PAPER CODE - 6471

11th CLASS – 12022

PHYSICS **TIME: 20 MINUTES**

GROUP : FIRST **OBJECTIVE** DGK-G1-22 **MARKS: 17**

NOTE: You have four choices for each objective type question as A , B , C and D . The choice which you think is correct , fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

QUESTION NO. 1

1	Number of colours used in process of colour printing to produce the entire range of colours are (A) 4 (B) 5 (C) 6 (D) 7
2	One femto is equal to (A) 10^{-9} (B) 10^{-18} (C) 10^{-6} (D) 10^{-15}
3	Resultant of two perpendicular vectors of equal magnitude A is (A) A^2 (B) A (C) $\sqrt{2}$ A (D) 2A
4	If $\vec{A} = 2\hat{\imath} + 3\hat{\jmath} - \hat{k}$ and $\vec{B} = 4\hat{\imath} + 6\hat{\jmath} - 2\hat{k}$ the angle between them will be (A) 0° (B) 45° (C) 60° (D) 90°
5	A bullet shot straight up , returns to its starting point in 10 sec , the initial speed was (A) 10 m/sec (B) 49 m/sec (C) 24 m/sec (D) 98 m/sec
6	Horizontal range is equal to 4 times of its maximum height only if angle of projection is (A) 90° (B) 45° (C) 60° (D) 30°
7	When two protons are brought closer together , then (A) K.E increases (B) P.E decreases (C) P.E increases (D) P.E remains same
8	The time period of artificial satellite close to earth is given by (A) $\frac{2\pi R}{V}$ (B) $2\pi RV$ (C) $\frac{2\pi V}{R}$ (D) $\frac{\pi R}{V}$
9	If a body of mass 10 kg is allowed to fall freely , its weight becomes (A) 10 N (B) 0 N (C) 100 N (D) 9.8 N
10	A two (2) meter high tank is full of water. A hole appears at its middle. The speed of efflux will be (A) 3.75 ms^{-1} (B) 5.11 ms^{-1} (C) 4 10 ms^{-1} (D) 4.42 ms^{-1}
11	The distance covered by a body in one complete vibration is 20 cm. What is the amplitude of the body (A) 10 cm (B) 20 cm (C) 1 cm (D) 5 cm
12	If the speed of sound in air at given pressure is 'V' then doubling the pressure, the new speed becomes (A) 2 V (B) V (C) 3 V (D) 4 V
13	A stretched string vibrates in ***n*** loops , its length in terms of wavelength is (A) $\frac{n\lambda n}{2}$ (B) $(n+1)\frac{\lambda n}{2}$ (C) $\left(n+\frac{1}{2}\right)\frac{\lambda n}{2}$ (D) $\left(n+\frac{1}{2}\right)\lambda n$
14	Which of the following phenomenon cannot produce colours with white light ? (A) Diffraction (B) Interference (C) Polarization (D) Dispersion
15	An astronomical telescope has objective of focal length 100 cm and eyepiece of focal length 10 cm. Its magnifying power is (A) 100 (B) 1000 (C) 10 (D) 1
16	Change in entropy of reversible process is (A) Positive (B) Maximum (C) Negative (D) Zero
17	Isobaric process is one in which ..... remains constant (A) Volume (B) Pressure (C) Temperature (D) Energy

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PHYSICS | 11th CLASS - 12022 | TIME : 2.40 HOURS
GROUP : FIRST | SUBJECTIVE | MARKS : 68

D

SECTION-I

QUESTION NO. 2 Write short answers of any Eight (8) parts of the following DGK-51-22 **16**

i	Define the terms , precision and accuracy
ii	Write the dimensions of (a) Pressure (b) Density
iii	How many seconds are in one year ? Calculate
iv	Differentiate in physical and non-physical quantities with examples
v	At what point or points in its path does a projectile have its minimum speed , its maximum speed ?
vi	Define impulse and show how it is related to linear momentum ?
vii	Why ballistic missiles are not useful for long range ?
viii	State second law of motion in terms of momentum
ix	A thermos flask containing milk as a system is shaken. Does the temperature of milk rise ?
x	Specific heat of gas at constant pressure is greater than specific heat at constant volume. Why ?
xi	Why entropy is called time arrow ?
xii	Can we say that first law of thermodynamics is law of conservation of energy ? Explain

QUESTION NO. 3 Write short answers of any Eight (8) parts of the following **16**

i	What changes take place in a vector when it is multiplied by " -2 " ?
ii	How the direction of the vector product of two vectors can be determined ? Explain
iii	Can a vector have rectangular component greater than the vector's magnitude ? Explain
iv	Define escape velocity. Does the escape velocity of a body depend upon its mass ?
v	In which case more work is done ? When a 50 kg bag of books lifted through 50 cm ; or when 50 kg crate is pushed through 2 m across the floor with force of 50 N ?
vi	Differentiate between renewable and non-renewable energy sources with examples
vii	Why does the coasting rotating system slow down as water drops into the beaker ?
viii	Why does a diver change his body positions before and after diving into the pool ?
ix	Calculate rotational K.E of solid circular disc and hoop
x	Can visible light produce interference fringes ? Explain
xi	What is meant by optically active crystals ? Give at least two examples
xii	Find the grating element of the diffraction grating containing 2000 lines/cm

QUESTION NO. 4 Write short answers of any Six (6) parts of the following **12**

i	Write down the properties of an ideal fluid
ii	Does frequency depend on amplitude of harmonic oscillator ? Explain briefly
iii	Can we realize an ideal simple pendulum ? Explain
iv	What will be the time period and frequency of a simple pendulum at the centre of earth ?
v	What is the effect of pressure and density on speed of sound ?
vi	Discuss briefly the phase changes when the transverse wave is reflected by a rarer and denser medium
vii	Is it possible for two identical waves travelling in the same direction along a string to give rise to a stationary wave ?
viii	Write down the importance of collimator in spectrometer
ix	One can buy a cheap microscope for use of children. The image seen in such a microscope have coloured edges. Why is this so ?

SECTION-II

Note: Attempt any Three questions from this section **8 x 3 = 24**

Q.5 (A) Define and formulate absolute gravitational potential energy 5

(B) Find the angle between two vectors $\vec{A} = 5\hat{i} + \hat{j}$ and $\vec{B} = 2\hat{i} + 4\hat{j}$ 3

Q.6 (A) State and prove law of conservation of linear momentum 5

(B) A body of moment of inertia $I = 0.80$ kg m^2 about a fixed axis , rotates with a constant angular velocity of 100 rad s^{-1} . Calculate its angular momentum L and the torque to sustain this motion 3

Q.7 (A) State and prove Bernoulli's equation for ideal fluid 5

(B) A pipe has length 1 m. Determine the frequency of fundamental and first two harmonics (a) if pipe is open at both ends (b) if pipe is closed at one end . (Speed of sound in air = 340 ms^{-1}) 3

Q.8 (A) Why simple pendulum is called simple. Also , derive a relation for its time period 5

(B) Sodium light ($\lambda = 589$ nm) is incident normally on a grating having 3000 lines per centimeter. What is the highest order of the spectrum obtained with this grating ? 3

Q.9 (A) What is Astronomical telescope ? Describe its construction and working. Also find its magnifying power 5

(B) Calculate the entropy change when 1.0 kg ice at 0 °C melts into water at 0 °C. Latent heat of fusion of ice = $L_f = 3.36 \times 10^5$ J kg^{-1} 3

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