NITESHPHYZICS

Nitesh Phyzics

CUET 2017

An Institute of
NET-JRF, IIT-JAM, GATE, JEST, TIFR
CUET Entrance in Physics
Physical Sciences
New Delhi

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CUET MSc Physics - 2017

PART A

1. Which of the following words is an antonym of the word 'reverently'?

A) Respectfully   B) Admiringly   C) Insincerely   D) Ardently

2. Find the odd one out.

A) Green   B) immature   C) Fresh   D) Emerald

For the word below, a contextual usage is provided. Pick the word from the alternatives given that is most **appropriate** in the given context.

3. Predicament: She began waving frantically at passing motorists as they sped by, but they remained oblivious to her predicament.

A) Gesture   B) Prediction   C) Intimation   D) Dilemma

4. Four statements with blanks are given followed by four words. Choose the word that fits the set of statements the maximum number of times.

(I) Saddam Hussein must be persuaded to _____, because the Americans are certainly not going to.

(II) You cannot see television because it is on the _____

(III) It was a fierce competition, the loser being whoever chose to _____ first.

(IV) The corrupt policeman decided to _____at this particular transgression.

A) Wink   B) Bow   C) Blink   D) Abdicate

5. Arrange the phrases to form a meaningful sentence.

a) in addition to posing a threat to wildlife

b) associated with big dams

c) the creation of reservoirs and construction of roads and buildings

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_____

d) affect the quantity

e) of rain and seepage of water in the catchment area

A) acdeb   B) baecd   C) cbdea   D) abcde

6. The following question consists of two capitalized words which share a certain relationship with each other, followed by 5 pairs of words. Choose the pair that is related to each other in the same way as the capitalized pair.

LOOK: OGLE

A) Smile: Stroll   B) Breathe: Gasp

C) Ring: Talk   D) Plead: Punish

7. Identify the correctly spelt word out of the following options.

A) Ecceptable   B) Necessary   C) Collectible   D) Definately

8. A sentence is given in the direct speech and its equivalent statement in the indirect speech is given in the options. Choose the grammatically correct option closest in meaning to the sentence given in the question.

He said. "Bravo! You have done well."

A) He applauded him

B) He told Bravo! he had done well

C) He applauded him and told him you have done well

D) He applauded him, saying that he had done well.

Directions for questions 9 and 10: Select the option that fits in the given blanks the maximum number of times.

9. She could not _____ her bad luck. One should_____ one's promise. He has no _____for her feelings. He is trying his best to _____up the reputation of his family.

A) Fulfil   B) Believe   C) Idea   D) Keep

_____

10. It was difficult to maintain a _____ foothold on the slope. He is a_____ believer in communism. His future looks _____. My team managed to _____a place in the finals.

A) Firm   B) Secure   C) Staunch   D) Grim

Directions for questions 11 to 14: choose the correct answer from the options given below each question.

11. A told B. "The girl I met yesterday was the youngest daughter of the brother-in-law of my friend's mother How is the girl related to A's friend?

A) Niece   B) Cousin   C) Friend   D) Daughter

12. If Arun's birthday is on May 25 which is Monday and his sister's birthday is on July 13, which day of the week is his sister's birthday?

A) Monday   B) Wednesday   C) Thursday   D) Friday

13. P. Q, R, S, T, U, V and W are sitting round the circle and are facing the centre:

P is second to the right of T who is the neighbour of R and V.

S is not the neighbour of P

V is the neighbour of U.

Q is not between S and W. W is not between U and S.

Which two of the following are not neighbours?

A) RV   B) UV   C) RP   D) QW

14. Statements: Population increase coupled with depleting resources is going to be the scenario of many developing countries in days to come. Conclusions:

I: The population of developing countries will not continue to increase in future.

II: It will be very difficult for the governments of developing countries to provide its people decent quality of life.

A) Only conclusion I follows   B) Only conclusion II follows

C) Either I or II follows   D) Neither I nor II follows

Directions for questions 15 to 20: Choose the correct answer from the options given below each question.

15. A bus started from bus stand at 8.00 a.m., and after 30 minutes staying at destination, it returned back to the bus stand. The destination is 27 miles from the bus stand. The speed of the bus is 18mph. In return journey bus travels with 50% fast speed. At what time it returns to the bus stand?

A) 10:30 a.m.   B) 10.00 a.m.   C) 11.00 a.m.   D) 11.30 a.m.

16. The greatest number, which can divide 432, 534 and 398 leaving the same remainder7 in each, is

A) 15   B) 16   C) 17   D) 20

17. In June a baseball team that played 60 games had won 30% of its game played. After a phenomenal winning streak this team raised its average to 50%. How many games must the team have won in a row to attain this average?

A) 12   B) 22   C) 24   D) 35

18. Two boys begin together to write out a booklet containing 535 lines. The first boy starts with the first line, writing at the rate of 100 lines an hour; and the second starts with the last line then writes line 534 and so on, backward proceeding at the rate of 50 lines an hour. At what line will they meet?

A) 356   B) 277   C) 357   D) 267

19. A trader mixes 26 kg of rice at Rs. 20 per kg with 30 kg of rice of other variety at Rs. 36 per kg and sells the mixture at Rs. 30 per kg. His profit percent is

A) No profit, no loss   B) 5%   C) 8%   D) 10%

20. The "Earth-Hour" - the planets largest movement for the environment is organized by

A) World Wide Fund for Nature

B) UNEP

C) IUCN

D) UNESCO

Directions for questions 21 to 25: Use the picture to choose the correct answer from the options given below each question.
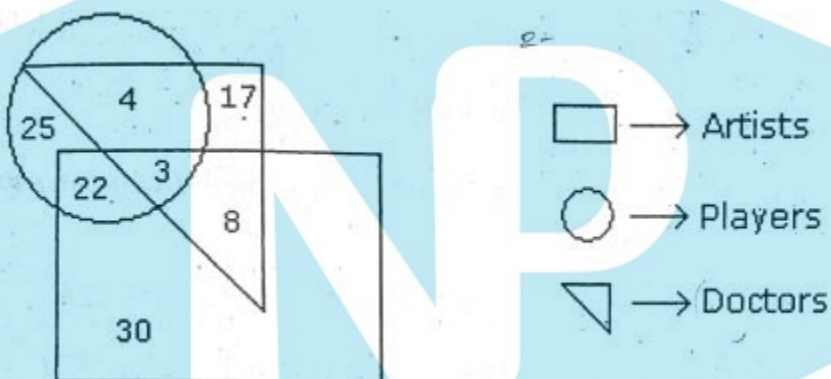
21. How many doctors are neither artists nor players?

A) 17   B) 5   C) 10   D) 30

22. How many doctors are both players and artists?

A) 22   B) 8   C) 3   D) 30

23. How many artists are players?

A) 5   B) 8   C) 25   D) 16

24. How many players are neither artists nor doctors?

A) 25   B) 17   C) 5   D) 10

25. How many artists are neither players nor doctors?

A) 10   B) 17   C) 30   D) 15

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PART B

26. The critical pressure of a real gas is

A) $\frac{a}{27bR}$ B) $\frac{a}{27b^2}$ C) $\frac{8a}{27bR}$ D) $\frac{a}{27bR^2}$

27. Which one expression is not true in case of adiabatic process?

A) $PV^\gamma = constant$

B) $TV^{\gamma-1} = constant$

C) $\frac{p^{\gamma-1}}{T^\gamma} = constant$

D) $PV^{\gamma-1} = constant$

28. The change in entropy when 10 grams of ice at 0°C is converted into water at the same temperature is (Given, latent heat of ice is 80 cal/g)

A) 2.93 cal/K   B) 2.93 cal/°C   C) 3.93 cal/K   D) 3.93 cal/°C

29. Choose the incorrect Maxwell thermodynamic relation

A) $\left(\frac{\partial T}{\partial V}\right)_S = -\left(\frac{\partial P}{\partial S}\right)_V$ B) $\left(\frac{\partial S}{\partial V}\right)_T = -\left(\frac{\partial P}{\partial T}\right)_V$

C) $\left(\frac{\partial T}{\partial P}\right)_S = -\left(\frac{\partial V}{\partial S}\right)_P$ D) $\left(\frac{\partial S}{\partial P}\right)_T = -\left(\frac{\partial T}{\partial V}\right)_P$

30. The ratio of most probable velocity (c_m), average velocity (C_{ave}) and root mean square velocity (c_{rms}) of the molecule in an ideal gas is

A) c_m: C_{ave}: $c_{rms} = 1:1.128:1.224$

B) c_m: C_{ave}: $c_{rms} = 1.128:1:1.224$

C) c_m: C_{ave}: $c_{rms} = 1.224:1:1.128$

D) c_m: C_{ave}: $c_{rms} = 1.128:1.224:1$

31. The rest mass of photon is

A) 0   B) p/c   C) E/c^2 D) E/P

32. At what velocity the kinetic energy of a body is equal to its rest mass energy?

A) $c\sqrt{2}$ B) c/3   C) c/2   D) $\frac{\sqrt{3}}{2}$ c

33. Of the two twin brothers, one goes on a relativistic tour and come back the brother on tour will

A) Become younger   B) Become older

C) Be of the same age   D) cannot say

34. Suppose there exists in nature a body with charge 1.7 e. Will it violate the principle of _____?

A) Conservation of charge   B) Quantization of charge

C) Charge Invariance   D) Superposition

35. The packing fraction of face centered cubic (fcc) structure is

A) 0.74   B) 0.48   C) 0.34   D) 0.68

36. Choose the incorrect option about the critical velocity of liquid.

A) It is directly proportional to its viscosity

B) Inversely proportional to its density

C) Inversely proportional to the radius of the tube

D) Directly proportional to its density

37. An inclined plane makes an angle of 30° with the horizontal. A solid sphere rolling down the inclined plane from rest without slipping has a linear acceleration given by

A) g/3   B) 2g/3   C) 5g/14   D) 5g/7

38. The potential energy of a particle executing S.H.M. is equal to its kinetic energy. When the displacement of the particle is (where a is the amplitude)

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A)$\pm a$ 　　　　　　 B) $\pm a/2$ 　　　　　　 C) $\pm a/\sqrt{2}$ 　　　　　　 D) $\pm a/\sqrt{3}$

39. The The quality factor Q of an electrical oscillator is

A) $\frac{\omega R}{L}$ 　　　　　　 B) $\frac{LR}{\omega}$ 　　　　　　 C) $\frac{\omega L}{R}$ 　　　　　　 D) $\frac{\omega}{LR}$

40. The resonant frequency of an electrical oscillator is given by

A) $v = 2\pi\sqrt{LC}$ 　　 B) $v = \frac{2\pi}{\sqrt{LC}}$ 　　 C) $v = \frac{1}{2\pi\sqrt{LC}}$ 　　 D) $v = \frac{2\pi}{LC}$

41. Which of the following theorem allows us to put relation between surface integral and volume integral?

A) Stokes theorem 　　　　　　　　　　 B) Gauss's theorem

C) Greens theorem 　　　　　　　　　　 D) Bloch theorem

42. Moment of inertia is

A) $2K.E.\times \omega^2$ 　　 B)$\frac{2.K.E.}{\omega^2}$ 　　 C) $\frac{2.P.E.}{\omega^2}$ 　　 D) $3K.E.\times \omega^2$

43. The velocity profile of liquid flowing through a capillary tube is

A) Straight line 　　 B) Circular arcs 　　 C) Hyperbolic 　　 D) Parabolic

44. To calculate the rate of flow of a liquid through a capillary tube which of the following is used?

A) Stokes law 　　　　　　　　　　 B) Bernoulli's theorem

C) Poiseuille's law 　　　　　　　　　 D) Newton's law

45. Two vectors $\vec{A}$ and $\vec{B}$ are perpendicular to each other if

A) $\vec{A}.\vec{B} = 0$ 　　 B) $\vec{A} \times \vec{B} = 0$ 　　 C) $\vec{A}.\vec{B} = 0$ 　　 D)$\vec{A} \times \vec{B} = 1$

46. The velocity of transverse waves in a string is given by

A) v $= \frac{\sqrt{T}}{\rho}$ 　　 B) v $= \frac{T}{\sqrt{\rho}}$ 　　 C) v$= \sqrt{\frac{T}{\rho}}$ 　　 D) v$= \frac{T}{\rho}$

47. The phase velocity (c) and group velocity (c_g) are related as

A) $c_g = c - \lambda \frac{dc}{d\lambda}$

B) $c_g = c + \lambda \frac{dc}{d\lambda}$

C) $c = c_g + \lambda \frac{dc_g}{d\lambda}$

D) $c = c_g - \lambda \frac{dc_g}{d\lambda}$

48. The amplitude of a stationary wave is zero at

A) An antinode

B) Node

C) A point midway between node and antinode

D) Nowhere

49. The distance between two nearest antinode is

A) λ

B) $\lambda/2$

C) $\lambda/4$

D) zero

50. The Lissajous figures make a figure of eight (8) if the frequency ratio is

A) 1:2

B) 2:1

C) 1:1

D) 1:3

51. The electric field in some region is found to be $\vec{E} = kr^3 \hat{r}$ in spherical coordinate (k is some constant) therefore charge density (ρ) would be

A) $5\varepsilon_0 kr^2$

B) $3\varepsilon_0 kr^2$

C) $5\varepsilon_0 kr^4$

D) $3\varepsilon_0 kr^4$

52. The energy of a uniformly charged spherical shell of total charge q and radius R is

A) $\frac{1}{4\pi\varepsilon_0} \frac{q^2}{R}$

B) $\frac{1}{8\pi\varepsilon_0} \frac{q^2}{R}$

C) $\frac{1}{16\pi\varepsilon_0} \frac{q^2}{R}$

D) $\frac{1}{2\pi\varepsilon_0} \frac{q^2}{R}$

53. The pointing vector has the direction

A) Along the direction of electric field

B) Along the direction of magnetic field

C) Perpendicular to electric field and magnetic field

D) Parallel to electric field and magnetic field

54. A long solenoid of radius 'a' is driven by an alternating current, so that the field inside is sinusoidal: $B(t) = B_0 \cos(\omega t)\hat{z}$. A circular loop of wire, of radius a/2 and resistance R is placed inside the solenoid and coaxial with it. The current induced in the loop as a function of time

A) $\frac{\pi a^2 \omega}{4R} B_0 \sin(\omega t)$

B) $\frac{\pi a^2 \omega}{2R} B_0 \sin(\omega t)$

C) $\frac{\pi a^2 \omega}{R} B_0 \sin(\omega t)$

D) $\frac{\pi a^2 \omega}{R} B_0 \sin(\omega t)$

55. The skin depth of a metal is dependent on the conductivity (σ) of the metal and the angular frequency (ω) of the incident field. For a metal of high conductivity, which of the following relation is correct (assume that $\sigma >>> \varepsilon\omega$, where ε is the electrical permittivity of the medium)

A) d $\propto \sqrt{\frac{\sigma}{\omega}}$

B) d $\propto \sqrt{\frac{1}{\sigma\omega}}$

C) d $\propto \sqrt{\sigma\omega}$

D) d $\propto \sqrt{\frac{\omega}{\sigma}}$

56. A black body at temperature T emits radiation at a peak wavelength λ. If the temperature of blackbody becomes 4T, the new peak wavelength is

A) $\frac{1}{256}\lambda$

B) $\frac{1}{64}\lambda$

C) $\frac{1}{16}\lambda$

D) $\frac{1}{4}\lambda$

57. If U, H, F and G represents internal energy, Helmholtz free energy, enthalpy, and Gibbs free energy respectively, then which one of the following is a correct thermodynamic relation?

A) dU = TdS - PdV

B) dH= -VdP + TdS

C) –PdV + SdT

D) dG=VdP+SdT

58. The Wiedemann-Franz law related to thermal conductivity and electrical conductivity of metals is

A) $\frac{K}{\sigma T} = $ constant

B) $\frac{K}{\sigma} = $ constant

C) $\sigma T = $ constant

D) $\frac{K}{T} = $ constant

59. A photon of wavelength λ is incident on a free electron at rest and is scattered in the backward direction. The functional shift in its wavelength in terms of the Compton wavelength λ_C' of the electron is

A) $\frac{\lambda_C}{2\lambda}$
B) $\frac{2\lambda_C}{3\lambda}$
C) $\frac{3\lambda_C}{2\lambda}$
D) $\frac{2\lambda_C}{\lambda}$

60. Two spherical nuclei have mass number 216 and 64 with their radii R_1 and R_2 respectively. The ratio $\frac{R_1}{R_2}$ is

A) 1
B) 3/2
C) 2
D) 5/2

61. Choose the correct statement about triclinic system.

A) $a \neq b \neq c$ and $\alpha \neq \beta \neq \gamma \neq 90°$

B) $a \neq b \neq c$ and $\alpha \neq \beta \neq 90° \neq \gamma$

C) $a \neq b \neq c$ and $\alpha = \beta = \gamma = 90°$

D) $a = b = c$ and $\alpha = \beta = \gamma = 90°$

62. The susceptibility of diamagnetic materials is

A) Positive
B) Negative
C) Zero
D) Infinite

63. The correct statement of PN junction diode is

A) In forward bias connection of PN junction, the depletion zone become narrowed

B) In forward bias connection of PN junction, the depletion zone remains same

C) In reverse bias connection of PN junction, the depletion zone become narrowed

D) In reverse bias connection of PN junction, the depletion zone remains same

64. When an impurity doped into an intrinsic semiconductor, the electrical conductivity of semiconductor is

A) Decreases
B) Increases

C) Remains the same
D) becomes zero

65. In a common base amplifier, the phase difference between the input and output voltage is

A) 0
B) π/4
C) π/2
D) π

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66. If $\vec{F}$ is a constant vector and $\vec{r}$ is the position vector then $\vec{V}(\vec{F}.\vec{r})$ would be

A) $|\vec{r}|\vec{F}$ 　　　　　　B) $\vec{F}$ 　　　　　　C) $(\vec{V}.\vec{r})\vec{F}$ 　　　　D) $(\vec{V}.\vec{F})\vec{r}$

67. For vectors $\vec{a} = \hat{j}+\hat{k}$, $\vec{b} = 2\hat{i}+3\hat{j}-5\hat{k}$ and $\vec{c} = \hat{j}-\hat{k}$, the vector product $\vec{a} \times (\vec{b} \times \vec{c})$ is

A) In the same direction as $\vec{c}$ 　　　　　　　　B) In the direction opposite to $\vec{c}$

C) In the same direction as $\vec{b}$ 　　　　　　　　D) In the direction opposite to $\vec{b}$

68. The trace of a 2x2 matrix is 4 and its determinant is 8. If one of the eigen values is 2(1+i), the other eigen value is

A) 2(1-i) 　　　　　　B) 2(1+i) 　　　　　　C) (1+2i) 　　　　　　D) (1-2i)

69. The triple integral $\iiint_T dxdydz$ gives

A) Volume of region T 　　　　　　　　B) Surface area of region T

C) Area of region T 　　　　　　　　　　D) Density of region T

70. The solution of the differential equation $x^4\frac{dy}{dx} +x^3y = -\sec(xy)$ would be

A) $\sin xy = \frac{1}{2x^2} + c$ 　　　　　　　　　　B) $\sin xy = \frac{1}{2y^2} + c$

C) $\sin xy = \frac{1}{2x} + c$ 　　　　　　　　　　D) $\sin xy = \frac{1}{2y} + c$

71. A particle is moving in a plane; its velocity $\vec{v}$ is given by

A) $r\dot{\theta}\hat{r}$ 　　　　B) $\dot{r}\hat{r} + r\dot{\theta}\hat{\theta}$ 　　　　C) $\dot{r}\hat{r}$ 　　　　D) $r\dot{\theta}\hat{\theta}$

72. Which one has the highest relative strength?

A) Gravitational force 　　　　　　　　　　B) Weak force

C) Electromagnetic force 　　　　　　　　　D) Strong force

73. Shape of the orbit is parabola, when the total energy (E) is

A) $E > 0$ 　　　　　　B) E=0 　　　　　　C) E<0 　　　　　　D) $E=-mc^2/ 2J^2$

74. The time period of a geostationary satellite is

A) 12h   B) 6h   C) 24h   D) 18h

75. The path of an α - particle in Rutherford scattering is always

A) Hyperbola   B) Parabola   C) Ellipse   D) Circle

76. A lightly damped harmonic oscillator with natural frequency ω_o is driven by a periodic force of frequency ω. The amplitude of oscillation is maximum when

A) ω is slightly lower than ω_o B) ω is slightly higher than ω_o

C) $\omega=\omega_o$ D) $\omega=2\omega_o$

77. The magnetic field associated with the electric field vector $\vec{E} = E_O \sin(kz-\omega t)\,\hat{j}$ is given by

A) $\vec{B} = -\frac{E_0}{c} \sin(kz-\omega t)\,\hat{\imath}$ B) $\vec{B} = \frac{E_0}{c} \sin(kz-\omega t)\,\hat{\imath}$

C) $\vec{B} = \frac{E_0}{c} \sin(kz-\omega t)\,\hat{j}$ D) $\vec{B} = \frac{E_0}{c} \sin(kz-\omega t)\,\widehat{k}$

78. The capacitance of two concentric spherical metal shells with radii a and b is

A) $4\pi\varepsilon_0 \frac{ab}{b-a}$ B) $4\pi\varepsilon_0 \frac{b-a}{ab}$ C) $4\pi\varepsilon_0 ab$ D) $4\pi\varepsilon_0(b-a)$

79. The electric potential of a dipole at a large distance 'r' goes like

A) ~1/r   B)~$1/r^2$ C) ~$1/r^{3/2}$ D) ~$1/r^{1/2}$

80. Magnetic field at a distance 's' due to a long straight wire carrying current (1) is

A) $\frac{\mu_0 I}{2\pi s}\,\widehat{\phi}$ B) $\frac{\mu_0 I}{2\pi}\,\hat{s}$ C) $\frac{\mu_0 I}{2s}\,\hat{s}$ D) $\frac{\mu_0 I}{2\pi s^2}\,\widehat{\phi}$

81. The electric potential of some configuration is given by the expression $V(r) = A\frac{e^{-\lambda r}}{r}$ where, A and λ are constants. The electric field $\vec{E}(r)$ would be

A) $Ae^{-\lambda r}(1 + \lambda r).\frac{\hat{r}}{r^2}$ B) $Ae^{-\lambda r}.\frac{\hat{r}}{r^2}$

___

C) $Ae^{-\lambda r}(1+\lambda r).\dfrac{\hat{r}}{r}$

D) $Ae^{-\lambda r}.\dfrac{\hat{r}}{r}$

82. The volume current density in the wire is proportional to the distance from the axis j-ks (for some constant k), the total current in the wire would be

A) $\dfrac{2\pi ka^3}{3}$

B) $\dfrac{\pi ka^3}{3}$

C) $\dfrac{2\pi ka^2}{3}$

D) $\dfrac{\pi ka^2}{3}$

83. For a perfect gas whose molecules have n degrees of freedom, the correct expression is

A) $\dfrac{C_P}{C_V}=1+\dfrac{2}{n}$

B) $\dfrac{C_P}{C_V}=1+\dfrac{n}{2}$

C) $\dfrac{C_P}{C_V}=1+\dfrac{2}{n^2}$

D) $\dfrac{C_P}{C_V}=1+\dfrac{n^2}{2}$

84. A thermodynamic system is maintained at constant temperature and pressure. In thermodynamic equilibrium its

A) Its Gibbs free energy is minimum

B) Enthalpy is maximum

C) Helmholtz free energy is minimum

D) Internal energy is zero

85. The correct expression of latent heat is

A) $\dfrac{dL}{dT}-\dfrac{L}{T}=c_{2}-c_{1}$

B) $\dfrac{L}{T}=c_{2}-c_{1}$

C) $\dfrac{dL}{dT}=c_{2}-c_{1}$

D) $\dfrac{dL}{dT}=c_{1}-c_{2}$

86. A particle of mass 'm' is confined in a two dimensional infinite square well potential of side 'a'. The eigen-energy of the particle in a given state is

A) 4-fold degenerate

B) 3-fold degenerate

C) 2-fold degenerate

D) Non-degenerate

87. For a wave in a medium the angular frequency 'ω' and the wave vector $\vec{k}$ are related by $\omega^2 = \omega_0^2 + c^2 k^2$, where ω_o c are constants. The product of group velocities and phase velocities, i.e. $v_g v_p$ is

A) 0.25 c²

B) 0.4 c²

C) 0.5 c²

D) c²

88. The wave function of a quantum mechanical particle is given by-

$\psi(x) = \frac{3}{5}\emptyset_1(x) + \frac{4}{5}\emptyset_2(x)$ where $\emptyset_1(x)$ and $\emptyset_2(x)$ are eigen functions with corresponding energy eigen values -1eV and -2eV respectively. The energy of the particle in the state ψ is

A) $-\frac{41}{25}eV$ B) $-\frac{11}{5}eV$ C) $\frac{36}{25}eV$ D) $-\frac{7}{5}eV$

89. The half-life of a radioactive nuclear source is 9 days. The fraction of nuclei which are left under cayed after 3 days is

A) 7/8   B) 1/3   C) 5/6   D) $1/2^{1/3}$

90. The postulates of special theory relativity are applicable to

A) Stationary frame   B) Accelerated frame

C) Inertial frames   D) Both A and B

91. An oscillator is nothing but amplifier with

A) No feedback   B) Positive feedback!

C) Negative feedback   D) Any photovoltaic devices

92. Depletion region in P-N junction consist of

A) Only electron   B) Only hole   C) Mobile ions   D) Immobile ions

93. To use transistor as an amplifier

A) Both the junction must be in forward bias

B) Both the junction must be in reverse bias

C) Emitter base junction must be in forward bias and collector base junction should be in reverse bias

D) No biasing voltage is required

94. Which one of the following is incorrect Boolean expression?

A) $\bar{P}Q = PQ = Q$

B) $(P = \bar{Q})(P = Q) = P$

C) $P(P = Q) = Q$

D) $\bar{P}\bar{Q}\bar{R} + \bar{P}\bar{Q}R + P\bar{Q}\bar{R} + P\bar{Q}R = Q$

95. Octal equivalent of decimal number $(478)_{10}$ is

A) $(736)_8$ B) $(673)_8$ C) $(637)_8$ D) $(367)_8$

96. The radius of convergence of the power series

A) 0   B) Infinite   C) 1   D) 2

97. The Fourier series for the function $f(x) = x + x^2$ for $-\pi < x < \pi$ is consisting of

A) Only sine terms

B) Only cosine terms

C) Both sine and cosine terms,

D) only constant values

98. If is such that $\nabla \times \vec{A} = 0$ then $\vec{A}$ is called

A) Irrotational

B) Solenoidal

C) Rotational

D) Rotational and Solenoidal both

99. Which of the following statement is correct

A) Real part comprising of cosine function

B) Real part comprising of sine function

C) Imaginary part comprising of cosine function

D) Both option B) and C) are correct

100. A square matrix A is idempotent if

A) A' = A   B) A' = -A   C) $A^2 = A$ D) $A^2 = 1$