Test Booklet Series

A

Paper No.

09

Written Test Paper, 2021

**SKILL INSTRUCTOR
(PHYSICS)**

Test Booklet No.

Name of Applicant ....

Answer Sheet No. ....

Application No. : SVSU/2020/Estt/NT/ ....

Signature of Applicant : ....

Date of Examination: **25 / 12 / 2021**

Signature of the Invigilator(s)

1. ....

Time of Examination : ....

2. ....

Duration : 60 Minutes]

[Maximum Marks : 50

IMPORTANT INSTRUCTIONS

(i)   The question paper is in the form of Test-Booklet containing **50 (Fifty)** questions. All questions are compulsory. Each question carries four answers marked (A), (B), (C) and (D), out of which only one is correct.

(ii) On receipt of the Test-Booklet (Question Paper), the candidate should immediately check it and ensure that it contains all the pages, i.e., **50** questions. Discrepancy, if any, should be reported by the candidate to the invigilator immediately after receiving the Test-Booklet.

(iii) A separate Answer-Sheet is provided with the Test-Booklet/Question Paper. On this sheet there are **50** rows containing four circles each. One row pertains to one question.

(iv) The candidate should write his/her Application number at the places provided on the cover page of the Test-Booklet/Question Paper and on the Answer-Sheet and NOWHERE ELSE.

(v)   No second Test-Booklet/Question Paper and Answer-Sheet will be given to a candidate. The candidates are advised to be careful in handling it and writing the answer on the Answer-Sheet.

(vi) For every correct answer of the question **One (1) mark will be awarded.** For every unattempted question, Zero (0) mark shall be awarded. **There is no Negative Marking.**

(vii) Marking shall be done only on the basis of answers responded on the Answer-Sheet.

(viii) To mark the answer on the Answer-Sheet, candidate should **darken** the appropriate circle in the row of each question with Blue or Black pen.

(ix) For each question only **one** circle should be **darkened** as a mark of the answer adopted by the candidate. If more than one circle for the question are found darkened or with one black circle any other circle carries any mark, the question will be treated as cancelled.

(x)   The candidates should not remove any paper from the Test-Booklet/Question Paper. Attempting to remove any paper shall be liable to be punished for use of unfair means.

(xi) Rough work may be done on the blank space provided in the Test-Booklet/Question Paper only.

(xii) *Mobile phones (even in Switch-off mode) and such other communication/programmable devices are not allowed inside the examination hall.*

(xiii) No candidate shall be permitted to leave the examination hall before the expiry of the time.

DO NOT OPEN THIS QUESTION BOOKLET UNTIL ASKED TO DO SO.

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1. One Kilogram weight is equal to
   (A) 9.8 dynes
   (B) 980 dynes
   (C) 9.8 newtons
   (D) 980 newtons.

2. Initial velocity of a body moving with uniform acceleration of 10 m/sec^2 is 10 m/sec. What will be the distance traversed in 10 seconds?
   (A) 160 m
   (B) 100 m
   (C) 600 m
   (D) 1000 m.

3. What is the length of a second's pendulum where 'g' is 980 cm/sec^2
   (A) 78 cm
   (B) 88 cm
   (C) 98 cm
   (D) 108 cm.

4. A machine gun has a mass of 10 kg. It fires 30 gm bullets at the rate of 6 bullets per second with a speed of 400 m/sec. What force in newtons must be applied to the gun to keep it in position?
   (A) 60 newtons
   (B) 72 newtons
   (C) 120 newtons
   (D) 144 newtons.

5. An aeroplane travelling at a speed of 900 km/hour banks at an angle of 45° as it makes a turn. What is the radius of the curve? g = 10 m/sec^2
   (A) 6.25 km
   (B) 9.00 km
   (C) 2.00 km
   (D) 4.50 km.

6. What is unit of torque?
   (A) Newton
   (B) Meter
   (C) Newton/meter
   (D) Newton-meter.

7. The term radius of gyration related to
   (A) Moment of force
   (B) Moment of inertia
   (C) Law of gravitation
   (D) Simple harmonic motion.

8. The number of vibration completed by the body in one second is known as its
   (A) Vibrations
   (B) Phase
   (C) Amplitude
   (D) Frequency.

9. Within elastic limit the ratio of the lateral strain to the longitudinal strain is constant for the material of the body is known as its
   (A) Young's modulus
   (B) Bulk's modulus
   (C) Shear modulus
   (D) Poisson's ratio.

10. The velocity of escape from earth is
    (A) 3×10^{10} cm/sec
    (B) 11.2×10^5 cm/sec
    (C) 8×10^5 cm/sec
    (D) 2.38×10^5 cm/sec.

11. When one end of a horizontal beam is fixed and the other end is free, it is called a
    (A) Uniform bar
    (B) Fixed bar
    (C) Cantilever
    (D) None of these.

12. A man with a mass of 60 kg runs along the rails with a velocity of 6 m/sec jumps into a car of mass 90 kg standing on the rails and stops there. Find the velocity with which the car will start travelling along the rails.
    (A) 2.4 m/sec
    (B) 3.0 m/sec
    (C) 3.6 m/sec
    (D) 4.5 m/sec.

13. What percentage of K.E. of a moving particle is transferred to the stationary particle, when it strike the stationary particle of equal mass?
    (A) 10%
    (B) 50%
    (C) 60%
    (D) 100%.

14. What should be the power of an engine required to lift 9 tonne of coal per hour from a mine whose depth is 200 meters?
    (A) 4.9 kilowatts
    (B) 9.0 kilowatts
    (C) 49 kilowatts
    (D) 90 kilowatts.

15. Which is a suitable method to decrease friction?
    (A) Ball and rollers bearings
    (B) Lubrication
    (C) Polishing
    (D) All the above.

16. Energy possessed by a body due to its position is known as
    (A) Pressure energy
    (B) Kinetic energy
    (C) Heat energy
    (D) Potential energy.

17. Phenomena of rise or fall of a liquid in an open tube of small bore in surface tension is known as
    (A) Angle of contact
    (B) Viscosity
    (C) Capillarity
    (D) None of the above.

18. A type of flow of a fluid in which the layers of fluid glide over one another without mixing is known as
    (A) Streamline flow
    (B) Laminar flow
    (C) Turbulent flow
    (D) None of the above.

19. Mean free path of gas molecules is inversely proportional to
    (A) Temperature
    (B) Pressure
    (C) Volume
    (D) Energy gap.

20. What will be the efficiency of the Carnot engine when it is operated between the temperatures 47° and 127° ?
    (A) 20%
    (B) 50%
    (C) 60%
    (D) 75%.

21. 104°F corresponds to what temperature on the Kelvin scale?
    (A) 308°
    (B) 313°
    (C) 377°
    (D) 418°.

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22. What is the molecular K.E. of translation of a mole of hydrogen at N.T.P. (R=8.30 Joule/Mole/K)

   (A) 1037 Joules

   (B) 2075 Joules

   (C) 3400 Joules

   (D) 8300 Joules.

23. Which is the temperature at which the r.m.s. velocity of gas molecules is double its velocity at 27°C, pressure remaining constant?

   (A) 54°C

   (B) 108°C

   (C) 540°C

   (D) 927°C.

24. A 30 gram bullet at 27°C moving with velocity 50 m/sec strikes a target and it just melts. What is the heat developed during contact?

   (Latent heat of lead bullet = 5 cal/gram)

   (Melting point of lead = 327°C)

   (A) 300 cal

   (B) 354 cal

   (C) 420 cal

   (D) 540 cal.

25. In a perfect adiabatic expansion of a gas its temperature

   (A) Decreases

   (B) Increases

   (C) Remains same

   (D) None of the above.

26. Power of a lens is measured in

   (A) cm

   (B) cm^{-1}

   (C) Diopters

   (D) Meters.

27. Light travelling from vaccum enters water. Which of the following characterstics of light will remain unchanged?

   (A) Velocity

   (B) Frequency

   (C) Amplitude

   (D) Wavelength.

28. Out of the following, which has the longest wavelength?

   (A) Visible rays

   (B) X-rays

   (C) Ultra-Violer light

   (D) Infrared rays.

29. Which helps to prove that light consists of a transverse waves?

   (A) Diffraction

   (B) Interference

   (C) Polarization

   (D) Refraction.

30. In Fresnel from of diffraction the distance between the screen and the obstacle/aperture is

   (A) Zero

   (B) Finite

   (C) Infinite

   (D) None of the above.

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31. Michelson's interferometer can be used to measure
    (A) Intensity of light
    (B) Wavelength of light
    (C) Amplitude of light
    (D) None of the above.

32. The ratio of the size of the image to the size of the object is called the
    (A) Focal length
    (B) Refractive index
    (C) Magnification
    (D) Parallax.

33. A small lamp is fixed at a distance of 6 meters directly above a table. When the distance is reduced to 4 meters the intensity of light will increase by how many times its previous value?
    (A) 2.00
    (B) 2.25
    (C) 3.75
    (D) 4.50.

34. What is the capacity of a conductor when a charge of one coulomb raised its potential by one volt?
    (A) 0.2 farad
    (B) 0.5 farad
    (C) 1.0 farad
    (D) 4π farad.

35. What is the dielectric constant for water?
    (A) 0.33
    (B) 1.00
    (C) 40.0
    (D) 80.0.

36. How the susceptibility of paramagnetic material varies with its absolute temperature?
    (A) Remains same
    (B) Directly proportional
    (C) Inversely proportional
    (D) None of the above.

37. A charge 'Q' is uniformly distribution over a large plastic plate. The electric field at a point P close to the centre of the plate is 10 V/m. If the plastic plate is replaced by a copper plate of the same geometrical dimensions and carrying the same charge 'Q', the electric field at the point P will become
    (A) Zero
    (B) 5 V/m
    (C) 10 V/m
    (D) 20 V/m.

38. Electromagnets are made of soft iron because it has
    (A) High retentivity and high coercive force
    (B) High retentivity and low coercive force
    (C) Low retentivity and high coercive force
    (D) Low retentivity and low coercive force.

39. Peak voltage in a 220 V A.C. source is
    (A) 220 V
    (B) About 260 V
    (C) About 310 V
    (D) 440 V.

40. To convert mechanical energy into electrical energy, one can use
    (A) Dynamo
    (B) Motor
    (C) Transformer
    (D) None of these.

41. The focal length of a normal eye lens of human being is about.
   (A) 1 mm
   (B) 2 cm
   (C) 25 cm
   (D) 1 meter.

42. Which of the following sources give best monochromatic lights?
   (A) Candle
   (B) Bulb
   (C) Mercury tube
   (D) Laser.

43. A vertical wire carries a current in upward direction. An electron beam sent horizontally towards the wire will be deflected?
   (A) Towards right
   (B) Towards left
   (C) Upwards
   (D) Downwards.

44. L, C and R represent the physical quantities inductance, capacitance and resistance respectively. Which of the following combinations has dimensions of frequency?
   (A) $\dfrac{C}{L}$
   (B) $\dfrac{1}{\sqrt{LC}}$
   (C) $\dfrac{L}{RC}$
   (D) $\dfrac{R}{LC}$.

45. If the distance between two charged bodies is halved, the force between them becomes
   (A) One-half
   (B) One-fourth
   (C) Double
   (D) Four times.

46. When we connect the two given cells in parallel the total e.m.f. of the combination is equal to
   (A) Zero
   (B) Sum of the e.m.f. of both cells
   (C) e.m.f. of the small cell
   (D) e.m.f. of large cell.

47. The rectifiers are used in
   (A) Mobile charges
   (B) Electric gysers
   (C) Electric iron
   (D) None of these.

48. The current gain of a transistor in common base configuration is 0.98. What is the base current if emitter current is 5 mA?
   (A) 0.1 mA
   (B) 4.9 mA
   (C) 5.0 mA
   (D) 9.8 mA.

49. A commercial instrument for measuring currents, voltages and resistances is known as
   (A) Ammeter
   (B) Voltmeter
   (C) Galvanometer
   (D) Avometer.

50. The atomic nucleus consists of
   (A) Protons and electrons
   (B) Protons and neutrons
   (C) Electrons and neutrons
   (D) Protons, electrons and neutrons.

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ROUGH WORK

ANSWER KEY- skill Instructor Physics

1. C	26. C
2. C	27. B
3. A	28. D
4. B	29. C
5. A	30. B
6. D	31. B
7. B	32. C
8. D	33. B
9. D	34. C
10. B	35. D
11. C	36. C
12. A	37. C
13. D	38. D
14. A	39. C
15. D	40. A
16. D	41. B
17. C	42. D
18. B	43. C
19. B	44. B
20. A	45. D
21. B	46. D
22. C	47. A
23. D	48. A
24. C	49. D
25. A	50. B