SSC JE 2019–20

Electrical Engineering

Mini Mock Challenge
(August 08- August 09 2020)

Questions & Solutions

1. Name the first woman chief minister of Jammu and Kashmir?

   A. Sarkina Itoo
   B. Mehbooba Mufti
   C. Asiya Naqash
   D. Hina shafi bhat

Ans. B

Sol. Mehbooba mufti on 4 April 2016 made history as she took oath as the first woman chief minister of jammu and Kashmir, the only muslim majority state of India she is the daughter of late mufti mohammad syed and the president of ruling people's democratic party.

2. Which article of the Indian Constitution for all citizen in public employment ?

   A. Article-22
   B. Article-16
   C. Article-20
   D. Article-25

Ans. B

Sol. Article 16 of the Indian Constitution deals with equality of opportunity in matters of public employment. It states that no citizen shall, on grounds only of religion, race, caste, sex, descent, place of birth, residence or any of them, be ineligible for, or discriminated against in respect or, any employment or office under the state.Equal Employment Opportunity (EEO) principles apply to:

   • Access to jobs

   • Conditions of employment

   • Relationships in the workplace

   • The evaluation of performance and

   • The opportunity for training and career development.

   Hence option B is the right answer.

3. Who is the first women cricketer to receive CK Nayudu lifetime achievement Award?

   A. Mithali Raj
   B. Jhulan Goswami
   C. Shantha Rangaswamy
   D. Harmanpreet Kaur

Ans. C

Sol. Shantha Rangaswamy is the first women cricketer to receive CK Nayudu lifetime achievement Award. She is the former captain of Indian Women Cricket Team.

4. Buffer stock operations are conducted by

   A. Warehousing Corporation of India
   B. State Trading Corporation of India
   C. Food Corporation of India
   D. Ministry of Agriculture

Ans. C

Sol.

• Buffer stock operations are conducted by Food Corporation of India.

• It is an attempt to use commodity-storage for the purposes of stabilising prices in an entire economy.

5.   'Strikeout' is associated with which sports?

A. Cricket   B. Snooker

C. Baseball   D. Tennis

Ans.   C

Sol.   Strikeout is a term associated with the sport baseball.In baseball or softball, a strikeout (or strike-out) occurs when a batter racks up three strikes during a time at bat. It usually means the batter is out.

6.   Atomic Number is denoted by which alphabet?

A. A   B. N

C. Z   D. E

Ans.   C

Sol.   Atomic number is denoted by Z while atomic weight is denoted by A.

Hence, Option C is the correct answer.

7.   Buccal cavity is a component of which organ system?

A. Digestive system   B. Respiratory system

C. Circulatory system   D. Reproductive system

Ans.   A

Sol.   Buccal cavity is a component of Digestive system. Digestion is one of the process of nutrition. The digestive system has six components which are mouth, esophagus, stomach, small intestines, colon, rectum etc.

Hence, Option A is the correct answer.

8.   'Faster, Higher, Stronger' is motto for which of the following Games Event?

A. Asian Games   B. IPL

C. Olympics   D. FIFA World Cup

Ans.   C

Sol.   'Faster, Higher, Stronger' is motto for the Olympics games.

The motto of IPL games is 'Yatra Pratibha Avsara Prapnotihi'. It is in Sanskrit which means 'where talent meets opportunity'.

The motto of FIFA is 'For the game, For the world'.

Hence, option C is the correct answer.

9.   Who authored the book 'Modi's Midas Touch in Foreign Policy'?

A. Surendra Kumar   B. Sunita Narayan

C. P.S. Negi   D. Anuj Dhar

Ans.   A

Sol.   Surendra Kumar is the author of the book 'Modi's Midas Touch in Foreign Policy. This book outlines the progress of India's Foreign Policy by the Prime Minister Narendra Modi in the last two and a half years. It includes different policy initiatives focusing on the vision of developing India into a strong economically developed nation.

10. Which Article of the Indian constitution provides free and compulsory education to children?

A. Article 21-A
B. Article 46
C. Article 39
D. Article 15

Ans. A

Sol.

- According to **Article 21A** of Indian Constitution, the State shall provide free and compulsory education to all children of the age of six to fourteen years in such manner as the State may, by law, determine.

- This article was inserted in the constitution by 86th Amendment Act, 2002, also known as Right of Children to Free and Compulsory Education Act.

11. A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.
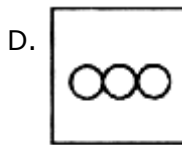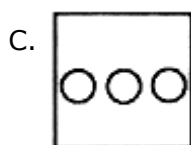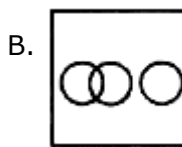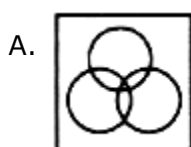
BE, DH, ? , HN, JQ

A. FI
B. FK
C. GI
D. GK

Ans. B

Sol.

$$B \xrightarrow{+2} D \xrightarrow{+2} F \xrightarrow{+2} H \xrightarrow{+2} J$$
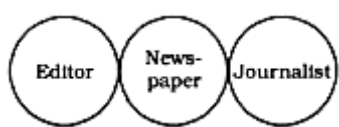$$E \xrightarrow{+3} H \xrightarrow{+3} K \xrightarrow{+3} N \xrightarrow{+3} Q$$

Hence, option B is the right answer.

12. Which figure best represents the relationship between Editor, Newspaper and Journalist?

A.

B.

C.

D.

Ans. D

Sol. Editor is different from Journalist. Similarly, News paper is different from both the Editor and Journalist. But, all the three inter-related in some manner.

Hence, option D is correct answer.

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

Plane : Hangar :: Car : ?

A. Road   B. Garage

C. Tyre   D. Brake

Ans. B

Sol. Plane is temporarily parked in the Hangar.

Similarly, car is parked in the garage.

Hence, option B is the correct response.

14. If 'FIRST' is written as 'HKTUV', how will 'SECOND' be written as?

A. UGEMPF   B. UHEQPF

C. UGEQSF   D. UGEQPF

Ans. D

Sol. As, FIRST is coded as,

F + 2 → H

I + 2 → K

R + 2 → T

S + 2 → U

T + 2 → V

Similarly,

SECOND will be coded as,

S + 2 → U

E + 2 → G

C + 2 → E

O + 2 → Q

N + 2 → P

D + 2 → F

Hence, option D is the correct response.

15. **A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.**

127, 63, 31, 15, 7, ?

A. 2   B. 3

C. 4   D. 5

Ans. B

Sol. **127** – 1 = 126**; 126 ÷ 2 = 63,**

63 – 1 = 62; 62 ÷ 2 = **31**,

31 – 1 = 30; 30 ÷ 2 = **15,**

15 – 1 = 14; 14 ÷ 2 = **7,**

7 – 1 = 6; 6 ÷ 2 = **3**

Thus the next number in the series will be '3'.

Hence, the correct option is B.
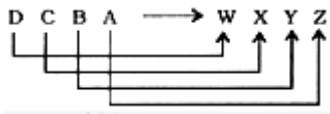
16. In the following question, select the related group of letters from the given alternatives.

    DCBA: WXYZ:: IJKL:?

    A. RQPO   B. QPON
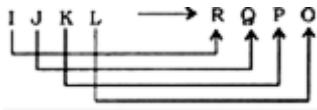
    C. PONM   D. SRQP
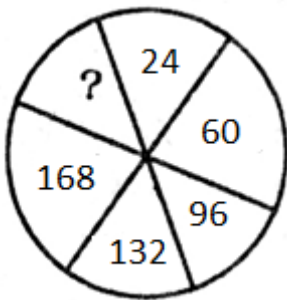
Ans. A

Sol. with reference to the position of the alphabets,

D C B A ⟶ W X Y Z

Pairs of Opposite Letters.

Similarly,

I J K L ⟶ R Q P O

Hence, option A is the right answer.

17. In each of the following questions, select the missing number front the given responses.

    A. 330   B. 204

    C. 428   D. 216

Ans. B

Sol. 24 +36 = 60

    60 + 36 = 96

    96 +36 = 132

    132 +36 = 168

    168 + 36 = 204

    Hence, option B is the correct answer.

18. A man goes 10 km westward, then turns right and proceeds 4 km, then travels 10 km towards left, then travels 8 km towards left and finally goes 4 km Northward . Calculate his distance from his initial place in the horizontal direction.

    A. 20 km   B. 22 km
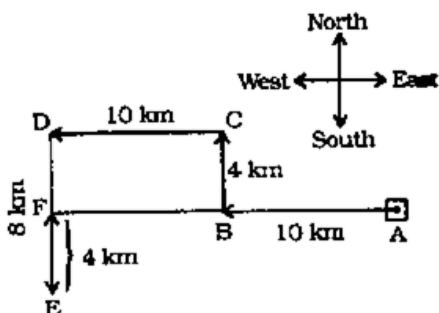
    C. 23 km   D. 25 km

Ans. A

Sol.

Required distance

= AF = AB + BF

= (10 + 10) km. = 20 km.

19. Babita is Ajay's wife and Chiranjiv is Divya's father. If Ajay's mother-in-law is wife of Divya's grandfather, then how is Babita related to Chiranjiv's wife?

A. Sister-in-law   B. Sister

C. Cousin   D. Nephew

Ans. A

Sol. Babita is the wife of Ajay.

Chiranjiv is father of Divya.

Wife of Divya's grandfather means grandmother of Divya.

Grandmother of Divya is mother-in-law of Ajay.

Therefore, Babita is daughter of Divya's grandmother.

Chiranjiv is brother of Babita.

Therefore, Babita is sister-in law of Chiranjiv's wife.

Hence, option A is the right answer.

20. In the following question, two statements are given each 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.

Statements:

All radios are electric goods.

All table lamps are electric goods.

Conclusions:

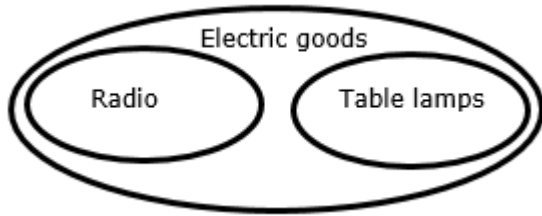I. Some radios are table lamps.

II. Some table-lamps are radios.

A. Conclusion I follows   B. Conclusion II follows

C. Neither I nor II follows   D. Both I and II follows

Ans. C

Sol. The least possible Venn diagram for the given statements is,

Conclusions:

I. Some radios are table lamps - False, it is not a definite case.

II. Some table-lamps are radios - False, it is not a definite case.

Thus neither conclusion I nor II follows.

Hence, option C is the correct response.

21. Equipment earthling gives protection against

    A. voltage fluctuation   B. Overloading

    C. electric shock   D. high temperature of conductor

Ans. C

Sol. Protection against electric shock is given by equipment earthing. So, electric shock is correct option.

22. For a p–n junction diode, the current in reverse bias maybe

    A. few amperes   B. few milliamperes

    C. between 0.5A–1A   D. few microamperes to nano amperes

Ans. D

Sol. The current in reverse bias maybe few microamperes to nano amperes. So, the correct option is D.

23. Thermal relay works on the principle of

    A. Heating effect of current   B. Flow of current in the circuit

    C. Ohm's low   D. Electromagnetic induction

Ans. A

Sol. The basic working principle of thermal relay is that' when a bimetallic strip is heated up by a heating will carrying over current of the system. It bends & makes normally open contacts.

24. The energy meter, braking torque is produced to

    A. safeguard it against creep

    B. brake the instrument

    C. bring energy meter to stand still

    D. maintain steady speed and equal to driving torque

Ans. A

Sol. Braking torque is produced to maintain steady speed and equal to driving torque by a permanent magnet

25. A digital frequency counter can be converted to Digital voltmeter by addition of which one?

   A. D/A converter
   B. Voltage controlled oscillator
   C. Op–Amp
   D. Power Amplifier

Ans. A

Sol. A digital frequency counter can be converted to Digital voltmeter by addition of D/A converter

26. Which of the following is known as metal rectifier?

   A. Selenium disc rectifier
   B. Copper oxide rectifier
   C. Gas tube diode
   D. Varactor diode

Ans. B

Sol. Copper oxide rectifier is known as metal rectifier.

27. Which of the following is ultrahigh switching speed diode?

   A. Zener diode
   B. Photo diode
   C. Fast recovery diode
   D. Tunnel diode

Ans. C

Sol. Fast Recovery diode is ultrahigh switching speed diode.

28. Pulsating output of a rectifier is converted into a steady DC level by:

   A. Amplifier
   B. Modulator
   C. Filter circuit
   D. transistor

Ans. C

Sol. The filter circuit converts pulsating output into steady DC output. So, Pulsating output of a rectifier is converted into a steady DC level by Filter circuit.

29. A fuse should be connected in _____in the _____ conductor.

   A. series, neutral
   B. series, live
   C. parallel, neutral
   D. parallel, live

Ans. B

Sol. A fuse should be connected in series in live conductor.

30. Which of the following is not a non–linear element?

   A. Gas diode
   B. Heater coil
   C. Tunnel diode
   D. Electric arc

Ans. B

Sol. Heater coil is not a non–linear element.

31. A filter circuit that consists of a second choke corrected to output side in order to improve filtering action is known as

   A. τ –type filter circuit
   B. π type filter circuit
   C. R–L filter circuit
   D. Inverted L–type filter circuit

Ans. A

Sol. A filter circuit that consists of a second choke corrected to output side in order to improve filtering action is known as τ type filter circuit .

32. The function of shunt in an ammeter is to

A. bypass the current

B. increase sensitivity of meter

C. increase resistance of meter

D. increase both resistance & sensitivity

Ans. A

Sol. The function of shunt in an ammeter is to bypass the current

33. Shoot circuit test on transformer is also known as:

A. Capacitance test

B. Impedance test

C. Inductance test

D. Current test

Ans. B

Sol. A short–circuit test for determination of transformer impedance and losses is carried out with relatively low power applied to the transformer, and with warding air rents of same magnitude as in operation. So, this test is known as impedance test.

34. The doping of a tunnel diode is approximately _____ times higher than a conventional diode.

A. 200

B. 500

C. 1000

D. 2000

Ans. C

Sol. The doping of a tunnel diode is approximately 103 or 1000 times higher than conventional diode.

35. Armature coil of a DC machine is usually made up of

A. Mica

B. Copper

C. Brass

D. Graphic

Ans. D

Sol. Armature or rotating coil and brushes of a DC machine is usually made up of carbon or graphite.

36. Electric networks which permit unattenuated transmission of signal are called _____

A. Rectifier

B. Diode

C. Transistor

D. Filter

Ans. D

Sol. Filter permit un attenuated transmission of signals.

37. The resistance in the circuit of moving coil of a dynamometer wattmeter should be

A. almost zero

B. low

C. high

D. very low

Ans. C

Sol. The resistance in the circuit of the moving coil of dynamometer wattmeter should be kept high.

38. The hysteresis loss in a given magnetic material may be decreased by.

A. laminating it

B. increasing the density through it

C. increasing frequency of reveresal of magnetizing

D. decreasing maximum flux density established through it

Ans. D

Sol. Hysteresis loss is directly proportional to the magnetic flux density so it decreases on decreasing the value of magnetic field or magnetic flux.

39. The rms value of a sinewave is 100 A then the peak value is given as:

A. 70.7 A   B. 141 A

C. 63.6 A   D. 126 A

Ans. B

Sol. Peak value of sine wave $= \sqrt{2} \times$ rms value

$$= \sqrt{2} \times 100 \Rightarrow 1.41 \times 100 = 141 \text{ A}$$

40. Effective resistance of two wires when connected in series and in parallel are 25Ω and 6 Ω respectively. The resistances of two wires is_____.

A. 10 Ω and 15 Ω   B. 20 Ω, 30 Ω

C. 5 Ω, 10 Ω   D. 10 Ω, 20 Ω

Ans. A

Sol. In series: R1+R2 = 25 (i)

in parallel: $\dfrac{R_1 R_2}{R_1 + R_2} = 6$ = R1R2 = 150 (ii)

So, option A satisfies both equation.

41. Which of the following motor is self-starting?

A. Split motor   B. Shaded pole motor

C. Reluctance motor   D. Hysteresis motor

Ans. B

Sol. The shaded pole is inherently self–starting due to its characteristics.

42. What is the amount of charcoal and salt needed for GI pipe earthing?

A. Charcoal 5 kg, salt 8 kg   B. Charcoal 10 kg, salt 8 kg

C. Charcoal 10 kg, salt 10 kg   D. Charcoal 5 kg, salt 5 kg

Ans. C

Sol. The amount of charcoal and salt needed for GI pipe earthing are 10 Kg and 10 Kg respectively.

43. Two incandescent lamps of wattage 40W, 60W are connected in series with voltage of 230 V. Which out of the two lamps will glow brighter?

A. 40W
B. 60W
C. both brightly
D. both dim

Ans. A

Sol. Connecting the 2 bulbs in series implies that the current is the same, hence the power consumption totally depends on how voltage gets divided between the bulbs. Naturally, the 40W bulb will have more voltage across it since it has more resistance. Hence, the 40W bulb will glow brighter.

44. What should be the insulation resistance in case of PVC wires?

A. 12.5 MΩ / number of outlets
B. 82.5 MΩ / number of outlets
C. 2.5 MΩ / number of outlets
D. 10.5 MΩ / number of outlets

Ans. A

Sol. The insulation resistance for PVC wires should be 12.5 MΩ / number of outlets.

45. In plate type earthing system what is the dimension of cast iron plate, which is used as earth plate?

A. (350 mm x 350 mm x 6.3 mm)
B. (550 mm x 550 mm x 7.2 mm)
C. (600 mm x 600 mm x 6.3 mm)
D. (600 mm x 600 mm x 7.2 mm)

Ans. C

Sol. In plate type earthing system cast iron plate is used as earth plate, which having dimensions of (600 mm x 600 mm x 6.3 mm). It is connected with a hot dip GI main earth strip by means of nut, bolt and washers of required size.

The earth plate is back filled & covered with earthing material (mixture of charcoal & salt) by 150 mm from all sides.

46. Which of the following will need lowest level of illumination?

A. Displays
B. Fine engraving
C. Railway platform
D. Auditoriums

Ans. C

Sol. From all the above options Railway platform needs the least amount of display.

47. In an electric heater, the metal case is connected to _____

A. Phase wire
B. earth wire
C. neutral wire
D. none of these

Ans. B

Sol. In electric heater, the metal case is connected to earth wire, so that the earth wire creates a safe route for the current to flow through it, if the live wire touches the casing. Earth wire will protect from the shocks.

48. The lighting system of almost all the earlier coaches and all the newly manufactured coaches has

   A. 50 V
   B. 110 V
   C. 220 V
   D. 440 V

Ans. B

Sol. The lighting system of almost all the earlier coaches and all the newly manufactured coaches has 110V.

49. The depth upto which current will penetrate in induction heating process is related to specific resistance of molten change (ρ) by –

   A. ρ
   B. $\sqrt{\rho}$

   C. ρ^2
   D. $\dfrac{1}{\sqrt{\rho}}$

Ans. B

Sol. The depth of penetration of induced current is given by equation –

$$d = \frac{1}{2\pi}\sqrt{\frac{\rho \times 10^9}{\mu f}}$$

$$\therefore d \propto \sqrt{\rho}$$

Where, ρ = Specific resistance of molten change in ohm - cm, f = frequency in Hz μ = permeablity of the change.

50. Which one of the following statement is INCORRECT regarding flat demand rate tariff?

   A. It is expressed in the form, C = Ax

   B. Electricity Bill depends only on the maximum demand

   C. It is independent of the energy consumed

   D. It is dependent on the energy consumed.

Ans. D

Sol. **Flat Demand Rate Tariff:** It is expressed in the form, C= Ax. The Electricity Bill depends only on the maximum demand not on the energy consumed. It is used in street lightning, sign lightning, signal system & in irrigation tube wells. Metering is not required in this system of tariff.

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