Date: 2-12-2024

LGS GROUP OF COLLEGES

Physics | Monthly Test | XII

TEST# MT-3

Topic: Chapter # 17 & 18	Name:……	Roll No:
Time: 1 hr.	Objective	Marks =35

SECTION-I OBJECTIVE TYPE

Note: Four possible answer A, B, C and D to each question are given. The choice which you think is correct, fill the circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question. (1 × 11 = 11)

Q1. Select the right option.

1) If length of wire increases by 1% on stretching then ……..
   A. Bulk strain on the wire is 0.01 B. Shear strain on the wire is 0.01
   C. Tensile strain on the wire is 0.01 D. There is no strain on the wire

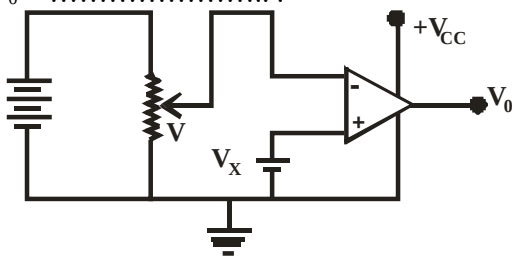
2) Gases have ……..
   A. Bulk modulus and shear modulus only B. Bulk modulus and young's modulus only
   C. Bulk modulus only D. Shear modulus only

3) Length of a wire whose stress is 5×10^8 N / m^2 increases by 1% then young's modulus of the wire may be 5 × …….. N/m^2.
   A. 10^4 B. 10^6
   C. 10^8 D. 10^{10}

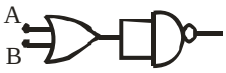
4) Two wires of the same material are stretched by same longitudinal force. If the ratio of their radii is 1:2 and ratio of their length is 2:1, then ratio of the extensions is ……
   A. 4:1 B. 1:4
   C. 8:1 D. 1:8

5) Nickel is …….. substance.
   A. diamagnetic B. paramagnetic
   C. ferromagnetic D. none of these

6) In figure when $V_- > V_+$ then V_0 = …….. .



   A. zero B. positive
   C. negative D. infinity

7) Algebric expression of  = ……..

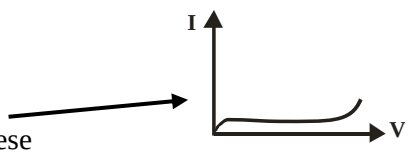
   A. X = A + B B. $X = \overline{A + B}$
   C. X = A .B D. $X = \overline{A \cdot B}$

8) Boleon algebric expression of  = ……..

   A. X = A + B B. $X = \overline{A + B}$
   C. X = A .B D. $X = \overline{A \cdot B}$

9) Change in potential of semiconductor diode per unit rise temp is …….volt.
   A. 2 B. 0.02
   C. 0.002 D. 0.0002

`10) Slope of reverse biased diode characteristic graph is
   A. zero B. infinity
   C. both D. none of these



11) Base current change, which can produce change in collector current of 100mA in a transistor having β = 100.
   A. 1 μ A B. 100μ A
   C. 0.01μ A D. 0.001 A

SECTION-II SUBJECTIVE TYPE

Q2. Write short answers of the following questions. **(8 x 2 = 16)**

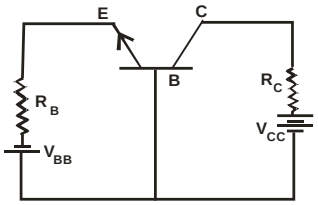
i) Differentiate critical temperature from curie temperature.

ii) Draw the figure showing difference between p-type and n-type semi conductors.

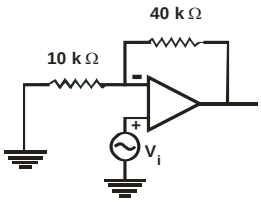
iii) With reference to energy, distinguish between orbital electrons and free electrons.

iv) Explain briefly the conductors on the basis of energy band theory.

v) Why is V_{CC} made high in comparison to V_{BB} as shown in the figure.



vi) Calculate the gain of non-inverting amplifier shown in figure.



vii) The anode of a diode is 0.2 V positive with respect to its cathode. Is it forward biased?

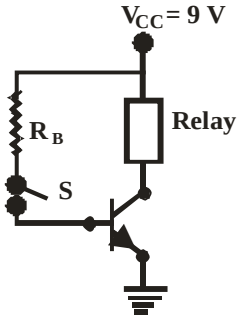
viii) What is the effect of forward and reverse biasing of a diode on the width of depletion region?

SECTION – II (PART–II)

Note: Attempt any one questions. **(5+3=8)**

Q3. a) Describe the hystersis loop in ferromagnetic substances.

b) Fig. shows a transistor which operates a relay as the switch S is closed. The relay is energized by a current of 10 mA. Calculate the value R_B which will just make the relay operate. The current gain β of the transistor is 200. When the transistor conducts, its V_{BE} can be assumed to be 0.6 V.



OR

Q3. a) What is meant by Amplifier, describe transistor in common emitter configuration as an amplifier.

b) A 1.25 cm diameter cylinder is subject to a load of 2500 kg. Calculate the stress on the bar in mega pascals.