



HPCL MT

Electrical Engineering

Mini Mock Challenge

(June 13th- June 14th 2021)

Questions & Answer Key

1. Select the word which means the same as the group of words given.

A person of great learning in several languages.

- A. polygon
B. polyglot
C. polychrome
D. polymath

Ans. B

2. **Direction:** In the following questions, sentences are given with blanks to be filled in with appropriate word(s). Four alternatives are suggested for each question. Choose the correct alternative out of the four.

By the time he was eighteen years old, Peter _____ to make a living and support his family.

- A. Begins
B. Began
C. started beginning
D. would begin
E. has just begun

Ans. B

3. **Direction:** Read the sentence to find out whether there is any error in it. The error, if any, will be in one part of the sentence. If the given sentence is correct as it is, mark E i.e. No error as the answer. Ignore the errors of punctuation, if any.

- A. With a fresh coat
B. of paint
C. the school can
D. look much nice.
E. No error

Ans. D

4. **Direction:** In the following question, a sentence with four words printed in bold is given. These words are numbered as (A), (B), (C) and (D). One or more of these four words may be inappropriate in the context of the sentence. Find out the word(s) that are inappropriate and mark the relevant option as your answer. If all the words printed in bold are correct, mark option (E), i.e. 'All are correct', as the answer.

The only way to get **nations** (A) like India to give up their **dedication** (B) on coal is to make **renewable** (C) energy far **cheaper** (D) and more dependable.

- A. Only C
B. Only B
C. Both A and B
D. Both B and C
E. All are correct

Ans. B

5. Change the voice of the following sentence:

It is time for the surgeon to be sent for.

- A. It is time for the surgeon to go.
- B. It is time to send for the surgeon.
- C. For the surgeon should be sent in time.
- D. The surgeon should be sent in time.

Ans. B

6. Choose the option in which each word in the following table has been correctly matched with its respective part of speech.

foamy ,flux ,but ,can

- A. Conjunction Verb Adjective Noun
- B. Adjective Noun Conjunction Verb
- C. Verb Adjective Noun Conjunction
- D. Noun Conjunction Verb Adjective

Ans. B

7. Identify the type of verb of the underlined word in the following sentence:

May I take extra classes this weekend?

- A. Transitive
- B. Intransitive
- C. Modal
- D. Auxiliary

Ans. C

8. Choose the correct order of the sentences to rearrange them in a suitable manner.

- | | |
|-----------------------------|------------------|
| P. to send their children | Q. Many parents |
| R. into prestigious schools | S. cannot afford |

OPTIONS:

- | | |
|---------|---------|
| A. QSRP | B. RSQP |
| C. QRSP | D. QSPR |

Ans. D

9. Convert the speech of the following sentence:

She said to him, 'Will you listen to such a leader?'

- A. She asked him if he will listen to such a leader.
- B. She confirmed that he will listen to such a leader.
- C. She asked him to not listen to such a leader.
- D. None of the above.

Ans. A

10. Identify the pronoun in the given sentence.

"They are going to plan a visit to California soon".

- A. They
- B. Plan
- C. California
- D. Soon

Ans. A

11. **Direction:** The following question carries a sentence with an idiom/ phrase highlighted in it. Select the alternative which states the meaning of the idiom/ phrase.

It was difficult to **put up with** the nagging relatives during the growth years.

- A. Decorate
- B. Issue
- C. Endure
- D. Ricochet
- E. Prioritise

Ans. C

12. **Direction:** Read the sentence to find out whether there is any error in it. The error, if any, will be in one part of the sentence. The number of that part is the answer. If the given sentence is correct as it is, the answer is (5) i.e. No error. Ignore errors of punctuation if any.

My friend lives (1)/ at a beautiful house (2)/ not more than (3)/ five minutes from the beach(4)/. No error (5)

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

Ans. B

13. **Direction:** Read the sentence to find out whether there is an error in it. The error, if any, will be in one part of the sentence. The number corresponding to that part will be your answer. If the given sentence is correct as it is, mark the answer as 'No error'. Ignore the errors of punctuation, if any.

With something as (1)/ delicate as brain (2)/ surgery, there (3)/ is few margin for error. (4)

- A. 1
- B. 2
- C. 3
- D. 4
- E. No Error

Ans. D



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14. **Direction:** Which of the following structures of the given words best represents a grammatically and meaningfully coherent sentence?

Only goal to be attained by all the worthwhile is moksha and the path only is renunciation.

- A. Worthwhile goal only to be attained by all is the moksha and renunciation is the only path.
- B. Only path is renunciation and the only worthwhile goal is moksha to be attained by all.
- C. The only worthwhile goal to be attained by all is moksha and the only path is renunciation.
- D. The only goal worthwhile to be attained by all is moksha and the path only is renunciation.
- E. No correction required

Ans. C

15. If $\frac{p}{a} + \frac{q}{b} + \frac{r}{c} = 1$ and $\frac{a}{p} + \frac{b}{q} + \frac{c}{r} = 0$, where p, q, r and a, b, c are non-zero. Then the value

of $\frac{p^2}{a^2} + \frac{q^2}{b^2} + \frac{r^2}{c^2}$ is

- A. -1
- B. 0
- C. 1
- D. 2

Ans. C

16. The average of six numbers is 3.95. The average of two of them is 3.4, while the average of the other two is 3.85. the average of the remaining two numbers is

- A. 4.6
- B. 4.5
- C. 4.8
- D. 4.7

Ans. A

17. For how many integral values of 'x', $\sin \Phi = \frac{(3x-2)}{4}$, where $0^\circ \leq \Phi \leq 90^\circ$

- A. 2
- B. 3
- C. 0
- D. 1

Ans. A

18. If the product of two numbers is 2160 and HCF is 6, then the ratio of HCF & LCM is

- A. 21 : 60
- B. 60 : 21
- C. 1 : 60
- D. 60 : 1

Ans. C

19. A sum of ₹ 2,400 amounts to ₹ 3,264 in 4 years at a certain rate of simple interest. If the rate of interest is increased by 1% then same sum in same time would amount to

- A. ₹ 3,288
- B. ₹ 3,312
- C. ₹ 3,340
- D. ₹ 3,360

Ans. D







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26. If $\tan\theta - \cot\theta = 0$ and θ is a positive acute angle, then the value of $\tan(\theta + 15^\circ)/\tan(\theta - 15^\circ)$ is:
- A. 3
B. $1/\sqrt{3}$
C. $1/3$
D. $\sqrt{3}$

Ans. A

27. $\frac{(5+5+5+5) \div 5}{3+3+3+3 \div 3}$ is equal to
- A. 1
B. $3/10$
C. $4/9$
D. $2/5$

Ans. D

28. If a man earns ₹ 2000 for his first 50 hours of work in a week and is then paid one and a half times his regular hourly rate for any additional hours then the hours must he work to make ₹ 2300 in a week is
- A. 6 hours
B. 4 hours
C. 7 hours
D. 5 hours

Ans. D

29. **Direction:** In the question below are given two statements followed by the conclusions. You have to take the given statements to be true even if they seem to be at variance with commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follows from the given statements disregarding commonly known facts.

Statements:

Only a few tiers are wheels.

All alloy are wheels.

No wheels are disc.

Conclusions:

I. Some tiers are not disc.

II. All alloy are tiers.

- A. Only I follows
B. Only II follows
C. Both follows
D. Either I or II follows
E. Neither I or II follows

Ans. A

30. In the following question, select the related group of letters from the given alternatives.

YAC : CEG :: NOQ : ?

A. RSU

B. RUS

C. STV

D. SVT

Ans. A

31. In a row of boys, Aman is 12th from top and Rajul is 18th from bottom. If they interchange their places, then Aman becomes 42nd from top. How many boys are there in the row?

A. 62

B. 60

C. 58

D. 59

Ans. D

32. A and B are brothers. C and D are sisters. A's son is D's brother. How is B related to C ?

A. Father

B. Brother

C. Uncle

D. Son

Ans. C

33. In a certain code language 'CANDLE' is written as 'D1OEM2' and 'MODERN' is written as N4E2SO. How will 'BEWARE' be written in the same code language ?

A. D2OEM2

B. C2X2S2

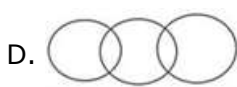
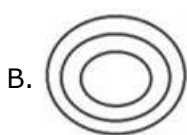
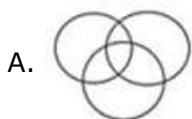
C. CFY2S2

D. C2X1S2

Ans. D

34. **Select the Ven-diagram which presents the correct relationship among the following variables.**

Women, Mothers, Fathers



Ans. C

35. **Select the set of numbers that is similar to the following set.**

{8, 19, 30}

A. {11, 24, 39}

B. {12, 25, 38}

C. {6, 21, 32}

D. {9, 20, 35}

Ans. B

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

GOSSIPING

- A. SOAP B. PING
C. GOING D. GOSSIP

Ans. A

37. **Direction:** Which of the given options can replace the question mark in the given series according to the pattern established by the other given elements of the series?

GHJM ...?... V

- A. T
B. R
C. Q
D. S

Ans. C

38. From the given alternatives select the word which **cannot** be formed using the letters of the given word.

RECAPITULATION

- A. CAPTURE B. TABULATION
C. RELATION D. PICTURE

Ans. B

39. In the following question, select the word which can be formed using the letters of the given word.

COMPANIONSHIP

- A. OPEN B. OPIUM
C. OPINION D. NATION

Ans. C

40. From the given words, select the word which can be formed using the letters of the given word.

SOMNAMBULISM

- A. BIOME
B. SOUL
C. NAMES
D. BASAL

Ans. B

41. **Direction:** Select the one which is different from the other three responses.

- A. Opponent
B. Adversary
C. Ally
D. Antagonist

Ans. C



42. Find out the one which does not belong to that group.

- A. PQR
- B. JKL
- C. XYZ
- D. FGI

Ans. D

43. A load of 0.8 power factor implies

- A. Reactive power demand of 0.75KVAR per KW of power
- B. Reactive power demand of 0.8KVAR per KW of power
- C. Reactive power demand of 1.2KVAR per KW of power
- D. Reactive power demand of 1KVAR per KW of power.

Ans. A

44. In a single pulse modulation of PWM inverters, the pulse width is 120° . For an input voltage of 220V dc, the rms value of output voltage is ____.

- A. 179.63 V
- B. 254.04 V
- C. 127.02 V
- D. 185.04 V

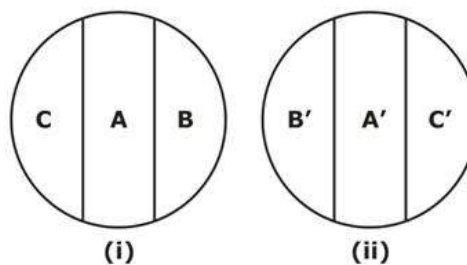
Ans. A

45. A 220 V shunt motor has an armature resistance of 0.5Ω and takes an armature current of 40A on a certain load. By how much the main flux be reduced to raise speed by 50%. If the developed torque remains constant.

- A. 50%
- B. 57%
- C. 63%
- D. 60%

Ans. A

46. Consider a practical pair of conductors i.e. conductor (i) and conductor (ii), which have three parallel loops AA', BB' and CC'. In which of the following loop the inductance effect is maximum ?



- A. AA'
- B. BB'
- C. CC'
- D. All will have same effect

Ans. C

47. The effect of increase in damping ratio of second order system will be:

- i) Reduce peak overshoot
- ii) Increase peak overshoot
- iii) Increase setting time
- iv) Reduces setting time

Which of the following option is correct?

- A. (i) and (ii)
- B. (i) and (iv)
- C. (ii) and (iii)
- D. (ii) and (iv)

Ans. B

48. What is the vectored address of interrupt RST 6?

- A. 0034H
- B. 0048H
- C. 0030H
- D. Interrupt RST 6 doesn't exist

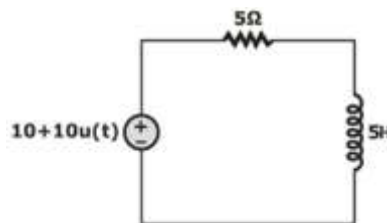
Ans. C

49. For a flat line system, the current reflection coefficient is

- A. 0
- B. 1
- C. -1
- D. 2

Ans. A

50. For the circuit shown in the figure, the energy stored by the inductor in the steady state ($t \rightarrow \infty$) is



- A. 20 Joules
- B. 30 Joules
- C. 40 Joules
- D. 60 Joules

Ans. C

51. In order to minimize both 5th and 7th harmonics, the coil span in 3-φ AC machines must be

- A. 144°
- B. $\frac{6}{7} \times \text{pole pitch}$
- C. 120°
- D. $\frac{5}{6} \times \text{pole pitch}$

Ans. D

52. A sinusoidal carrier voltage is amplitude modulated using a sinusoidal message signal resulting in minimum and maximum amplitudes of the modulated signal as 90V and 110V respectively. The amplitudes of each side band is

- A. 2V
- B. 5V
- C. 10V
- D. 15V

Ans. B



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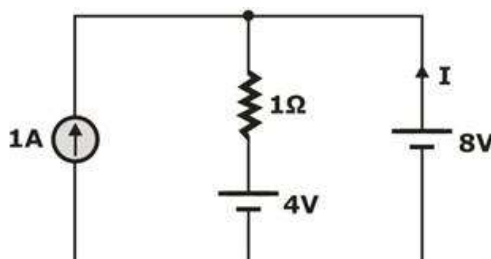
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59. In the circuit shown below, find the value of current supplied by 8V source.



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

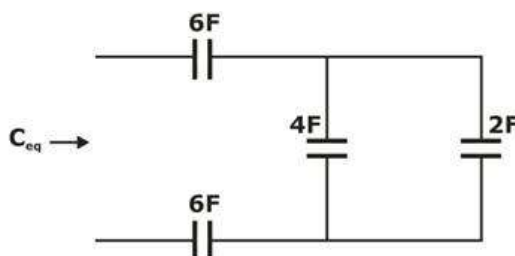
Ans. B

60. A 220V single phase circuit supplies a choke coil that allows a power dissipation of 5MW at 0.6 p.f lagging. With the help of static capacitor the load p.f increases to 0.8 lagging. Due to the addition of static capacitor the changes in losses will be.

- A. 21.73%
B. 43.75%
C. 77.77%
D. No change

Ans. B

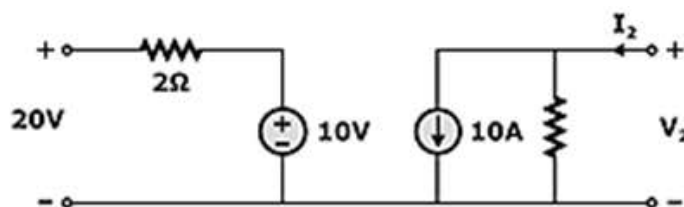
61. Find the equivalent capacitance of the network shown in the figure.



- A. 2F
B. 3F
C. 4F
D. 6F

Ans. A

62. The circuit shown below is a h-parameter model of some electrical network. The value of the parameter h_{21} is



- A. 1
B. 2
C. 5
D. 10

Ans. B



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63. Find the Fourier transform of $e^{at}u(-t)$

A. $\frac{1}{a + j\omega}$

B. $\frac{1}{a - j\omega}$

C. $\frac{1}{aj\omega}$

D. $\frac{1}{j\omega - a}$

Ans. B

64. A device that converts energy of combustion of fuels like hydrogen and methane, directly into electrical energy is known as

- A. fuel cell
- B. electrolytic cell
- C. dynamo
- D. Ni-Cd cell

Ans. A

65. An alternator with fixed source voltage of 300V, delivers power to a load of 10KVA, 0.5 lag P.F with load current of 25Amp. What will be the system utilization factor if the load is connected with an alternator through transmission line with line reactance of 10ohm ?

- A. 0.42
- B. 0.667
- C. 0.91
- D. 1.33

Ans. B

66. The range of decimal number that can be represented using 5 bit 2's complement

- A. -7 to + 7
- B. -8 to + 7
- C. -16 to + 16
- D. -16 to + 15

Ans. D

67. Which of the following type of 1- ϕ IM having highest power factor at full load ?

- A. Shaded pole type
- B. Split-phase type
- C. Capacitor start type
- D. Capacitor run type.

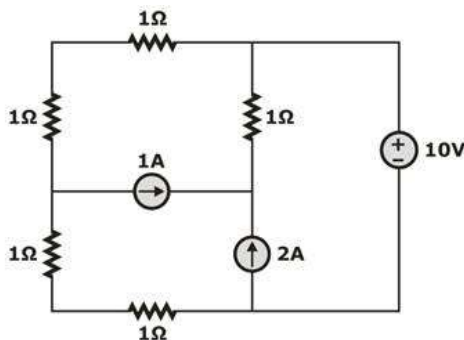
Ans. D

68. In a single phase induction motor

- A. Both main and auxillary windings are placed on stator
- B. Main winding is placed on stator and auxiliary winding on rotor
- C. Both the main and auxillary windings are placed on rotor
- D. Auxillary winding is placed on stator and main winding on rotor.

Ans. A

69. In the below given network, the power delivered by 10V source will be:



- A. 35Watt
B. 27Watt
C. 12Watt
D. No power delivered

Ans. D

70. A Boost regulator has an input voltage of 5V and the average output voltage of 15V. The duty cycle is

- A. $\frac{3}{2}$
B. $\frac{2}{3}$
C. $\frac{5}{2}$
D. $\frac{15}{2}$

Ans. B

71. The open-circuit voltage across the load is equal to 45 V. Calculate the load voltage (in V) when the maximum power is transferred to the circuit.

- A. 11.25
B. 22.5
C. 45
D. 90

Ans. B

72. An 800 kV 3-phase transmission line is having per phase inductance of 1.1 mH/km and per phase line capacitance of 11.68 nF/km. Its power transfer capability under surge impedance loading is-

- A. 2085 MW
B. 2605 MW
C. 1205 MW
D. 15.5 MW

Ans. A

73. Positive edge triggered SR flip flop with clock pulse = 0 and input combinations is $S = 1$, $R = 0$. The output state will be

- A. Set
B. Reset
C. Hold
D. Invalid

Ans. C

74. A 3- ϕ , 33kV circuit breaker is rated 1200 A, 2000 MVA, 3s. The rated making current capacity is-

- A. 79.25 kA (rms)
B. 89.25 kA (peak)
C. 79.25 kA (peak)
D. 89.25 kA (rms)

Ans. B

75. With respect to power transformer, the distribution transformer of the same rating has
- Large size and more per unit reactance
 - Large size and less per unit reactance
 - Small size and more per unit reactance
 - Small size and less per unit reactance

Ans. A

76. The power angle equation, $P_e = 6 \sin \delta$, operating at $\delta = 30^\circ$. Find out the stability factor at operating point.

- $2\sqrt{3}$
- $\sqrt{3}$
- $3\sqrt{3}$
- $\frac{\sqrt{3}}{2}$

Ans. C

77. The impulse response of the given transfer function will be-

$$T.F = \frac{1}{(s+2)(s+3)}$$

- $e^{-2t} - e^{-3t}$
- $(e^{-t} - e^{-3t})$
- $(e^{-t} - e^{-2t})$
- $(e^{-2t} - e^{-t})$

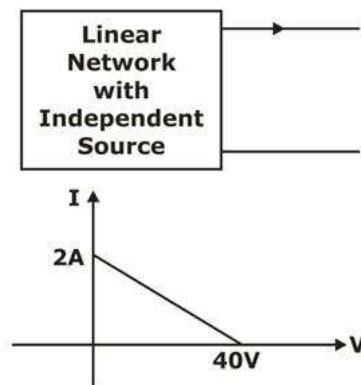
Ans. A

78. What is the minimum number of NAND gates required to implement $A + A\bar{B} + A\bar{B}C$?

- 0
- 1
- 4
- 7

Ans. A

79. The VI characteristic of a network is shown below. Find the maximum power dissipated in the variable resistor connected across A, B



- 40 Watt
- 20 Watt
- 60 Watt
- 80 Watt

Ans. B

80. A potential function $V = x^2yz + Ay^3z$ volts satisfies the Laplace's equation, the value of A is ____

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

Ans. B

81. Which of the following statement is true for current flowing through semi-conductor?

- A. Only conduction current B. Only Diffusion Current
C. Both (A) and (B) D. None of the above

Ans. C

82. Which of the following motors should not be allowed to run at no-load.

- A. Separately excited dc motor B. Shunt motor
C. Series motor D. All of the above

Ans. C

83. The connected configuration of Distribution Transformer is

- A. Star-Star B. Delta-Delta
C. Star-Delta D. Delta-Star

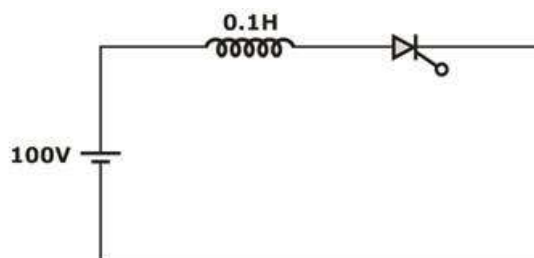
Ans. D

84. The resistance of the series RCL circuit is doubled and inductance is halved, then band width becomes.

- A. Double B. Half
C. Four time D. No change

Ans. C

85. If the latching current in the circuit shown below is 10 mA, obtain the minimum width of the gating pulse required to properly turn on the SCR



- A. 5 μ s B. 2 μ s
C. 8 μ s D. 10 μ s

Ans. D



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