MEGA MOCK CHALLENGE

gradeup

SSC JE 2019-20

Electrical Engineering

Mini Mock Challenge
(July 22- July 23 2020)

Questions & Solutions

1. '**Taj Mahal**' is related to '**Agra**' in the same way '**Victoria Memorial**' is related to '_____.'
   A. Kolkata
   B. Kerala
   C. Mumbai
   D. New Delhi

Ans. A

Sol. Taj Mahal is situated in Agra city and Victoria Memorial is situated in Kolkata.

Hence, option A is the correct answer.

2. **In the following question, select the odd letter group from the given alternatives.**
   A. AF
   B. HM
   C. UZ
   D. TO

Ans. D

Sol. Clearly, the first letter moves five steps forward to give the second letter except 'TO'.

A + 5 = F

H + 5 = M

U + 5 = Z

T + 5 = **Y**

Hence, option D is the correct answer.

3. **Arrange the following words in a logical and meaningful order.**
   1) Helium
   2) Carbon
   3) Beryllium
   4) Hydrogen
   5) Boron
   6) Lithium
   A. 4, 1, 6, 3, 5, 2
   B. 4, 1, 3, 5, 2, 6
   C. 4, 5, 2, 1, 6, 3
   D. 1, 4, 6, 5, 3, 2

Ans. A

Sol. Correct order is-

4. Hydrogen(Atomic number=1)

1. Helium(Atomic number=2)

6. Lithium(Atomic number=3)

3. Beryllium(Atomic number=4)

5. Boron(Atomic number=5)

2. Carbon(Atomic number=6)

Correct order is- 4, 1, 6, 3, 5, 2.

Hence, option A is the correct answer.

4. If **THOR** is coded as **20** and **RANKED** is coded as **42**, then how will **STRENGTH** be coded as?
   A. 56
   B. 48
   C. 73
   D. 72

Ans. D

Sol. The pattern of code language is multiplication of total number of letters with its just succeeded number.

Total number of letters in THOR is 4 x 5 (succeeded number) = 20

Similarly, RANKED = 6 x 7 = 42

Therefore, code of STRENGTH = 8 X 9 = 72

Hence, option D is the correct answer.

5. **A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.**
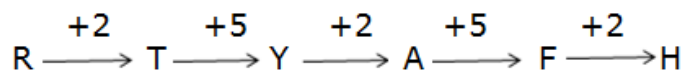
R, T, ?, A, F, H

A. Y   B. M

C. G   D. Q

Ans. A

Sol. Given series follows the pattern given below:

$$R \xrightarrow{+2} T \xrightarrow{+5} Y \xrightarrow{+2} A \xrightarrow{+5} F \xrightarrow{+2} H$$

Hence, option A is the correct answer.

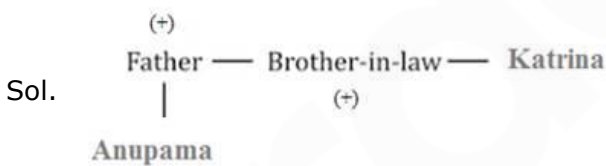6. Anupama's father's brother-in-law is the brother of Katrina. How's Katrina related to Anupama?

A. Mother-in-law   B. Sister

C. Niece   D. Can not be determined

Ans. D

Sol.

```
        (÷)
Father — Brother-in-law — Katrina
   |              (÷)
Anupama
```

Since, we do not know the gender of either Anupama or Katrina.

Therefore, We can not determine the correct answer.

Hence, option D is the correct answer.

7. **Find the missing number.**

9	5	3
4	2	6
2	8	?

A. 6   B. 10

C.16   D. 15

Ans. A

Sol. In 1st column: $9 + 4 + 2 = 15$

In 2nd column: $5 + 2 + 8 = 15$

Similarly, in 3rd column:

3 + 6 + x = 15

X= 6

Hence, option A is correct.

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

EXTRANEOUS

A. RATE	B. NATION
C. EXTRA	D. RUN

Ans. B

Sol. In this question, we show that the letter 'I' is used once in option B but the letter 'I' is not used in the word EXTRANEOUS. Thus we cannot form a word NATION.

Hence, option B is the correct answer.

9. **Which of the following two sings need to be interchanged to make the given equation correct?**

4 × 6 ÷ 33 + 3 — 15= 20

A. × and —	B. + and —
C. ÷ and ×	D. + and ÷

Ans. D

Sol. **By checking Option A,**

4 × 6 ÷ 33 + 3 — 15= 20

After changing the symbols,

4 - 6 ÷ 33 + 3 × 15= 20

Since, 6 ÷ 33 will give result in decimal.

Therefore, 4 × 6 ÷ 33 + 3 — 15= 20 is not the correct equation.

By checking Option B,

4 × 6 ÷ 33 - 3 + 15= 20

After changing the symbols,

4 × 6 ÷ 33 + 3 — 15= 20

Since, 6 ÷ 33 will give result in decimal.

Therefore, 4 × 6 ÷ 33 + 3 — 15= 20 is not the correct equation.

By checking Option C,

4 × 6 ÷ 33 + 3 — 15= 20

After changing the symbols,

$4 \div 6 \times 33 + 3 - 15 = 20$

Applying BODMAS we get,

$= 4 \div 6 \times 33 + 3 - 15$

$= 22 + 3 - 15$

$= 25 - 15 = 10$

Therefore, $4 \times 6 \div 33 + 3 - 15 = 20$ is not the correct equation.

By checking Option D,

$4 \times 6 \div 33 + 3 - 15 = 20$

After changing the symbols,

$4 \times 6 + 33 \div 3 - 15 = 20$

Applying BODMAS we get,

$= 4 \times 6 + 11 - 15$

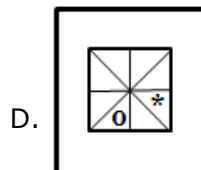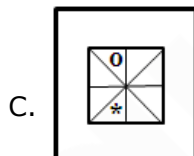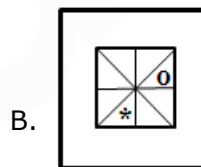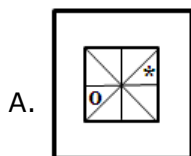$= 24 + 11 - 15$

$= 35 - 15 = 20$

Therefore, $4 \times 6 \div 33 + 3 - 15 = 20$ is the correct equation.

Hence, option D is the correct response.

10. **Select the figure that will come next in the following figure series.**

A.

B.

C.

D.
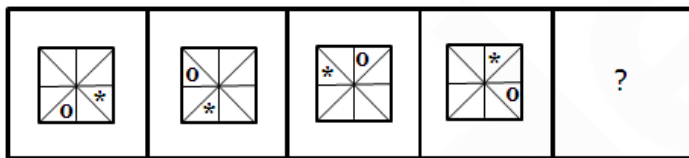
Ans. D

Sol. After carefully observing the figures given in the question, it is very clear that the answer figure(d) will be the next figure.

Logic- * moves two steps clockwise and O also moves two steps clockwise.

Hence, option D is the correct answer.

11. The method of constitution Amendment is provided in which of the following articles ?

    A. Article 348   B. Article 358
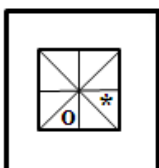
    C. Article 368   D. Article 378

Ans. C

Sol. The procedure of **amendment** in the constitution is laid down in **Part XX** (**Article 368**) of the Constitution of India.

12. Lichens are constituted by_____.

    A. Fern & Fungi   B. Algae & Bryophata

    C. Bacteria & Virus   D. Fungi & Algae

Ans. D

Sol. • A lichen is not a single organism. Rather, it is a symbiosis between different organisms - a fungus and an alga or cyanobacterium.

    • Cyanobacteria are sometimes still referred to as 'blue-green algae', though they are quite distinct from the algae. The non-fungal partner contains chlorophyll and is called the photobiont. The fungal partner may be referred to as the mycobiont.

13. When was Poona pact concluded?

    A. 1932   B. 1934

    C. 1933   D. 1936

Ans. A

Sol. • The Poona Pact refers to an agreement between B. R. Ambedkar on the reservation of electoral seats for the depressed classes in the legislature of British India government.

    • It was concluded on 24 September 1932 at Yerwada Central Jail in Poona.

14. Dry Ice is nothing but

    A. Gaseous carbon dioxide   B. Washing soda

    C. Solid carbon dioxide   D. Carbon monoxide

Ans. C

Sol. Dry ice is nothing but the solid CO_2, When CO_2 is compressed under high pressure, it first come to liquid state and when more pressure is applied on it, it becomes solid. This solid is called as Dry Ice. Thus we can say that dry ice in solid state.

    Hence, option C is correct.

15. In June 2020, the world's largest plasma therapy trials for the COVID-19, "Project Platina" has been launched by which of the following state of India?

    A. Kerala   B. Maharashtra

    C. Karnataka   D. Uttar Pradesh

Ans. B

Sol. * **In June 2020, Maharashtra state government launched the world's largest plasma therapy trials for the COVID-19 "Project Platina".**

* This project was launched by the Chief Minister Uddhav Thackeray.

* The project is aimed at creating robust data for treating the disease for which no specific line of treatment exists.

* The plasma therapy trials will be conducted in 17 medical colleges across the Maharashtra state.

16. Which one of the following rivers originates near Mahabaleshwar?

A. Godavari   B. Krishna

C. Kaveri   D. Tapi

Ans. B

Sol. Mahabaleshwar is a city in Maharashtra.

• **It is the source of the Krishna River** that flows across Maharashtra, Karnataka, Telangana and Andhra Pradesh.

• It is the fourth-biggest river in terms of water inflows and river basin area in India.

17. Who was defeated by Babar in the First Panipat war?

A. Ibrahim Lodi   B. Bahulal Lodi

C. Sikander Lodi   D. Muhammed Lodi

Ans. A

Sol. • First Battle of Panipat (21 April 1526) was fought **between the forces of Babur and the Lodi Kingdom.**

• **Ibrahim Lodi died** on the field of battle along with 15,000 of his troops.

• The battle of Panipat was militarily a decisive victory.

18. The period of pendulum depend upon_____.

A. Mass   B. Length

C. Amplitude   D. Energy

Ans. B

Sol. **The period of pendulum** depends on the **length** of the **pendulum** and also to a **slight degree** on the amplitude, the **width** of the pendulum's swing.

19. What is the maximum strength prescribed for State Legislative Assemblies?

A. 350   B. 600

C. 500   D. 750

Ans. C

Sol. The Legislative Assembly consists of not more than 500 members and not less than 60. The biggest state like Uttar Pradesh has 403 members in its Assembly. States which have small population and are small in size have a provision for having even lesser number of members in the Legislative Assembly. Puducherry has 30 members. Mizoram, Goa have only 40 members each. Sikkim has 32 members.

20. Largest fresh water lake in India is _____.

A. Lonar lake   B. Dal lake

C. Wular lake   D. Tilyar lake

Ans. C

Sol. Wular lake is considered as the largest fresh water lake of India. It is located in Bandipora district of Jammu and Kashmir.

21. In $3-\phi$ measurement using two wattmeter method, Both the wattmeter had identical readings. The power factor of the load is –
   A. Zero
   B. Unity
   C. 0.8 lagging
   D. 0.8 leading

Ans. B

Sol. If wattmeter's reading is identical means $W_1 = W_2$

$$\text{then } \cos\phi = \cos\left[\tan^{-1}\left(\frac{\sqrt{3}\left(W_1 - W_2\right)}{W_1 + W_2}\right)\right]$$

power factor $= \cos\phi = 1$ (unity)

22. The degree of humming level of the noise caused in the transformers may be reduced by
   A. Magnetostriction
   B. High flux density in core
   C. Tightening of core by clamps
   D. Quality of transformer oil

Ans. C

Sol. The transformer humming noise is caused due to magnetostriction. A transformer is excited by an alternating current so that core is executed and contracted twice during a full cycle of magnetization. This humming noise can be reduced by tightening the core by clamps.

23. The daily energy produced in a thermal power station is 720 MWh at a load factor of 0.6. What is the maximum demand of the station?
   A. 50 MW
   B. 30 MW
   C. 72 MW
   D. 720 MW

Ans. A

Sol. Daily load factor

$$= \frac{\text{Energy produced daily}}{24\,\text{Hrs} \times \text{max. demand}}$$

$$\text{Max. demand} = \frac{720\,\text{MWh}}{24 \times 0.6} = 50\,\text{MW}$$

24. The field current of an under excited synchronous motor is increased while its load is constant. How will its power angle and power factor will change?
   A. Power angle decreases and power factor improves.
   B. Power angle remains same throughout, but power factor improves.
   C. Power angle increases while its power factor gradually decreases.
   D. Power angle and power factor both increases.

Ans. A

Sol. Consider the phasor diagram,
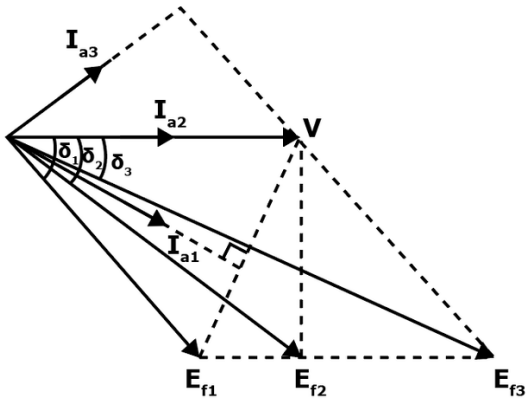
From the phasor diagram,

$$\left|E_{f1}\right| = \left|E_{f2}\right| < \left|E_{f3}\right|$$

$$\delta_1 > \delta_2 > \delta_3$$

If the field current or excitation of under excited synchronous motor is increased, while the load is constant then power angle decreases, and power factor improves but in over excited condition power factor deteriorates.

25. Which of the following statements is NOT true with respect to a secondary cell?

A. Wet cells   B. Rechargeable cells

C. Electrolyte in liquid form   D. Light in weight

Ans. D

Sol. Secondary cells can be reused by charging them. The electrolyte used in the cell remains in liquid form. These are also called wet cells. These are heavy in weight and have high initial cost.

26. Which of the following heating methods has leading power factor?

A. Resistance   B. Induction

C. Dielectric   D. Both B and C

Ans. C

Sol. • Resistances heating method has unity PF.

• Induction heating method has lagging PF.

• Dielectric heating method has leading PF.

27. What does section-44 refer to?

A. Theft of Energy   B. Penalty for wasting Energy

C. Penalty for interferences with meters   D. Penalty for illegal Transmission

Ans. C

Sol. Section 39 – Theft of Energy

Section 40 – Penalty for wasting energy

Section 43 – Penalty for illegal Transmission

Section 44 – Penalty for interferences with meter.

28. The simplified expression of (A + AB + ABC) is-

    A. 1   B. A

    C. 0   D. (A+B)

Ans. B

Sol. A + AB + ABC

    = A [1 + B + BC]

    = A.1 = A

    So, A + AB + ABC = A

29. The most accurate method to measure resistance is –

    A. V-I method   B. Megger

    C. Balance Bridge Method   D. Ohm meter method.

Ans. C

Sol. The most accurate method of measuring resistance is balance bridge method.

30. A synchronous phase modifier supplies

    A. Inductive reactive power only   B. Active power only

    C. Both active and reactive power   D. Both lagging and leading reactive power

Ans. D

Sol. SPM is a synchronous motor operating under no load conditions under variety of excitation. Depending on load, it may be overexcited (supplies lagging VAR) or under-excited (supplies leading VAR)

31. An instrument transformer is used to extend the range of –

    A. Induction Instrument   B. PMMC Instrument

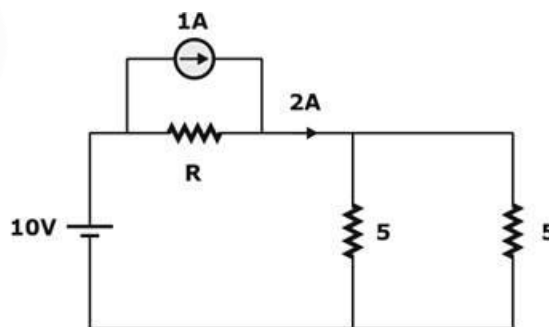   C. MI instrument   D. Electrostatic Instrument

Ans. A

Sol. Instrument transformers are used to extend the range of induction type of instrument.

32. Kirchhoff's law is applicable to-

    A. Passive network   B. Both AC and DC network

    C. AC network   D. DC network

Ans. B

Sol. Kirchhoff's law is applicable to both AC and DC circuits.

33. In the figure the value of R is –

A. 10 Ω   B. 5 Ω

C. 2.5 Ω   D. 15 Ω

Ans. B

Sol. The current in R is 1 A,

By applying KVL.

$10 - I_R . R - 2 (5 \parallel 5) = 0$

$10 - 1. R - 2 \times 2.5 = 0$

$R = 5\Omega$

34. In which welding process the heat is not applied to join the metal?

A. Plastic Welding   B. Fusion Welding

C. Cold Welding   D. None of the above

Ans. C

Sol. In cold welding process, the joints are produced without the application of heat but by applying pressure which results in the Inter-surface molecular fusion of the parts to be joined.
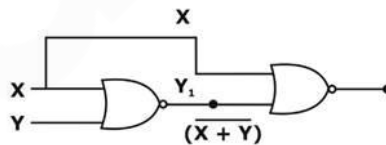
35. The given circuit can be minimized to:
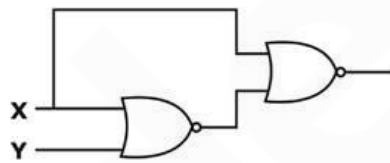
A. $\bar{X}Y$ B. X

C. Y   D. XY

Ans. A

Sol.

$Y_1 = \overline{\left(X + Y \right)}$

Output Y

$Y = \overline{\left(X + Y_1 \right)} = \overline{\left[X + \overline{\left(X + Y \right)} \right]}$

By Demorgan's law

$Y = \bar{X}\left[\overline{\overline{X + Y}} \right] = X\bar{X} + \bar{X}Y$

$y = \bar{X}\left[X + Y \right]$

$y = \bar{X}Y$

36. A stepper motor has a step angle of 2.5°. If the shaft is to make 25 revolutions, the number of steps required will be
    A. 1800   B. 2200
    C. 2800   D. 3600

Ans. D

Sol. Number of revolution = 25

Total angle rotated = 25 x 360°

No. of steps $= \dfrac{25 \times 360}{2.5} = 3600$

37. There are 4 units is a sting insulator. The voltage across the bottom most unit is 30% of total voltage. The string efficiency is
    A. 90 %   B. 75 %
    C. 80 %   D. 83 %

Ans. D

Sol. $\%\eta = \left(\dfrac{V}{4 \times 0.3V}\right) \times 100 = \dfrac{100}{1.2} = 83.33\%$

38. Superposition theorem in a linear circuit is used to find out-
    A. Voltage and power response   B. Power and current response
    C. Voltage and current response   D. Voltage, current and power response.

Ans. C

Sol. Superposition theorem is applicable to a linear network to determine voltage and current response, because of the square relation of power with voltage and current. It is not used for power response.

39. Which of the following is not true for reactance relay?
    A. It provides protection to short length lines.
    B. Ground resistance has no effect on its operation.
    C. Its operating characteristics is a circle having centre at origin, on R-X diagram.
    D. It is a direction restrain over current relay.

Ans. C

Sol. Operating characteristics of a reactance relay is a horizontal straight line on R-X diagram.

40. For an N-channel FET, what is the direction of electron flow?
    A. Source to Drain   B. Drain to Source
    C. Gate to source   D. Gats to Drain

Ans. A

Sol. When a Voltage greater than pinch off is applied, the current starts flowing from drain to source. So, the electrons flow from source to Drain.

41. At very high frequency, the series RC circuit behaves as-

A. Pure resistance circuit   B. Pure capacitance circuit

C. RC circuit   D. Can't determine

Ans. A

Sol. Capacitive reactance $(X_c) = \dfrac{1}{2\pi fc}$

At high frequency, $X_c \simeq 0$ (s.c)

So, series RC circuit will behave like a pure resistance circuit.

42. The armature resistance and brush voltage drop of a 200 V DC shunt motor are 0.1 Ω and 2 V respectively. The current at the instant of starting equals to-

A. 100A   B. 2000A

C. 1980A   D. 1890A

Ans. C

Sol. At starting ($E_b = 0$)

$$\therefore V = E_b + I_a r_a + V_{\text{brush drop}}$$

$V = I_a r_a + V_{\text{brush drop}}$

$200 = I_a \times 0.1 + 2$

$$I_a = 1980\ A$$

43. The application of maximum power transfer theorem is-

A. Power system   B. Electronic circuits

C. Power electronic circuits   D. None of the above.

Ans. B

Sol. The maximum power transfer theorem is used in electronic circuits.

44. The treatment used to protect the wooden polls from the action of termites is -

A. Lime Water   B. $CaOCl_2$

C. NaOH   D. Creosote oil

Ans. D

Sol. In order to protect the wooden poles from the action of termites etc. It is necessary to treat them with creosote oil.

45. The chording angle to eliminate 5th harmonic in induction machine should be:

A. 18°   B. 30°

C. 36°   D. 72°

Ans. C

Sol. To eliminate n^{th} hormonic $= \dfrac{n \propto}{2} = 90°$

Where, $\propto$ = chording angle

To eliminate 5th hormonic

$$\dfrac{5 \times \propto}{2} = 90°$$

$\propto = 36°$

46. A DC ammeter has a resistance of 0.2Ω and its current range is 0-200A. If the range to be extended to 0-500A then the shunt resistances should be-

A. 0.025 Ω
B. 0.133 Ω

C. 0.33 Ω
D. 0.25 Ω

Ans. B

Sol. Meter Resistance (R_m) = 0.2 Ω

$$\text{Shunt Resistance} = \left[\frac{R_m}{\left(\dfrac{I}{I_m} \right) - 1} \right]$$

J is the current to be measured and Im is meter current.

$$R_{sh} = \left[\frac{0.2}{\left(\dfrac{500}{200} \right) - 1} \right] = 0.133\Omega$$

47. Series capacitor compensation is used in transmission lines to

A. Reduce the voltage profile
B. Improve power transfer capability

C. Reduce corona loss
D. Compensate for Ferranti effect

Ans. B

Sol. $P = \dfrac{VE}{X} \sin\delta$

Series capacitor reduces reactance X. Therefore, power transferred capability will increase.

48. Which of the following is NOT true about diamagnetic materials-

A. These materials are repelled by a magnet.

B. Susceptibility small and negative.

C. Relative permeability is more than unity.

D. Atomic orbitals are completely filled.

Ans. C

Sol. Relative permeability is always less than 1. Rest statements are correct about diamagnetic materials.

So, option C is correct.

49. Find out the peak factor of the following periodic waveform
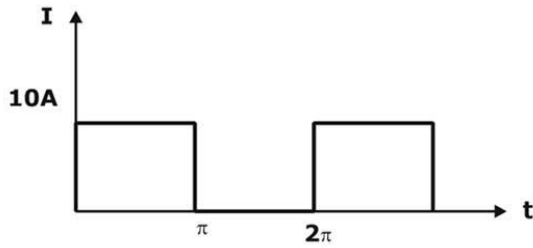
A. $\sqrt{3}$

B. 1

C. $\sqrt{5}$

D. $\sqrt{2}$

Ans. D

Sol. Peak factor$=\dfrac{\text{Maximum value}}{\text{RMS value}}$

Maximum value = 10 A

RMS value$=10\left[\dfrac{\pi}{2\pi}\right]^{1/2}=\dfrac{10}{\sqrt{2}}$

Peak factor$=\dfrac{10}{\left(\dfrac{10}{\sqrt{2}}\right)}=\sqrt{2}$

50. Two infinite parallel wire carry currents of 10A each. The magnitude of the force between the conductor per metre length if the distance between them is 25cm.

A. 4×10^{-5}N

B. 2×10^{-5}N

C. 6×10^{-5}N

D. 8×10^{-5}N

Ans. D

Sol. Force per unit length $=\dfrac{\mu_0 I_1 I_2}{2\pi r}$

$\dfrac{f}{l}=\dfrac{4\pi \times 10^{-7}\times(10)^2}{2\pi \times 25 \times 10^{-2}}=\dfrac{2\times 10^{-3}}{25}$

$\dfrac{f}{l}=8\times 10^{-5}$ N

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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

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