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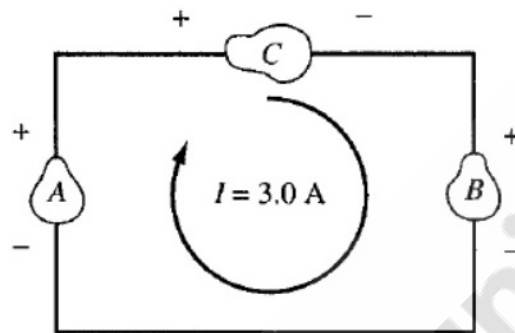
Exam Name : ST - SA - ELECTRICAL

A

Exam Timing : 28/08/2022 8:30 AM - 10:30 AM

Note: Questions answered are highlighted with selection

- 1 If $A=10\text{Volts}$, $B=2\text{Volts}$, $C = R \text{ ohms}$ and $I=3 \text{ Amp}$. As shown in circuit below, the value of R is.....Ohms.



- ☐ 2/3
- ☒ 8/3 (Correct Answer)
- ☐ 11/3
- ☐ 17/3
- 2 What is admittance in a RLC series circuit at resonance?
- ☐ Minimum
- ☒ Maximum (Correct Answer)
- ☐ Zero
- ☐ Fluctuating
- 3 What is the electronic configuration of Sodium?
- ☒ $1s^2 2s^2 2p^6 3s^1$ (Correct Answer)
- ☐ $1s^2 2s^2 2p^6 3s^2$
- ☐ $1s^2 2s^2 2p^6 3s^2 3p^1$
- ☐ $1s^2 2s^1 2p^6 3p^2$
- 4 What is the purpose of the lamination of armature for a DC generator?
- ☐ reduce the bulk
- ☐ provide the bulk
- ☐ insulate the core
- ☒ reduce eddy current loss (Correct Answer)
- 5 Flux created by current flows through the primary winding. It induces emf in ____.
- ☐ only the primary winding
- ☐ only the secondary winding
- ☐ only the transformer core

☒ both the primary and secondary winding (Correct Answer)

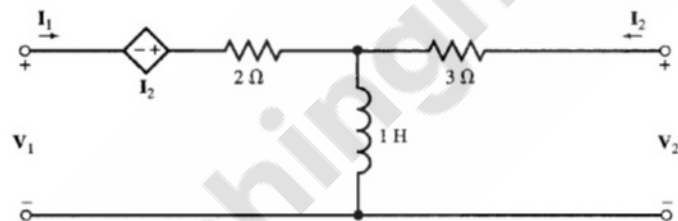
6 The power factor of an AC circuit is equal to ____

- ☐ Unity for a reactive circuit
☐ Sine of the phase angle
☐ Unity for a resistive circuit
☒ Cosine of the phase angle (Correct Answer)

7 For a DC voltage, an inductor ____

- ☒ is virtually a short circuit (Correct Answer)
☐ is an open circuit
☐ depends on polarity
☐ depends on voltage value

8 The Z_{22} parameter of the circuit shown below is:



- ☐ S
☐ S+1
☐ S+2
☒ S+3 (Correct Answer)

9 When is a current said to be a direct current ?

- ☐ When its direction changes with time
☐ When its magnitude changes with time
☐ When its magnitude and direction changes with time
☒ When its magnitude remains constant with time (Correct Answer)

10 What is the time constant of R-L circuit ?

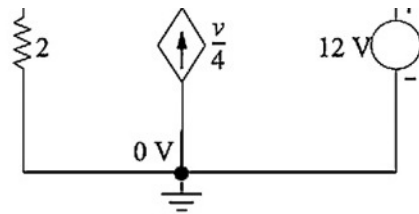
- ☐ unity
☒ R/L
☐ L/R (Correct Answer)
☐ LR

11 The force of gravity ____.

- ☐ is same at all places.
☐ increases with increasing altitude.
☒ decreases with increasing altitude. (Correct Answer)
☐ All of the above

12 At what power factor will the transformer efficiency be maximum?

- ☐ 0.8 leading
☐ 0.8 lagging
☐ 0.5 leading or lagging
☒ unity (Correct Answer)



- ☐ -0 V
☐ -4 V
☐ -6 V
☒ -8 V (Correct Answer)
- 14 Under the condition of resonance, series RLC circuit behaves as a ____
- ☒ Purely resistive circuit. (Correct Answer)
☐ Purely inductive circuit.
☐ Capacitive circuit.
☐ Reactive circuit.
- 15 The amount of charge which will flow through a metallic wire in 1 hour when a constant current of 0.4 ampere is following through it is ____.
- ☒ 1440 C (Correct Answer)
☐ 2880 C
☐ 720 C
☐ 3600 C
- 16 How much energy is stored by a $5\mu\text{F}$ capacitor with a voltage of 500V?
- ☐ 0.025J
☒ 0.625J (Correct Answer)
☐ 1.25J
☐ 0.25J
- 17 What is the terminal voltage of a battery that expends 1100 joules of energy to move 155 coulombs of charge around an electrical circuit?
- ☐ 28.4
☐ 14.2
☒ 7.1 (Correct Answer)
☐ 56.8
- 18 In what units is the rating of fuse wire always expressed ?
- ☐ Volts
☒ Amperes (Correct Answer)
☐ Ampere-volts
☐ Ampere hours
- 19 A small sudden drop in supply voltage in a DC series motor would result in ____
- ☐ Rise in current (Correct Answer)
☒ Drop in current
☐ No change in current
☐ Can't say
- 20 In an electrical circuit, practical ammeter (with finite internal resistance) is inserted. What happens to the resultant current flowing in the circuit ?
- ☐ Will Increase
☒ Will Decrease (Correct Answer)

- ☐ watt
☒ Volt- Ampere reactive (Correct Answer)
☐ Ohm

22 If two resistors are connected in series then _____.

- ☒ Equal amount of current flows through each resistor (Correct Answer)
☐ Equal amount of voltage drop occurs through each resistor
☐ Unequal amount of current flows through each resistor
☐ Equivalent resistance will be lesser than individual resistor.

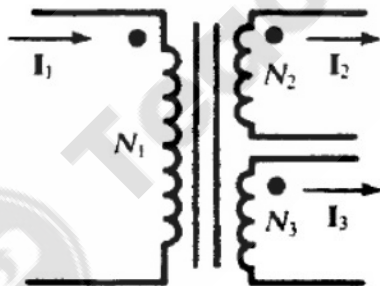
23 A current of 50 mA flows through a series circuit consisting of a $0.6\mu\text{F}$ capacitor and a resistor in series with a 10 kHz, 250 V ac source. What is the total circuit impedance?

- ☐ 100Ω
☐ 500Ω
☒ 5 k Ω (Correct Answer)
☐ 5 M Ω

24 The frequency of DC supply is _____.

- ☐ 1 Hz
☐ 50 Hz
☒ Zero Hz (Correct Answer)
☐ 100 Hz

25 For the magnetic circuit given below, if $I_1 = 4\text{ A}$, $N_1 = 4$, $I_2 = 2\text{ A}$, $N_2 = 2$ and $N_3 = 2$ then $I_3 =$ _____.



- ☐ 2A
☐ 4A
☒ 6A (Correct Answer)
☐ 8A

26 The input of an ac circuit having power factor of 0.7 lagging is 28 kVA. The power drawn by the circuit is _____ kW.

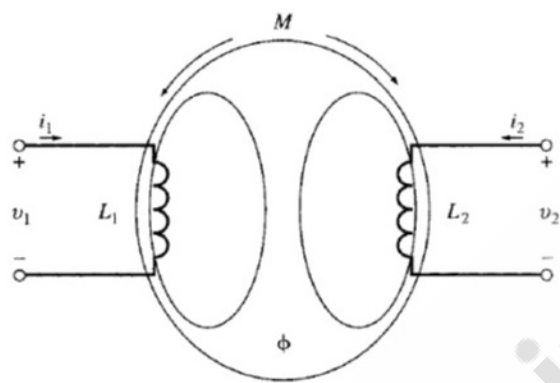
- ☐ 0.6
☐ 24
☐ 9.8
☒ 19.6 (Correct Answer)

27 For periodic even function, the trigonometric Fourier series contains _____.

- ☐ only sine terms
☒ only cosine terms (Correct Answer)
☐ cosine terms and constant
☐ sine terms and constant

28

M is the mutual inductance between the two coils having self-inductance L_1 and L_2 as show in the circuit. the value of output voltage v_2 is given by.....

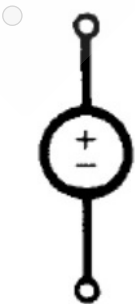


- ☒ $v_2 = L_2 \frac{di_2}{dt} + M \frac{di_1}{dt}$ (Correct Answer)
- ☐ $v_2 = L_1 \frac{di_2}{dt} + M \frac{di_1}{dt}$
- ☐ $v_2 = L_1 \frac{di_1}{dt} + L_2 \frac{di_2}{dt}$
- ☐ $v_2 = L_2 \frac{di_1}{dt} + M \frac{di_2}{dt}$

29 Determine the mechanical advantage of a lever in which the effort arm is 36 cm and the load arm is 1.6 cm.

- ☐ 45
- ☐ 12
- ☒ 22.5 (Correct Answer)
- ☐ 90

30 Which one of the following symbols represents a "Independent current source"?

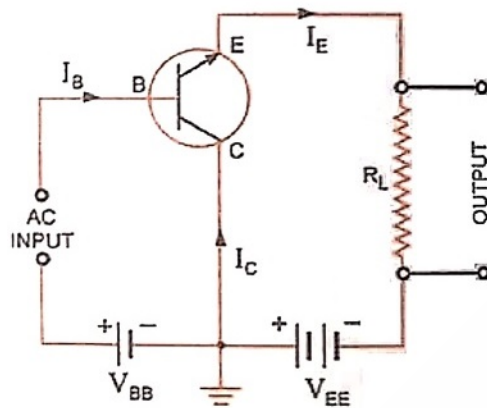




- 31 A current of 50 mA flows through a series circuit consisting of a $1\mu\text{F}$ capacitor and a resistor in series with a 10 kHz, 100 V ac source. What is the total circuit impedance?
- ☐ 10 k Ω
☐ 100 Ω
☒ 2 k Ω (Correct Answer)
☐ 0.5 k Ω
- 32 Which of the following describes the surface integral of the electrical field intensity ?
- ☐ Charge density
☒ Flux density
☐ Net flux emanating from the surface (Correct Answer)
☐ Electric charge
- 33 A load is connected to an active network. At the terminal to which the load is connected, Thevenin's equivalent resistance and voltage are 10 ohms & 60 V respectively. Then maximum power supplied to the load is ____
- ☐ 10 Watts
☐ 30 Watts
☐ 60 watts
☒ 90 watts (Correct Answer)
- 34 State the type of function : $f(t)$ satisfies the condition $f(t) = f(-t)$.
- ☒ Even (Correct Answer)
☐ Odd
☐ Parabolic
☐ Ramp
- 35 Which one of the following is the rotational analogue of Force?
- ☐ Moment of inertia
☐ Gyration
☒ Torque (Correct Answer)
☐ Angular momentum
- 36 The wire of resistance 'R' is cut into '10' equal parts. These parts are then connected in parallel with each other. The effective resistance of the combination is ____.
- ☐ R/10

- ☐ 29.5 Ω
- ☒ 3.38 Ω (Correct Answer)
- ☐ 16.8 Ω

38 The circuit given below is:



- ☐ Common Emitter NPN Transistor
- ☒ Common Collector NPN Transistor (Correct Answer)
- ☐ Common Base PNP Transistor
- ☐ Common Collector PNP Transistor

39 In a series R-C circuit, 6 V ac is measured across the resistor and 8 V ac is measured across the capacitor. The applied voltage is:

- ☒ 10 V ac (Correct Answer)
- ☐ 14 V ac
- ☐ 18 V ac
- ☐ 12 V ac

40 Repeatedly sending an email message to a particular email address with the objective of consuming network resources is called ____.

- ☐ spamming
- ☒ email bombing (Correct Answer)
- ☐ phishing
- ☐ cyber stalking

41 If two parallel-connected resistors dissipate 5 watts and 25 watts power, then what is the total power loss?

- ☐ 0.2 watts
- ☐ 5 watts
- ☒ 30 watts (Correct Answer)
- ☐ 25 watts

42 80 C of charge flows from a point in 20 sec. The value of current will be ____

- ☒ 4A (Correct Answer)
- ☐ 0.25A
- ☐ 25 A
- ☐ 40 A

43 In a purely resistive circuit, the peak power is _____ the average power.

- ☒ Equal to

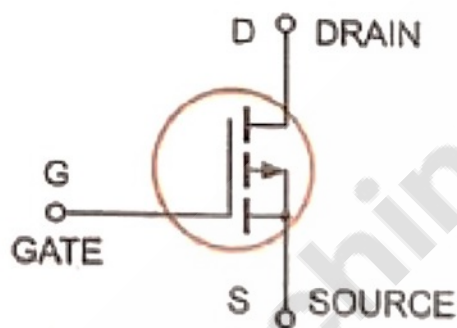
- ☐ it avoids core saturation and high voltage induction (Correct Answer)
☒ it is safe to human beings
☐ it protects the primary circuit
☐ None of the above
- 45 What is the value of a capacitor that can store two coulombs of charge when 1000 volts is applied across its plates?
- ☐ 2 μF
☐ 200 μF
☒ 2000 μF (Correct Answer)
☐ 500 μF
- 46 The resultant of two resistances R1 and R2 connected in series is 4.5 ohms and in parallel is 1 ohm. What are the values of R1 and R2 respectively?
- ☐ 3 ohms and 6 ohms
☐ 3 ohms and 9 ohms
☒ 1.5 ohms and 3 ohms (Correct Answer)
☐ 1.5 ohms and 0.5 ohms
- 47 $\cos\left(\cos^{-1}\left(\frac{4}{5}\right) + \cos^{-1}\left(\frac{12}{13}\right)\right) =$
- ☐ $\frac{33}{65}$ (Correct Answer)
☐ 5
☐ $\frac{63}{65}$
☐ 0
- 48 In a series R-C circuit, 15 V AC is measured across the resistor and 20 V AC is measured across the capacitor. The applied voltage is:
- ☒ 25 V ac (Correct Answer)
☐ 35 V ac
☐ 40 V ac
☐ 30 V ac
- 49 60 C of charge flows from a point in 30 seconds. The value of current is given by ____
- ☒ 2 A (Correct Answer)
☐ 0.5 A
☐ 20 A
☐ 60 A
- 50 Which of the following equivalent circuit represent a Voltage-source with open circuit voltage 10 V and internal resistance 10 Ω ?
- ☒ A current-source of strength 1A in shunt with a resistance of 10 Ω . (Correct Answer)
☐ A current -source of strength 1A in series with a resistance of 10 Ω .
☐ A current-source of strength 10 A in shunt with a resistance of 10 Ω .
☐ A current-source of strength 1A in shunt with a resistance of 100 Ω .

Find the cofactor of the element 10 in the determinant.

$$\Delta = \begin{vmatrix} -7 & -2 & 3 \\ 10 & -11 & 6 \\ -1 & 9 & -4 \end{vmatrix}$$

- ☐ 19
- ☒ -19 (Correct Answer)
- ☐ 35
- ☐ -35

52 The symbol shown below is:



- ☐ P- Channel E- MOSFET
- ☒ P- Channel E-MOSFET (Correct Answer)
- ☐ N- Channel JFET
- ☐ P- Channel JFET

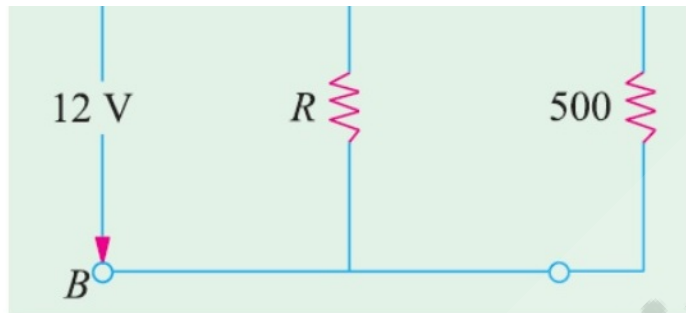
53 Which of the following bulbs will have the highest resistance?

- ☒ 220V, 60W (Correct Answer)
- ☐ 220 V, 100 W
- ☐ 300 V, 150W
- ☐ 115 V, 60 W

54 An atom of an element P has two electrons in its outermost orbit and that of Q has one electron in its outermost orbit. What will be the formula of the compound?

- ☐ P₂Q
- ☒ PQ₂ (Correct Answer)
- ☐ PQ
- ☐ PQ₃

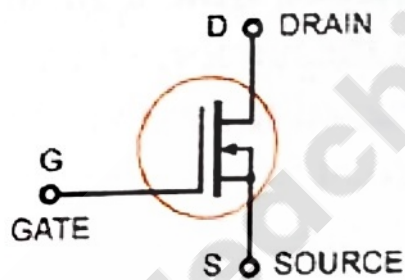
55



If the voltage drop across the 500 ohms is 2.5 volts, then the value of voltage across R ohm resistance is.....

- ☐ 0 V
- ☐ 0.25 V
- ☒ 2.75 V (Correct Answer)
- ☐ 10 V

56 The symbol shown below is:



- ☐ P- Channel DE- MOSFET
- ☒ N- Channel DE- MOSFET (Correct Answer)
- ☐ P- Channel JFET
- ☐ N- Channel JFET

57 Which of the following is not a bilateral element?

- ☐ Resistor
- ☐ Inductor
- ☐ Capacitor
- ☒ Diode (Correct Answer)

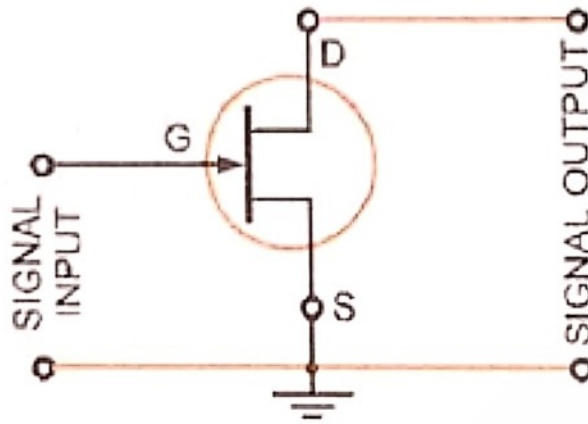
58 A shunt generator running at 1200 r.p.m. has generated e.m.f. as 100 V. If the speed increases to 2000 r.p.m., the generated e.m.f. will be nearly ____

- ☐ 150 V
- ☐ 175.6 V
- ☒ 166.6 V (Correct Answer)
- ☐ 290 V

59 The material used for construction of filament of bulbs is ____.

- ☐ carbon
- ☐ aluminium
- ☒ tungsten (Correct Answer)
- ☐ nickel

- 61 The configuration of the circuit shown below is:



- ☐ Common Gate
- ☒ Common Source (Correct Answer)
- ☐ Common Drain
- ☐ None of these
- 62 What is the total resistance of a voltmeter on the 10 V range when the meter movement is rated for 50 μ A of full-scale current?
- ☐ 10 k Ω
- ☐ 20 k Ω
- ☒ 200 k Ω (Correct Answer)
- ☐ 100K Ω
- 63 A ball is thrown vertically upward. It has a speed of 7 m/s when it has reached one half of its maximum height. Maximum height up to which the ball rise is _____meter. (take $g = 10 \text{ m/s}^2$)
- ☐ 7
- ☐ 9.8
- ☐ 10
- ☒ 4.9 (Correct Answer)
- 64 Which one of the following material is used construct the field coil of D.C generator?
- ☐ Mica
- ☒ Copper (Correct Answer)
- ☐ Cast iron
- ☐ Carbon
- 65 The product of the order and degree of the differential equation $(y''')^2 + (y'')^3 + (y')^4 + y^5 = 0$ is _____.
- ☒ 6 (Correct Answer)
- ☐ 12
- ☐ 8
- ☐ 2
- 66 The option that best explains the meaning of the word 'prone' is
- ☐ conscientiously honest and careful of details
- ☐ watchfulness
- ☒ inclined to (Correct Answer)
- ☐ an earlier / older model

☐ looked / waiting

68 A is higher than B by 135%. Then B is lower than A by ____ %.

☒ 57.44 (Correct Answer)

☐ 114.88

☐ 219.76

☐ 28.72

69 Two sets of statements are given below:

Set 1

Active Voice: She spoke to the official on duty.

Passive Voice: She was spoken to by the official on duty.

Set 2

Active Voice: We will know the outcome of these experiments after six months.

Passive Voice: These experiments will have a known outcome after six months.

For the given active voice statements in Set 1 and Set 2, check if the respective passive voice statements are correct or incorrect.

☐ Both sets are correct

☐ Both sets are incorrect (Correct Answer)

☐ Only Set 1 is correct

☐ Only Set 2 is correct

70 Fill in the most suitable and appropriate form of tense/s in the sentence: You ____ very thoughtful. What ____ you ____ about?

☐ look / are / thinking (Correct Answer)

☐ looked / was / thinking

☐ look / are / think

☒ looking / are / thinking

71 Select the correct passive voice form of the sentence: You do not forget your lesson.

☐ Your lesson is not to be forgotten by you (Correct Answer)

☐ Do not forget your lesson

☐ Is your lesson being forgotten by you?

☐ Forgetting the lesson is not done by you

72 $1 + \{5 - (1 + 9) + 6 - 7\} - 1 + 8 = \underline{\hspace{2cm}}$

☒ 2 (Correct Answer)

☐ 5

☐ 0

☐ 6

73 Two sets of proverbs and their usage are given below:

Set 1

Proverb: Better to wear out than rust out

Usage: To serve them fine French cuisine was better to wear out than rust out.

Set 2

Proverb: Beggars can't be choosers

Usage: Mr. Walke, my elderly neighbour, keeps yelling but he's harmless. Its like beggars can't be choosers.

For the given proverbs in Set 1 and Set 2, check if the usage are correct or incorrect.

☐ Both sets are correct

☐ Both sets are incorrect (Correct Answer)

☐ Only Set 1 is correct

☐ Only Set 2 is correct

☐ Passionate

75 If $A : B = 3 : 5$ and $B : C = 2 : 3$, then $A : C =$

- ☐ 1 : 1
☐ 3 : 2
☐ 2 : 3
☒ 2 : 5 (Correct Answer)

76 If x and y are odd numbers between 1 and 10, then $4 + 7x + 5y$ is

- ☐ odd
☒ even (Correct Answer)
☐ can be odd or even
☐ prime number

77 Match the main word with its meaning.

Main Word

- A. nexus
B. profuse
C. renowned
D. spurn

Meaning

1. a connection; tie or link
2. abundant
3. famous
4. reject or refuse

- ☒ A-1, B-2, C-3, D-4 (Correct Answer)
☐ A-4, B-3, C-2, D-1
☐ A-2, B-3, C-4, D-1
☐ A-4, B-3, C-1, D-2

78 Find the synonym of the following word: epidemic

- ☐ internal
☐ local
☒ outbreak (Correct Answer)
☐ tasty

79 What can you say about the Mean, Mode and Median of the following numbers?
2, 4, 7, 8, 9, 3, 5, 8, 1, 3

- ☐ Mean = Mode
☒ Mode < Median (Correct Answer)
☐ Mean < Mode
☐ Median > Mean

80 There was a steaming mist in all the hollows, and it had roamed in its forlornness up the hill, like an evil spirit, seeking rest and finding none. A clammy and intensely cold mist, it made its slow way through the air in ripples that visibly followed and overspread one another, as the waves of an unwholesome sea might do. It was dense enough to shut out everything from the light of the coach-lamps but these its own workings, and a few yards of road; and the reek of the labouring horses steamed into it, as if they had made it all. What is the tone of the passage above?

- ☐ Descriptive
☐ Tired
☐ Excited
☒ Ominous (Correct Answer)

- 82 What is the meaning of the idiom: By the skin of one's teeth
- ☐ Narrowly; barely. Usually used in regard to a narrow escape from a disaster. (Correct Answer)
 - ☐ To agree wholeheartedly.
 - ☐ Without any hesitation.
 - ☐ To display aloofness and disdain.
- 83 Select the option which best completes the paragraph given below: Even though most educational institutions retain royalties from inventions by faculty members, _____.
- ☐ the royalties from books and articles are retained by them.
 - ☐ the faculty members get to retain the royalties from the books and articles they write. (Correct Answer)
 - ☐ the books and articles written by the members are retained by them.
 - ☐ they retain, from books and articles, the royalties from these.
- 84 Find the largest value amongst following.
- ☐ $10\% \times (2\% \times 1100)$
 - ☐ $30\% \times (1\% \times 3500)$
 - ☐ $10\% \times (2\% \times 6100)$
 - ☒ $35\% \times (2\% \times 3600)$ (Correct Answer)
- 85 Pick the right idiom which fits into the sentence: His interference in the peace process is putting a ____ of the negotiations.
- ☐ Spoke in the wheel (Correct Answer)
 - ☐ Wet blanket
 - ☐ Deaf ear
 - ☐ Weal and woe
- 86 Fill in the blank with the options that best completes the sentence: Any ____ from the semifinal win in the FIFA Cup had drained away in the hearts of the Brazilian football fans after their team lost the final match.
- ☐ euphoria (Correct Answer)
 - ☐ depression
 - ☐ homesickness
 - ☐ lessons
- 87 Find which mathematical operation is indicated by @, #, \$ and % in following equation: $57 @ 1 \% 9 \$ 3 \# 1 = 55$
- ☐ \$ means \div , @ means \times , # means $-$, % means $+$
 - ☒ \$ means \div , @ means $-$, # means $+$, % means \times (Correct Answer)
 - ☐ \$ means \times , @ means \div , # means $-$, % means $+$
 - ☐ \$ means \times , @ means $+$, # means \div , % means $-$
- 88 Which of the following will give second largest value?
- ☐ $20.09 + 34.15 - 41.9 + 9.32 - 51.3$
 - ☐ $24.11 + 89.6 - 89.69 + 39.44 - 92.84$
 - ☒ $58.13 + 12.94 - 73.29 + 36.57 - 62.66$ (Correct Answer)
 - ☐ $8.51 + 7.37 - 30.94 + 39.59 - 51.48$
- 89 Which of the following words is misspelt?
- ☐ concede
 - ☒ tomorrow
 - ☐ aggression (Correct Answer)
 - ☐ acceptable

- 91 Read the following sentence and change the tense as per the given directions: (Change into present perfect tense) I always wanted to be a scientist.
- ☒ I have always wanted to be a scientist (Correct Answer)
 - ☐ I am wanting to be a scientist
 - ☐ I will be becoming a scientist
 - ☐ I was to have become a scientist
- 92 The number 1575 is divisible by ____
- ☐ 3 and 10
 - ☐ 13 and 18
 - ☒ 7 and 9 (Correct Answer)
 - ☐ 5 and 17
- 93 Which of the following is meaning of the word: fritter
- ☒ to waste (Correct Answer)
 - ☐ by experimental and trial-and-error methods
 - ☐ difficult for the mind to grasp easily
 - ☐ measure or understand
- 94 If $X > 16$, arrange the following fractions in descending order.
[1] $X/915$
[2] $2X/1025$
[3] $X/1025$
[4] $2X/915$
- ☒ 4, 2, 1, 3 (Correct Answer)
 - ☐ 4, 3, 2, 1
 - ☐ 2, 1, 3, 4
 - ☐ 2, 1, 4, 3
- 95 Fill in the blank with the correct option: Due to his fanatical and extreme thinking, he was known as a ____ reformer.
- ☐ Hopeless
 - ☐ Idiotic
 - ☐ Shallow-thinking
 - ☒ Radical (Correct Answer)
- 96 Cost of a toy is Rs. 15. Selling Price is Rs. 25. Profit percentage is ____ percent.
- ☐ 10
 - ☐ 25
 - ☐ 50
 - ☒ 66.66 (Correct Answer)
- 97 Which of the following will give second smallest value?
- ☐ $12/81 + 11/97 + 69/75$
 - ☒ $0/71 + 84/91 + 27/77$ (Correct Answer)
 - ☐ $29/26 + 18/75 + 6/79$
 - ☐ $89/99 + 34/88 + 17/81$

98

Match the Main Word and their Opposites.

Main Word

- A. proceed
- B. restricted
- C. permitted
- D. recall

Opposite

- 1. stop
- 2. unrestricted
- 3. prohibited
- 4. forget

- ☒ A-1, B-2, C-3, D-4 (Correct Answer)
- ☐ A-4, B-3, C-2, D-1
- ☐ A-2, B-3, C-4, D-1
- ☐ A-4, B-3, C-1, D-2

99 The option that best explains the meaning of the word 'cynicism' is

- ☐ feeling doubt
- ☐ that which cannot be changed
- ☐ distrusting or disparaging the motives of others (Correct Answer)
- ☐ without taste or flavour

100 Which of the following options is the second smallest?

- ☐ $24\% \times 3000 + 6\% \times 3700 + 11\% \times 4200$
- ☐ $4\% \times 3500 + 11\% \times 4200 + 16\% \times 4700$
- ☒ $10\% \times 1900 + 17\% \times 2600 + 22\% \times 3100$ (Correct Answer)
- ☐ $17\% \times 2300 + 24\% \times 3000 + 4\% \times 3500$

