150307 A

Question Booklet Series:	CET – 2015 PAPER – A [Physics & Chemistry] QUESTION BOOKLET INSTRUCTIONS	Question Booklet Number:
A		111206

Maximum Time Allowed : Two Hours (120 minutes)
Negative Marking : 0.25

No. of Questions: 120
Maximum Marks: 120

Roll Number: | | | | | | | | | Answer Sheet Number: | | | | | | |

Please read the following Instructions carefully:

1) **Check the Booklet thoroughly**: In case of any defect – Misprint, Missing question(s), Missing page, Blank page, Damaged or Defaced page, or duplication of question(s) / Page(s), get the Booklet changed with the Booklet of the same series from the Room Invigilator. No complaint shall be entertained after the Entrance Test is over.

2) Write your Roll Number and the OMR Answer Sheet Number on the Question Booklet.

3) Check your Roll Number, Question Booklet Number and Question Booklet Series carefully before entering them on the OMR Sheet. Ensure twice that you have made their entries on the OMR Answer Sheet correctly and darken the relevant bubbles on the Answer Sheet and sign at the appropriate place. Your OMR Answer Sheet will be evaluated on the basis of the information given by you in its ovals.

4) If you have made any wrong entry of Roll Number, Booklet Number or Booklet Series Number in the OMR Answer Sheet, you should report it to the Invigilator / Superintendent or report it within three days after the conclusion of the Entrance Test to the BOPEE office, Jammu / Srinagar positively, failing which no complaint / representation will be entertained and the OMR Answer Sheet will be evaluated strictly according to the entries made by you.

5) Strictly follow the instructions given by the Centre Supervisor / Room Invigilator and those given on the Question Booklet.

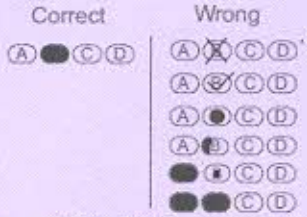
6) Candidates are not allowed to carry any papers, notes, books, calculators, cellular phones, scanning devices, pagers etc. to the Examination Hall. Any candidate found using, or in possession of, such unauthorized material or indulging in copying or impersonation or adopting unfair means / reporting late / without Admit Card will be debarred from the Entrance Test.

7) Please mark the right responses on the OMR Sheet with ONLY a Blue/Black ball point pen. Use of eraser, whitener (fluid) and cutting on the OMR Answer Sheet is NOT allowed.

8) The test is of objective type containing multiple choice questions (MCQs). Each objective question is followed by four responses. You are required to choose the correct/best response and mark your response on the OMR Answer Sheet and NOT on the Question Booklet.

9) There will be 0.25 negative marking for every wrong answer.

10) For marking response to a question, completely darken the CIRCLE so that the alphabet inside the CIRCLE is not visible. Ensure that you darken only one circle in the Answer Sheet. Even a stray mark / faint mark on the Answer Sheet is read by the scanner and will make your answer invalid by reading it as a case of double shading. You have to be very very careful while darkening the bubbles. The CORRECT and the WRONG methods of darkening the CIRCLE on the OMR Answer Sheet are shown below.



11) Please be careful while marking the response to questions. The response once marked cannot be changed and if done shall be treated as a wrong answer.

12) In view of the limited time, do NOT waste your time on a question which you find difficult. Attempt easier questions first and come back to the difficult questions later during the test.

13) DO NOT fold or wrinkle the OMR Answer Sheet.

14) Rough work MUST NOT be done on the OMR Answer Sheet. Use rough page of your Question Booklet for this purpose.

15) Candidates are provided carbonless OMR Answer Sheet having original copy and candidate's copy. After completing the examination, candidates are directed to fold at perforation on the top of the Sheet, tear it to separate original copy and candidate's copy and then hand over the original copy of OMR Answer Sheet to the Room Invigilator and retain candidate's copy.

DO NOT OPEN THE SEAL OF THIS BOOKLET UNTIL TOLD TO DO SO

Section 1 - Physics

1. The dimension of magnetic flux is:
   (A) $MLT^{-1}A^{-1}$
   (B) $ML^{-1}TA^{-2}$
   (C) $ML^{-2}T^{2}A^{-2}$
   (D) $ML^{2}T^{-2}A^{-1}$

2. The carbon resistor has the color band sequence of green, orange, blue and silver. The value of resistance will be :
   (A) $64x10^{7} \pm 20\%\ \Omega$
   (B) $53x10^{6} \pm 20\%\ \Omega$
   (C) $64x10^{7} \pm 10\%\ \Omega$
   (D) $53x10^{6} \pm 10\%\ \Omega$

3. Newton's law of cooling applies when a body is losing heat to its surroundings by
   (A) conduction
   (B) convection
   (C) radiation
   (D) conduction as well as radiation

4. Consider an electric dipole placed in a region of non-uniform electric field. Choose the correct statement out of the following options:
   (A) The dipole will experience only a force
   (B) The dipole will experience only a torque
   (C) The dipole will experience both force and the torque
   (D) The dipole will neither experience a force nor a torque

5. A block of mass 3 kg starts from rest and slides down a curved path in the shape of a quarter-circle of radius 2 m and reaches the bottom of path with a 4 m/s speed. If '*g*' is 10 m/s^2, the amount of work done against friction is
   (A) 60 J
   (B) 36 J
   (C) 24 J
   (D) 12 J

6. In an *n-p-n* transistor, '*p*' is
   (A) intrinsic semiconductor
   (B) emitter
   (C) collector
   (D) base

7. A magnet makes a single pass through a coil. Then across the ends of the coil it produces
   (A) d.c. voltage
   (B) sinusoidal voltage
   (C) single voltage pulse
   (D) two voltage pulses

8. Conductivity of semiconductors
   (A) is maximum at 0 K
   (B) decreases with increase in temperature
   (C) increases with increase in temperature
   (D) is maximum at 300K

9. Values for Brewster's angle can be
   (A) only less than 45°
   (B) only greater than 45°
   (C) any value in the range 0° to 90° except 45°
   (D) any value in the range 0° to 90° including 45°

10. Consider a region of uniform magnetic field directed along positive x-axis. Now a positive test charge Q, located at origin O (0, 0) inside the field, is released from rest position. The particle will

(A) remain stationary at origin O

(B) move along positive x-axis

(C) move along negative x-axis

(D) undergo a circular motion in the x-y plane

11. Radius of Earth is 6400 km and that of Mars is 3200 km. Mass of Mars is 0.1 that of Earth's mass. Then the acceleration due to gravity on Mars is nearly

(A) 1 m/s^2

(B) 2.5 m/s^2

(C) 4 m/s^2

(D) 5 m/s^2

12. The ratio of mass defect of the nucleus to its mass number is maximum for

(A) U^{238}

(B) N^{14}

(C) Si^{28}

(D) Fe^{56}

13. Un-polarized light is travelling from a medium of refractive index 2 to a medium of index 3. The angle of incidence is 60°. Then

(A) reflected light will be partially polarized

(B) reflected light will be plane polarized in a plane perpendicular to plane of incidence

(C) refracted light will be plane polarized in a plane perpendicular to plane of incidence

(D) refracted light will be plane polarized in a plane parallel to plane of incidence

14. A series LCR circuit is connected to an a.c. source and is showing resonance. Then

(A) $V_R = 0$

(B) $V_L = V_R$

(C) $V_C = V_R$

(D) $V_L = V_C$

15. The path of a charge particle after it enters a region of a uniform electrostatic field with velocity perpendicular to the field will be:

(A) Straight line

(B) Circular

(C) Helical

(D) Parabolic

16. An ideal gas is heated at constant volume until its pressure doubles. Which one of the following statements is correct?

(A) The mean speed of the molecules doubles

(B) Root mean square speed of the molecules doubles

(C) Mean square speed of the molecules doubles

(D) Mean square speed of the molecules remains unchanged

17. In the fringe pattern of a Young's double slit experiment the ratio of intensities of maxima and minima is 25: 9. Then the ratio of the amplitudes of interfering waves is

(A) 4 : 1

(B) 5 : 3

(C) 4 : 3

(D) 25 : 9

18. A ball is projected up at an angle θ with horizontal from the top of a tower with speed 'v'. It hits ground at point A after time t_A with speed v_A. Now this ball is projected at same angle and speed from the base of the tower (located at point P) and it hits ground at point B after time t_B with speed v_B. Then

(A) PA = PB

(B) $t_A < t_B$

(C) $v_A > v_B$

(D) ball A hits the ground at an angle $(-\theta)$ with horizontal

19. A parallel narrow-beam of light is falling normally on a glass sphere. It will come to a focus

(A) inside the sphere (except at its center)

(B) on the surface of the sphere

(C) outside the sphere

(D) exactly at the center of the sphere

20. Red, blue, green and violet color lights are one by one made incident on a photocathode. It is observed that only one color light produces photo-electrons. That light is

(A) Red

(B) Blue

(C) Green

(D) Violet

21. Consider a bi-convex lens and a plano-convex lens, with radii of curvature of all the curved surfaces being same. If 'f' is focal length of bi-convex lens then the focal length of the plano-convex lens is

(A) 4 f

(B) 2 f

(C) f

(D) 0.5 f

22. Consider a ray of light travelling from a denser to a rarer medium. If it is incident at the critical angle then

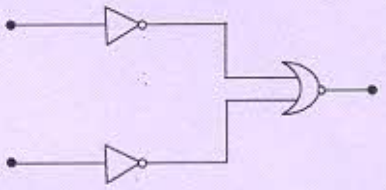
(A) it will emerge out into the rarer medium

(B) it will undergo total internal reflection

(C) it will travel along the interface separating the two media

(D) it will retrace its path

23. The combination of gates as shown in the figure forms the



(A) AND gate

(B) OR gate

(C) NOR gate

(D) NOT gate

24. A body is travelling east with a speed of 9 m/s and with an acceleration of 2 m/s^2 acting west on it. The displacement of the body during the 5th second of its motion is

(A) 0.25 m

(B) 0.5 m

(C) 0.75 m

(D) zero

25. Bulk modulus is defined by

(A) increase in length per unit length per unit applied stress

(B) increase in volume per unit volume per unit applied stress

(C) lateral displacement per unit length per unit applied stress

(D) change in cross-sectional area per unit area per unit applied stress

26. A concave mirror has focal length '*f*'. A convergent beam of light is made incident on it. Then the image distance 'v' is

(A) zero

(B) less than '*f*'

(C) equal to '*f*'

(D) more than '*f*'

27. A ball is dropped from the top of 80 m high tower. If after 2 sec of fall the gravity (g = 10 m/s^2) disappears, then time taken to reach ground since the gravity disappeared is

(A) 2 sec

(B) 3 sec

(C) 4 sec

(D) 5 sec

28. Assuming density '*d*' of a planet to be uniform, we can say that the time period of its artificial satellite is proportional to

(A) d

(B) $\sqrt{d}$

(C) $1/\sqrt{d}$

(D) 1/d

29. The wave nature of electrons is demonstrated by the

(A) Photoelectric effect

(B) Rutherford's experiment

(C) Doppler's effect

(D) Davisson and Germer experiment

30. A charge particle having charge 1×10^{-19}C revolves in an orbit of radius 1 Å such that the frequency of revolution is 10^{16} Hz. The resulting magnetic moment in SI units will be:

(A) 1.57×10^{-21}

(B) 3.14×10^{-21}

(C) 1.57×10^{-23}

(D) 3.14×10^{-23}

31. In a transformer the number of primary turns is four times that of the secondary turns. Its primary is connected to an a.c. source of voltage V. Then

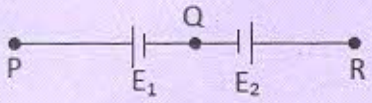
(A) current through its secondary is about four times that of the current through its primary

(B) voltage across its secondary is about four times that of the voltage across its primary

(C) voltage across its secondary is about two times that of the voltage across its primary

(D) voltage across its secondary is about $1/(2\sqrt{2})$ times that of the voltage across its primary

32. Consider the two cells having *emf* E_1 and E_2 ($E_1 > E_2$) connected as shown in the figure. A potentiometer is used to measure potential difference between P and Q, and the balancing length of the potentiometer wire is 0.8 m. Same potentiometer is then used to measure potential difference between P and R, and the balancing length is 0.2 m. Then the ratio E_1/E_2 is



(A) 4/3

(B) 5/4

(C) 5/3

(D) 4/1

33. Metal alloys are used for making standard resistance coils because

(A) they have high thermal conductivity

(B) their resistance depend weakly on temperature

(C) they have low thermal conductivity

(D) their resistance depend strongly on temperature

34. Smallest division on the main scale of given vernier calipers is 0.5 mm. Vernier scale has 25 divisions and these coincide with 24 main scale divisions. The least count of vernier calipers is

(A) 0.001 cm

(B) 0.002 cm

(C) 0.01 cm

(D) 0.02 cm

35. A particle is undergoing uniform circular motion with angular momentum '*L*'. While moving on the same path if its kinetic energy becomes four times, then its angular momentum will be

(A) L/4

(B) L/2

(C) L

(D) 2L

36. The 220 V a.c. line voltage that we receive in our homes is

(A) rms value

(B) peak value

(C) average value

(D) none of the above

37. Two copper spheres having same radii, one solid and other hollow, are charged to the same potential. Which of the following statements is correct?

(A) Hollow sphere will hold more charge

(B) Solid sphere will hold more charge

(C) Solid sphere will have uniform volume charge density

(D) Both spheres will hold same charge

38. Dimensions of Planck's constant are

(A) ML^2T^{-1}

(B) ML^2T^{-3}

(C) MLT^{-1}

(D) ML^3T^{-3}