PROVISIONAL ANSWER KEY

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Exam:	Lecturer in Physics
Medium of Question:	English
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Alphacode	A

Question1:-When and by whom was the 'Nair Service Society' founded?
A:-1903 - Sree Narayana Guru
B:-1910 - TM Nair
C:-1914 - Mannath Padmanabhan
D:-1916 - K Ramakrishna Pillai
Correct Answer:- Option-C

Question2:-The 'Al- Ameen ' started publication from Calicut in October 1924 under the Editorship of
A:-Muhammed Abdur Rahiman
B:-Ali Musliyar
C:-Sithi koya Thangal
D:-Vakkam Abdul Khadir
Correct Answer:- Option-A

Question3:-The Autobiography of C Kesavan
A:-Kazhnjakalam
B:-Jeevitha Samaram
C:-Atmakatha
D:-Ente Purvakala Smaranakal
Correct Answer:- Option-B

Question4:-The novel 'Tottiyude Makan' was written by
A:-kesavadev
B:-P C kuttikrishnan
C:-Basheer
D:-Thakazhi
Correct Answer:- Option-D

Question5:-Guruvayoor Satyagraha was started on
A:-30 March 1924
B:-01 November 1931
C:-12 November 1936
D:-15 May 1903
Correct Answer:- Option-B

Question6:-Which Nuclear power plant became India's first Nuclear plant to generate 1000 MW power
A:-Kudankulam
B:-Kakrapar
C:-Narora
D:-kaiga
Correct Answer:- Option-A

Question7:-The Global Day of Parents was observed on
A:-12 June
B:-05 June
C:-14 June
D:-01 June
Correct Answer:- Option-D

Question8:-Who was selected for the J C Daniel award for life time achievement in Cinema for the year 2013 ?
A:-Sasi kumar
B:-Navodaya Appachan
C:-M T Vasudevan Nair
D:-K S Sethu Madhavan
Correct Answer:- Option-C

Question9:-Who became the Chief minister of Odisha consecutively for four times?
A:-Naveen Patnaik
B:-Biju Patnaik
C:-Shivaraj Singh Chouhan
D:-Giridhar Gamang
Correct Answer:- Option-A

Question10:-The autobiography of Sachin Tendulkar
A:-Cutting Edge
B:-Open
C:-Playing it my way
D:-Dreams from my father
Correct Answer:- Option-C

Question11:-A unit vector perpendicular to the surface $x^2 + y^2 + z^2 = 3$ at the point(1,1,1) is
A:-(i+j+k)/√3
B:-(i+j+k)/2
C:-(i+2j+3k)/√3
D:-(i+j+k)/√2
Correct Answer:- Option-A

Question12:-If B = Curl A, the value of ∫B.ds over a closed surface S is
A:-4Π
B:-A
C:-B
D:-0
Correct Answer:- Option-D

Question13:-Number of independent components of an antisymmetric tensor of rank 2 in 4-dimension is
A:-16
B:-6
C:-4
D:-8
Correct Answer:- Option-B

Question14:-If square of a Hermitian matrix is a unit matrix,then its eigen values are
A:-(0,1)
B:-(2,-2)
C:-(1,-1)

D:-(0,2)
Correct Answer:- Option-C

Question15:-The trace of metric tensor for Minkowski space is
A:-2
B:-1
C:--1
D:-0
Correct Answer:- Option-A

Question16:-Gauss's theorem for a vector function A is
A:-∫A.ds = ∫CurlA dV
B:-∫A.ds = ∫DivA dV
C:-∫CurlA.ds = $\oint A \,.\, dl$
D:-∫A.ds = $\oint A \,.\, dl$
Correct Answer:- Option-B

Question17:-Which of the following form a group under ordinary multiplication
A:-(1,i,0,-i)
B:-(1,i,0,-1)
C:-(1,i,-i,-1)
D:-(-1,-i,0,i)
Correct Answer:- Option-C

Question18:-The value of the integral $\int_{-\infty}^{\infty} \frac{\exp(ax)}{1+\exp(x)} dx$, 0<a<1 is
A:-0
B:-1
C:-sinaΠ
D:-(π /sinaπ)
Correct Answer:- Option-D

Question19:-If P_n (x) is the Legendre polynomial of order n, then $\int_{-1}^{1} [P_n(x)]^2 dx$ is
A:-$\frac{2}{2n+1}$
B:-$\frac{1}{2n+1}$
C:-2n+1
D:-1
Correct Answer:- Option-A

Question20:-Find the Fourier sine transform of e^{-at}
A:-$\sqrt{\frac{2}{\pi}} \frac{\omega}{\omega^2 + a^2}$
B:-$\sqrt{\frac{2}{\Pi}} \frac{a}{\omega^2 + a^2}$
C:-$\sqrt{\frac{2a}{\Pi(\omega^2 + a^2)}}$
D:-ω
Correct Answer:- Option-A

Question21:-The value of a and b for which the transformations Q = q^a cos bp and P = q^a sin bp represents a canonical transformation is
A:-a=1; b=2
B:-a=1/2; b=2
C:-a=2; b=1/2
D:-a=2; b=1
Correct Answer:- Option-B

Question22:-The homogenity of time leads to the law of consevation of
A:-linear momentum
B:-angular momentum
C:-energy
D:-charge
Correct Answer:- Option-C

Question23:-Van der Pol equation $d^2x/dt^2 - \varepsilon(1-x^2)dx/dt + x=0$ (with non zero ε) is an example of
A:-Linear conservative system
B:-Non linear conservative system
C:-Non linear non conservative system
D:-None of the above.
Correct Answer:- Option-C

Question24:-The first integrals of motion of a system under central force are
A:-Linear momentum and energy
B:-Linear and angular momentum
C:-Angular momentum and energy
D:-Linear momentum, angular momentum and energy
Correct Answer:- Option-B

Question25:-Which of the following represents a logistic map function
A:-$X_{n+1} = AX_n (1 + X_n)$
B:-$X_{n+1} = A\left(1 - Xn^2\right)$
C:-$X_{n+1} = A\left(1 + Xn^2\right)$
D:-$X_{n+1} = AX_n (1 - X_n)$
Correct Answer:- Option-D

Question26:-For a relativistic particle, the product of particle velocity and phase velocity of the associated de-Broglie wave is
A:-c^2
B:-c
C:-2c
D:-$2c^2$
Correct Answer:- Option-A

Question27:-Constraint in a rigid body is
A:-non holonomic and rheonomic
B:-holonomic and rheonomic
C:-non holonomic and schleronomic

D:-holonomic and schleronomic
Correct Answer:- Option-D

Question28:-If generalized coordinate has the dimension of velocity, then corresponding generalized velocity has the dimension of
A:-force
B:-displacement
C:-velocity
D:-acceleration
Correct Answer:- Option-D

Question29:-A particle of rest mass energy of 8MeV is moving with energy 10 MeV. Find momentum of the particle in MeV/c
A:-8 MeV/c
B:-10 MeV/c
C:-6 MeV/c
D:-5 MeV/c
Correct Answer:- Option-C

Question30:-A particle is moving in an inverse square force field. If the total energy of the particle is positive, then the trajectory of the particle will be
A:-hyperbolic
B:-elliptical
C:-parabolic
D:-circular
Correct Answer:- Option-A

Question31:-What is the frequency of the electromagnetic radiation that can just ionise H atom?
A:-13.6×10^{-16} Hz
B:-3.29×10^{-15} Hz
C:-13.6×10^{16} Hz
D:-3.29×10^{15} Hz
Correct Answer:- Option-D

Question32:-A He-Ne laser emits radiation with wavelength 633nm. How many photons are emitted per second by this laser with a power of 1 milliwatt?
A:-10^{15}
B:-3.19×10^{-15}
C:-3.19×10^{15}
D:-633×10^{-9}
Correct Answer:- Option-C

Question33:-Which among the following is the correct commutation relation?
A:-[x,p] =i$\frac{h}{2\Pi}$
B:-[x,p]=0
C:-[x,p]=-ih
D:-[x,p]=$\frac{h}{2\Pi}$
Correct Answer:- Option-A

Question34:-A particle of mass m moves freely inside a one dimensional impenetrable box of side a. What is the lowest energy eigen value of the particle?
A:-0
B:-$\frac{h^2}{8ma^2}$
C:-$\frac{h^2}{ma^2}$
D:-$\frac{ha}{2}$
Correct Answer:- Option-B

Question35:-Fine structure constant α is given by
A:-$\frac{2\Pi e^2}{hc}$
B:-$\frac{hc}{2\Pi}$
C:-$\frac{e^2hc}{2\Pi}$
D:-$\frac{hc}{2\Pi e^2}$
Correct Answer:- Option-A

Question36:-What is the change arises in ground state energy of a harmonic oscillator of frequency ω, if there is an anharmonic term of x^4 in the potential?
A:-$\frac{8\Pi^2m^2\Omega^2}{h^2}$
B:-$\frac{3h^2}{16\Pi^2m^2\omega^2}$
C:-$\frac{2\Pi m\omega}{h}$
D:-$\frac{3h}{4\Pi m\omega}$
Correct Answer:- Option-B

Question37:-For a system of two identical particles, each of which can be in one of n quantum states. Then number of antisymmetric states of the system is
A:-$\frac{n(n+1)}{2}$
B:-n(n-1)
C:-$\frac{n(n-1)}{2}$
D:-n(n+1)
Correct Answer:- Option-C

Question38:-Dirac's relativistic quantum theory leads to the discovery of which particle?
A:-Neutrino
B:-Electron
C:-Positron
D:-Neutron
Correct Answer:- Option-C

Question39:-What is the energy of a photon of wavelength 300nm?
A:-300J
B:-300×10^{-9} J

C:-6.625×10^{19} J

D:-6.625×10^{-19} J

Correct Answer:- Option-D

Question40:-Pauli's exclusion principle is obeyed by

A:-Photons

B:-Bosons

C:-Electrons

D:-Gravitons

Correct Answer:- Option-C

Question41:-A charge Q is placed at the centre of a cube of side L. The flux of the electric field through the six surfaces of the cube is

A:-$Q/(6\varepsilon_0)$

B:-$\frac{Q}{\varepsilon_0}$

C:-$Q/6L^2$

D:-$Q/3L^2$

Correct Answer:- Option-B

Question42:-Two electron beams moving parallel in the same direction will

A:-attract each other

B:-repel each other

C:-no change will be there

D:-attract and repel alternatively

Correct Answer:- Option-A

Question43:-The lation between magnetic, electric and optical wave propagation is given by

A:-$c=\sqrt{\mu_0\varepsilon_0}$

B:-$c=\frac{1}{\sqrt{\mu_0\varepsilon_0}}$

C:-$c=\mu_0\ \varepsilon_0$

D:-$\sqrt{c}=\mu_0\ \varepsilon_0$

Correct Answer:- Option-B

Question44:-For an isotropic dielectric media, the relative permitivity is a

A:-scalar quantity

B:-vector quantity

C:-Tensor quantity

D:-none of the above

Correct Answer:- Option-C

Question45:-The maxwell's equation which remains unchanged when a medium changes is

A:-$\nabla\ .B=0$

B:-$\nabla\ .E=\frac{\rho}{\varepsilon_0}$

C:-$\nabla\ \text{x}\ B=\mu_0\ J+\mu_0\ \varepsilon_0\ \frac{dE}{dt}$

D:-none of these

Correct Answer:- Option-A

Question46:-The efficiency of a Carnot engine whose temperature of sink is 10 degree centigrade is 50%. By how much should the temperature of the source be increased so as to increase the efficie

A:-377K

B:-377 degree C

C:-943K

D:-943 degree C

Correct Answer:- Option-A

Question47:-Two spherical vessels contain equal quantities of air. One is at a temperature of 70 degree C and its internal radius is 7cm with pressure P. The other vessel is at temperature 239 degree pressure P1.The pressure exerted by air inside them satisfy which of the following relation

A:-P1= 2P

B:-P1= 3P

C:-P1= P

D:-P1= 4P

Correct Answer:- Option-C

Question48:-A system consists of 10,000 atoms and is at 300K. Assuming there is no inter atomic energy in the system, its total energy will be

A:-12.4 KJ

B:-12.4 J

C:-6.21 KJ

D:-6.21 J

Correct Answer:- Option-C

Question49:-Consider the system of four identical particles each of which can be in any one of five single particle states. Then the accessible number of states of the system according to Bose-Einstei

A:-24

B:-50

C:-32

D:-70

Correct Answer:- Option-D

Question50:-The fermi energy for a metal is 4.7 eV. What is its value for another metal which has the free electron density 27 times that of the former?

A:-42.3 eV

B:-9 eV

C:-27 eV

D:-18.2 eV

Correct Answer:- Option-A

Question51:-When the electron jumps from the fourth orbit to the second orbit, one gets

A:-first line of Balmer series

B:-second line of Lyman series

C:-second line of Paschen series

D:-second line of Balmer series

Correct Answer:- Option-D

Question52:-The maximum number of electrons in a subshell with orbital quantum number l is

A:-(2l+1)

B:-(2l-1)

C:-2(2l+1)

D:-2(2l-1)

Correct Answer:- Option-C

Question53:-The magnetic moment associated with first orbit in hydrogen atom is

A:-$\frac{h}{4\Pi me}$

B:-$\frac{4\Pi m}{he}$

C:-$\frac{eh}{4\Pi m}$

D:-$\frac{ehm}{4\Pi}$

Correct Answer:- Option-C

Question54:-The L,S and J quantum numbers corresponding to the ground state electonic configuration of Boron (Z=5) are

A:-L=1, S=1/2, J=3/2

B:-L=1, S=1/2, J=1/2

C:-L=1, S=3/2, J=1/2

D:-L=0, S=1/2, J=3/2

Correct Answer:- Option-B

Question55:-Which one of the following molecules does not exhbit a rotational spectrum

A:-H_2

B:-CO

C:-HCl

D:-HBr

Correct Answer:- Option-A

Question56:-A hexagonal structure has a symmetry element

A:-One 6-fold rotation axis

B:-Two 3-fold rotation axis

C:-Three 2-fold rotation axis

D:-A 4-fold rotation- inversion axis

Correct Answer:- Option-A

Question57:-Packing fraction for a simple cubic lattice as comapred to that of fcc lattice is

A:-greater

B:-smaller

C:-can be greater or smaller

D:-not possible to say

Correct Answer:- Option-B

Question58:-When irradiated with visible light, which of the following types of solids are always opaque ?

A:-ionic crystals

B:-covalent solids

C:-metallic solids

D:-none of these

Correct Answer:- Option-C

Question59:-Eistein's theory concludes that at lower temperatures the specific heat

A:-drops linearly with increase of temperature

B:-drops linearly with decrease of temperature

C:-drops exponentially with decrease of temperature

D:-remains constant

Correct Answer:- Option-C

Question60:-For a conventional superconductor, which of the following statement is NOT true?

A:-specific heat is discontinuous at transition temperature Tc

B:-The resistivity falls sharply at Tc

C:-It is diamagnetic below Tc

D:-It is paramagnetic below Tc

Correct Answer:- Option-D

Question61:-x in the nuclear reaction: $29^{Cu^{64}} \rightarrow 28^{Ni^{64}}$ + x: is

A:-Positron

B:-Proton

C:-Photon

D:-Electron

Correct Answer:- Option-A

Question62:-Half life of a radioactive sample is 365 days. Its mean life is then

A:-50.67 days

B:-5543.32 days

C:-526.87 days

D:-None of these

Correct Answer:- Option-C

Question63:-Shell model potential is

A:-V(r) = $-V_0$ if r<R and V(r) = 0 if r>R

B:-V(r) = $\frac{-V_0}{\left(1+e^{\frac{r-R}{a}}\right)}$

C:-V(r) = $\frac{kr^2}{2}$, if r<R and V(r)=0 if r>R

D:-V(r) = $\frac{V_0}{\left(1+e^{-\frac{r}{a}}\right)}$

Correct Answer:- Option-B

Question64:-For spontaneous fission of a nucleus with atomic number Z and mass number A,

A:-$\frac{Z}{A}$ >47

B:-$\frac{Z^2}{A^2}$ >47

C:-$\frac{Z}{A^2}$ >47

D:-$\frac{Z^2}{A}$ >47

Correct Answer:- Option-D

Question65:-Which of the following is true?

A:-Quarks do not have colour

B:-Photons have colour

C:-Leptons do not have colour

D:-None of these
Correct Answer:- Option-C

Question66:-For a transistor operating in the saturation region,
A:-$I_c = 0$
B:-$I_c = h_{FE} \cdot I_B$
C:-$I_c > h_{FE} \cdot I_B$
D:-$I_c \leq h_{FE} \cdot I_B$
Correct Answer:- Option-D

Question67:-Output voltage v_0 of the ideal op-amp given below is:
A:-0 V
B:-6V
C:-2V
D:-10V
Correct Answer:- Option-B

Question68:-The transistor circuit shown uses silicon transistor with $V_{BE} = 0.7$, $I_C \approx I_E$ and a current gain of 100. The value of V_0 is,
A:-4.65V
B:-5V
C:-6.3V
D:-7.23V
Correct Answer:- Option-A

Question69:-A 4-bit D/A converter produces an output voltage of 4.5V for an input code of 1001. Its output voltage for an input code 0011 will be:
A:-0.5V
B:-2.25V
C:-1.5V
D:-2.75V
Correct Answer:- Option-C

Question70:-The variation of drain current with gate-to-source voltage (I_D - V_{GS} characteristics) of a MOSFET is shown in figure. The MOSFET is,
A:-An n-channel depletion mode device
B:-An n-channel enhancement mode device
C:-A p-channel depletion mode device
D:-A p-channel enhancement mode device
Correct Answer:- Option-C

Question71:-Nano tubes are structures with confinement in
A:-2 dimensions
B:-3 dimensions
C:-1 dimensions
D:-zero dimension
Correct Answer:- Option-A

Question72:-Unique properties of nano materials can be ascribed to
A:-large surface to volume ratio
B:-quantum confinement effect
C:-phonon confinement
D:-all of the above
Correct Answer:- Option-D

Question73:-CNT can be metallic if the chiral vector (n,m)
A:-n-m = ½
B:-(n-m)/3 is not an integer
C:-n-m= 0
D:-n-m = ¼
Correct Answer:- Option-C

Question74:-An example of top down approach in nano technology is
A:-sputtering
B:-vapour deposition
C:-sol gel technique
D:-milling
Correct Answer:- Option-D

Question75:-Ballistic quantum conductance is related to
A:-Space technology
B:-CNT
C:-IC technology
D:-FET
Correct Answer:- Option-B

Question76:- An important feature of Big Bang cosmology that is supported by observational astronomy is that the universe
A:-is increasing its total mass over time
B:-is expanding at an accelerating rate
C:-is formed from an earlier collapsed universe
D:-contains a great deal of dark matter
Correct Answer:- Option-B

Question77:-Pulsars are stars that give off precisely spaced bursts of radiation. Which of the following is responsible for this phenomenon?
A:-The strong magnetic field of a neutron star causes it to emit radiation in two narrow beams that sweep by Earth as the star spins
B:-The presence of a neutron star orbiting very close to the pulsar causes a recurring increase in the pulsar's energy output.
C:-The buildup and collapse of a neutron star's magnetic field repels and attracts ionized gases on the star's surface.
D:-The low mass of a pulsar produces alternating cycles of nuclear fusion and chemical burning that release different amounts of energy.
Correct Answer:- Option-A

Question78:- In a typical H-R diagram, stars are graphed by these two characteristics
A:-Distance and temperature
B:-Luminosity and distance
C:-Temperature and luminosity
D:-Size and distance
Correct Answer:- Option-C

Question79:- Which of the following appliances use solar photovoltaic technology?
A:-Solar lantern
B:-Solar water heater
C:-Solar air heater
D:-all of the above
Correct Answer:- Option-A

Question80:-The value of solar constant is approximately
A:-65 kW/m²

B:-1.36 kW/m²
C:-364 kW/m²
D:-10 kW/m²
Correct Answer:- Option-B

Question81:- "The systematic and controlled handling of variables to see if treatments will create expected result" is an essential step in
A:-Ex Post facto Research
B:-Scientific Method
C:-Diagnostic method
D:-Exploratory research
Correct Answer:- Option-B

Question82:- In a sponsored research which of the following action of the sponsor is in compliance with ethical considerations
A:- Instructions on How to do research
B:- Instructions on what is to be reported and not
C:-Instructions on purposes of research
D:- Instructions on not to conceal the sponsor
Correct Answer:- Option-D

Question83:-Reliability in research stands for
A:-Replicability
B:-Validity
C:-Measureability
D:-Comparability
Correct Answer:- Option-A

Question84:- Insufficient evidence in research leads to
A:-Faulty analysis
B:-Over generalization
C:-Poor sampling
D:- Wrong methodology
Correct Answer:- Option-B

Question85:- Citation index is directly related to
A:-Periodicity of a journal
B:-Popularity of a journal
C:-Impact factor of a journal
D:- Publication of a journal
Correct Answer:- Option-C

Question86:- Which among the following skill is required most for a present day teacher?
A:-Planning
B:-Instruction
C:-Evaluation
D:-Facilitation
Correct Answer:- Option-D

Question87:- While initiating the instructional process a teacher should be aware of
A:-Learner qualities
B:-Learner readiness
C:-Structure of the Lesson
D:-Preparation for the lesson
Correct Answer:- Option-B

Question88:- Comprehensive evaluation is inclusive in nature by doing it
A:-Regularly
B:-Periodically
C:-Continuously
D:-Subject specific
Correct Answer:- Option-C

Question89:- Which of the following is most suitable for meaningful learning in a classroom?
A:-Interactions
B:-Instructions
C:-Experiments
D:-Demonstration
Correct Answer:- Option-A

Question90:- Which of the following is a best teaching aid?
A:-Diorama
B:-Programmed Instruction
C:-Power point Presentation
D:-Sound motion picture
Correct Answer:- Option-D

Question91:- 1 Money Bill can be introduced in .....in the Parliament
A:-Lok Sabha
B:-Rajya Sabha
C:-Both house simultaneously
D:-Either of the Houses
Correct Answer:- Option-A

Question92:- 1 Special Constitutional Status of Jammu & Kashmir is Provided in...
A:-Art. 324
B:-Art. 356
C:-Art. 368
D:-Art. 370
Correct Answer:- Option-D

Question93:- 1 Who among the following administers oath of office to the President of India ...
A:-Vice President
B:-Speaker
C:-Chief Justice of India
D:-Chairman of Rajya Sabha
Correct Answer:- Option-C

Question94:- 1 The fundamental right to education is incorporated in ....
A:-Art. 14
B:-Art. 16
C:-Art. 21A
D:-Art. 31A
Correct Answer:- Option-C

Question95:- 1 Which of the following is NOT a writ

A:-Habeas Corpus
B:-Ipso Facto
C:-Mandamus
D:-Prohibition
Correct Answer:- Option-B

Question96:-The National Commission for Women consists of a Chairperson and ..... members.
A:-3
B:-4
C:-5
D:-6
Correct Answer:- Option-C

Question97:-What is the name of the programme launched on December 25, 2000 by the Central Government for providing food grains to the poor at highly subsidised rates?
A:-Antyodaya Anna Yojana.
B:-Targeted Public Distribution System.
C:-Indira Awaas Yojana.
D:-Sampoorna Grameen Rozgar Yojana.
Correct Answer:- Option-A

Question98:-What is the maximum time period fixed by Section 7(1) of Right to Information Act,2005 for providing information by Central or State Public Information Officers in normal course?
A:-15 days.
B:-30 days.
C:-60 days.
D:-90 days.
Correct Answer:- Option-B

Question99:-The Environment (Protection) Act was enacted in India in pursuance of .....
A:-World Commission on Environment and Development 1987.
B:-UN Conference on the Human Environment 1972.
C:-UN Conference on Sustainable Development 2012.
D:-UN Conference on Environment and Development.
Correct Answer:- Option-B

Question100:-The National Rural Employment Guarantee Act, 2005 aims at providing a minimum of ..... days unskilled manual work.
A:-25
B:-50
C:-100
D:-150
Correct Answer:- Option-C