SAMPLE QUESTION PAPER

INSTITUTE NAME & LOGO

NEET – EXAM YEAR

Phy : Full Portion Paper

Test Number	Test Booklet No.
Write/Check this Code on your Answer Sheet	Write this number on your Answer Sheet

: IMPORTANT INSTRUCTIONS :

01. Immediately fill in the particulars on this page of the Test Booklet with **Blue/Black Ball point Pen. Use of pencil is strictly prohibited**
02. The Answer Sheet is kept inside this Test Booklet. When you are directed to open the Test Booklet, take out the Answer Sheet and fill in the particulars carefully.
03. The test is of **45 Min.** duration
04. The Test Booklet consists of **45** questions. The maximum marks are **180**. All the Ques. consists of **FOUR** (**4**) marks each.
05. **PHYSICS- 45 Ques. (180 marks).**
06. Candidates will be awarded marks as stated above in Instruction No.4 for correct response of each question. **ONE** (**1**) mark will be deducted for indicating incorrect response of each question. **No deduction** from the total score will be made **if no response** is indicated for an item in the Answer Sheet.
07. Use **Blue/Black Ball Point Pen only** for writing particulars/marking responses on **Side-1** and **Side-2** of the Answer Sheet. **Use of pencil is strictly prohibited.**
08. No candidate is allowed to carry any textual material, printed or written, bits of papers, pager, mobile phone, any electronic device, etc., except the Admit Card inside the examination hall/room.
09. Rough work is to be done on the space provided for this purpose in the Test Booklet only. This space is given at the bottom of each page of the booklet.
10. On completion of the test, the candidate must hand over the Answer Sheet to the Invigilator on duty in the Room/Hall. **However, the candidates are allowed to take away this Test Booklet with them.**
11. The CODE for this Booklet is A. Make Sure that the CODE printed on **Side-2** of the Answer Sheet is the same as that on this booklet. In case of discrepancy, the candidate should immediately report the matter to the Invigilator for replacement of both the Test Booklet and the Answer Sheet.
12. Do not fold or make any stray marks on the Answer Sheet.
13. No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.

Name of the Candidate : _____

Roll Number : In figures : | | | | | | | |

In words : _____

Examination Centre Number : | | | | | | |

Name of Examination Centre (in Capital letters) : _____

Candidate's Signature : _____ Invigilator's Signature : _____

INSTITUTE NAME - EXAM YEAR

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NEET – EXAM YEAR

Time : 45 Min	**Phy : Full Portion Paper**	**Marks : 180**

01) Statement 1 : Sound would travel faster on a hot summer day than on a cold winter day.
Statement 2 : Velocity of sound is directly proportional to the square of its absolute temperature.
1) Both statement 1 and statement 2 are true and the statement 2 is the correct explanation of the statement 1.
2) Both statement 1 and statement 2 are true but statement 2 is not the correct explanation of the statement 1.
3) Statement 1 is true but statement 2 is false.
4) Statement 1 and statement 2 both are false.

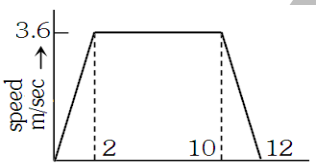
02) The gravitational potential energy of a body of mass 'm' at the earth's surface $-mgR_e$. Its gravitational potential energy at a height R_e from the earth's surface will be (Here R_e is the radius of the earth.)

1) $-\frac{1}{2}mgR_e$ 2) $\frac{1}{2}mgR_e$
3) $-2\,mgR_e$ 4) $2\,mgR_e$

03) Light coming from a star is observed to have a wavelength of 3737 Å, while its real wavelength is 3700 Å. The speed of the star relative to the earth is [Speed of light $3\times10^8 m/s$]

1) $3.7\times10^7 m/s$ 2) $3.7\times10^6 m/s$
3) $3\times10^6 m/s$ 4) $3\times10^5 m/s$

04) A lift is going up. The total mass of the lift and the passenger is 1500 kg. The variation in the speed of the lift is as given in the graph. The tension in the rope pulling the lift at t = 11th s will be



1) Zero 2) 12000 N
3) 14700 N 4) 16400 N

05) A particle executes simple harmonic motion with an amplitude of 4 cm. At the mean position the velocity of the particle is 10 cm/s. The distance of the particle from the mean position when its speed becomes 5 cm/s is

1) $2(\sqrt{5})$ cm 2) $2(\sqrt{3})$ cm
3) $\sqrt{5}$ cm 4) $\sqrt{3}$ cm

06) At a place the earth's horizontal component of magnetic field is 0.36×10^{-4} weber / m^2. If the angle of dip at that place is 60°, then the vertical component of earth's field at that place in weber/m^2 will be approximately

1) 0.62×10^{-4} 2) 0.40×10^{-4}
3) 0.24×10^{-4} 4) 0.12×10^{-4}

07) A wooden block of mass M rests on a horizontal surface. A bullet of mass m moving in the horizontal direction strikes and gets embedded in it. The combined system covers a distance x on the surface. If the coefficient of friction between wood and the surface is μ, the speed of the bullet at the time of striking the block is (where m is mass of the bullet.)

1) $\sqrt{\frac{2\mu mx}{M+m}}$ 2) $\sqrt{\frac{2Mg}{\mu m}}$
3) $\sqrt{\frac{2\mu mg}{Mx}}$ 4) $\sqrt{2\mu gx}\left(\frac{M+m}{m}\right)$

08) A wheel of moment of inertia 5 x 10^{-3} kg-m^2 is making 20 rev/s. The torque required to stop it in 10 s is

1) 4π x 10^2 N-m 2) 4π x 10^{-2} N-m
3) 2π x 10^2 N-m 4) 2π x 10^{-2} N-m

09) $\frac{2.5}{\pi}\mu F$ capacitor and 3000-ohm resistance are joined in series to an ac source of 200 volt and 50 s^{-1} frequency. The power factor of the circuit and the power dissipated in it will respectively

1) 4.8, 0.6 W 2) 0.6, 4.8 W
3) 0.06, 0.6 W 4) 0.6, 0.06 W

10) A 60 kg weight is dragged on a horizontal surface by a rope upto 2 metres. If coefficient of friction is $\mu = 0.5$, the angle of rope with the surface is 60° and g = 9.8 m/s^2, then work done is

1) 197 joules 2) 294 joules
3) 315 joules 4) 588 joules

11) An ideal gas heat engine operates in a Carnot cycle between 27°C and 127°C. It absorbs 6 kcal at the higher temperature. The amount of heat (in kcal) converted into work is equal to

1) 4.8 2) 3.5
3) 1.6 4) 1.2

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12) Statement 1 : Woolen clothes keep the body warm in winter.
Statement 2 : Air is a bad conductor of heat.
1) Both statement 1 and statement 2 are true and the statement 2 is the correct explanation of the statement 1.
2) Both statement 1 and statement 2 are true but statement 2 is not the correct explanation of the statement 1.
3) Statement 1 is true but statement 2 is false.
4) The statement 1 and statement 2 both are false.

13) A glass flask of volume one litre at 0°C is filled, level full of mercury at this temperature. The flask and mercury are now heated to 100°C. How much mercury will spill out, if coefficient of volume expansion of mercury is $1.82\times10^{-4}\ /^{o}C$ and linear expansion of glass is $0.1\times10^{-4}\ /^{o}C$ respectively
1) 1.52 cc 2) 2.12 cc
3) 15.2 cc 4) 21.2 cc

14) Work done by air when it expands from 50 litres to 150 litres at a constant pressure of 2 atmosphere is
1) 2×100 joules
2) 2×10^{4} joules
3) $2\times10^{5}\times100$ joules
4) $2\times10^{-5}\times100$ joules

15) An electromagnetic wave travels along z-axis. Which of the following pairs of space and time varying fields would generate such a wave?
1) E_y, B_z 2) E_z, B_x
3) E_y, B_x 4) E_x, B_y

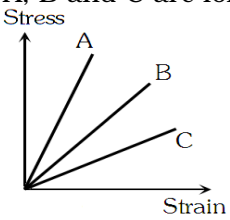
16) A car is moving with speed 30 m/s on a circular path of radius 500 m. Its speed is increasing at the rate of 2 m/s^2. What is the acceleration of the car?
1) $1.8\ m/s^2$ 2) $2\ m/s^2$
3) $2.7\ m/s^2$ 4) $9.8\ m/s^2$

17) A point Q lies on the perpendicular bisector of an electrical dipole of dipole moment p. If the distance of Q from the dipole is r (much larger than the size of the dipole), then electric field at Q is proportional to
1) p and r^{-3} 2) p^{-1} and r^{-2}
3) p and r^{-2} 4) p^{-1} and r^{-2}

18) A uniform chain of length 2m is kept on a table such that a length of 60cm hangs freely from the edge of the table. The total mass of the chain is 4kg. What is the work done in pulling the entire chain on the table?
1) 1200 J 2) 120 J
3) 7.2 J 4) 3.6 J

19) The period of oscillation of a simple pendulum in the experiment is recorded as 2.63 s, 2.56 s, 2.42 s, 2.71 s and 2.80 s respectively. Find the average absolute error?
1) 0.1 s 2) 1.0 s
3) 0.001 s 4) 0.11 s

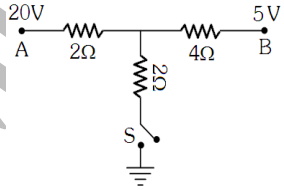
20) The stress-strain curves for brass, steel and rubber are shown in the following figure. The lines A, B and C are for



1) Steel, rubber and brass respectively.
2) Steel, brass and rubber respectively.
3) Brass, steel and rubber respectively.
4) Rubber, brass and steel respectively.

21) The frequency of vibration 'f' of a mass 'm' suspended from a spring of spring constant 'K' is given by a relation of this type $f = Cm^{x}K^{y}$; where 'C' is a dimensionless quantity. The value of 'x' and 'y' are
1) $x=\frac{1}{2}, y=\frac{1}{2}$ 2) $x=-\frac{1}{2}, y=\frac{1}{2}$
3) $x=\frac{1}{2}, y=-\frac{1}{2}$ 4) $x=-\frac{1}{2}, y=-\frac{1}{2}$

22) As the switch S is closed in the circuit shown in figure below, current passed through it is



1) 6.0 A 2) 4.5 A
3) 3.0 A 4) Zero

23) To what temperature should the hydrogen at 327°C be cooled at constant pressure, so that the root mean square velocity of its molecules become half of its previous value?
1) - 123°C 2) - 100°C
3) 0°C 4) 123°C

24) A wire of diameter 0.02 meter contains 10^{28} free electrons per cubic meter. For an electrical current of 100 A, the drift velocity of the free electrons in the wire is nearly
1) 8×10^{3} m/s 2) 2×10^{-4} m/s
3) 5×10^{-10} m/s 4) 1×10^{-19} m/s

25) Statement 1 : Specific heat of a gas at constant pressure (C_P) is greater than that of its specific heat at constant volume (C_V).
Statement 2 : Some heat is spent in expansion of the gas at constant pressure.
1) Both statement 1 and statement 2 are true and the statement 2 is the correct explanation of the statement 1.
2) Both statement 1 and statement 2 are true but statement 2 is not the correct explanation of the statement 1.
3) Statement 1 is true but statement 2 is false.
4) The statement 1 and statement 2 both are false.

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26) Four point masses P,Q,R and S with respective masses 1kg, 1 kg, 2 kg and 2 kg form the corners of a square of side a. The centre of mass of the system will be farthest from
1) P only 2) R only
3) P and Q 4) R and S

27) A bullet is fired from a gun. The force on the bullet is given by F = 600 - 2 x 10^5 t, where F is in newtons and t in seconds. The force on the bullet becomes zero as soon as it leaves the barrel. What is the average impulse imparted to the bullet?
1) 0.9 Ns 2) 1.8 Ns
3) 9 Ns 4) Zero

28) A conductor of 3 m in length is moving perpendicularly to magnetic field of 10^{-3} tesla with the speed of 10^2 m/s, then the e.m.f. produced across the ends of conductor will be
1) 3 volt 2) 0.3 volt
3) 0.03 volt 4) 3×10^{-3} volt

29) The focal length of objective and eye lens of a astronomical telescope are respectively 2 m and 5 cm. Final image is formed at (i) least distance of distinct vision (ii) infinity. The magnifying power in both cases will be
1) - 48, 40 2) - 40, 48
3) - 40, - 48 4) - 48, - 40

30) The wavelengths involved in the spectrum of deuterium (^2_1D) are slightly different from that of hydrogen spectrum, because
1) the masses of the two nuclei are different.
2) the nuclear forces are different in the two cases.
3) the size of the two nuclei are different.
4) the attraction between the electron and the nucleus is different in the two cases.

31) The magnitude of a given vector with end points (4, - 4, 0) and (-2, -2, 0) must be
1) 4 2) $5\sqrt{2}$
3) 6 4) $2\sqrt{10}$

32) A square frame of side L is dipped in a liquid. On taking out, a membrane is formed. If the surface tension of the liquid is T, the force acting on the frame will be
1) 10 TL 2) 8 TL
3) 2 TL 4) 4 TL

33) de-Broglie wavelength of a body of mass 1 kg moving with velocity of 2000 m/s is
1) 0.55 x 10^{-22} Å 2) 1.5 x 10^7 Å
3) 3.32 x 10^{-27} Å 4) None of these

34) A particle of charge q and mass m moving with a velocity v along the x-axis enters the region x >0 with uniform magnetic field B along the $\hat{k}$ direction. The particle will penetrate in this region in the x-direction upto a distance d equal to
1) $\frac{mv}{qB}$ 2) $\frac{2mv}{qB}$
3) Infinity 4) Zero

35) The decay constant of a radioactive element is 1.5×10^{-9} per second. Its mean life in seconds will be
1) 10.35×10^8 2) 6.67×10^8
3) 4.62×10^8 4) 1.5×10^9

36) Which is the correct relation for forbidden energy gap in conductor, semi conductor and insulator?
1) $\Delta Eg_{sc} > \Delta Eg_{conductor} > \Delta Eg_{insulator}$
2) $\Delta Eg_{conductor} > \Delta Eg_{insulator} > \Delta Eg_{sc}$
3) $\Delta Eg_{insulator} > \Delta Eg_{sc} > \Delta Eg_{conductor}$
4) $\Delta Eg_c > \Delta Eg_{sc} > \Delta Eg_{insulator}$

37) An ideal refrigerator has a freezer at a temperature of -13°C. The coefficient of performance of the engine is 5. The temperature of the air (to which heat is rejected) will be
1) 325°C 2) 320°C
3) 39°C 4) 325 K

38) Two boys are standing at the ends A and B of a ground where AB = α. The boy at B starts running in a direction perpendicular to AB with velocity v_1. The boy at A starts running simultaneously with velocity v and catches the other boy in a time t, where t is
1) $a/(v+v_1)$ 2) $a/(v-v_1)$
3) $a/\sqrt{v^2+v_1^2}$ 4) $\sqrt{a^2/(v^2-v_1^2)}$

39) Eight dipoles of charges of magnitude e are placed inside a cube. The total electric flux coming out of the cube will be
1) Zero 2) $\frac{e}{\varepsilon_0}$
3) $\frac{8e}{\varepsilon_0}$ 4) $\frac{16e}{\varepsilon_0}$

40) A parallel plate capacitor of plate separation 2 mm is connected in an electric circuit having source voltage 400 V. If the plate area is 60 cm^2, then the value of displacement current for 10^{-6} s will be
1) 1.062 amp 2) 1.062×10^{-2} amp
3) 1.062×10^{-3} amp 4) 1.062×10^{-4} amp

41) The insulation property of air breaks down at $E = 3\times10^6$ volt/m. The maximum charge that can be given to a sphere of diameter 5 m is approximately (in coulombs)
1) 2×10^{-5} 2) 2×10^{-4}
3) 2×10^{-3} 4) 2×10^{-2}

42) The rotation period of an earth satellite close to the surface of the earth is 83 minutes. The time period of another earth satellite in an orbit at a distance of three earth radii from its surface will be
1) 664 minutes 2) 249 minutes
3) 83 minutes 4) $83\times\sqrt{8}$ minutes

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43) When radiation is incident on a photoelectron emitter, the stopping potential is found to be 9 volts. If e / m for the electron is 1.8×10^{11} C kg^{-1}, the maximum velocity of the ejected electrons is

1) 1.8×10^{5} ms^{-1} 2) 1.8×10^{6} ms^{-1}

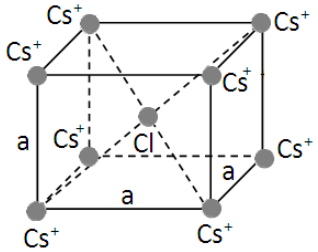
3) 8×10^{5} ms^{-1} 4) 6×10^{5} ms^{-1}

44) A metallic block of density 5 gm cm^{-3} and having dimensions 5 cm × 5 cm × 5 cm is weighed in water. Its apparent weight will be

1) 4 × 5 × 5 × 5 g f 2) 5 × 4 × 4 × 4 g f

3) 4 × 4 × 4 × 4 g f 4) 5 × 5 × 5 × 5 g f

45) What is the net force on a Cl^- placed at the center of the bcc structure of CsCl?



1) ke^2/a^2 2) ke^2a^2

3) Zero 4) Data is incomplete

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