



# SSC JE 2019-20

Electrical Engineering

Mini Mock Challenge  
(June 27- June 28 2020)

Questions &  
Solutions

1. **In the following question, select the related word from the given alternatives.**

Japan : Yen :: Mongolia : ?

- A. Dollar
- B. Ringgit
- C. Won
- D. Togrog

Ans. D

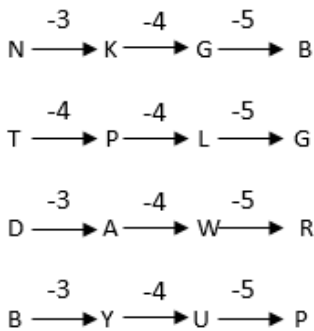
Sol. Yen is the currency of Japan. Similarly, Togrog is the currency of Mongolia. Hence, option D is the correct response.

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

- A. NKGB
- B. TPLG
- C. DAWR
- D. BYUP

Ans. B

Sol. As,



Thus TPLG are the odd letters. Hence, option B is correct.

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

- 1) Players
  - 2) Polished
  - 3) Potash
  - 4) Plateau
  - 5) Parabola
- A. 51432
  - B. 51423
  - C. 51234
  - D. 54123

Ans. D

Sol. Alphabetical order is:

- 5. Parabola
- 4. Plateau
- 1. Players
- 2. Polished
- 3. Potash

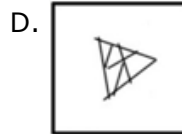
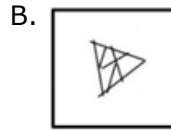
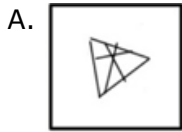
Thus the correct sequence is 54123 Hence, option D is the correct answer.

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7. From the given answer figures, select the one which is hidden/embedded in the question figure.



Ans. A

Sol. On observing the options we can see that the figure given under option (A) is indeed embedded in the original figure. It has been represented below,



hence, option A is correct.

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

BANKRUPT

A. BURP

B. TANK

C. RUN

D. CORRUPT

Ans. D

Sol. **BANKRUPT** has BURP

**BANKRUPT** has TANK

**BANKRUPT** has RUN

CORRUPT has C which is not present in the word BANKRUPT.

Hence, option C is the correct answer.

9. If "÷" denotes "x", "+" denotes "÷", "x" denotes "-" and "-" denotes "+", then  $33 + 11 - 8 \div 4 \times 12 = ?$

A. 108

B. 23

C. 86

D. 58

Ans. B

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Sol.

Symbol	÷	+	×	-
Meaning	×	÷	-	+

Substituting symbols with their respective operator, the equation becomes,

$$33 \div 11 + 8 \times 4 - 12$$

Applying BODMAS rule we get,

$$33 \div 11 + 8 \times 4 - 12$$

$$= 3 + 8 \times 4 - 12$$

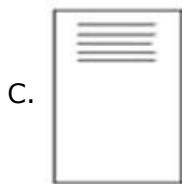
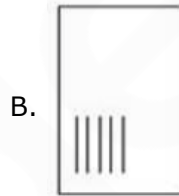
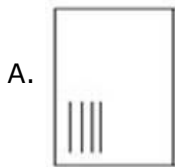
$$= 3 + 32 - 12$$

$$= 3 + 20$$

$$= 23$$

Hence, option B is the correct answer.

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



Ans. B

Sol. After observation, it is clear that, answer figure (b) will be the next figure.

Logic- number of Straight lines increasing by +1 in each step.



Hence, option(B) is the correct answer.

11. Who among the following Mughal Emperors was called Darvesh or a Zinda Fakir?

A. Aurangzeb

B. Shah jahan

C. Humayun

D. Babur

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23. In cables, the thickness of the layer of insulation on the conductor depends upon.

- A. Current carrying capacity
- B. Voltage
- C. Power factor
- D. reactive power

Ans. B

Sol. Voltage variation causes the change required in the thickness of insulation on conductor of cables

24. Which of the following is not distribution which is normally used.

- A. 3 phase 4 wire
- B. 3 phase – 3 wire
- C. single phase 3 wire
- D. single phase 4 wire

Ans. D

Sol. Single phase 4 wire system are not used normally.

25. An induction motor having, and poles runs at 727.5 rpm, if the supply frequency is 50 Hz the emf in the rotor will have a frequency of

- A. 1.5 Hz
- B. 48.5 Hz
- C. 51.5 Hz
- D. 75 Hz

Ans. A

Sol.  $N_s = \frac{120 \times 50}{8} = 750 \text{ rpm}$

$$S = \frac{750 - 727.5}{750} = 0.03$$

$\therefore$  Slip frequency of rotor =  $sf = 0.03 \times 50 = 1.5 \text{ Hz}$

26. In a loaded dc motor, if the brushed are given from the interpole axis in the direction of rotation then the commutation will

- A. Improve and the speed falls
- B. Deteriorate and speed rises
- C. deteriorate and speed falls
- D. Improve and speed rises

Ans. C

Sol. In this case, the armature reaction is partially magnetising and partially cross magnetising in nature so it deteriorates and speed falls

27. If in a transformer copper loss is 500 w than how much should be the iron loss for maximum efficiency?

- A. 200 W
- B. 400 W
- C. 500 W
- D. 700W

Ans. C

Sol. For maximum efficiency

$100n \text{ loss} = \text{copper loss} = 500 \text{ w}$

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28. Neglecting all losses, how is the developed torque (T) of a DC separately excited motor, operating under constant terminal voltage, related to its output power (P):

- A.  $T_e \propto \sqrt{P}$
- B.  $T_e \propto P$
- C.  $T_e^2 \propto P^3$
- D.  $T_e$  independent of P

Ans. B

Sol. The output power and torque is directly to each other so, option B is current.

29. The deflection expression  $Q \propto V^2 = \frac{dc}{d\theta}$  corresponds to

- A. moving iron type instruments
- B. Electrodynamics type instruments
- C. Electrostatic type instruments
- D. Induction type instruments

Ans. C

Sol. The given expression represents the electrostatic type instruments.

30. In calibration of dynamometer wattmeter by phantom loading arrangement is used because

- A. the arrangement gives accurate results.
- B. the power consumed in calibration work is minimum
- C. the method gives quick results.
- D. the onsite calibration is possible.

Ans. B

Sol. Actual loading arrangements would involve a considerable waste of power in order to avoid this 'Phantom' or 'Frictions' loading is done.

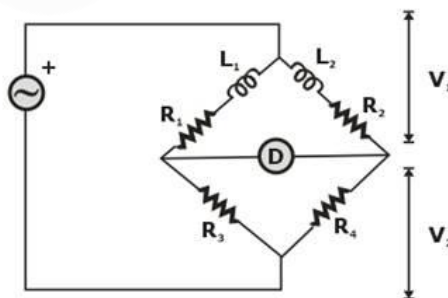
31. The ratio and phase angle errors in a well-designed current transformer (CT) are kept within specified limits by using

- A. Ferrite Core
- B. Strip wound core
- C. Fractional turn
- D. None of these

Ans. A

Sol. Ferrite core is the correct option.

32. The bridge shown in the figure represents



- A. Maxwell's bridge
- B. Wien's bridge
- C. Anderson's bridge
- D. Hay's bridge

Ans. A

Sol. The given figure represents Maxwell's bridge which measures inductances.

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33. An ac voltage source  $100 \sin \omega t$  is connected to the load resistor  $R$  of  $50 \Omega$ . The average power in the load resistor  $R$  is given as:
- A. 100 W
  - B. 200 W
  - C. 400 W
  - D. 1600 W

Ans. A

Sol.  $P = \frac{(V_{rms})^2}{R}$  here  $V_{rms} = \frac{100}{\sqrt{2}}$

$$\text{So, } P = \frac{\left(\frac{100}{\sqrt{2}}\right)^2}{50} = \frac{10000}{2 \times 50} = 100 \text{ W}$$

34. What is resonant frequency of 2.7 pf capacitor and a 33nH inductor?
- A. 513 mHz
  - B. 720 GHz
  - C. 250 MHz
  - D. 533 MHz

Ans. D

Sol. Frequency  $f = \frac{1}{2\pi\sqrt{LC}} = \frac{1}{2 \times 3.14 \sqrt{33 \times 10^{-9} \times 2.7 \times 10^{-12}}} = 533 \text{ MHz}$

35. What is the equivalent inductance when inductors are connected in series:
- A. Sum of all the individual inductances
  - B. product of all the individual inductances
  - C. Sum of the reciprocal of all the individual inductances.
  - D. Product of the reciprocal of all the individual inductances.

Ans. A

Sol. Sum of all the individual inductances represent the equivalent inductance in series connection.

36. When the sole purpose of an alternating current is heating, the selection of conductor is based on:
- A. rms value of current
  - B. average value of current
  - C. Peak value of current
  - D. Any of the above

Ans. A

Sol. rms value of current used for the selection of conductor.

37. The presence of parallel alignment of magnetic dipole moment is given by which materials:
- A. Diamagnetic
  - B. Ferromagnetic
  - C. Paramagnetic
  - D. Ferrimagnetic

Ans. B

Sol. The ferromagnetic material are characterized by parallel alignment of magnetic dipole moments. Their susceptibility is very large.

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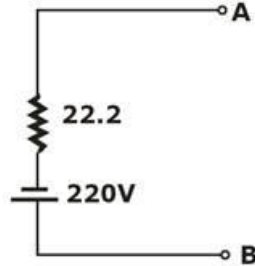
Sol. Total voltage by moving in clock-wise direction

$$-10 - 20 + 30 = 0 \text{ V}$$

$$\text{As } I = \frac{V}{R} = 0$$

So, current is 0A

42. What will be the value of current be once source transformation is applied to the circuit?



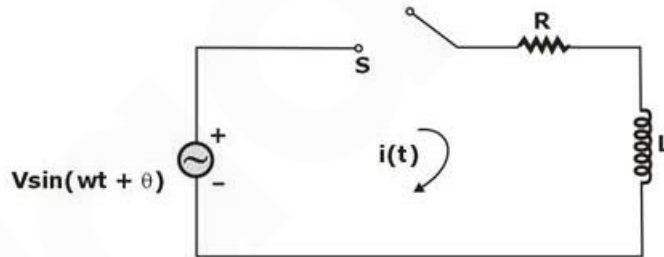
- A. 10A
- B. 20A
- C. 30A
- D. 40A

Ans. A

Sol. Using ohm's law  $V = IR$

$$I = \frac{V}{R} = \frac{220}{22} = 10A$$

43. In the given circuit, switch S is closed at time  $t = 0$ . The steady state current equals:



- A.  $\frac{V}{\sqrt{R^2 + \omega^2 L^2}} \sin\left(\omega t + \theta - \tan^{-1} \frac{\omega L}{R}\right)$
- B.  $V \sin\left(\omega t + \theta - \tan^{-1} \frac{\omega L}{R}\right)$
- C.  $\frac{V}{\sqrt{R^2 + \omega^2 L^2}} \sin\left(\omega t + \theta + \tan^{-1} \frac{\omega L}{R}\right)$
- D.  $V \sin\left(\omega t + \theta + \tan^{-1} \frac{\omega L}{R}\right)$

Ans. A

Sol. At steady state conductor, inductor becomes short circuited so  $i(t)$

$$\frac{V}{\sqrt{R^2 + \omega^2 L^2}} \sin\left(\omega t + \theta - \tan^{-1} \frac{\omega L}{R}\right)$$

44. The 'Q' Quality factor of a series R-L-C circuit is equal to the

- A. impedance
- B. Resonant frequency
- C. Voltage gain
- D. Current Gain

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Ans. C

Sol. For series RLC circuit

$$Q = \frac{wL}{R} = \frac{w}{\Delta w} \text{ have } \Delta w \rightarrow \text{band width}$$

So, it is equivalent to voltage gain.

45. A balanced RYB sequence,  $\gamma$ -connected source with  $V_{RN} = 100V$  is connected to a  $\Delta$  connected balanced load of  $(8+j6)$  ohm per phase. The phase current and line current values respectively are:

A. 10A, 30A

B.  $10\sqrt{3}A$ , 30A

C. 10A, 10A

D.  $10\sqrt{3}A$ ,  $10\sqrt{3}A$

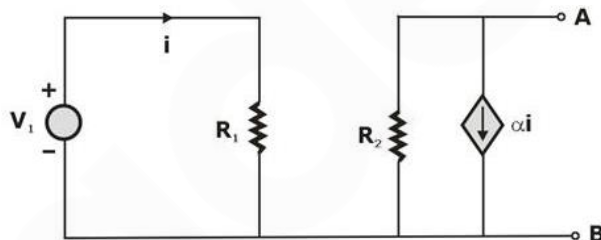
Ans. B

Sol. Phase current =  $\frac{V_{ph}}{Z_{ph}} = \frac{100\sqrt{3}}{\sqrt{8^2 + 6^2}} = \frac{100\sqrt{3}}{10} = 10\sqrt{3}$

Line current = phase current  $\times \sqrt{3}$

=  $10\sqrt{3} \times \sqrt{3} = 30A$

46. For the circuit shown below, what are the value of the Norton's equivalent current and conductance between AB terminals:



A.  $-\alpha \frac{V_1}{R_1}$  and  $C_1 = \frac{1}{R_2}$

B.  $\alpha \frac{V_1}{R_2}$  and  $C_1 = \frac{1}{R_1}$

C.  $\alpha \frac{V_1}{R_1}$  and  $C_1 = \frac{1}{R_1}$

D.  $-\alpha \frac{V_1}{R_1}$  and  $C_1 = \frac{1}{R_1}$

Ans. A

Sol.  $I_{eq} = -\alpha i = -\alpha \left( \frac{V_1}{R_1} \right) \Rightarrow \alpha \frac{V_1}{R_1}$

And  $C_1 = \frac{1}{R_2} \rightarrow$  Conductance

So, correct answer is

$-\alpha \frac{V_1}{R_1}$  and  $C_1 = \frac{1}{R_2}$

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47. The total capacitance of two capacitors  $C_1$  and  $C_2$  connected in series will be
- A. less than smallest capacitor
  - B. more than highest capacitor
  - C. equal to highest capacitor
  - D. equal to  $C_1 + C_2$

Ans. A

Sol. When connected in series then

$$C_{eq} = \frac{C_1 \cdot C_2}{C_1 + C_2}$$

So,  $C_{eq}$  is smaller in values of  $C_1$  &  $C_2$ .

48. Two bulbs 100 w, 250V and 200w, 250v are connected is series across a 500V line then,
- A. 100W bulb will be fused
  - B. 200W bulb will be fused
  - C. Both bulbs will be fused
  - D. No bulb will be fused

Ans. C

Sol. Both bulbs will get fused as connected across HV line.

49. Which of the following is an ohmic conductor?

- A. Copper
- B. Silver
- C. Gold
- D. All of these

Ans. D

Sol. All the given conductor is ohmic in nature.

50. In the case of an inductor:

- A. Voltage lags the current by  $\frac{\pi}{2}$
- B. voltage leads the current by  $\frac{\pi}{2}$
- C. voltage leads the current by  $\frac{\pi}{3}$
- D. Voltage leads the current by  $\frac{\pi}{4}$

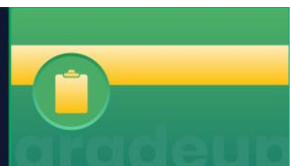
Ans. B

Sol. Inductor current lags the voltage so option B is correct.

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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

