

PHYSICS PAPER-X
(A-I-KT-26)



VERSION: B

& Stamp of Supdt:

Roll No.

C No.172

Name: _____

Time Allowed: 20 Minutes

SECTION-A

Marks:12

1. An object is placed at a distance of 20 cm from a convex lens of focal length 10cm. Its real and inverted image is formed at a distance of:
A. 10cm B. 20cm C. 30cm D. 60cm
2. The ability of an optical instrument to distinctively separate two very close points is called: 1217234
A. power of lens B. linear magnification C. angular magnification D. resolving power
3. All of the following factors affect the capacitance of a capacitor except:
A. shape and size of plates B. applied voltage C. separation between plates D. nature of dielectric
4. A battery of 30V is connected across two resistances each of 5 ohms joined in series. The current passing through them is:
A. 1A B. 2A C. 3A D. 6A
5. A current carrying conductor of length L having current I placed in a magnetic field B at an angle of 30° experiences magnetic force of magnitude:
A. 0.5 ILB B. ILB C. 0.7 ILB D. 0.86 ILB
6. Identify the gate that gives high output when all of its inputs are high:
A. AND gate B. OR gate C. NOT gate D. NAND gate
7. A telecommunication device that is used to transmit sound on a beam of light is called:
A. computer B. photo phone C. fax machine D. cell phone
8. A radioactive sample contains 64000 atoms. The number of atoms remaining in the sample after 4 half-lives is:
A. 1000 B. 2000 C. 3000 D. 4000
9. The radioactive decay in which there is no change in atomic number as well as mass number of element is:
A. alpha decay B. beta decay C. gamma decay D. both alpha and beta decay
10. In order to make the time period of a simple pendulum double, its length must be:
A. doubled B. halved C. quadrupled D. reduced to one-fourth
11. If the frequency of waves produced in a string is doubled, the speed of waves in the string will be: 1217234
A. doubled B. halved C. constant D. quadrupled
12. The intensity level of a certain sound is 30 dB. How much times is this sound more intense than faintest audible sound?
A. 10 B. 100 C. 300 D. 1000

Write Roll No. in the boxes and shade the appropriate circle.

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0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

Shade the correct answers
for each question below.

1. (A) (B) (C) (D)
2. (A) (B) (C) (D)
3. (A) (B) (C) (D)
4. (A) (B) (C) (D)
5. (A) (B) (C) (D)
6. (A) (B) (C) (D)
7. (A) (B) (C) (D)
8. (A) (B) (C) (D)
9. (A) (B) (C) (D)
10. (A) (B) (C) (D)
11. (A) (B) (C) (D)
12. (A) (B) (C) (D)
13. (A) (B) (C) (D)
14. (A) (B) (C) (D)
15. (A) (B) (C) (D)

Section "B"

Marks: 32

Attempt any EIGHT questions. All questions carry equal marks.

- Define the terms pitch and quality of sound. How does frequency of sound affect its pitch? Why does a woman's voice have a higher pitch than a man's voice? 1+1+1+1
- Calculate the speed of sound at a temperature of -50°C . 1+1+1+1
- A ray of light is incident on a plane mirror at a certain angle and is reflected. With a neat diagram, label the angle of incidence and angle of reflection. Also state the two laws of reflection. 1+1+1+1
- Q.4 Two point charges of magnitudes $10\mu\text{C}$ and $20\mu\text{C}$ in air exert a force of 50 N on each other. Determine the distance between them. 1+1+1+1
- Q.5 The electrical resistance of a metallic wire is R when its length and cross-sectional area are L and A. Describe what will be the effect on its electrical resistance when:
(a) its length is increased to 3L. (b) its cross-sectional area is increased to 2A. 2+2
- Q.6 Draw and interpret the V-I characteristics graph for thermistor. 2+2
- Q.7- A conductor of length 2m carrying current of magnitude 3A is placed in a uniform magnetic field of strength 4T at an angle of 30° with the field. Calculate the magnetic force acting on the wire. 1+1+1+1
- Q.8 Draw the truth table and circuit symbol for NOR gate. Also write its Boolean equation. 2+1+1
- Q.9 What are primary storage devices? Name any two primary storage devices. How do they differ from secondary storage devices? 1+1+1+1
- Q.10 What changes will occur to the nucleus of an atom of atomic number Z and mass number A when it undergoes: (a) alpha decay (b) beta decay.
Write down the general equation that represents each decay. 1+1+1+1
- Q.11 Differentiate nuclear fission and fusion. Give one example of each process. What is the source of large amount of energy in these nuclear processes? 1+1+1+1

Section "C"

Marks: 21

Note: Attempt any THREE of the following questions. All questions carry equal marks.

- Q.12.(a). What is simple harmonic motion? Show mathematically that both the restoring force and acceleration in case of simple pendulum of length L is directly proportional to its displacement from the mean position. 1+1+1+1
- b). The length of a simple pendulum on a planet X is 0.843m. Calculate its time period on this planet. (Given that $g_X = 3.7\text{ms}^{-2}$) 1+1+1
- Q.13.(a) Discuss the purpose, construction, working and magnifying power of refracting telescope using its ray diagram. 1+1+1+1
- b). Light is incident from one medium of refractive index 1 at an angle of incidence 60° on a second medium. If the angle of refraction is 35° , calculate the refractive index of the second medium. 1+1+1
- Q.14.(a) Explain the concept of electric potential through an example. Write its formula and define its unit volt. 1+1+1+1
- b). Two capacitors of $8\mu\text{F}$ and $12\mu\text{F}$ are connected in parallel across a 9V battery. Calculate: (a) equivalent capacitance of the combination. 1+1+1
- (b) charge stored by each capacitor.
- Q.15.(a) Define the following: 1+1+1+1
- (a). mutual induction. (b). coefficient of mutual induction.
- (c). transformer (d). Henry.
- b). The mutual inductance of two coils is 0.50H and the current in primary coil increases from 2A to 5A in 0.010s. How much emf is induced in the secondary coil? 1+1+1