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Motto :

"We are saviour of nation."

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STARS ACADEMY LAHORE

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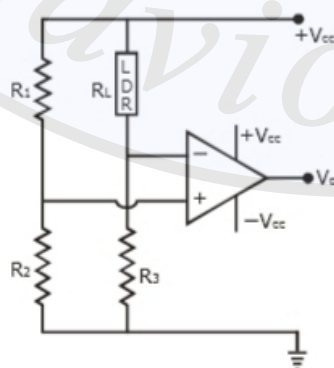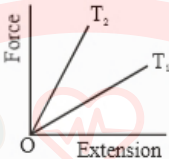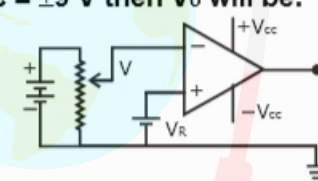1. The Young's modulus of a wire of length "L" and radius "r" is Y N/m^2. If the length and radius are reduced to L/2 and r/2, then its Young's modulus will be
   A) Y/2
   B) 2Y
   C) Y
   D) 4Y

2. In **CGS** system, the Young's modulus of a steel wire is 2×10^{12}. To double the length of a wire of unit cross-section area, the force required is
   A) 4×10^6 dynes
   B) 2×10^{12} newtons
   C) 2×10^{12} dynes
   D) 2×10^8 dynes

3. If the temperature increases, the modulus of elasticity
   A) Decreases
   B) Remains constant
   C) Increases
   D) Becomes zero

4. A force F is needed to break a copper wire having radius "R". The force needed to break a copper wire of radius "2R" will be
   A) F/2
   B) 4F
   C) 2F
   D) F/4

5. "A" and "B" are two wires. The radius of "A" is twice that of "B". They are stretched by the some load. Then the stress on B is
   A) Equal to that on A
   B) Two times that on A
   C) Four times that on A
   D) Half that on A

6. Under elastic limit the stress is
   A) Inversely, proportional to strain
   B) Directly proportional to strain
   C) Square root of strain
   D) Independent of strain

7. The work done in stretching an elastic wire per unit volume is or strain energy in a stretched string is
   A) Stress × Strain
   B) 2×strain×stress
   C) $\frac{1}{2}$ (Stress × Strain)
   D) Stress/Strain

8. What will be the value of reference voltage "V_R" in night switch? If V_{cc} = + 9V:
   $R_1 = 4\Omega$, $R_2 = 2 \Omega$, $R_3 = 6\Omega$ and $R_L = 18 \Omega$

   A) 3V
   B) 6V
   C) 9V
   D) 12V

9. Hook's law defines
   A) Stress
   C) Strain

B) Modulus of elasticity   D) Elastic limit

10. In a wire of length L, the increase in its length is I. If the length is reduced to half, the increase in its length will be
A) I   C) 2l
B) l/2   D) None of the above

11. The force required to stretch a steel wire of 1 cm^2 cross-section to 1.1 times its length would be $Y = 2×10^{11}$ N/m^2.
A) $2×10^6$ N   C) $2×10^3$ N
B) $2 × 10^{-6}$ N   D) $2×10^{-7}$ N

12. Which of the following affects the elasticity of a substance?
A) Hammering   C) Impurity in substance
B) Change in temperature   D) All of these

13. On applying a stress of $20 ×10^8$ N/ m^2 the length of a perfectly elastic wire is doubled. Its Young's modulus will be
A) $40 ×10^8$ N / m^2 C) $20 ×10^8$ N / m^2
B) $10 ×10^8$ N / m^2 D) $5 ×10 ^8 N / m^2$

14. A PN junction diode cannot be use:
A) As rectifier
B) For converting light energy to electrical energy
C) For getting light radiation
D) For increasing the amplitude of an ac signal

15. A uniform plank of Young's modulus Y is moved over a smooth horizontal surface by a constant horizontal force F. The area of cross section of the plank is A. The compressive strain on the plank in the direction of the force is
A) F / AY C) $2F / AY$
B) $\frac{1}{2}(F/AY)$ D) $3F / AY$

16. Four identical rods are stretched by same force. Maximum extension is produced in
A) $L =10$ cm, $D =1$ mm   C) $L =100$ cm, $D = 2$ mm
B) $L =200$ cm, $D =3$ mm   D) $L = 300$ cm, $D = 4$ mm

17. The only elastic modulus that applies to fluids is
A) Young's modulus   C) Shear modulus
B) Modulus of rigidity   D) Bulk modulus

18. A uniform cube is subjected to volume compression. If each side is decreased by 1%, then bulk strain is
A) 0.01   C) 0.06
B) 0.02   D) 0.03

19. The output resistance of an ideal operational amplifier is:
A) Very high   C) Zero
B) Very low   D) infinite

20. The ratio of Young's modulus of the material of two wires is 2 : 3. If the same stress is applied on both, then the ratio of elastic energy per unit volume will be
A) 3 : 2   C) 2 : 3
B) 3 : 4   D) 4 : 3

21. Wires A and B are made from the same material. A has twice the diameter and three times the length of B. If the elastic limits are not reached, when each is stretched by the same tension, the ratio of energy stored in A to that in B is
A) 2 : 3   C) 3 : 4
B) 3 : 2   D) 6 : 1

22. Voltage gain of non-inverting op. amplifier
A) $1+\dfrac{R_1}{R_2}$ C) $1-\dfrac{R_1}{R_2}$

B) $1+\dfrac{R_2}{R_1}$ D) $1-\dfrac{R_2}{R_1}$

23. To derive expression for voltage gain of inverting op amplifier we apply

A) Virtual ground principle
C) Kirchhoff voltage rule
B) Kirchhoff current rule
D) Virtual ground principle and Kirchhoff's current rule

24. In non-inverting amplifier when $R_1 = \infty$ and $R_2 = 0$. The voltage gain is
A) 1
C) ∞
B) 0
D) 10^5

25. Which of given is not the use of operational amplifier
A) Inverting amplifier
C) Rectifier
B) Non-inverting amplifier
D) Comparator

26. Operational amplifier works with open loop potential difference between input terminals is 150 μ V. The out voltage is
A) 50 V
C) 100 V
B) 15 V
D) 150 V

27. The diagram shows the change in the length of a thin uniform wire caused by the application of stress at two different temperatures T_1 and T_2. The variations shown suggest that
A) $T_1 > T_2$
B) $T_1 < T_2$
C) $T_1 = T_2$
D) None of these

28. The valence electrons of the impurity atom that is to be added to germanium crystal so as to make it a N-type semiconductor, is
A) 6
C) 5
B) 4
D) 3

29. A substance which undergoes a permanent deformation is called
A) Ceramic
C) Ductile
B) Organic
D) Brittle

30. Unit of Modulus of Elasticity is
A) Coulomb
C) Pascal
B) Volt
D) Ampere

31. A 1.0m long Cu wire is subjected to stretching force and its length increases by 10cm, percent elongation which the wire undergoes.
A) 1%
C) 20%
B) 0.10%
D) 10%

32. When a semiconductor is heated, its resistance
A) Decreases
C) Increases
B) Remains unchanged
D) Nothing is definite

33. Let n_P and n_e be the number of holes and conduction electrons respectively in a semiconductor. Then
A) $n_P > n_e$ in an intrinsic semiconductor
C) $n_P = n_e$ in an intrinsic semiconductor
B) $n_P < n_e$ in an extrinsic semiconductor
D) $n_P > n_e$ in an intrinsic semiconductor

34. In a semiconductor the separation between conduction band and valence band is of the order of
A) 100 eV
C) 10 eV
B) 1eV
D) 0 eV

35. A diode as a rectifier converts:
A) a.c into d.c
B) d.c into a.c
C) Varying d.c current into constant d.c current
D) High voltage into low voltage and vice-versa

36. Resistance of semiconductor at 0 K is
A) Zero
C) Infinite
B) Large
D) Small

37. The area under stress-strain graph represents:
A) Energy stored
C) Energy density
B) Modulus of elasticity
D) None of these

38. Two identical wires of copper and steel are joined end to end and a force is applied on them so that the combined length increases by one centimeter in both the wires, there will be:
    A) Unequal stress and equal strain   C) Unequal stress and unequal strain
    B) Equal stress and equal strain   D) Equal stress and unequal strain

39. In a good conductor the energy gap between the conduction band and the valence band is
    A) Infinite   C) Wide
    B) Narrow   D) Zero

40. Which is the correct relation for forbidden energy gap in conductor, semi conductor and insulator
    A) $\Delta Eg_c > \Delta Eg_{sc} > \Delta Eg_{insulator}$ C) $\Delta Eg_c > \Delta Eg_{insulator} > Eg_{sc}$
    B) $\Delta Eg_{insulator} > \Delta Eg_{sc} > \Delta Eg_c$ D) $\Delta Eg_{sc} > \Delta Eg_c > \Delta E_{insulator}$

41. Regarding a semiconductor which one of the following is wrong
    A) There are no free electrons at room temperature
    B) There are no free electrons at 0 K
    C) The number of free electrons increases with rise of temperature
    D) The charge carriers are electrons and holes

42. A certain force F increases the length of a given wire by 1mm. the force required to increase its length by 2mm is:
    A) F   C) 3F
    B) 2F   D) 4F

43. In operational amplifier as comparator circuit shown in fig.
    If   VR = 5 V
              V = 5.1 V   and Vcc = ±9 V then V₀ will be:

    A) V₀ = +9V   C) V₀ = -9V
    B) V₀ = −5.1V   D) V₀ = + 5V

44. The electrical circuit used to get smooth *dc* output from a rectifier circuit is called
    A) Oscillator   C) Filter
    B) Amplifier   D) Logic gates

45. In a half wave rectifier the current through load resistance flows only
    A) Positive half cycle   C) Both half cycles
    B) Negative half cycle   D) One half cycle

46. To reduce ripples in the output of bridge rectifier we should use
    A) Diodes having low forward resistance   C) Low frequency A.C
    B) Diodes having high forward resistance   D) A filter circuit

47. Open loop gain of operational amplifier is
    A) Zero   C) 10^{-5}
    B) ∞ D) 10^{+5}

48. Voltage gain of op amplifier is given by equation $\dfrac{-R_2}{R_1}$ it is possible when input signal is applied at

    A) Inverting terminal   C) Both of input terminal
    B) Non inverting terminal   D) Either of input terminal

49. The resistance of a reverse biased P-N junction diode is about
    A) 1 ohm   C) 10^2 ohm
    B) 10^3 ohm   D) 10^6 ohm

50. PN-junction diode works as a insulator, if connected
    A) To A.C.   C) In forward bias
    B) In reverse bias   D) None of these

51.   **What is the current in the circuit shown below**

$-4V$ ▬▶▮ $300\,\Omega$ $-1\,V$

A) 0 amp   C) 10^{-2} amp
B) 1 amp   D) 0.10 amp

52.   **Which of the following has the least elasticity?**
A) Copper   C) Steel
B) Rubber   D) Iron

53.   **A semiconductor device is connected in a series circuit with a battery and a resistance. A current is found to pass through the circuit. If the polarity of the battery is reversed, the current drops almost to zero. The device may be**
A) A P-type semiconductor   C) An N-type semiconductor
B) A PN-junction   D) An intrinsic semiconductor

54.   **The signal applied at inverting terminal of operational amplifier, appears at the output terminal with phase shift of:**
A) 90° C) 180°
B) 0° D) 45°

55.   **If young's modulus for material is zero, then the state of material should be:**
A) Solid   C) Solid but powder
B) Gas   D) Both (A) , (B)

56.   **In the steel young's modulus and the strain at the breaking point are 2×10^{11} Nm^{-2} and 0.15 respectively. The stress at the break point for steel is therefore:**
A) 1.33×10^{11} Nm^{-2} C) $7.5 \times 10\ 10^{-3}$ Nm^{-2}
B) 1.33×10^{12} Nm^{-2} D) $3 \times 10\ 10^{10}$ Nm^{-2}

57.   **Which of the following statement is correct?**
A) Hooke's law is applicable only within elastic limit
B) The adiabatic and isothermal elastic constants of a gas are equal
C) Young's modulus is dimensionless
D) Stress multiplied by strain is equal to the stored energy

58.   **In OP-AMP if $V_+ = V_-$, then gain of OP-AMP is:**
A) 0   C) 10^5
B) ∞ D) 10^6

59.   **If a full wave rectifier circuit is operating from 50 Hz mains, the fundamental frequency in the ripple will be**
A) 50 Hz   C) 70.7 Hz
B) 100 Hz   D) 25 Hz

60.   **Open loop gain of operational amplifier is:**
A) Zero   C) 10^{-5}

B) ∞ D) 10^{+5}

Medicos Hub Phy Test #16 Key

1.	C	17.	D	33.	B	49.	D	65.		81.		97.	
2.	D	18.	D	34.	B	50.	B	66.		82.		98.	
3.	A	19.	C	35.	A	51.	A	67.		83.		99.	
4.	B	20.	A	36.	C	52.	B	68.		84.		100.	
5.	C	21.	C	37.	C	53.	B	69.		85.		101.	
6.	B	22.	B	38.	D	54.	C	70.		86.		102.	
7.	C	23.	D	39.	D	55.	B	71.		87.		103.	
8.	A	24.	A	40.	B	56.	D	72.		88.		104.	
9.	B	25.	C	41.	A	57.	A	73.		89.		105.	
10.	B	26.	B	42.	B	58.	A	74.		90.		106.	
11.	A	27.	A	43.	C	59.	B	75.		91.		107.	
12.	D	28.	C	44.	C	60.	D	76.		92.		108.	
13.	C	29.	C	45.	D	61.		77.		93.		109.	
14.	D	30.	C	46.	D	62.		78.		94.		110.	
15.	A	31.	D	47.	D	63.		79.		95.		111.	
16.	C	32.	A	48.	A	64.		80.		96.		112.	