



SSC JE Electrical Engineering 2013

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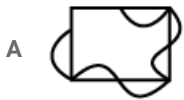
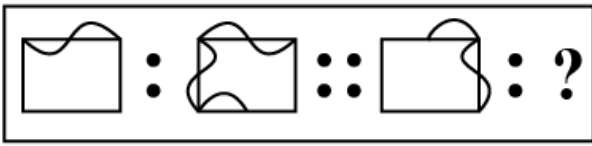
General Intelligence and Reasoning

Instructions

In the following questions, select the related figure/letters/number from the given alternatives.

Question 1

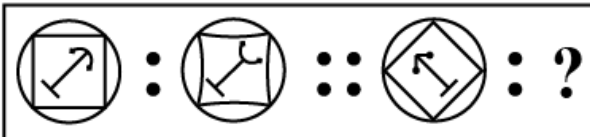
Question figures:



Answer: C

Question 2

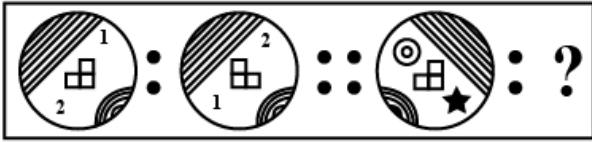
Question figures:



Answer: C

Question 3

Question figures:



Answer: A

Question 4

23 : 8 :: 32 : ?

- A 6
- B 9
- C 17
- D 27

Answer: B

Question 5

MLKJ : NOPQ :: IHGF : ?

- A UTSR
- B RSTU
- C SRUT
- D UTRS

Answer: B

Question 6

ACEG : ZXVT :: BDFH : ?

A YWUS

B YXWV

C YWVT

D YXVW

Answer: A

Question 7

BADC : XWZY :: FEHG : ?

A VXRT

B TSVU

C YXCV

D VSXW

Answer: B

Question 8

$\frac{5}{9} : \frac{7}{13} :: \frac{10}{19} : ?$

A $\frac{14}{26}$

B $\frac{14}{27}$

C $\frac{14}{23}$

D $\frac{14}{25}$

Answer: B

Question 9

3 : 9 :: 6 : ?

A 14

B 18

C 17

D 16

Answer: B

Instructions

In the following questions, select the one which different from the other three responses.

Question 10

A 7 - 145

B 6 - 108

C 5 - 75

D 4 - 48

Answer: A

Question 11

A Mars

B Jupiter

C Earth

D Comet

Answer: D

Question 12

A Geeta

B Quran

C Bible

D Mahabharat

Answer: D

Question 13

A Message

B Information

C Matter

D Material

Answer: D

Question 14

A Guitar

B Veena

C Flute

D Sitar

Answer: C

Question 15

A 17 - 142

B 71 - 34

C 41 - 28

D 14 - 28

Answer: D

Question 16

- A 3, 5, 7, 9
- B 5, 7, 9, 11
- C 4, 6, 8, 10
- D 2, 5, 9, 10

Answer: D

Question 17

- A 8662
- B 5731
- C 4628
- D 2864

Answer: B

Question 18

- A Tagore
- B Raman
- C Bhaskara
- D Khurana

Answer: C

Instructions

For the following questions answer them individually

Question 19

Arrange the ee words Soeen order :

1. Grapes
2. Vineyard
3. Whisky
4. Brewing
5. Distillation

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

Answer: D

Question 20

Which will appear fourth in the dictionary ?

- A Xylophilous
- B Xylophagus
- C Xylopyrography
- D Xylophagan

Answer: C

Question 21

Number of letters skipped in between adjacent letters in the series increases by one. Which of the following series observes the rule given below?

- A BEIN
- B CDJO
- C GJLS
- D QUNZ

Answer: A

Question 22

In the following words, the group of letters should not contain more than three vowels. Which of the following words does not conform to the rule?

- A SCARCITY
- B PROGNOSIS
- C COMPLEXITY
- D CONVULSION

Answer: D

Instructions

In the following questions, choose the correct alternative from the given responses that will complete the series.

Question 23

?, PSV, EHK, TWZ, ILO

- A BEH
- B IMP
- C ACG
- D ADG

Answer: D

Question 24

78, 86, ?, 88, 82, 90

- A 76

B 84

C 83

D 80

Answer: D

Question 25

3 7 13 ? 31 43 57

A 51

B 81

C 41

D 21

Answer: D

Question 26

EJOT, INSX, AFKP, ?

A CHMS

B XTOJ

C BGLQ

D EJOT

Answer: C

Instructions

For the following questions answer them individually

Question 27

My father has two brothers. The youngest has two sons and one daughter. The elder one has one son and two daughters and the remaining one has three sons. If my father has four nephews, how many cousins (brothers) have I got ?

A 6

B 4

C 7

D 5

Answer: B

Question 28

Find the wrong number in the given series.

3, 7, 15, 31, 64, 127

A 127

B 64

C 31

D 3

Answer: B

Question 29

A car covers the first half of the distance between two places at 40 km/hr and the second half of the distance at 60 km/hr. So what is the average speed of the car?

A 46 km/hr

B 48 km/hr

C 50 km/hr

D 60 km/hr

Answer: B

Question 30

In a certain code language, TOGETHER is written as EGTORETH. How is CONGRATULATE written in that language ?

A GRTULTEANOC

B GNCOUTRAETLA

C GNOCUTARETAL

D GLNAOTCEURTA

Answer: B

Question 31

In certain code language, REQUEST is written as S2H52TU. How is RETEST written in that language?

A S2V2RV

B S2U2RU

C S2U2TU

D S2V2TV

Answer: C

Question 32

Some equations are solved on the basis of a certain system. On the same basis, find out the correct answer for the unsolved equation. If $4^2 = 7$, $5^2 = 7$, $6^2 = 9$, then $7^2 = ?$

A 14

B 13

C 10

D 8

Answer: B

Question 33

Find out the number which belongs to the given group of numbers from the alternatives:
246, 579, 135, 35, 68

- A 55
- B 468
- C 123
- D 31

Answer: B

Question 34

If P stands for \div , Q stands for \times , R stands for $+$, then
 $18 Q 12 P 4 R 5 = ?$

- A 59
- B 26
- C 11.7
- D 2.33

Answer: A

Question 35

From the given alternatives, select the word which cannot be formed using the letters of the given word.
ACCOMPANIED

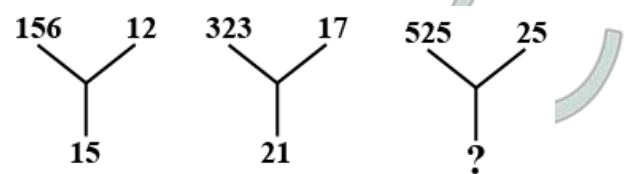
- A PANIC
- B COME
- C COMB
- D PAIN

Answer: C

Instructions

In the following questions, find the missing number from the given responses.

Question 36



- A 43
- B 17
- C 23
- D 87

Answer: C

Question 37

6	11	25
8	6	16
?	5	16

- A 10
- B 14
- C 12
- D 16

Answer: B

Instructions

For the following questions answer them individually

Question 38

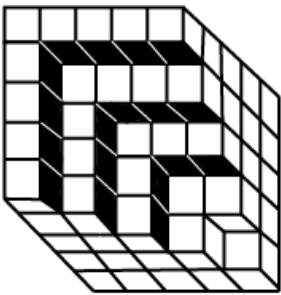
Ram travelled 6 ft towards West, he turned left and walked 8 ft, then turned left and walked 4 ft, then turned left and walked 8 ft again. How far is he now from the starting point ?

- A 8 ft
- B 6 ft
- C 4 ft
- D 2 ft

Answer: D

Question 39

How many black-faced cubes are there in the given structure ?



- A 75
- B 55
- C 25
- D 16

Answer: B

Question 40

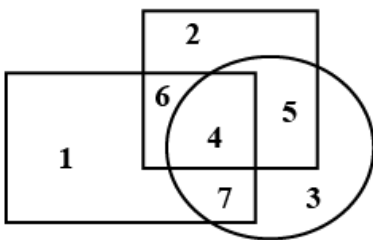
The door of Priya's house faces East. From the back side of the house, she walks straight 50 meters, then turns to the right and walks 50 meters again. Finally, she turns towards the left and stops after walking 25 meters. Now Priya is facing which direction ?

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

Answer: B

Question 41

In the following diagram, rectangle represents males, circle represents urban and square represents educated. Which region represents educated urban males?

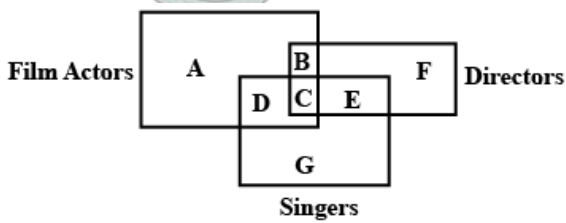


- A 5
- B 4
- C 6
- D 7

Answer: B

Question 42

In the following Venn diagram, identify the letter which denotes Film Actors who are Singers but not Directors.



- A D
- B C
- C E
- D F

Answer: A

Question 43

Identify the answer figure from which the pieces given in the question figure have been cut.

Question figure:



Answer: D

Instructions

In the following questions, one or 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 have to decide which of the given conclusions, if any, follows from the given statements.

Question 44

Statement :

A social movement is an interaction of people with a common motivational base in frustration.

Conclusions :

I. In a social movement, people who are satisfied interact with frustrated people.

II. Frustrated people interact with each other in a social movement.

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

Answer: B

Question 45

Statements:

All scientists are hard-working. No hard-working man is poor.

Conclusions:

- I. No scientist is poor.
- II. No poor man is a scientist.

- A Only conclusion I follows
- B Only conclusion II follows
- C Both conclusions I and II follow
- D None of the conclusions I or II follows

Answer: C

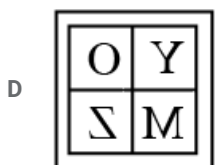
Instructions

For the following questions answer them individually

Question 46

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

Question figure:



Answer: C

Question 47

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 the two matrices given below. The columns and rows of Matrix I are numbered from 0 to 4 and that of Matrix II are numbered from 5 to 9. A letter from these matrices can be represented first by its row and next by its column, eg. 'A' can be represented by 13, 76, etc., and 'G' can be represented by 22, 65, etc. Similarly, you have to identify the set for the word 'PUBLIC'.

Matrix I

	0	1	2	3	4
0	A	U	O	T	B
1	T	E	P	A	W
2	R	M	G	G	I
3	U	M	M	C	L
4	P	L	N	E	C

Matrix II

	5	6	7	8	9
5	P	T	A	M	E
6	G	I	O	T	M
7	E	A	L	T	M
8	R	A	B	L	T
9	N	I	E	G	P

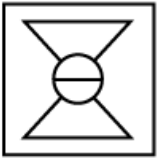
- A 12, 30, 87, 41, 66, 83
- B 99, 30, 87, 77, 23, 44
- C 55, 01, 87, 98, 34, 87
- D 40, 30, 87, 89, 24, 43

Answer: A

Question 48

Components of which of the answer figures will exactly make up the question figure given below.

Question figure:





Answer: D

Question 49

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

Question figure:

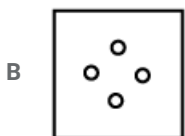
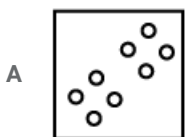
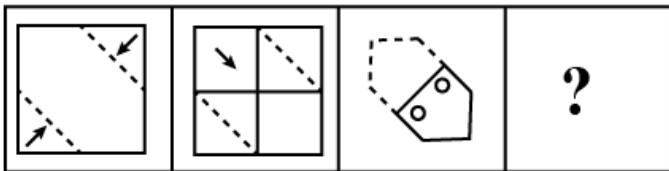


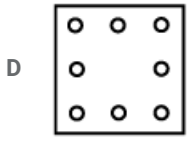
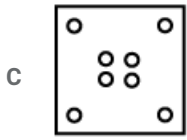
Answer: B

Question 50

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

Question figure:





Answer: A

General Awareness

Instructions

For the following questions answer them individually

Question 51

Who was the first economist to have coined the terms "Micro Economics" and "Macro Economics" ?

- A Milton Friedman
- B Ragnar Frisch
- C J.M. Keynes
- D Paul Samuelson

Answer: B

Question 52

In a free enterprise economy, the decision on what shall be produced is made by

- A Demand
- B Income
- C Price mechanism
- D Cost

Answer: C

Question 53

The main reason for the high growth of money supply in India since 1970 has been the rise in

- A Foreign lending
- B Foreign borrowing
- C RBI credit to the government
- D Bank credit to the private sector

Answer: D

Question 54

Who was the first Muslim to be elected as President of the Indian National Congress ?

- A Syed Ahmad Khan
- B Agha Khan
- C Muhammad Ali Jinnah
- D Badruddin Tyabji

Answer: D

Question 55

Which of the following was not known to the Rigvedic period ?

- A Joint family system
- B Agriculture
- C Marriage system
- D Varna system

Answer: D

Question 56

The characteristic feature of democratic socialism is

- A Privatization
- B Liberalization
- C Nationalization
- D Socialization

Answer: C

Question 57

If a group of rich people use power for their selfish goals, it is called as

- A Monarchy
- B Oligarchy
- C Polity
- D Democracy

Answer: B

Question 58

Who said that "Man is born free and everywhere he is in chains"

- A Locke
- B Aristotle
- C Marx

D Rousseau

Answer: D

Question 59

A civil servant in India may exercise poliliberty by

- A joining any political party
- B contesting in the elections
- C criticizing the government
- D exercising his franchise

Answer: D

Question 60

The term 'Law' used in the pharse 'Rule of Law' refers to

- A Positive law
- B Natural law
- C Common law
- D Conventions of the Constitution

Answer: C

Question 61

The total physical product per unit of a variable input is known as

- A Average product
- B Average returne
- C Average physical product
- D Average revenue

Answer: C

Question 62

The discount on price when a large quantity is purchased is known as

- A Volume discount
- B Maximum discount
- C Minimum discount
- D Marginal discount

Answer: A

Question 63

What type of fruit is pineapple?

- A Siliqua
- B Sorosis
- C Syconus
- D Samara

Answer: B

Question 64

Strobilus is a structure associated with

- A Pea
- B Potato
- C Pinus
- D Palm

Answer: C

Question 65

Signet-ring is seen in the life cycle of

- A Mosquito
- B Plasmodium
- C Entamoeba
- D Giardia

Answer: B

Question 66

The number of occipital condyles in man is

- A One
- B Two
- C Three
- D Four

Answer: B

Question 67

Migratory larvae of Ascaris produce symptoms of pneumonia. This is known as

- A Down's syndrome
- B Klinefelter's syndrome
- C Turner's syndrome

D Loeffler's syndrome

Answer: D

Question 68

Which of the following animals is an osmoconformer ?

A Hagfish

B Seal

C Whale

D Rohu

Answer: A

Question 69

Which one of the following is the source of Solar energy ?

A Nuclear fission

B Nuclear fusion

C Artificial radioactivity

D X-ray emission

Answer: B

Question 70

Who, for the first time, successfully determined the charge of an electron ?

A Thomson

B Millikan

C Rutherford

D Coulomb

Answer: B

Question 71

The first Muslim king who invaded South India was

A Balban

B Mohammad bin Tughlaq

C Babar

D Alauddin Khilji

Answer: D

Question 72

The Great Bath was located in

- A Harappa
- B Mohenjodaro
- C Lothal
- D Kalibangan

Answer: B

Question 73

The Mughal judicial system was based on

- A Persian law
- B Hebrew law
- C Islamic law
- D Indian law

Answer: C

Question 74

Hurricanes are generally

- A active over the land
- B travelling in families
- C dust storms
- D active over the sea

Answer: A

Question 75

Orinoco oil belt is in

- A Dubai
- B Saudi Arabia
- C Venezuela
- D Brazil

Answer: C

Question 76

The highest peak in Africa is

- A Aconcagua
- B Kilimanjaro
- C McKinley

D Mount Elbrus

Answer: B

Question 77

A layer of the Earth made up of mixed metals and silicates is called

A Sial

B Sima

C Mantle

D Nife

Answer: C

Question 78

The exhaustion of soil fertility is the result of

A Cover cropping

B Multiple cropping

C Rotation cropping

D Over cropping

Answer: D

Question 79

Injection of weakened microbes to confer resistance to a disease is known as

A Transfusion

B Vaccination

C Inoculation

D Intimation

Answer: B

Question 80

Who, among the following, is the author of 'Das-Kapital'

A Rousseau

B Karl Marx

C Chanakya

D Montesquieu

Answer: B

Question 81

When and where will the next Olympics be held ?

- A Beijing, 2014
- B Shanghai, 2012
- C Rio-de-Janeiro, 2016
- D Taiwan, 2013

Answer: C

Question 82

A Persian form of singing a poem is called

- A Ghazal
- B Qawali
- C Thumri
- D Bhajan

Answer: A

Question 83

Green-house effect causes

- A increase of temperature
- B increase of moisture in air
- C decrease of temperature
- D decrease of moisture in air

Answer: A

Question 84

The advantages of rain-water harvesting is that it

- A helps in reducing floods
- B increases the ground water level
- C cause more rains
- D reduces floods and replenishes ground water

Answer: D

Question 85

The 'solder' used for connecting electronic circuits consists of

- A Lead and Tin
- B Tin and Iron
- C Copper and Lead

D Lead and Aluminium

Answer: A

Question 86

What type of molecular motion is responsible for heat conduction ?

A Translational

B Vibrational

C Rotational

D Spin

Answer: B

Question 87

Pick the odd one out.

A Compiler

B Interpreter

C Assembler

D Word processor

Answer: D

Question 88

MS-Office is an example of

A an operational system

B a telecommunication software

C a programming language

D a productivity software

Answer: D

Question 89

In India, the day ^{5th} September is celebrated as Teacher's Day to honour the birthday of

A Rabindra Nath Tagore

B Dr. S. Radhakrishnan

C Dr. Rajendra Prasad

D Mrs. Indira Gandhi

Answer: B

Question 90

Which among the following polluting agents is responsible for creating a hole in the ozone layer ?

- A CO
- B CFC
- C SO_2
- D CH_4

Answer: B

Question 91

Fly ash is

- A CO_2
- B Organic particulate matter
- C Small ash particles
- D NO_x

Answer: C

Question 92

Addition of chlorine to raw water before treatment is known as

- A Plain chlorination
- B Post-chlorination
- C Pre-chlorination
- D Super-chlorination

Answer: C

Question 93

Which of the following is not a water treatment technique ?

- A Reverse osmosis
- B Ion exchange
- C Electro-dialysis
- D Electrostatic precipitation

Answer: D

Question 94

Which one of the following is m major indoor air pollutantin India ?

- A Ozone
- B Peroxy Acetyl Nitrite (PAN)
- C Carbon monoxide

D Sulphur dioxide

Answer: C

Question 95

Multi Drug Therapy is for the infection of

A Leprosy

B AIDS

C Cholera

D Hepatitis

Answer: A

Question 96

Volvo, the car manufacturing company, introduced

A Alarm

B Fog light

C Seat belts

D Rear view mirrors

Answer: C

Question 97

The Dark Continent is

A Asia

B Australia

C Africa

D Europe

Answer: C

Question 98

The major constitution of air is

A Nitrogen

B Carbon dioxide

C Oxygen

D Hydrogen

Answer: A

Question 99

The souring of milk to curd is an example of

- A Saponification
- B Putrefaction
- C Fermentation
- D Esterification

Answer: C

Question 100

Which one of the following compounds is formed when formaldehyde is treated with Grignard reagent ?

- A Primary alcohol
- B Secondary alcohol
- C Tertiary alcohol
- D Dihydric alcohol

Answer: A

General Engineering (Electrical)

Instructions

For the following questions answer them individually

Question 101

The voltage wave $v = V_m \sin(\omega t - 15^\circ)$ volts is applied across an AC circuit. If the current leads the voltage by 10° and the maximum value of currents is I_m , then the equation of current is

- A $i = I_m \sin(\omega t + 5^\circ) \text{ amps}$
- B $i = I_m \sin(\omega t - 25^\circ) \text{ amps}$
- C $i = I_m \sin(\omega t + 25^\circ) \text{ amps}$
- D $i = I_m \sin(\omega t - 5^\circ) \text{ amps}$

Answer: D

Question 102

The average value of current (I_{av}) of a sinusoidal wave of peak value (I_m) is

- A $I_{av} = \frac{I_m}{2}$
- B $I_{av} = \frac{\pi}{2} I_m$
- C $I_{av} = \frac{2}{\pi} I_m$
- D $I_{av} = \frac{I_m}{\sqrt{2}}$

Answer: C

Question 103

The emf induced in a coil is given by $e = -N \frac{d\phi}{dt}$ where e is the emf induced, N is the number of turns and $d\phi$ is the instantaneous flux linkage with the coil in time dt

- A Hans christain Oersted
- B Andre-Marie Ampere
- C Mechale Faraday
- D Emil Lenz

Answer: D

Question 104

The mutual inductance between two coils having self inductances 3 henry and 12 henry and coupling coefficeient 0.85 is

- A 12.75 henry
- B 5.1 henry
- C 0.425 henry
- D 1.7 henry

Answer: B

Question 105

Resistance temperature coefficient of copper at $20^{\circ}C$ is

- A $0.0045/^{\circ}C$
- B $0.0017/^{\circ}C$
- C $0.00393/^{\circ}C$
- D $0.0038/^{\circ}C$

Answer: C

Question 106

The load characteristic of DC shunt generator is determined by

- A the voltage drop in armature resistance
- B the voltage drop due to armature reaction, voltage drop due to decreased field current and voltage drop in armature resistance
- C the voltage drop to armature reaction and voltage drop in armature resistance
- D the voltage drop due to armature reaction, voltage drop due to decreased field current and voltage drops in armature and field resistance

Answer: B

Question 107

How many watt-seconds are supplied by a motor developing 2 hp (British) for 5 hours

- A 2.6856×10^7 watt-seconds
- B 4.476×10^5 watt-seconds
- C 2.646×10^7 watt-seconds
- D 6.3943×10^6 watt-seconds

Answer: A

Question 108

A 4-pole generator is running at 1200 rpm. The frequency and time period of the emf generated in its coils respectively

- A 50 Hz, 0.02 sec
- B 40 Hz, 0.025 sec
- C 300 Hz, 0.00333 sec
- D $2400\text{Hz}, \frac{1}{2400}\text{sec}$

Answer: B

Question 109

The single phase Induction Motor (IM) which does not have centrifugal switch is

- A capacitor start single phase IM
- B resistance split single phase IM
- C capacitor start capacitor run single phase IM
- D permanent capacitor run single phase IM

Answer: D

Question 110

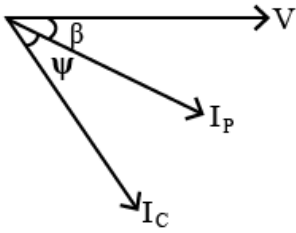
When a multiplier is added to an existing voltmeter for extending its range, its electromagnetic damping

- A remains unaffected
- B increases
- C decreases
- D changes by an amount depending on the controlling torque

Answer: C

Question 111

Phasor diagram of load voltage (V), current in pressure coil (I_P) and current in current coil (I_C) is shown in the figure when an electrodynamic watt meter is used to measure power. The reading of the watt meter will be proportional to



- A $\cos(\beta + \psi)$
- B $\cos \psi$
- C $\cos \beta \cos \psi$
- D $\cos \beta \cos(\beta + \psi)$

Answer: C

Question 112

Two parallel conductors carrying current in opposite directions will exert on each other

- A an attractive forces
- B a repulsive force
- C an axial force
- D no force

Answer: B

Question 113

The unit of reluctance of magnetic circuit is

- A AT / m
- B Weber / m
- C At / Weber
- D Weber / AT

Answer: C

Question 114

In indicating instruments the springs are mainly used to

- A conduct the current to the coils
- B hold the pivot in position
- C control the pointer movement
- D reduce the vibration of the pointer

Answer: C

Question 115

A balanced 3-phase, 3-wire supply feeds balanced star connected resistors. If one of the resistors is disconnected, then the percentage reduction in load will be

- A 33.33
- B 50
- C 66.67
- D 75

Answer: B

Question 116

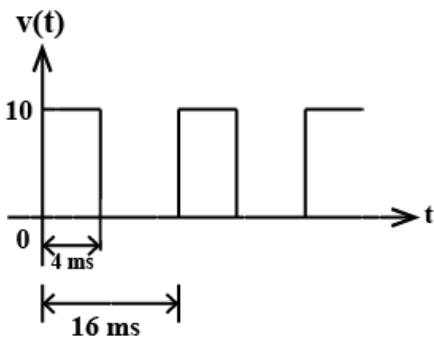
The total flux at the end of a long permanent bar magnet is $100 \times 10^{-6} \text{ Wb}$. The end of this magnet is withdrawn through a 1000 turn coil in 1/20 seconds. The induced e.m.f. in the coil is

- A 20.0 V
- B 2.0 V
- C 0.2 V
- D 0.02 V

Answer: B

Question 117

In reference to the figure, the voltage waveform $v(t)$ is measured by a PMMC, a PMMC combined with bridge rectifier and a moving iron (MI) instrument. Two lists are prepared thereafter



List-I
(Instrument List)

- a. PMMC
- b. PMMC rectifier
- c. M.I

List-II
(List of Instrument reading)

- i. 5V
- ii. 2.75
- iii. 2.5 V

The correct option relation the instruments and their reading is

- A a-i, b-ii, c-iii
- B a-iii, b-ii, c-i

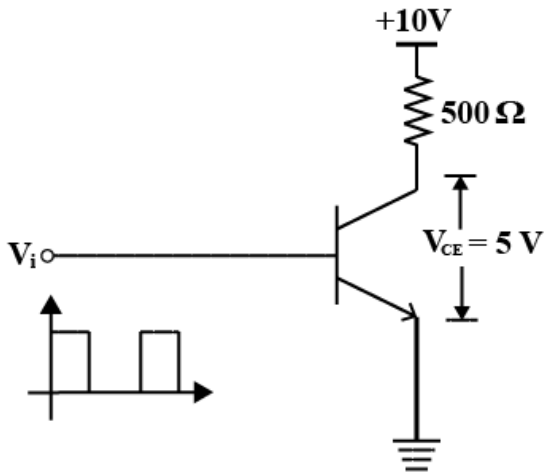
C a-ii, b-iii, c-i

D a-iii, b-i, c-ii

Answer: B

Question 118

The switching transistor as shown, carries in the collector side an rms current of 8 mA. If the frequency of rectangular pulse train V_i is 50 Hz, then on-time of the transistor is



A 20 ms

B 6.4 ms

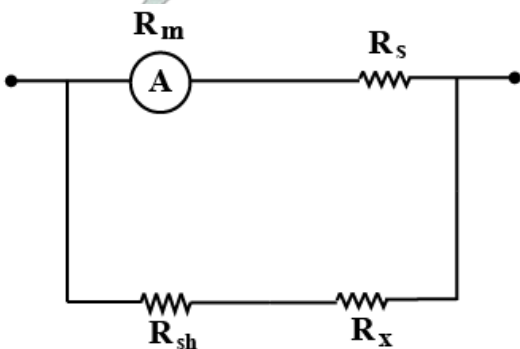
C 12.8 ms

D 16 ms

Answer: C

Question 119

A ammeter of resistance R_m is placed in an arrangement as shown in the figure. Material of R_m, R_{sh} is copper whereas that of R_s, R_x is manganin. The condition for which the meter performance is compensated against temperature, is



A $\frac{1}{R_m} + \frac{1}{R_{sh}} = \frac{1}{R_s} + \frac{1}{R_x}$

B $R_m R_s = R_{sh} R_x$

C $R_m + R_s = R_{sh} + R_x$

D $\frac{R_m}{R_s} + \frac{R_{sh}}{R_x}$

Answer: D

Question 120

If a 110 V, 50 Hz is applied across a PMMC voltmeter of full-scale range 0-220 V and internal resistance of 10Ω , reading of the voltmeter will

- A 0V
- B $110\sqrt{2}V$
- C 78V
- D 55V

Answer: A

Question 121

To maximize the driving torque in an induction type instrument, flux produced by shunt coil and series coil should be

- A in phase with each
- B in quadrature with each other
- C displaced by 45° with respect to each other
- D out of phase with respect to each other

Answer: B

Question 122

To minimize the errors due to lead and contact resistances, low resistances used in electrical measurement work are provide with

- A guard rings
- B four terminals
- C thick insulation
- D metal shields

Answer: A

Question 123

Examine the two statements 'A' and 'R' and select your answer

Statement A : Switching of a lamp in house produce noise in a radio.

Statement R : Switching operation produces are across separating contacts

- A Both A and R are true and R is a correct explanation of A
- B Both A and R are true and R is not correct explanation of A
- C A is true but R is false
- D A is false but R is true

Answer: A

Question 124

The small pockets of air in the high voltage cable provide _____ relative permittivity _____ electric field and at these sites breakdown is likely to be initiated

- A high, high
- B low, low
- C low, high
- D high, low

Answer: C

Question 125

The capacitance measured between any two cores of a 3-core cable with the sheathed earthed is $3\mu F$. The capacitance per phase will be

- A $15\ \mu F$
- B $6\ \mu F$
- C $1\ \mu F$
- D None of the above

Answer: B

Question 126

In an insulated cable having core diameter d and overall diameter D , the ratio of maximum to minimum dielectric stress is given by

- A $\left(\frac{D}{d}\right)^{\frac{1}{2}}$
- B $\left(\frac{D}{d}\right)^2$
- C $\left(\frac{D}{d}\right)$
- D $\left(\frac{d}{D}\right)$

Answer: C

Question 127

Compared to the breaking capacity of a circuit breaker, its making capacity should be

- A more
- B less
- C equal
- D the two are unrelated to each other

Answer: A

Question 128

In electronic circuits, for blocking the DC component of a voltage signal, a/an _____ is connected in series with the voltage source

- A capacitor
- B diode
- C resistor

D inductor

Answer: A

Question 129

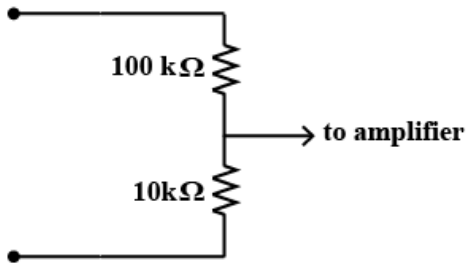
For n-type semiconductor, the doping material is

- A tetravalent
- B pentavalent
- C trivalent
- D bivalent

Answer: B

Question 130

An attenuator probe as shown, is connected to an amplifier of input capacitance $0.1 \mu\text{F}$. Value of C that must be connected across $100 \text{ k}\Omega$ to make the overall gain independent of frequency, is



- A $0.01 \mu\text{F}$
- B $0.1 \mu\text{F}$
- C $1 \mu\text{F}$
- D $10 \mu\text{F}$

Answer: A

Question 131

Silicon content in iron lamination is kept within 5% as it

- A makes the material brittle
- B reduces the curie point
- C increased hysteresis loss
- D increased cost

Answer: A

Question 132

A wattmeter is marked 15A/30A, 300V/600V and its scale is marked up to 4500 watts. When the meter is connected for 30A, 600V, the point indicated 2000 watts. The actual power in the circuit is

- A 2000 watts

- B 4000 watts
- C 6000 watts
- D 8000 watts

Answer: D

Question 133

Resistance switching is normally employed in

- A bulk oil breakers
- B minimum oil breakers
- C air blast circuit breakers
- D all of (a), (b) and (c)

Answer: C

Question 134

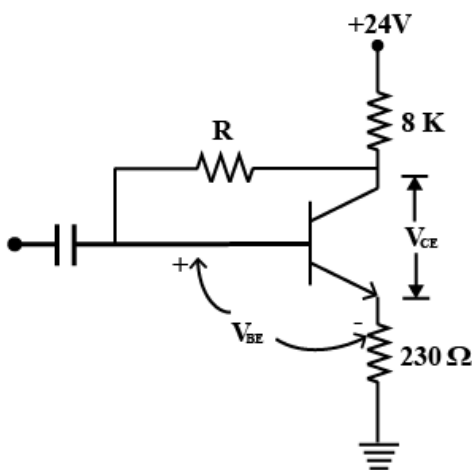
If the angular frequency of an alternating voltage is ω , then the angular frequency of instantaneous real power absorbed in an ac circuit is

- A 2ω
- B ω
- C 3ω
- D $\frac{\omega}{2}$

Answer: A

Question 135

If the transistor having $V_{CE} = 5\text{ V}$, $V_{BE} = 0.7\text{ V}$ has $\beta = 45$, value of R is



- A 85.64 k
- B 63.14 k
- C 72.15 k
- D 91.18 k

Answer: A

Question 136

In a balanced 3-phase circuit, the line current is 12 A. When the power is measured by two wattmeter method, one meter reads 11kW while the other reads zero. Power factor of the load is

- A 0
- B 0.5
- C 0.866
- D 1.0

Answer: B

Question 137

In case of frosted GLS lamps, frosting is done by

- A Acid etching
- B ammonia
- C ozone
- D salt water

Answer: B

Question 138

If the supply polarity to the armature terminals of a separately excited DC motor is reversed, the motor will run under

- A Plugging condition
- B Regenerative braking condition
- C Dynamic braking condition
- D Normal motoring condition

Answer: A

Question 139

For welding purpose, the secondary of transformer used should be capable of carrying

- A high voltage, high current
- B high voltage, low current
- C low voltage, high current
- D low voltage, low current

Answer: C

Question 140

Which of the following is correct ?

- A Load factor = capacity factor \times utilisation factor
- B Utilisation factor = capacity factor \times load factor
- C Capacity factor = load factor \times utilisation factor
- D Load factor has no relation with capacity factor and utilisation factor

Answer: C

Question 141

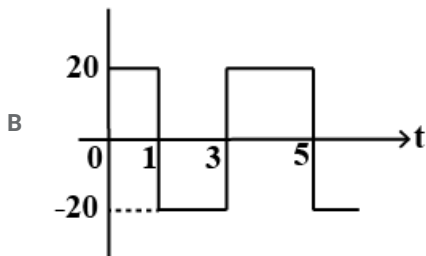
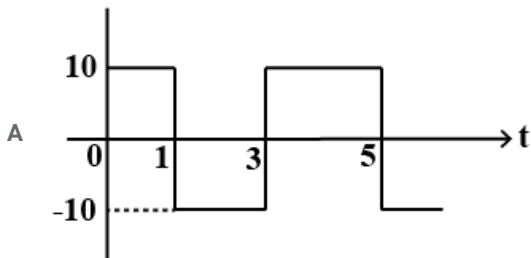
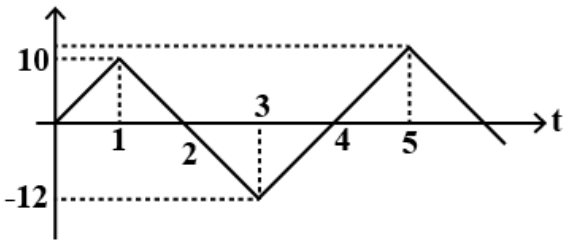
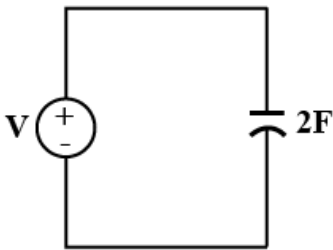
In a motor starter, the electromechanical contactor provides inherent protection against

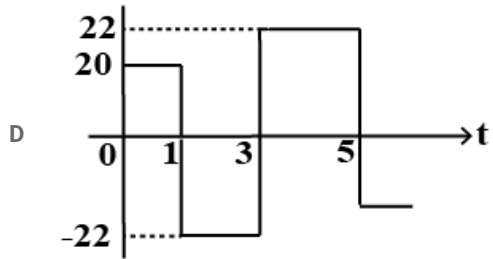
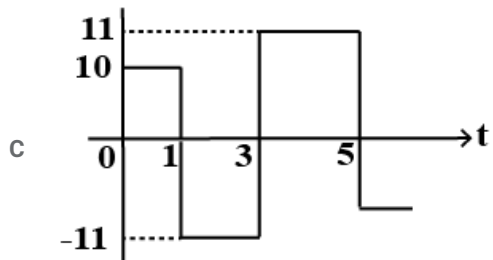
- A over-current
- B short-circuit
- C single-phasing
- D under-voltage

Answer: D

Question 142

In the circuit, V is the input voltage applied across the capacitor of 2 F. Current through the capacitor is





Answer: D

Question 143

In a semiconductor, the resistivity

- A depends on temperature
- B depends on voltage
- C depends on current through it
- D None of the above

Answer: A

Question 144

A geyser is operated from 230V, 50 c/s mains. The frequency of instantaneous power consumed by the geyser is

- A 25 c/s
- B 50 c/s
- C 100 c/s
- D 150 c/s

Answer: C

Question 145

Ampere-second is the unit of

- A emf
- B power
- C electric charge
- D energy

Answer: C

Question 146

Two lossy capacitors with equal capacitance values and power factors of 0.01 and 0.02 are in parallel, and the combination is supplied from a sinusoidal voltage source. The power factor of the combination is

- A 0.03
- B 0.015
- C 0.01
- D 0.0002

Answer: B

Question 147

A voltmeter when connected across a DC supply, reads 124 V. When a series combination of the voltmeter and an unknown resistance X is connected across the supply, the meter reads 4V. If the resistance of the voltmeter is $50\text{k}\Omega$, the value of X is

- A $1550\text{ k}\Omega$
- B $1600\text{ k}\Omega$
- C $1.6\text{ k}\Omega$
- D $1.5\text{ k}\Omega$

Answer: D

Question 148

The purpose of providing a choke in the tube-light is

- A to eliminate the corona effects
- B to avoid radio interference
- C to improve power factor
- D to limit current to appropriate value

Answer: D

Question 149

In a 3-phase 400 V, 4-wire system, two incandescent lamps, one having 230 V, 100 W specification and the other 230 V, 200 W are connected between R phase-neutral and Y phase-neutral respectively. If the neutral wire breaks

- A 100 W lamp will fuse first
- B 200 W lamp will fuse first
- C both the lamps will fuse together
- D both the lamps will glow

Answer: A

Question 150

A solenoid of inductance 250 mH and resistance $10\ \Omega$ is connected to a battery. The time taken for the magnetic energy to reach $\frac{1}{4}$ of its maximum value is

- A $\log_e(2)$
- B $10^{-3} \log_e(2)$
- C $25 \log_e(2)$
- D $\frac{1}{40} \log_e(2)$

Answer: D

Question 151

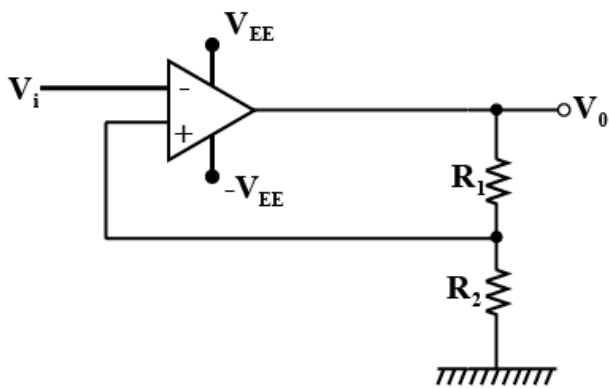
The peak value of the output voltage of a half wave rectifier is 100 V. The r.m.s value of the half-wave rectifier output voltage will be

- A 100 V
- B 50 V
- C 70.7 V
- D 35.35 V

Answer: B

Question 152

The given circuit represents a



- A Monostable multivibrator
- B Astable multivibrator
- C Schmitt trigger
- D Bistable multivibrator

Answer: C

Question 153

The input resistance of a FET is of the order of

- A 100Ω
- B 10Ω
- C $1 \text{ m}\Omega$
- D $100 \text{ M}\Omega$

Answer: D

Question 154

In a series R-L circuit supplied from an sinusoidal voltage source, voltage across R and L are 3 V and 4 V respectively. The supply voltage is then

- A 7 V
- B 1 V
- C 3.5 V
- D 5

Answer: D

Question 155

If the insulation resistance of 2m long sample of a cable is $10\text{M}\Omega$, then a 8m long sample of the same will have an insulation resistance of

- A 40 $\text{M}\Omega$
- B 2.5 $\text{M}\Omega$
- C 2 $\text{M}\Omega$
- D 5.5 $\text{M}\Omega$

Answer: B

Question 156

An inductor is supplied from a sinusoidal voltage source. The magnetic field energy in the inductor changes from peak value to minimum value 10 msec. The supply frequency is

- A 50 Hz
- B 25 Hz
- C 1 Hz
- D 100 Hz

Answer: B

Question 157

Two $2000\ \Omega$, 2 watt resistors are connected in parallel. Their combined resistance value and wattage rating are

- A $1000\ \Omega$, 2 watt
- B $1000\ \Omega$, 4 watt
- C $2000\ \Omega$, 4 watt
- D $2000\ \Omega$, 2 watt

Answer: B

Question 158

We have three resistances each of value $1\ \Omega$, $2\ \Omega$ and $3\ \Omega$. If all the three resistances are to be connected in a circuit, how many different values of equivalent resistance are possible?

- A Five
- B Six
- C Seven
- D Eight

Answer: D

Question 159

One B.O.T. unit is

- A 1000 kWh
- B 10 kWh
- C 1 kWh
- D 0.1 kWh

Answer: C

Question 160

An electric heater draws 1000 watts from a 250 V source. The power drawn from a 200 V source is

- A 800 W
- B 640 W
- C 1000 W
- D 1562.5 W

Answer: D

Question 161

Three $3\ \mu\text{F}$ capacitors are in series. A $6\ \mu\text{F}$ capacitor is in parallel with this series arrangement. The equivalent capacitance of this combination is

- A $7\ \mu\text{F}$
- B $15\ \mu\text{F}$
- C $3.6\ \mu\text{F}$
- D $1\ \mu\text{F}$

Answer: A

Question 162

A DC series motor has an armature resistance of $0.06\ \Omega$ and series field resistance of $0.08\ \Omega$. The motor is connected to a 400 V supply. Thus line current is 20 A when the speed of the machine is 1100 rpm. When the line current is 50 A and the excitation is increased by 30%, speed of the machine in rpm is

- A 1100
- B 1003

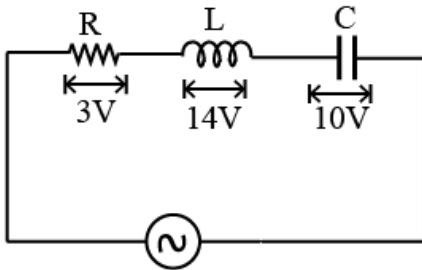
C 837

D 938

Answer: C

Question 163

The voltage across R, L and C are 3V, 14 V, and 10 V respectively as in the figure. If the voltage source is sinusoidal, then the input voltage (rms) is



A 10 V

B 5 V

C 2.5 V

D 15 V

Answer: B

Question 164

In 1-phase series RL circuit fed by voltage source, the resistance and reactance values are 4 ohm each. In this circuit.

A the current leads the voltage by 45°

B the current lags the voltage by 45°

C the current lags the voltage by 60°

D None of the above

Answer: B

Question 165

Super position theorem requires as many circuits to be solved as there are

A nodes

B sources

C loops

D None of the above

Answer: B

Question 166

In squirrel cage induction motor, the rotor conductors are

A open circuited

- B short circuited via end rings
- C short circuited via external reactance
- D short circuited via external resistance

Answer: B

Question 167

A 3-phase synchronous motor is started by utilizing the torque developed in

- A the high speed steam turbine
- B the damper winding on the rotor
- C the damper winding on the stator
- D the low speed water turbine

Answer: B

Question 168

If the frequency of input voltage of a transformer is increased keeping the magnitude of the voltage unchanged, then

- A both hysteresis loss and eddy current loss in the core will increase.
- B hysteresis loss will increase but eddy current loss will decrease
- C hysteresis loss will increase but eddy current loss will remain unchanged
- D hysteresis loss will decrease but eddy current loss will increase

Answer: C

Question 169

Two 1-phase AC motors A and B operate from a 1000 V supply. A consumes 2 kW at a power factor of 0.8 (lagging) and B consumes 1 kW at a power factor of 0.5 (lagging). The total current drawn from the supply is approximately

- A 4.5 A
- B 2.1 A
- C 4.41 A
- D 9 A

Answer: C

Question 170

The high voltage and low voltage winding resistances of a distribution transformer of 100KVA, $\frac{1100}{220}$ V, 50 Hz are 0.1 Ω and 0.004 Ω respectively. The equivalent resistances referred to high voltage side and low voltage side are respectively

- A 2.504 Ω and 0.2 Ω
- B 0.2 Ω and 0.008 Ω
- C 0.10016 Ω and 2.504 Ω

D 0.008Ω and 0.10016Ω

Answer: B

Question 171

A tank circuit consists of

- A an inductor and a capacitor connected in series
- B an inductor and a capacitor connected in parallel
- C a pure inductance and a pure capacitance connected in series
- D a pure inductance and a pure capacitance connected in parallel

Answer: D

Question 172

The instantaneous power of a 1-phase series circuit supplying R-L load from a sinusoidal voltage source has in each cycle.

- A negative twice, zero four times
- B zero twice, negative once
- C negative four times, zero twice
- D negative twice, zero once

Answer: A

Question 173

In a series R-L-C circuit, the "Q-factor" is given by

- A $Q = \frac{1}{R} \sqrt{\frac{L}{C}}$
- B $Q = R \sqrt{\frac{L}{C}}$
- C $Q = \frac{1}{R} \sqrt{\frac{C}{L}}$
- D $Q = R \sqrt{\frac{C}{L}}$

Answer: A

Question 174

In an ac circuit, $V = (200 + j 40) \text{ V}$ and $I = (30 - j 10) \text{ A}$. The active and reactive power of the circuit are respectively

- A 6400 W, 800 VAR capacitive
- B 6400 W, 800 VAR inductive
- C 5600 W, 3200 VAR capacitive
- D 5600 W, 3200 VAR inductive

Answer: D

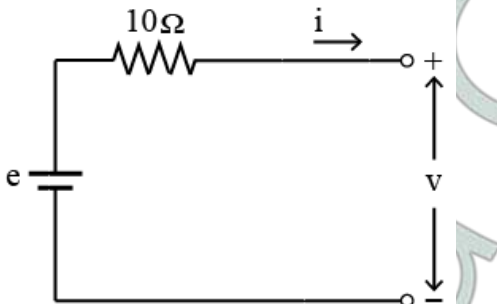
Question 175

Application of Norton's theorem in a circuit results in

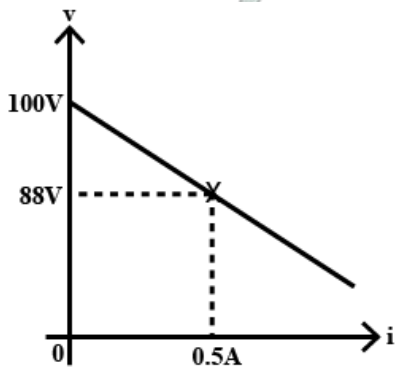
- A a current source and an impedance in parallel
- B a voltage source and an impedance in series
- C an ideal voltage source
- D an ideal current source

Answer: A

Question 176



The voltage (v) vs current (i) curve of the circuit is shown below :



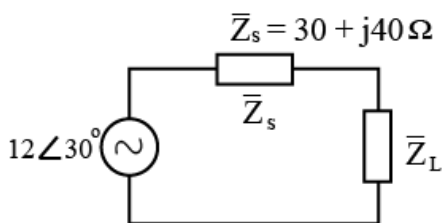
Internal resistance of the source e is

- A $24\ \Omega$
- B $4\ \Omega$
- C $10\ \Omega$
- D $14\ \Omega$

Answer: D

Question 177

Value of the load impedance \overline{Z}_L for which the load consumes maximum power is



- A $50\ \Omega$ at a power factor of 0.6 lead
- B $50\ \Omega$ at a power factor of 0.6 lag

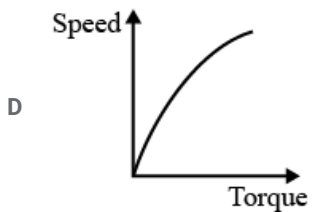
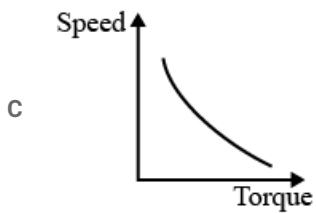
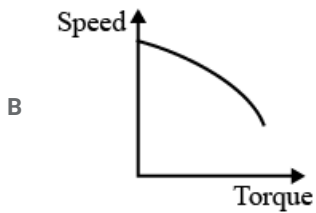
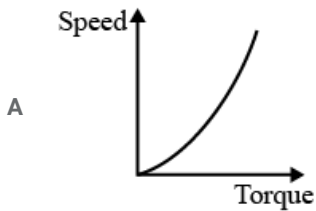
C 30Ω at a power factor of unity

D None of the above

Answer: A

Question 178

The speed - torque characteristics of a DC series motor operating from a constant voltage supply is



Answer: C

Question 179

Match List I (Machine) with List II (Graph) and select the appropriate response

List I

List II

- | | |
|---------------------------|--|
| A. DC Motor | 1. Circle diagram |
| B. DC Generator | 2. V - curve |
| C. Alternator | 3. Open circuit characteristics |
| D. Induction motor | 4. Speed - Torque characteristics |

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

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

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

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

Answer: C

Question 180

Three equal impedances are first connected in delta across a 3-phase balanced supply. If the same impedances are connected in star across the same supply

- A phase currents will be $\frac{1}{3}$ of the previous value
- B line currents will be $\frac{1}{3}$ of the previous value
- C power consumed will be $\frac{1}{3}$ of the previous value
- D power consumed will be 3 times the previous value

Answer: C

Question 181

The average value of the voltage wave $v = 110 + 175 \sin(314t - 25^\circ)$ volts is

- A 110 V
- B 175 V
- C 165.57 V
- D 206.7 V

Answer: A

Question 182

A current from an AC source divides into two branches A and B in parallel. Branch A is an inductor with $30 \mu\text{H}$ inductance and 1Ω resistance. Branch B is another inductor with inductance L and 1.5Ω resistance. For the ratio of currents in the branches to be independent of supply frequency, value of L should be

- A $30.5 \mu\text{H}$
- B $20 \mu\text{H}$
- C $45 \mu\text{H}$
- D $29.5 \mu\text{H}$

Answer: C

Question 183

A universal motor is one which

- A can run on any value of supply voltage
- B has infinitely varying speed
- C can operate on ac as well as dc voltage
- D can work as single phase or three phase

Answer: C

Question 184

If the centrifugal switch of a single phase resistance split induction motor does not open after starting of motor, the motor

- A will run above normal speed
- B will run below normal speed
- C will draw very small current
- D will draw high current and get over heated

Answer: D

Question 185

Alternators are usually designated to generate which type of AC voltage ?

- A with fixed frequency
- B with variable frequency
- C fixed current
- D fixed power factor

Answer: A

Question 186

Three inductors each of 60 mH are connected in delta. The value of inductance of each arm of the equivalent star connection is

- A 10 mH
- B 15 mH
- C 20 mH
- D 30 mH

Answer: C

Question 187

The magnetic field energy in an inductor changes from maximum value to minimum value in 5 msec when connected to an AC source. The frequency of the source in Hz is

- A 500
- B 200
- C 50
- D 20

Answer: C

Question 188

A voltage source having an open-circuit voltage of 150 V and internal resistance of 75Ω is equivalent to a current source of

- A 2A in series with 75Ω

- B 2A in parallel with 37.5Ω
- C 2A in parallel with 75Ω
- D 1 A in parallel with 150Ω

Answer: C

Question 189

A 300 kW alternator is driven by a prime mover of speed regulation 4% while the prime mover of another 200 kW alternator has a speed regulation of 3%. When operating in parallel; the total load they can take without any of them being overloaded is

- A 500 kW
- B 567 kW
- C 425 kW
- D 257 kW

Answer: C

Question 190

The commutator in DC machine acts as

- A a mechanical inverter
- B a mechanical rectifier
- C current controller
- D either (a) or (b)

Answer: D

Question 191

The purpose of using dummy coil in DC machine is to

- A eliminate harmonics developed in the machine
- B eliminate harmonics reaction
- C bring mechanical balance of the armature
- D bring mechanical balance of the body of the motor

Answer: C

Question 192

An inductor with a ferromagnetic core is supplied from a sinusoidal voltage source with frequency 'f'. The current drawn by the inductor will be

- A sinusoidal with frequency 'f'
- B sinusoidal with frequency '2f'
- C a sawtooth wave
- D non-sinusoidal with frequency 'f'

Answer: D

Question 193

For a 6-pole DC machine with wave wound armature, the number of brushes required is

- A 2
- B 4
- C 6
- D 12

Answer: A

Question 194

Function of interpoles in a DC machine is to

- A reduce field winding heating
- B improve commutation
- C compensate for air gap variation
- D reduce losses

Answer: B

Question 195

The commutator segments of DC machine are made of

- A tungsten
- B hard drawn copper
- C soft copper
- D electrolytic copper

Answer: B

Question 196

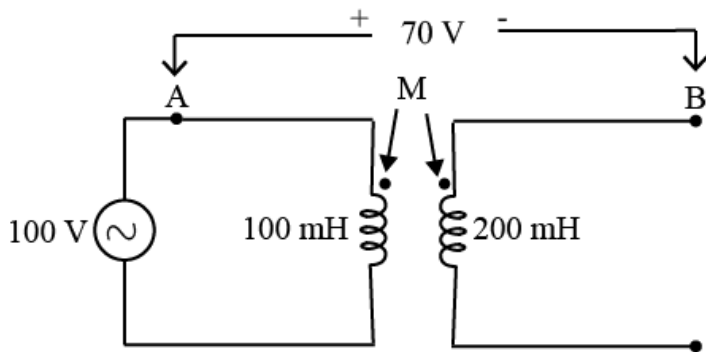
Which one of the following is a speed control method of three phase squirrel cage induction motor?

- A Plugging method
- B Star - delta switch method
- C Pole changing method
- D Centrifugal clutch method

Answer: C

Question 197

In the circuit as shown, voltage measured between A, B, is found to be 70 V. Value of M is



- A 30 mH
- B 100 mH
- C 200 mH
- D 70 mH

Answer: A

Question 198

Two coupled coils, connected in a series have an equivalent inductance of 16 mH or 8 mH depending on the connection. The mutual inductance between the coils is

- A 12 mH
- B $8\sqrt{2}$ mH
- C 4 mH
- D 2 mH

Answer: D

Question 199

Tesla is the unit of

- A electric flux density
- B magnetic field intensity
- C electric field intensity
- D magnetic flux density

Answer: D

Question 200

Which one of the following is a valid value of coefficient of coupling between two inductors?

- A 1.414
- B 0.2
- C 1.732

D 17.32

Answer: B

