate department called the Diwan-i-Khairat?

- A Muhammad-bin-Tughlaq
- B Firoz Tughlag
- C Sher Shah
- D Akbar

Answer: B

Question 92

Birmingham is an Industrial Centre of

- A The Pittsburg-Lake Erie region
- B Volge region
- C The Midlands

D The Keihin region

Answer: C

Question 93

Acrescent shaped sand dune is known as

A Barkhan

B Sandbar

C Seif

D Zeugen

Answer: A

Question 94

Which is an ore of dolomite?

A Aluminium

B Magnesium

C Copper

D Lead

Answer: B

Question 95

Stalactites and stalagmites are found mainly in

A underground coal mines

B sandstone regions

C granite regions

D limestone regions

Answer: D

Question 96

Which one of the following is the oldest and deepest fresh waterlake in the world?

A Lake Baikal

B Lake Chilka

C Lake Superior

D Lake Titicaca

Answer: A

Question 97

Which one of the following plants shows vivipary?

- A Rhizophora
- B Mango
- C Pinus
- D Litchi

Answer: A

Question 98

The kind of inflorescence in sunflower is

- A Capitulum
- B Raceme
- C Spadix
- D Spike

Answer: A

Question 99

Moulting in insects is mainly controlled by

- A Parathormone
- B Ecdysone
- C Ecotone
- D Parahormone

Answer: B

Question 100

Silver fish is included in the phylum

- A Chordata
- B Arthropoda
- C Annelida
- D Echinodermata

Answer: B

General Engineering (Electrical)

Instructions

For the following questions answer them individually

Question 101

Which one of the following is correct ?

- A The effect of field current on main flux of a synchronous machine is called armature reaction
- B The effect of air gap flux on armature current of a synchronous machine is called armature reaction
- C The effect of armature current on main flux of a synchronous machine is called armature reaction
- D The effect of armature current on air gap flux of a synchronous machine is called armature reaction

Answer: C

Question 102

A lap wound DC generator having 250 armature conductor runs at 1200 rpm. If the generator emf is 200 V, then the operating flux of the DC generator is

- A 0.02 Wb
- B 0.08 Wb
- C 0.04 Wb
- D 0.06 Wb

Answer: C

Question 103

The highest speed attainable by DC shunt motor is

- A equal to no-load speed
- B much higher than no-load speed
- C much lower than no-load speed
- D ideally infinite

Answer: A

Question 104

The direction of rotation of a DC shunt motor can be reversed by interchanging

- A the field terminals only
- B the armature terminals only
- C either field or armature terminals
- D the supply terminals

Answer: C

Question 105

AC series motors are built with as few turns as possible to reduce

- A speed
- B flux
- C reactance

D iron losses

Answer: C

Question 106

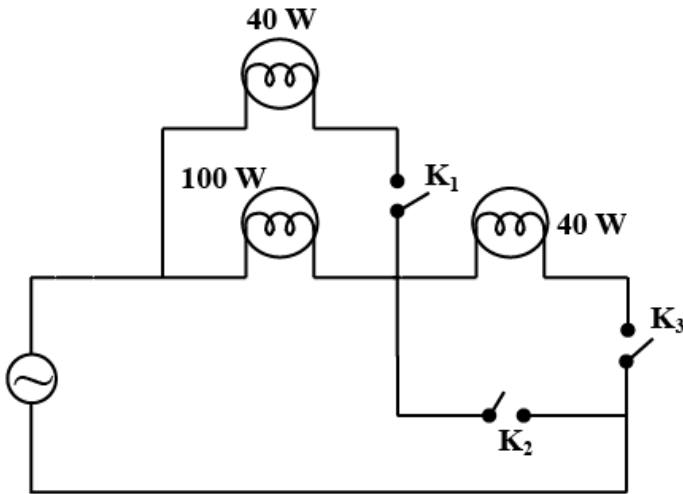
Based on revolving field theory, the forward and backward frequencies of the rotor emf of a 4-pole, 50 Hz, single-phase induction motor when running at 1300 rpm in the same direction of the forward field are respectively

- A 6.67 Hz, 93.33 Hz
- B 107.69 Hz, 7.69 Hz
- C 93.33 Hz, 6.67 Hz
- D 7.69 Hz, 107.69 Hz

Answer: A

Question 107

Three lamps are in circuit as shown in figure. At what condition 100 W lamp will have the maximum brightness?



- A Key K_1 is open, K_2 is closed and K_3 is open
- B K_1 is closed, K_2 is open and K_3 is also open
- C Both (a) and (b)
- D Key K_1 is closed, K_2 is open and K_3 is closed

Answer: A

Question 108

Given two coupled inductors L_1 and L_2 having their mutual inductance M . The relationship among them must satisfy

- A $M > \frac{L_1 + L_2}{2}$
- B $M > L_1 L_2$
- C $M \leq L_1 L_2$
- D $M = L_1 L_2$

Answer: C

Question 109

If the length of a bar of magnetic material is increased by 20% and the cross-sectional area is decreased by 20% then the reluctance is

- A increased by 67%
- B increased by 50%
- C remaining same
- D decreased by 33%

Answer: B

Question 110

Two coupled inductors $L_1 = 0.2H$ and $L_2 = 0.8H$, have coefficient of coupling $K = 0.8$, The mutual inductance M is

- A 0.24 H
- B 0.16 H
- C 0.02 H
- D 0.32 H

Answer: D

Question 111

A coil with a certain number of turns has a specified time constant. If the number of turns is doubled, its time constant would

- A become doubled
- B become four fold
- C get halved
- D remain unaffected

Answer: A

Question 112

The iron loss per unit frequency in a ferromagnetic core, when plotted against frequency, is a

- A Constant
- B Straight line with positive slope
- C Straight line with negative slope
- D Parabola

Answer: B

Question 113

The mutual inductance between two closely coupled coils is 1 H. If the turns of one coil is decreased to half and those of the other is doubled, the new value of the mutual inductance would be

- A $\frac{1}{2}H$

B $\frac{1}{4}H$

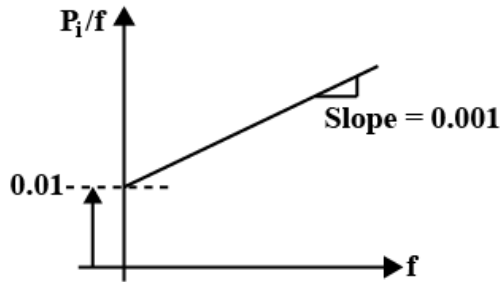
C 1 H

D 2 H

Answer: C

Question 114

Following graph shows the loss characteristics of a sheet of ferromagnetic material against varying frequency f . P_i is the iron loss at frequency f , Hysteresis and eddy current losses of the sheet at 100 Hz are



A 1 W, 10 W

B 10 W, 100 W

C 10 W, 50 W

D 1 W, 5 W

Answer: A

Question 115

Hysteresis losses are present in iron core coil when

A the current in the coil is sinusoidal only

B the current in the coil is alternating

C the current is unsymmetrical alternation only

D the current in the coil is DC only

Answer: B

Question 116

Eddy current loss in ferromagnetic core is proportional to

A reciprocal frequency

B square of frequency

C square root of frequency

D frequency

Answer: B

Question 117

Two inductors have self inductances of 9 mH and 25 mH. The mutual inductance between the two is 12 mH. The coefficient of inductive coupling between the two inductors is

- A 1.25
- B 18.75
- C 0.25
- D 0.8

Answer: D

Question 118

The magnetic materials that are used to prepare permanent magnets should have

- A low coercive force
- B steeply rising magnetisation curve
- C small hysteresis loop
- D high retentivity

Answer: D

Question 119

Poles of dc machines are often laminated to reduce

- A hysteresis loss
- B eddy current loss
- C iron weight
- D armature reaction

Answer: B

Question 120

Universal motor is a _____ motor

- A shunt
- B series
- C single phase induction
- D synchronous

Answer: B

Question 121

Which of the following motors can work satisfactory on both AC and DC?

- A Synchronous motor

- B Series motor
- C Shunt motor
- D Induction motor

Answer: B

Question 122

Two alternators rated 40 MVA and 60 MVA respectively are working in parallel and supplying a total load of 80 MW. Speed

- A 30 MW, 50 MW
- B 32 MW, 48 MW
- C 36 MW, 44 MW
- D 40 MW each

Answer: B

Question 123

Slip of a 3-phase induction motor may be expressed as

- A rotor power input/rotor copper loss
- B rotor copper loss/rotor core loss
- C rotor copper loss/rotor power input
- D rotor copper loss/total input power

Answer: C

Question 124

The emf induced per phase in a three phase star connected synchronous generator having the following data

Distribution factor = 0.955

Coil-span factor = 0.966

Frequency = 50 Hz

Flux per pole = 25 mwb

Turns per phase = 240

emf per phase is

- A 1737.80 V
- B 2128.36 V
- C 1228.81 V
- D 869.46 V

Answer: C

Question 125

In a 1-phase transformer, the copper loss at full load is 600 W. At half of the full load the copper loss will be

- A 300 W
- B 150 W

C 75 W

D 600 W

Answer: B

Question 126

An auto-transformer used with a sodium vapour lamp should have high

A transformation ratio

B winding resistance

C leakage reactance of windings

D VA rating

Answer: C

Question 127

In an auto-transformer, the number of turns in primary winding is 210 and in secondary winding is 140. If the input current is 60 A, the currents in output and in common winding are respectively

A 90 A, 150 A

B 40 A, 20 A

C 40 A, 100 A

D 90 A, 30 A

Answer: D

Question 128

A 3-phase transformer has its primary connected in delta and secondary in star. Secondary to primary turns ratio per phase is 6. For a primary voltage of 200 V, the secondary voltage would be

A 58 V

B 2078 V

C 693 V

D 1200 V

Answer: B

Question 129

A resistance and another circuit element are connected in series across a DC voltage V . The voltage across the second element is V initially and zero after time. The other element is pure

A inductance

B capacitance

C both (b) and (d)

D resistance

Answer: A

Question 130

For RLC AC series circuit at resonance the current is

- A maximum at leading p.f
- B minimum at leading p.f
- C minimum at lagging p.f
- D maximum at unity p.f

Answer: D

Question 131

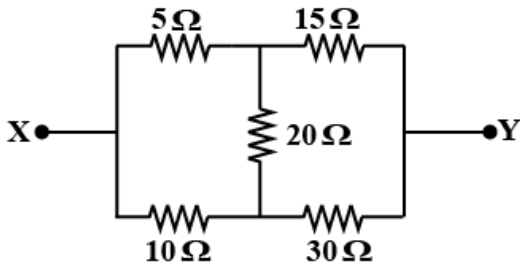
A series R-L-C circuit resonates at 1 MHz. At frequency 1.1 MHz the circuit impedance will be

- A inductive
- B resistive
- C will depend on the relative amplitude of R, L and C
- D capacitive

Answer: A

Question 132

The equivalent resistance between terminals X and Y of the network shown is



- A $\frac{20}{9} \Omega$
- B 8Ω
- C $\frac{100}{3} \Omega$
- D $\frac{40}{3} \Omega$

Answer: D

Question 133

Application of Thevenin's Theorem in a circuit results in

- A a voltage source and an impedance in series
- B An ideal voltage source
- C An ideal current source

D a current source and an impedance in parallel

Answer: A

Question 134

A current of $i = 6 + 10 \sin(100\pi t) + 20 \sin(200\pi t)$ is flowing through a series combination of a PMMC and moving iron instrument. Ratio of the two currents as registered by the M.I. and PMMC meter is

A 2.63

B 1.81

C 3.11

D 2.82

Answer: D

Question 135

Three resistances 5Ω each are connected in star. Values of equivalent delta resistances are?

A 15Ω each

B 1.5Ω each

C 2.5Ω each

D $\frac{5}{3} \Omega$ each

Answer: A

Question 136

A 120 V , 60 W incandescent lamp has to be operated from 220 V , 50 c/s , 1-phase AC supply. In order to do this, a circuit element has to be connected in series with the lamp. Which one of the following series element is preferable ?

A Pure inductance

B Pure capacitance

C Pure inductance or capacitance

D Resistance

Answer: D

Question 137

The bandwidth of an ac series circuit consisting of R, L and C is

A $\frac{RC}{L}$

B $\frac{L}{R}$

C $\frac{R}{L}$

D $\frac{L}{RC}$

Answer: C

Question 138

For balanced 3-phase supply system, the phasor sum of the line currents is NOT zero if the load is

- A Unbalanced star connected
- B Balanced delta connected
- C Unbalanced delta connected
- D Balanced star connected

Answer: A

Question 139

At series resonance of an ac R-L-C circuit the impressed voltage is

- A equal to the inductive drop
- B equal to the resistive drop
- C equal to the capacitive drop
- D greater than the resistive drop

Answer: B

Question 140

In a series RLC circuit $R = 20 \Omega$, $X_L = 30 \Omega$ and $X_C = 30 \Omega$ If the supply voltage across the combination is $v = 100 \sin(100\pi t + 30^\circ)$ volts, the instantaneous current and the power factor of the circuit are respectively

- A $i = 5 \sin(100\pi t + 30^\circ)$ Amps, p.f. = 0.866
- B $i = 3.536 \sin(100\pi t + 30^\circ)$ Amps, p.f. = 0.866
- C $i = 5 \sin(100\pi t + 30^\circ)$ Amps, p.f. = unity
- D $i = 3.536 \sin(100\pi t + 30^\circ)$ Amps, p.f. = unity

Answer: C

Question 141

The rms of the alternating current given by the equation $i = 50 \sin(314t - 10^\circ) + 30 \sin(314t - 20^\circ)$ is

- A 77.43 A
- B 41.23 A
- C 58.31 A
- D 38.73 A

Answer: B

Question 142

A series RLC circuit will have unity power factor if operated at a frequency of

- A $\frac{1}{\sqrt{LC}}$

B $1 - (2\pi\sqrt{LC})$

C LC

D $\frac{1}{(LC)}$

Answer: B

Question 143

In a balanced 3-phase system, the current coil of a wattmeter is inserted in line 1 and the potential coil across 2 and 3. If the wattmeter reads 100 W, the reactive power drawn by the 3-phase load is

A 141.4 VAR

B 173.2 VAR

C 50 VAR

D 100 VAR

Answer: B

Question 144

An electric iron is rated at 230 V, 400 W, 50 Hz. The voltage rating 230 V refers to

A peak value

B rms value

C peak-to-peak value

D average value

Answer: B

Question 145

A non-sinusoidal periodic waveform is free from DC component, cosine components and even harmonics. The waveform has

A only half wave is symmetry

B half wave and odd function symmetry

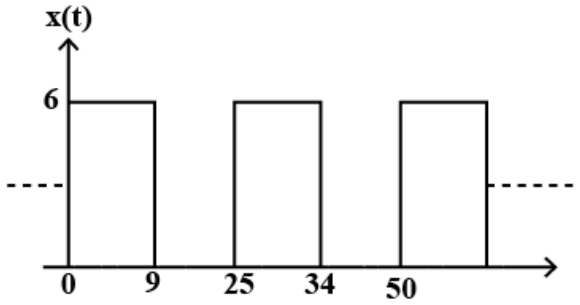
C half wave and even function symmetry

D only odd function symmetry

Answer: B

Question 146

A periodic train of rectangular pulses $x(t)$ with a time period of 25 seconds, has a pulse width of 9 seconds as shown in figure. The RMS value of the waveform is

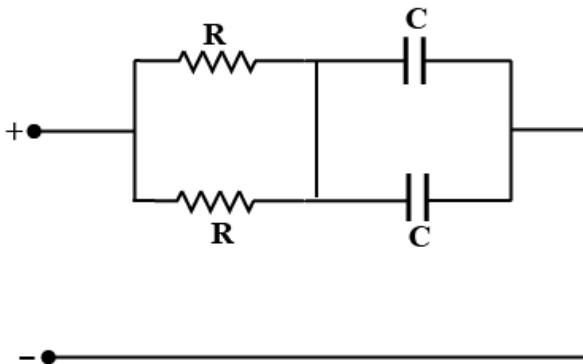


- A 2.16 V
- B 10 V
- C $\sqrt{6}V$
- D 3.6 V

Answer: D

Question 147

The time constant of the network shown in the figure is



- A $2 CR$
- B $\frac{CR}{4}$
- C $\frac{CR}{2}$
- D CR

Answer: D

Question 148

In the series RC circuit, the voltage across C starts increasing, the moment the circuit is switched to V volts DC. The rate of increase of voltage across C at the instant just after the switch is closed (i.e. at $t = 0^+$) is

- A $\frac{R}{CV}$
- B $\frac{RV}{C}$
- C $\frac{CV}{R}$

D $\frac{V}{RC}$

Answer: D

Question 149

Form factor of an alternating wave is

A Formfactor = rms value \times average value

B Formfactor = $\frac{\text{averagevalue}}{\text{rmsvalue}}$

C Formfactor = $\frac{(\text{rmsvalue})^2}{\text{averagevalue}}$

D Formfactor = $\frac{\text{rmsvalue}}{\text{averagevalue}}$

Answer: D

Question 150

The phase difference between the following voltage and current waves $v = 311 \sin(100\pi t + 30^\circ)$ Volts $i = 17 \sin(100\pi t - 20^\circ)$ Amps is

A 30°

B 20°

C 50°

D 10°

Answer: C

Question 151

Match the items given in List-I (Material) and those in List-II (Temperature Coefficient of Resistance). Select your answers using codes given in the lists

List-I

a. Aluminium

b. Manganin

c. Carbon

List-II

P. Negligibly small

Q. Positive

R. Negative

A $a \rightarrow R, b \rightarrow P, c \rightarrow Q$

B $a \rightarrow R, b \rightarrow Q, c \rightarrow P$

C $a \rightarrow Q, b \rightarrow P, c \rightarrow R$

D $a \rightarrow P, b \rightarrow Q, c \rightarrow R$

Answer: C

Question 152

Which of the following material posses the least resistivity?

- A Copper
- B Iron
- C Maganin
- D Aluminium

Answer: A

Question 153

The resistances of insulations, in general, ____ with temperature rise

- A does not change
- B decreases
- C increases rapidly
- D increases slowly

Answer: B

Question 154

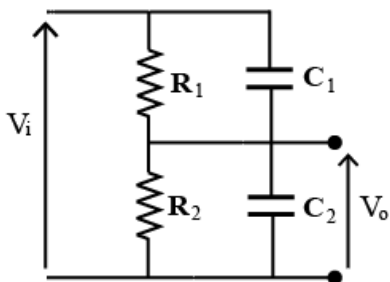
A $10\mu F$ and a $20\mu F$ capacitor are in series. The combination is supplied at 150 V from a sinusoidal voltage source. The voltage across the $20\mu F$ capacitor is then

- A 50 V
- B 75 V
- C 125 V
- D 100 V

Answer: A

Question 155

The conditions at which the following potential divider is independent of frequency, may be



- (i) $\frac{R_1}{R_2} = \frac{C_1}{C_2}$
- (ii) $\frac{R_1}{R_2} = \frac{C_2}{C_1}$
- (iii) $R_1 C_1 \ll 1, R_2 C_2 \ll 1$
- (iv) $R_1 + R_2 = \frac{1}{C_1} + \frac{1}{C_2}$

- A (ii) is true only
- B (ii) and (iv) are true

C (i) and (iii) are true

D (i) is true only

Answer: A

Question 156

Which of the following is the best conductor of electricity ?

A Distilled water

B Warm water

C Salt water

D Cold water

Answer: C

Question 157

SI unit of Electrical Energy is

A Volt-Ampere-second

B Watt-second

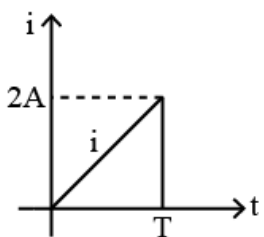
C Joule

D KWh

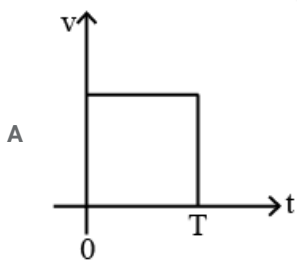
Answer: C

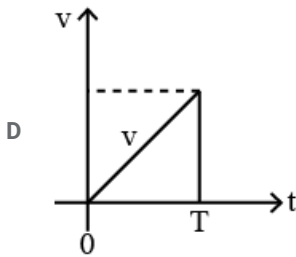
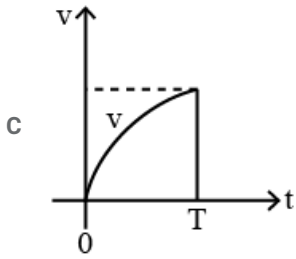
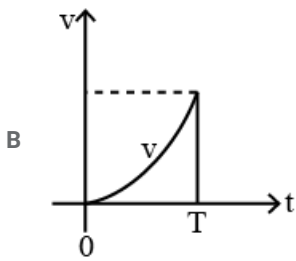
Question 158

The wave shape of current flowing through an inductor is



The wave shape of voltage drop (v) across the inductor is





Answer: A

Question 159

Two wires A and B of the same material but of different lengths L and $2L$ have the radius r and $2r$ respectively. The ratio of specific resistance will be

- A 1 : 2
- B 1 : 4
- C 1 : 8
- D 1 : 1

Answer: D

Question 160

A 20 micro farad capacitor is connected across an ideal voltage source. The current in the capacitor

- A will be very high at first, then exponentially decay
- B will be very high at first, then exponentially decay and at steady state will become zero
- C None of these are true
- D will be zero at first, then exponentially rise

Answer: B

Question 161

In general, if a sine wave is fed into a Schmitt trigger, the output will be

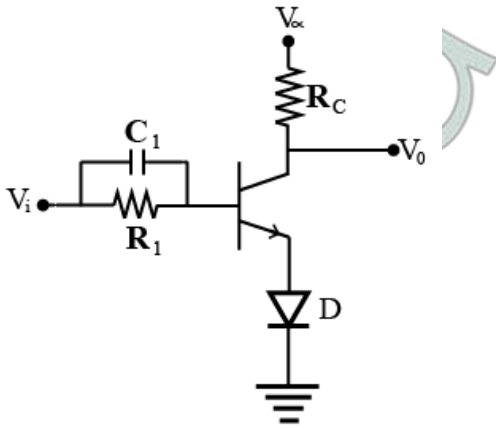
- A a triangular wave

- B a square wave
- C a saw-tooth wave
- D an amplified sine wave

Answer: B

Question 162

In the given circuit the function of the diode D is



- A to clip the output voltage
- B to protect the base-emitter junction
- C to hold the output voltage to a constant value
- D to bias the transistor

Answer: B

Question 163

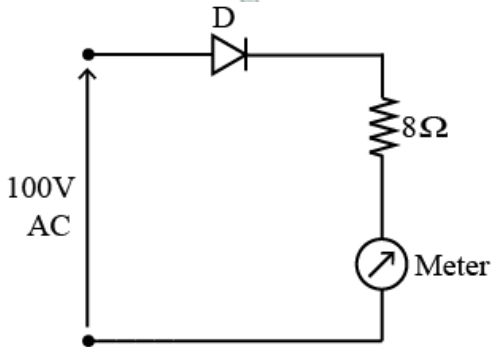
FET are

- A bipolar devices
- B either unipolar or bipolar
- C None of these
- D unipolar devices

Answer: D

Question 164

In the circuit forward resistance of the diode D is $2\ \Omega$ and its reverse resistance is infinitely high



A list consists of meters (List-I) and another list shows, the meter readings (List-II)

- | List-I | List-II |
|---------------|------------|
| (i) PMMC | (a) 7.07 A |
| (ii) Hot wire | (b) 4.5 A |
| (iii) Carbon | (c) 10 A |
| | (d) 12.5 A |

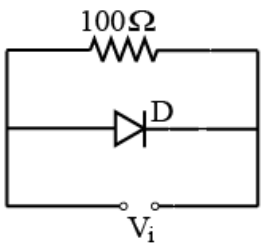
Which one of the options given here is correct to indicate the type of meter (List-I) and its reading (List-II)

- A (i) \rightarrow (b), (ii) \rightarrow (a)
- B (i) \rightarrow (a), (ii) \rightarrow (c)
- C (i) \rightarrow (b), (ii) \rightarrow (d)
- D (i) \rightarrow (a), (ii) \rightarrow (b)

Answer: A

Question 165

In the figure. D is an ideal diode. If the rms value of the input voltage is 50V, then the rms current through $100\ \Omega$ is



- A $0.5\sqrt{2}\text{ A}$
- B $\frac{0.5}{\sqrt{2}}$
- C 0.25
- D 0.5 A

Answer: B

Question 166

Which of the following materials is a semiconductor?

- A Silica
- B Chromium
- C Selenium
- D Bismuth

Answer: C

Question 167

In a rectifier circuit, the primary function of the filter is to

- A suppress odd harmonics in the rectifier output
- B control the DC level the output voltage
- C remove ripples from the rectified output
- D minimise AC input variations

Answer: C

Question 168

In an R-L series circuit $R = 20 \Omega$, $L = 0.056 \text{ H}$ and the supply frequency in $f = 50 \text{ Hz}$. The magnitude of impedance of the circuit is

- A 20.056Ω
- B 26.64Ω
- C 20.0Ω
- D 37.6Ω

Answer: B

Question 169

A pure sinusoidal current is being rectified. For the given maximum value of sinusoidal current if rms value of half wave rectified current is 50 A , then the rms value of full wave rectification will be

- A 70.7 A
- B $\frac{50}{\pi} \text{ A}$
- C $\frac{100}{\pi} \text{ A}$
- D 100 A

Answer: A

Question 170

Under thermal equilibrium in a pure semiconductor the ratio of the number of holes to the number of conduction electrons is

- A 2
- B $\frac{1}{2}$

C infinity

D 1

Answer: D

Question 171

As per IE rules the maximum allowable variation between declared and actual voltage at consumer's premises should be

A $\pm 3.5\%$

B $\pm 4\%$

C $\pm 4.5\%$

D $\pm 3\%$

Answer: E

Question 172

Alternator used in hydel power station has more number of poles in it than used in thermal power station, because

A power generated by the alternator is less

B speed of the prime mover may be changed whenever required

C power generated by the alternator may be changed according to demand

D speed of its prime mover is less

Answer: D

Question 173

The connected load of a consumer is 2kW and the maximum demand is 1.5kW. The demand factor of the consumer is

A 0.375

B 1.33

C None of these

D 0.75

Answer: D

Question 174

In a thyrite lightning arrester the resistance

A decrease linearly with the applied voltage

B is high at low current and low at high current

C is low at low current and high at high current

D increase linearly with the applied voltage

Answer: B

Question 175

A consumer is offered the following rate of tariff. He has to pay a fixed charge of Rs. 1,000 per month and a running charge of Rs. 4.50 per unit consumed. If the consumer runs a motor load of 1kW at 0.85 power factor lagging on an average of 15 hours per day, his annual bill is

- A Rs. 32941.88
- B Rs. 25637.50
- C Rs. 36637.50
- D Rs. 40985.29

Answer: C

Question 176

Glare is caused due to

- A excessive luminance
- B none of (a) and (d)
- C both of (a) and (d)
- D excessive lighting contrast in the field of vision

Answer: C

Question 177

Which of the following method is suitable for heating of conducting medium?

- A Eddy current heating
- B Induction heating
- C Both (a) and (b)
- D Radiant heating

Answer: C

Question 178

Furnaces used for cremation use

- A Induction heating
- B Dielectric heating
- C Arc heating
- D Resistance heating

Answer: D

Question 179

In a fluorescent tube circuit high voltage surge is produced by

- A Choke

- B Heater
- C Electrode
- D Starter

Answer: A

Question 180

In AC operated electromechanical contractors, the problem of chattering is eliminated by

- A placing copper shading band on plot face of electromagnet
- B increasing the conductor cross-section
- C using aluminium instead of copper as conductor
- D laminating the electromagnet core

Answer: A

Question 181

Magnetic blowout coils are generally used in

- A oil circuit breaker
- B vacuum circuit breaker
- C air break circuit breaker
- D air blast circuit breaker

Answer: C

Question 182

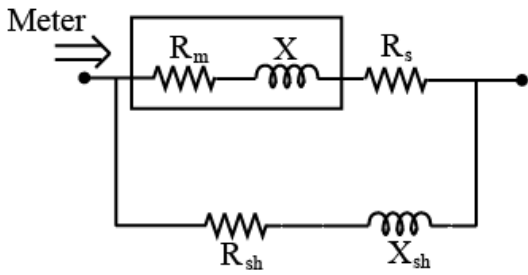
The pitch factor for a full pitched winding of a synchronous machine is

- A 1.0
- B 0.5
- C 0.9
- D 0.0

Answer: A

Question 183

An AC meter of resistance R_m and reactance X_m is connected in series with a resistance R_s . A shunt of impedance $(R_{sh} + jX_{sh})$ is applied in parallel to the existing combination of meter and R_s . The current division across the two branches will be independent of frequency when



A $(R_s + R_m)^2 + X_m^2 = R_{sh}^2 + X_{sh}^2$

B $\frac{X_m}{R_m + R_s} = \frac{X_{sh}}{R_{sh}}$

C $\sqrt{\frac{R_s}{R_m + X_m^2}} = \frac{R_{sh}}{X_{sh}}$

D $\frac{X_m}{R_m} = \frac{X_{sh}}{R_{sh}}$

Answer: B

Question 184

In phantom loading arrangement, energy consumption in the calibration test of wattmeter is reduced because of

- A the absence of load in the test set
- B the separate application of low voltage supply across current coil
- C no common point between the two coils
- D the reduced loss in current coil and pressure coil

Answer: A

Question 185

In the measurement of power in a balanced 3 - phase circuit by two-wattmeter method if the two wattmeters show equal readings, then the power factor of the circuit is

- A 0.8 leading
- B zero
- C unity
- D 0.8 lagging

Answer: C

Question 186

Two meters X and Y required 40mA and 50mA respectively for fully scale deflection. Then

- A Y is more sensitive than X

- B Both are equally sensitive
- C Data are insufficient to comment
- D X is more sensitive than Y

Answer: D

Question 187

The household energy meter is

- A integrating instrument
- B recording instrument
- C None of these
- D indicating instrument

Answer: A

Question 188

A ballistic galvanometer of constant equal to 1 micro-coulomb/degree gives a throw of 22.5° , when a capacitor discharges through the meter. If a battery of 15V is used to recharge the capacitor, value of capacitance is

- A $15\mu F$
- B $22.5\mu F$
- C $10\mu F$
- D $1.5\mu F$

Answer: D

Question 189

A potentiometer is used to measure the voltage between two points of a DC circuit, which is found to be 1.2V. This is also measured by a voltmeter, which is found to be 0.9V. The resistance of the volt meter is 60 k Ω . The input resistance between two points

- A 80 Ω
- B 60 Ω
- C 20 Ω
- D 45 Ω

Answer: C

Question 190

A load is connected to supply. A current transformer (CT), and a potential transformer (PT) is used in between load and supply. A power factor of 0.5 is measured at the secondary side of CT and PT . If phase angle error of CT and PT are 0.4° and 0.7° , power factor of the load is

- A $\cos 61.1^\circ$
- B $\cos 60.3^\circ$

C $\cos 58.9^\circ$

D $\cos 59.7^\circ$

Answer: A

Question 191

During the measurement of a low resistance using a potentiometer, the following readings were obtained: Voltage drop across unknown resistance = 0.531V. Voltage drop across a 0.1Ω standard resistance connected in series with the unknown = 1.083V. Value of the unknown resistor is

A 53.1 milliohm

B 49.03 milliohm

C 108.3 milliohm

D 20.4 milliohm

Answer: B

Question 192

Which one of the following types of instruments does suffer from error due to magnetic hysteresis?

A PMMC

B Induction type

C Electrodynamic

D Moving iron

Answer: D

Question 193

Which one of the following does not employ a null method of measurement?

A AC potentiometer

B Megger

C DC potentiometer

D Kelvin double bridge

Answer: B

Question 194

In star-delta starting of three-phase induction motor the starting voltage is reduced to

A $\frac{1}{\sqrt{3}}$ times of normal voltage

B $\sqrt{3}$ times of normal voltage

C 3 times of normal voltage

D $\frac{1}{3}$ times of normal voltage

Answer: A

Question 195

An electromagnetic torque is produced as an interaction between a flux and current. The angle between flux and current is 45° . If this angle is change to 30° , flux increases by 100% and current reduces by 25%, then the torque

- A reduces to 66.7% of the original
- B increases to 81.6% of teh original
- C reduces to 81.6.7% of the original
- D reduces to 54.4% of the original

Answer: B

Question 196

Mamimum temperature limit for class F insulation is

- A $155^\circ C$
- B $130^\circ C$
- C $120^\circ C$
- D $105^\circ C$

Answer: A

Question 197

Match List-I (Types of motors) with List-II (Characteristics) and select the appropriate response

List-I

List-II

- | | |
|---------------------------|--------------------------------|
| A. DC series motor | 1. Constant speed |
| B. DC shunt motor | 2. High starting torque |

- A A - 1, B - 2
- B A - 2, B - 1
- C A - 1, B - 1
- D A - 2, B - 2

Answer: C

Question 198

The motor characteristics best suited for traction purpose are those of

- A DC shunt motor
- B DC series motro
- C synchronous motor
- D induction torque

Answer: B

Question 199

If the starting torque of a 3-phase induction motor is T_{st} for DOL starting, that star-delta starting of the motor is

- A $3T_{st}$
- B $\frac{T_{st}}{3}$
- C $\frac{T_{st}}{\sqrt{3}}$
- D $\sqrt{3}T_{st}$

Answer: B

Question 200

The iron loss in a 100 KVA transformer is 1kW. and at full load copper loss is 2 kW. The maximum efficiency occurs at a load of

- A 50 KVA
- B 100 KVA
- C 70.7 KVA
- D 14.4 KVA

Answer: C