



SSC JE 2019-20

Electrical Engineering

Mini Mock Challenge
(July 08- July 09 2020)

Questions &
Solutions

1. **Select the word-pair in which the two words are related in the same way as the two words in the following word-pair.**

Baht : Thailand

A. Dinar : Burma

B. Drachma : Greece

C. Yen : china

D. Guilder : Spain

Ans. B

Sol. Just like baht is the currency of Thailand, drachma is the currency of Greece.

Hence, option B is the correct answer.

2. **In the following question, select the odd letters from the given alternatives.**

A. VTXZ

B. OWFL

C. GFRQ

D. LPSG

Ans. B

Sol. From the given options, only OWFL contains a vowel.

Hence, option B is the correct answer.

3. **Arrange the given words in the sequence in which they occur in the dictionary.**

1) Rustic

2) Rural

3) Roller-coaster

4) Rustproof

5) Robotics

A. 53214

B. 35214

C. 32541

D. 53142

Ans. A

Sol. Alphabetical order is:

5. Robotics

3. Roller-coaster

2. Rural

1. Rustic

4. Rustproof

Thus the correct sequence is 53214.

Hence, option A is the correct answer.

4. In a code language, **CARNIVAL** is written as **LPYAJYTG**. How will **DISTANCE** be written as in that language?

A. RQGBDAMY

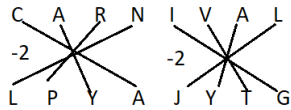
B. SQHBCALZ

C. RQGBCALY

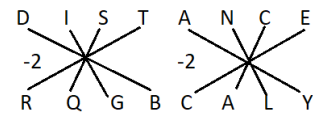
D. RPGBCZLY

Ans. C

Sol. As,



Similarly,



Hence, option C is the correct answer.

5. **Select the number that can replace the question mark (?) in the following series.**

13, 15, 19, 25, 33, ?

A. 54

B. 43

C. 42

D. 41

Ans. B

Sol. Logic is:

$$13+2=15$$

$$15+4=19$$

$$19+6=25$$

$$25+8=33$$

$$33+10=43$$

Hence, option B is the correct answer.

6. A + B means 'A is brother of B'

A - B means 'A is father of B'

A × B means 'A is mother of B'

A ÷ B means 'A is sister of B'

If T - G × M + S - R ÷ V, then how is T related to V?

A. Great-grand-father

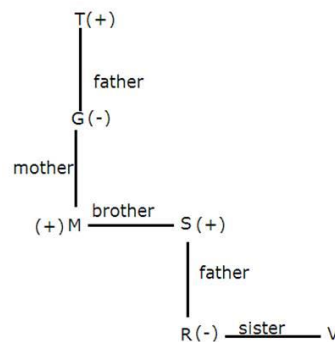
B. Father

C. Grand-father

D. Uncle

Ans. A

Sol. Diagram of the expression T - G × M + S - R ÷ V can be drawn as given below as per the means given in the question-



From the above figure, it's clear that T is the great-grand-father of V.

Hence, the correct answer is option A.

7. In the following question, select the missing number from the given alternatives.

6	15	20
8	4	5
3	5	20
51	65	?

- A. 12
C. 56
B. 51
D. 120

Ans. D

Sol. As,

$$(8 \times 6) + 3 = 48 + 3 = 51$$

$$(15 \times 4) + 5 = 60 + 5 = 65$$

Similarly,

$$(20 \times 5) + 20 = 100 + 20 = 120$$

Hence, option D is the correct answer.

8. In the following question, select the word which cannot be formed using the letters of the given word.

CAPABILITIES

- A. PLATE
C. PALATE
B. PIABLE
D. PAYABLE

Ans. D

Sol. Letter 'Y' is not present in the word CAPABILITIES. Thus we cannot form word PAYABLE. Hence, option D is the correct answer.

9. Which two signs do need to be interchanged to correct the following equation?

$$\frac{1}{4} \div \frac{1}{64} - 5 + 45 \times 120 = 5$$

- A. + and \times
C. + and -
B. \times and -
D. - and \div

Ans. B

Sol. By checking Option(A)-

$$\frac{1}{4} \div \frac{1}{64} - 5 + 45 \times 120 = 5$$

After interchanging-

$$\frac{1}{4} \div \frac{1}{64} - 5 \times 45 + 120 = 5$$

Apply BODMAS,

$$16 - 225 + 120 = 16 - 105 = -89$$

Thus, $\frac{1}{4} \div \frac{1}{64} - 5 + 45 \times 120 = 5$ is not the correct equation.

By checking Option(B)-

$$\frac{1}{4} \div \frac{1}{64} - 5 + 45 \times 120 = 5$$

After interchanging-

$$\frac{1}{4} \div \frac{1}{64} \times 5 + 45 - 120 = 5$$

Apply BODMAS,

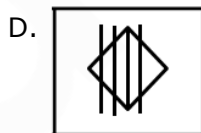
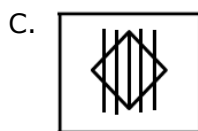
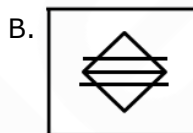
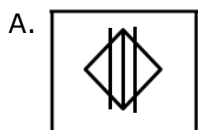
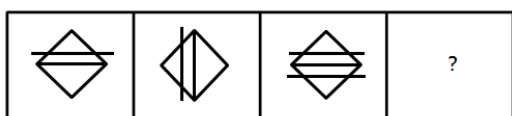
$$16 \times 5 + 45 - 120 = 80 + 45 - 120 = 125 - 120 = 5$$

Thus, $\frac{1}{4} \div \frac{1}{64} - 5 + 45 \times 120 = 5$ is the correct equation.

As we found the correct answer, therefore not need to check more options.

Hence, the correct answer is option B.

10. **Select the option that will come next in the given series.**



Ans. A

Sol. After carefully observing the figures given in the question, it is very clear that the answer figure A is the next figure.

Logic - Fig 1 rotates 90 degree left and form fig 2 in the same way fig 3 rotates 90 degree left to form fig 4 .



Hence, option A is the correct answer.

11. In which year, the Indian National Congress was established?

A. 1885 AD

B. 1889 AD

C. 1895 AD

D. 1900 AD

Ans. A

Sol. • The **Indian National Congress** was founded by **Allan Octavian Hume** in **1885**. It was founded as **Indian National Union** but later on the suggestion of **Dadabhai Naoroji**, it was renamed as **Indian National Congress**.

- The Indian National Congress conducted its **first** session in **Bombay** from **28–31 December 1885**. This first session of Congress was presided over by **Womesh Chandra Banerjee** and he was also elected as the **first president** of the organization.

12. Which of the following is related to Faraizi Movement?

- A. Haji Shariatullah
- B. Dudu Miyan
- C. Shah Abdul Aziz
- D. Both A and B

Ans. A

Sol. The Faraizi Movement developed under Haji Shariatullah.

- The movement was aimed to spread the new found realisation of Shariatullah about Islam.
- He raised small army which attacked zamindars and European Indigo planters.
- After the death of Shariatullah, his son Muhsinuddin Ahmad Dudu Miyan became the leader of the movement.
- The movement slowly died after the death of Dudu Miyan in 1862.

13. In which state, president's rule was imposed for the first time?

- A. Jammu & Kashmir
- B. Goa
- C. Punjab
- D. Sikkim

Ans. C

Sol. • **The President rule was first imposed in the Punjab State.**

- The president rule is imposed under Article 356.
- It is the suspension of state government and imposition of direct central government rule in a state.

14. Veld grasslands are located in which of the following country?

- A. New Zealand
- B. Australia
- C. South Africa
- D. USA

Ans. C

Sol. Veld grasslands are found in South Africa.

- Veld grasslands come under Temperate Grasslands.
- Temperate grasslands are found in the regions with temperate and semi arid to semi humid climates.
- Temperate grasslands have hot summers and cold winters and here rainfall is moderate.
- Other temperate grasslands- The Puszta of Hungary, The Pampas of Argentina and Uruguay, The Steppes of the former Soviet Union.

15. Alaknanda & Pindaki rivers confluence at which place?
- | | |
|-----------------|----------------|
| A. Vishnuprayag | B. Nandaprayag |
| C. Karnaprayag | D. Rudraprayag |

Ans. C

Sol. The Panchprayags and Rivers which confluence in each prayag are as follow-

1. **Vishnuprayag**- Confluence of Alakhnanda and Dhauri Ganga.
2. **Nandaprayag**- Confluence of Alakhnanda and Nadakini Rivers.
3. **Karnaprayag**- Confluence of Alakhnanda and Pinder Rivers.
4. **Rudraprayag**- Confluence of Mandakini and Alakhnanda Rivers.
5. **Devprayag**- Confluence of Alakhnanda and Bhagirathi Rivers.

16. What principle does Hydraulic lift work on?
- | | |
|---------------------|----------------------------|
| A. Pascal's law | B. Newton's law of motion |
| C. Angular Momentum | D. Motion in one dimension |

Ans. A

Sol. • Pascal's law states that if any force is applied to any point of a confined fluid, then the pressure is equally and undiminished transmitted throughout the liquid. Hydraulic lift works on this principle.

17. Which of the following gas was used as a chemical weapon during World War I?
- | | |
|-------------|------------------|
| A. Phosgene | B. Hydrogen |
| C. Xenon | D. Nitrous Oxide |

Ans. A

Sol. • **Phosgene, Chlorine, Mustard gas & tear gas were used in World War 1** as chemical weapons.

- Phosgene was responsible for 85% of chemical-weapons fatalities.
- Chemical Warfare was a major component of World War 1.

18. The National Action Plan on Climate Change consists of how many national missions?
- | | |
|-------|-------|
| A. 4 | B. 8 |
| C. 12 | D. 15 |

Ans. B

Sol. * The National Action Plan on Climate Change consists of **8 National Missions**.

* National Action Plan on Climate Change was **launched in 2008** by Prime Minister's Council on Climate Change.

* In 2018, the Estimates Committee submitted its report on the performance of the NAPCC.

* **National Mission on Strategic Knowledge** for Climate Change is a submission under NAPCC to ensure exchange of knowledge and informed research in India.

* NAPCC is established to line up climate efforts and targets in accordance to **UNFCCC**.

19. Rani ki Vav is a UNESCO World Heritage site and also printed in new hundred Rupee note, is located in which state?

- A. Rajasthan
B. Gujrat
C. Madhya Pradesh
D. Uttar Pradesh

Ans. B

Sol. * **Rani ki Vav is located in Gujrat.**

* It is a UNESCO World Heritage Site and is located on the banks of **Saraswati River**.

* It was constructed during the rule of the **Chaulukya Dynasty**.

* It was named India's "**Cleanest Iconic Place**" at the **2016** Indian Sanitation Conference.

* **Rani Udayamati** commissioned this vav or stepwell, in 1063 in the memory of her husband King Bhimdev I of the Solanki dynasty.

20. E Biz programme is being run by which company?

- A. Google
B. Wipro
C. Amazon
D. Infosys

Ans. D

Sol. * **e Biz** programme is being run by **Infosys**.

* It is a part of **27 mission mode** projects under the National E Governance Plan.

* It aims to improve business environment in country.

* Infosys implement it under the guidance of Department of Industrial Policy and Promotion.

21. To obtain linear scale for calibration in moving iron meter, which of the condition is true?

- A. $\theta dL = \text{constant}$
B. $\frac{\theta dL}{d\theta} = \text{constant}$
C. $\frac{\theta d\theta}{dL} = \text{constant}$
D. $\theta d\theta = \text{constant}$

Ans. B

Sol. For moving iron meter $T_0 = \frac{1}{2} I^2 \frac{dL}{d\theta}$

Under steady state condition

$$k\theta = \frac{1}{2} I^2 \frac{dL}{d\theta} \quad \dots(i)$$

For linear scale $I \propto \theta$, $I = k\theta$

Putting in (i) $k\theta = \frac{1}{2} k^2 \theta^2 \frac{dL}{d\theta}$

$$\theta \frac{dL}{d\theta} = \text{constant}$$

22. Current chopping can be avoided by which of the following:

- A. Resistance switching B. Inductance switching
C. Capacitive switching D. None of the above.

Ans. A

Sol. During Arc interruption stored electromagnetic energy $\frac{1}{2} Li^2$ is converted into electrostatic energy $\frac{1}{2} CV^2$ which leads to high voltage across circuit breaker.

By Resistance switching, this electromagnetic energy is dissipated as heat and is converted into electrostatic energy, hence current chopping is avoided.

23. In a circuit the voltage and current is given by $V = 10 \angle 0$ and $I = 10 \angle 30^\circ$. The nature of the circuit is:

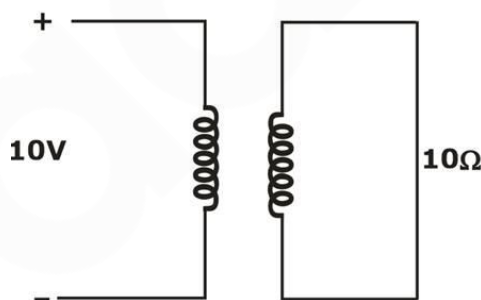
- A. Inductive B. Resistive
C. Capacitive D. None

Ans. C

Sol. In a capacitive circuit, the current leads the voltage

As current in this question leads the voltage by 30° Hence it is capacitive in nature.

24. In the ideal T/F given below find the power absorbed by the load. Primary and secondary turns of T/F are 500 and 1000 respectively.



- A. 100 B. 40
C. 20 D. 50

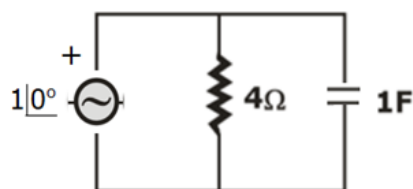
Ans. B

Sol. We know $\frac{V_1}{V_2} = \frac{N_1}{N_2}$

$$\text{So, } V_2 = V_1 \frac{N_2}{N_1} = 10 \times \frac{1000}{500} = 20$$

$$\text{Now } P = \frac{V_2^2}{R} = \frac{20 \times 20}{10} = 40$$

25. In the circuit the average power dissipated is?



- A. 0.25
B. 0.75
C. 1.5
D. 0.75

Ans. A

Sol. Average power is dissipated only in resistor because average power dissipated in capacitor is 0, So In this circuit power dissipated across resistor is: $P = \frac{V_{rms}^2}{R} = \frac{1}{4} = 0.25$

26. If $\frac{V}{f}$ is not constant then eddy current losses in a single phase T/F is directly proportional to?

- A. V^2
B. f^2
C. V
D. f

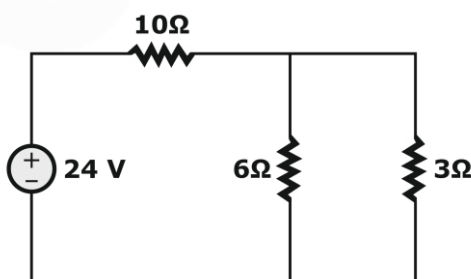
Ans. A

Sol. Eddy current Loss $P_e = K_e B_m^2 f^2$

$$P_e = K_e \frac{V^2}{f^2} \cdot f^2 \left\{ \text{as } B_m = \frac{V}{f} \right\}$$

$$P_e \propto V^2$$

27. In the circuit below, find the voltage across 6 Ω resistance.

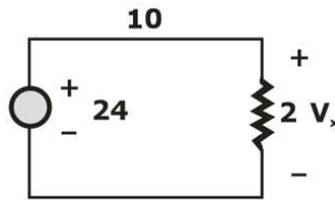


- A. 4v
B. 8v
C. 5v
D. 6v

Ans. A

Sol. 6Ω and 3Ω in parallel so their eq. resistance = $\frac{6 \times 3}{6 + 3} = \frac{18}{9} = 2$

So, circuit looks like



Now according to voltage division law $V_x = 24 \times \frac{2}{10+2} = 4$

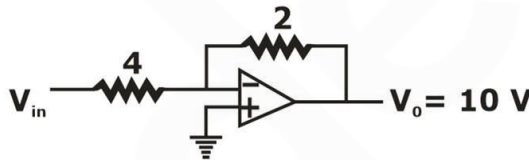
Voltage across parallel combination is same as voltage across individual so, voltage across $6\Omega = 4V$.

28. Carbon brushes in DC machines keeps the voltage drop across it constant because of which property?
- A. Positive temperature coefficient. B. Negative temperature coefficient .
C. Self lubricating property. D. None of the above

Ans. B

Sol. Carbon brushes have negative temp coefficient So, when $I \uparrow \rightarrow T \uparrow \rightarrow R \downarrow$ So $IR = \text{constant}$
Similarly when $I \downarrow \rightarrow T \downarrow \rightarrow R \uparrow$ So $IR = \text{constant}$

29. In the circuit shown below. Find V_{in} if the op-amp is ideal.



- A. 20 B. -40
C. -20 D. 30

Ans. C

Sol. As we can see it is an non inverting OP-Amp

$$\text{So here } \frac{V_0}{V_{in}} = -\frac{R_2}{R_1}$$

$$\frac{V_0}{V_{in}} = \frac{-2}{4}$$

$$V_{in} = -\frac{4}{2} V_0 = -2 \times 10 = -20$$

$$V_{in} = -20$$

30. The reluctance and the MMF in a circuit is directly proportional to which of the following quality.
- A. Length of magnetic path (l) B. Magnetic permeability (μ)
C. Area of cross- section (A) D. All of the above.

Ans. A

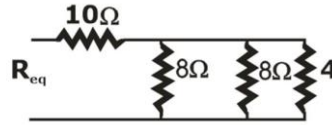
Sol. Reluctance = $\frac{l}{\mu A} \propto l$

MMF = $\phi R \propto R \propto l$

So, MMF $\propto l$

Hence option A is correct.

31. In the circuit give below, find Req.



A. 18

B. 16

C. 12

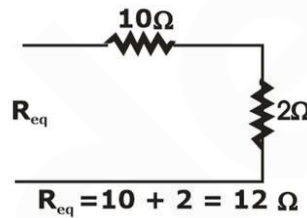
D. 14

Ans. C

Sol. Here $8\Omega \parallel 8\Omega = 4\Omega$

Now $4\Omega \parallel 4\Omega = 2\Omega$

Final circuit



32. With respect to synchronous machines which of the following is true?

A. Field winding is on stator and armature winding on rotor.

B. Armature winding is on stator and field winding on rotor.

C. Both the windings are on the stator.

D. None of the above.

Ans. B

Sol. Synchronous machines are high power rating machines hence armature winding is kept on stator due to various advantages like. Better cooling, Better insulation and better efficiency.

33. A line of 50 km length and 100 Hz frequency is considered as:

A. Long line

B. Small line

C. Medium line

D. None of above

Ans. C

Sol. For nature of line $l \times f$ criteria is used.

$L \times f < 4000$ {small line}

$4000 < l \times f < 10,000$ {Medium line}

$L \times f > 10,000$ {long line}

Here $l \times f = 50 \times 100 = 5000$ hence it is a medium line.

34. Which of the following is the unit of brightness?

- A. Candela/m B. Candela/m²
C. Candela/m³ D. None of the above.

Ans. B

Sol. Brightness is defined as luminous intensity per unit projected area.

Unit of luminous Intensity = Candela.

So, Unit of brightness = Candela/m²

35. Which of the relay is used for the protection of long line?

- A. Impedance Relay.
B. Mho relay.
C. Reactance Relay
D. None

Ans. B

Sol. Mho Relay is used for protection of long line.

Impedance Relay is used for protection of medium line.

Reactance Relay is used protection of small line.

36. Find the number of turns for a single layer winding with 50 slots if one coil have 10 turns.

- A. 300
B. 200
C. 150
D. 250

Ans. D

Sol. For single layer winding no. of coils = $\frac{\text{no. of slots}}{2}$

$$\text{No. of coils} = \frac{50}{2} = 25$$

No. of turns = $25 \times 10 = 250$ {as one coil have 10 turns}

37. Ferranti-effect is caused by which of the following elements in the line?

- A. Resistance
B. Inductance
C. Capacitance
D. None

Ans. C

Sol. Ferranti effect is due to the line charging current which is due to capacitance of the line.

38. If the DC current gain (β) of an N-P-N transistor is 100 and base current $I_B = 1$ mA. Find emitter current I_E

- A. 50 mA B. 70 mA
C. 100 mA D. 101 mA

Ans. D

Sol. For an NPN transistors,

$$I_E = I_B + I_C \dots (1)$$

We know $\frac{I_C}{I_B} = \beta$

$$I_C = \beta I_\beta$$

Putting I_c in (1)

$$IE = \beta I_{\beta} + I_{\beta} = (\beta + 1) I_{\beta} = (100 + 1) 1$$

$$I_E = 101 \text{ mA}$$

39. In two wattmeter method ,formula to find power factor angle of the load is?

A. $\phi = \tan^{-1} \frac{[w_2 - w_1]}{w_2 + w_1}$

B. $\phi = \tan^{-1} \frac{[w_2 + w_1]}{w_2 - w_1}$

C. $\phi = \tan^{-1} \sqrt{3} \frac{[w_2 + w_1]}{w_2 - w_1}$

D. $\phi = \tan^{-1} \sqrt{3} \frac{[w_2 - w_1]}{w_2 + w_1}$

Ans. D

Sol. In two wattmeter method real power

$$P = w_1 + w_2$$

In two wattmeter method reactive power

$$Q = \sqrt{3} (w_2 - w_1)$$

$$\text{So, } \tan \phi = \frac{Q}{P}$$

$$\phi = \tan^{-1} \sqrt{3} \frac{(w_2 - w_1)}{w_1 + w_2}$$

40. Calculate the number of poles for a synchronous machine rotating at 1200 RPM at a frequency of 60 Hz:

A. 4

B. 6

C. 8

D. 5

Ans. B

Sol. In synchronous machine synchronous speed (N_s) is given by $N_s = \frac{120f}{P}$

$$1200 = \frac{120 \times 60}{P} = \boxed{P = 6}$$

41. With increase in frequency of the supply which of the following is true with respect to skin effect:

A. Skin effect increases

B. Skin effect decreases.

C. Skin effect remains same.

D. None.

Ans. A

Sol. Skin depth $\delta = \sqrt{\frac{2}{\omega \sigma}}$

As frequency increases $\delta \downarrow$, hence current flows more on the surface of conductor hence skin effect increases.

42. If the spring in PMMC instrument breaks then what happens to the deflecting torque.

A. Deflecting torque is reduced.

B. Deflecting torque is 0

C. Deflecting torque is increased

D. None of the above.

Ans. B

Sol. Since spring is connected in series with the coil So, if spring breaks, current in the coil becomes 0, due to which deflecting torque becomes 0 So pointer returns to 0 position.

43. The load factor and Plant utilization factor in a power system is $\frac{1}{2}$ and $\frac{3}{4}$. Find the plant factor of the system?

- A. $\frac{3}{2}$ B. $\frac{1}{8}$
C. $\frac{3}{8}$ D. $\frac{4}{3}$

Ans. C

Sol. Plant factor = Load factor * Plant utilisation factor

$$= \frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$$

44. Which of the following is a semi-controlled switch?

- A. G.T.O. B. SCR
C. DIODE D. TRIAC

Ans. B

Sol. SCR is a semi controlled switch as it can be turned ON by a positive gate pulse but cannot be turned off by a negative gate pulse.

45. Which type of slots are generally preferred in Induction machines ?

- A. Open slots. B. Semi open slots.
C. Closed slots. D. None of the above.

Ans. B

Sol. Semi open slots are preferred to have less harmonics as well as less leakage in induction machines.

46. Which of the following is a type of solid state welding ?

- A. SPOT welding. B. Electro- slag welding.
C. Diffusion welding. D. Seam welding.

Ans. C

Sol. SPOT and seam welding are the example of resistance welding.

Electro slag welding is an example of arc welding.

Diffusion welding is an example of solid state welding.

47. Two Resistances R_1 and R_2 are connected in series. The value of resistances along with absolute errors are:-

$$R_1 = 100 \pm 1 \Omega \quad R_2 = 200 \pm 0.5 \Omega$$

Calculate the overall resistance.

- A. 300 ± 0.5 B. 300 ± 1
C. 300 ± 1.5 D. 300 ± 2

Ans. C

Sol. In series connection both resistances are added and in addition absolute errors are added
So, Net $R = 300 \pm 1.5$

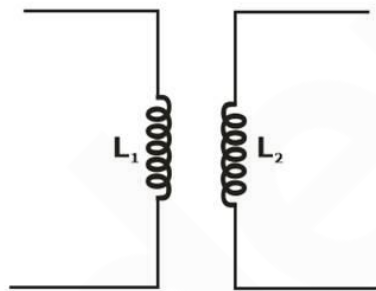
48. Which of the following is correct with respect to instrument current T/F and protective current T/F.

- A. $I_{\text{saturation}} = (2 - 3) I_{FL}$ [In protective T/F]
- B. $I_{\text{saturation}} = (20 - 30) I_{FL}$ [In instrument T/F]
- C. $I_{\text{saturation}} = (20 - 30) I_{FL}$ [In protective T/F]
- D. None of the above

Ans. C

Sol. In protective T/F $I_{\text{saturation}} = (20 - 30) I_{FL}$ So that T/F does not saturates at high current and operates at minimum possible time

49. Two coils with inductance $L_1=10$ H and $L_2=10$ H is shown below:



If the coupling factor $k = 0.5$, Calculate mutual inductance between the coil:

- A. 10
- B. 4
- C. 5
- D. 2

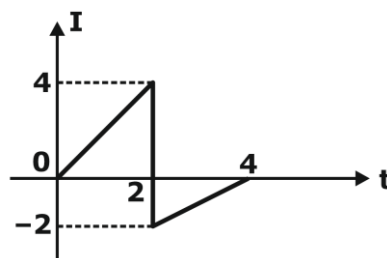
Ans. C

Sol. Mutual inductance is given by $M = k\sqrt{L_1 L_2}$

$$M = 0.5\sqrt{10 \times 10}$$

$$M = 5$$

50. Figure shows the current flowing through a capacitor. The charge acquired by capacitor during interval $t = 0$ to $t = 4$ sec is?



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

Ans. C

Sol. For a capacitor,

$$I = \frac{Cdv}{dt}$$

$$\frac{1}{C} \int Idt = \int dv \dots (1)$$

$$Q = CV$$

Or multiplying by C on both sides in eq. (1)

$$\int Idt = Q$$

Hence charge = Area under I vs t graph

$$\text{So hence } Q = \frac{1}{2} \times 2 \times 4 - \frac{1}{2} \times 2 \times 2$$

$$Q = 2$$

Upcoming Mini Mock Challenge in **July Month**

SSC JE

Electrical Engineering

Exam	Live Date	Syllabus	No. of Questions	Time
SSC JE Mini Mock Test-1	08 July 2020	Full Syllabus (Tech. (30 Q's) & Non-Tech. (20 Q's))	50	30
SSC JE Mini Mock Test-2	15 July 2020	Full Syllabus (Tech. (30 Q's) & Non-Tech. (20 Q's))	50	30
SSC JE Mini Mock Test-3	22 July 2020	Full Syllabus (Tech. (30 Q's) & Non-Tech. (20 Q's))	50	30
SSC JE Mini Mock Test-4	29 July 2020	Full Syllabus (Tech. (30 Q's) & Non-Tech. (20 Q's))	50	30



Scoreup SSC JE

A Crash Course for Electrical Paper-1

Crack Paper-1 with a 60-Day Study Plan

Why take this course?

- › All Technical & Non-Technical Topics Covered through Questions
- › 200+ Hours of Live Classes
- › 5000+ Questions' Discussion in Live Classes
- › 2000+ Questions in Daily & Weekly Quizzes
- › 20 Subject-wise & 10 Full-Length Mock Tests



Manoj Singh



Vijay Bansal



Neha Joshi



Zubair Ehsani