MEGA MOCK CHALLENGE

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DFCCIL Executive

Electrical Engineering

Mini Mock Challenge

(June 5th - June 6th 2021)

Questions & Solutions

1. Where is the first Vedic school was established?

A. Farrukhabad
B. Mirzapur
C. Kasganj
D. Varanasi

Ans. A

2. What is the location of Nokrek biosphere reserves of India?

A. Part of Annupur (Madhya Pradesh)
B. Part of Garo hills (Meghalaya)
C. Part of Siang (Arunachal Pradesh)
D. Part of Kuchchh (Gujarat)

Ans. B

3. Monistic theory of sovereignty stated by

A. Aristotle
B. Bodin
C. Austin
D. None of these

Ans. C

4. Production refers to

A. Destruction of utility
B. Creation of utilities
C. Exchange value
D. Use of a product

Ans. B

5. **Directions:** In each of the following questions, select the related word/ letters/ number/ figure from the given alternatives.

KML : NPO : : CED : ?

A. EGF
B. GHF
C. FHG
D. HGF

Ans. C

6. A boy runs 20 m towards East and turns to right, runs 10 m and turns to right, runs 9 m and again turns to right, runs 5 m and turns to left, runs 12 m and finally turns to right and runs 6m. Now, which direction is the boy facing?

A. East
B. West
C. North
D. South

Ans. C

7. **Directions:** In each of the following questions, a series is given, with one term missing. Choose the correct alternative from the given ones that will complete the series.

WORLD, XPSME, ?, ZRUOG

A. YQTNF
B. YRTNF
C. YTQNF
D. YQNTF

Ans. A

8. The sum of ages of 4 children born at intervals of 4 years each is 60. What is the age of the youngest child?

A. 7 B. 9

C. 10 D. 12

Ans. B

9. Respective ratio of curved surface area and total surface area of cylinder is 1 : 4 and total surface area of that cylinder is 1232 cm^2 then what is its volume?

A. 1078 B. $1078\sqrt{3}$

C. $592\sqrt{3}$ D. $3000\sqrt{3}$

Ans. B

10. A and B together have Rs. 6300. If 5/19 of A's amount is equal to 2/5 of B's amount. The amount of 'B' is how much?

A. Rs. 2500 B. Rs. 3800

C. Rs.2300 D. Rs. 4000

Ans. A

11. An article is sold at a loss of 10%. Had it been sold for Rs. 9 more, there would have been a gain of $12\frac{1}{2}\%$ on it. The cost price of the article is

A. Rs. 40 B. Rs. 45

C. Rs. 50 D. Rs. 35

Ans. A

12. What number must be added to the expression $16a^2 - 12a$ to make it a perfect square?

A. 9/4 B. 11/2

C. 13/2 D. 16

Ans. A

13. Which of the following materials is/are used as moderators?

A. Heavy water B. Graphite

C. Beryllium D. All of the above

Ans. D

14. Bundled conductors are used for EHV transmission lines primarily for reducing the:

A. Corona loss B. Copper loss

C. Voltage-drop across the line D. Surge impedance of the line

Ans. A

15. In Nuclear power plant which material is/are used of coolant?

A. Liquid solution B. Graphite

C. Beryllium D. All of the above

Ans. A

16. Which of the following insulator is practically used for railway crossings?

A. Pin insulator
B. Strain insulator
C. String insulator
D. All of the Above

Ans. B

17. Asynchronous tie line is a:

A. AC transmission line
B. DC transmission line
C. Either (A) or (B)
D. None of the above

Ans. B

18. An overcurrent relay having a current setting of 125% connected to a supply circuit through a current transformer of ratio 500/1. The pick up value is

A. 15 A
B. 1.25 A
C. 5 A
D. 6.25 A

Ans. B

19. A power station has a maximum demand of 10000 KW. The annual load factor is 60% and plant capacity factor is 50%. What is the reserve capacity of the plant?

A. 8333.34 KW
B. 1666.67 KW
C. 12000 KW
D. 2000 KW

Ans. D

20. Which damping is used in moving iron instrument?

A. Air friction damping
B. Eddy current damping
C. Fluid friction damping
D. Electromagnetic damping

Ans. A

21. Which of the following devices can be used to convert energy into linear motion?

A. Solenoid
B. Solar cell
C. Potentiometer
D. All the above

Ans. A

22. Which of the below commonly used as DC bridge?

A. Desauty and Wagner
B. Schering and Anderson
C. Maxwell and Hay's
D. Wheat stone and kelvin

Ans. D

23. A moving iron type ammeter has fewer turns of thick wire so that

A. Resistance is high
B. Sensitivity is high
C. Damping is effective
D. Resistance is less

Ans. D

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24. The value of shunt resistance is _____ Ω, if a 100 μA meter movement with an internal resistance of 500 Ω is converted to an ammeter having (0-200 mA) range.

A. 0.25 B. 0.5

C. 0.75 D. 1

Ans. A

25. The bandwidth of a control system can be increased by using

A. Phase-lead network

B. Phase-lag network

C. Both Phase-lead network and Phase-lag network

D. Cascaded amplifier in the system

Ans. A

26. Which one of the following statements is correct?

A. Phase margin is always positive for stable feedback system.

B. Phase margin is always negative for stable feedback system.

C. Phase margin can be negative or positive for stable feedback system.

D. None of the above

Ans. A

27. A plant is controlled by a proportional controller. If a time delay element is introduced in the loop, its

A. Phase margin remains the same B. Phase margin increases

C. Phase margin decreases D. Gain margin increases

Ans. C

28. A signal sin(2t) is applied to a system with transfer function $\frac{1}{s-2}$ then the steady state output is

A. $\frac{1}{2\sqrt{2}}\sin\left(2t+135^\circ\right)$ B. $\frac{1}{2\sqrt{2}}\sin\left(2t-45^\circ\right)$

C. $\frac{1}{2\sqrt{2}}\sin\left(2t-135^\circ\right)$ D. None of these

Ans. D

29. A large time constant corresponds to a

A. Sluggish system

B. Faster system

C. Overdamped system

D. Underdamped system

Ans. A

30. Characteristic equation of a system is $s^2 + 4s + K = 0$, for what values of K the poles will lie left side of s = −1 is

A. K > 0 B. K > 3

C. K >−3 D. K > 2

Ans. B

31. Which of the following effects in the system is NOT caused by negative feedback?

A. Reduction in gain B. Increase in bandwidth

C. Increase in distortion D. Reduction in output impedance

Ans. C

32. The transfer function of a lead compensator is $\left(\frac{1+0.3s}{1+0.1s}\right)$. The maximum phase lead angle is

A. 30° B. 45°

C. 60° D. 75°

Ans. A

33. What will be the instantaneous value of alternative voltage (in V) which is represented by v(t) = 60cos(10t − 10) V when the value of t is 10 sec?

A. 0 B. 60

C. 30 D. 51.9

Ans. A

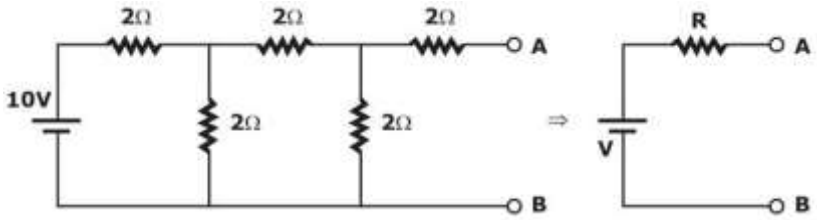
34. A 3-phase, 4-wire system supplies power to a balanced star-connected load. The current in each phase is 10 A. the current in the neutral wire will be

A. 30 A B. 10 A

C. 0 A D. 40 A

Ans. C

35. Consider the following circuit:



What will be the value of v and R respectively?

A. 2V, 3.2 Ω

B. 2V, 1.6 Ω

C. 4V, 3 Ω

D. 6V, 4 Ω

Ans. A

36. A choke of 10 H carries a current of 500 mA. Calculate the energy stored (in J) in form of magnetic field by the choke.

A. 1 J
B. 1.5 J
C. 1.25 J
D. 1.75 J

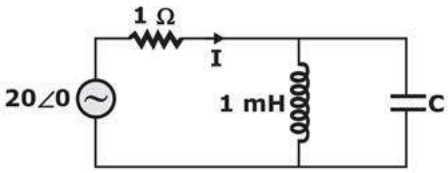
Ans. C

37. Which of the following statements is correct?

A. All meshes are loops but not all loops are meshes.
B. All loops are meshes.
C. All loops are meshes but not all meshes are loops.
D. Number of meshes are always equal to number of loops.

Ans. A

38. What will be the value of capacitor to make the current(I) zero?



A. 5.07 mF
B. 10.14 mF
C. 10.14 μF
D. 5.07 μF

Ans. B

39. A wire of resistance 10 Ω is being cut into four equal parts and all are connected in parallel. The new equivalent resistance is_____.

A. 0.25 Ω
B. 0.25 Ω
C. 6.25 Ω
D. 0.625 Ω

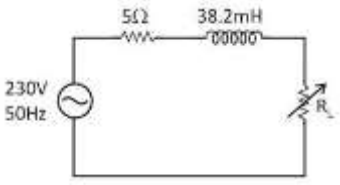
Ans. D

40. The total capacitance of two capacitors is 25F when connected in parallel and 4F when connected in series. The smaller capacitance will be among two-

A. 5 F
B. 2 F
C. 4 F
D. 6 F

Ans. A

41. What is the value of R_L such that maximum power is transferred through load resistance?



A. 5 Ω
B. 12 Ω
C. 13 Ω
D. 10 Ω

Ans. C

42. Which of the following is True for Bartlett Bisection theorem?

A. It is used for designing the network

B. It is applicable for symmetrical networks only

C. Network is separated into 2 equal parts and then bisected from middle

D. All of the above

Ans. D

43. A 6 pole, 1500 rpm DC wave wound generator has 1200 conductors. If the flux per pole is 5 miliweber, then the induced emf of generator is

A. 480 V B. 460 V

C. 450 V D. 490 V

Ans. C

44. The number of electrical degrees passed through in one revolution of a 6-pole synchronous alternator is

A. 720° B. 1000°

C. 1080° D. 3600°

Ans. C

45. In the DC machine, the fractional pitch winding is used

A. To reduce harmonic Generated EMF

B. To increase EMF

C. To improve cooling

D. To balance the winding mechanically

Ans. A

46. Pitch factor is the ratio of EMF of

A. Full pitch winding to the Distributed winding

B. Full pitch coil to the short-pitched coil

C. Short pitch coil to the full pitched coil

D. Concentrated winding to the Distributed winding

Ans. C

47. What should be ideal volatility and ideal viscosity of the transformer oil?

A. High, High B. Low, Low

C. High, Low D. Low, High

Ans. B

48. In the case of Zero Power Factor leading load on the alternation, the effect of armature reaction is

A. To Demagnetize B. To increase induced EMF

C. To Cross-Magnetize D. To Decrease the induced EMF

Ans. B

49. In a 3- phase induction motor crawling happens at

A. Even multiples of fundamental B. Odd multiple of fundamental

C. No-load speed D. Full load speed

Ans. B

50. Two AC series motors are connected in series to produce a torque of 4 N-m. Now if the motors are connected in parallel, the torque produce will be-

A. 1 Nm B. 16 Nm

C. 2 Nm D. 8 Nm

Ans. A

51. If static voltage of a squirrel case induction motor reduced to 75% of its rated value, the developed torque is reduced by how many % of its full load value?

A. 56.25% B. 75%

C. 43.75% D. 25%

Ans. C

52. If the Back EMF of DC motor vanishes then

A. Motor will stop

B. Armature will Burn

C. Motor continue to run normally

D. Motor continue to run with slower speed.

Ans. B

53. A transistor has a current gain of 0.98 in common base mode. Its current gain in common emitter mode will be

A. 50 B. 49

C. 48 D. 47

Ans. B

54. Determine the Average value of alternating voltage (in V) if peak to peak value of voltage is 10V.

A. 3.18 B. 6.37

C. 1.59 D. 12.73

Ans. A

55. If $n_i = 1.5 \times 10^{16}\ m^{-3}$, $\mu_n = 0.5\ m^2/Vs$, $\mu_p = 0.045\ m^2/Vs$, then the resistivity of intrinsic silicon semiconductor at 300 K is

A. $0.468 \times 10^{-3}\ \Omega$-m

B. $2.137 \times 10^{-3}\ \Omega$-m

C. $2.137 \times 10^{3}\ \Omega$-m

D. 763 Ω-m

Ans. D

56. If the load resistance decreases in a Zener regulator, the series current
    A. Decreases
    B. Remains the same
    C. Increases
    D. Equals the source voltage divided by the series resistance

Ans. B

57. A supercapacitor is-
    A. Variable capacitance capacitor
    B. Large value of capacitances
    C. An electrolytic capacitor
    D. Both B & C

Ans. D

58. The temperature coefficient of an intrinsic semiconductor is
    A. Positive
    B. Zero
    C. Negative
    D. Like that of metals

Ans. C

59. The temperature coefficient of resistance of wire is 0.002/°C. At 300K its resistance is 5Ω. The resistance of the wire at 327K will be_____
    A. 5 Ω
    B. 5.27 Ω
    C. 5.54 Ω
    D. 5.81 Ω

Ans. B

60. What will be the susceptibility of a material Kept in free space if the field strength of the material is 0.2×10^7 A-m^{-1} and the flux density of material is 10T?
    A. 2
    B. 3
    C. 1
    D. 4

Ans. B

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