Online Examinations (Even Sem/Part-I/Part-II Examinations 2020 - 2021

Course Name - –Engineering Physics II
Course Code - PH201

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Answer all the questions. Each question carry one mark.

9. 1. For small value of damping constant, the quality factor

Mark only one oval.

- decreases
- increases
- remains constant
- none of these

10.   2. Two vibrating systems are said to be in resonance if

Mark only one oval.

⬭ their amplitudes are equal

⬭ their frequencies are equal

⬭ they are in same phase

⬭ none of these

11.   3. The first law of thermodynamics is conservation of

Mark only one oval.

⬭ momentum

⬭ energy

⬭ both energy & momentum

⬭ Option 4

12.   4. The MB statistics applicable for

Mark only one oval.

⬭ distinguishable particle

⬭ indistinguishable particle

⬭ semi distinguishable particle

⬭ none of these

13. 5. A perfect black body

Mark only one oval.

- absorbs all the incident radiation
- allow all the incident radiation to pass through it
- allow all the incident radiation to pass through it
- has its surface coated with lamp black or graphite

14. 6. The core of an optical fiber has a

Mark only one oval.

- lower refracted index than air
- lower refractive index than the cladding
- higher refractive index than the cladding
- samerefractive index with the cladding

15. 7. The pinch-off voltage is equal to

Mark only one oval.

- drain-to-source voltage
- gate-to-source voltage
- gate-to-source cut-off voltage
- gate voltage

16.   8. If two SHM of the same amplitude, time period and phase act at right angles to each other, the resultant vibration is

Mark only one oval.

⬭ elliptical

⬭ circular

⬭ straight line

⬭ parabolic

17.   9. Critical angle depends on

Mark only one oval.

⬭ colour of light

⬭ refractive index of two the concerned media

⬭ wavelength of light

⬭ all of these

18.   10. The SI unit of the force constant of a spring is

Mark only one oval.

⬭ Nm

⬭ Nm^(-2)

⬭ Nm^(-1)

⬭ N

19.   11. Which of the following is not essential for simple Harmonic motion

Mark only one oval.

◯ Inertia

◯ Gravity

◯ restoring force

◯ elasticity

20.   12. Production of Lissajous figures can be shown in a device known as

Mark only one oval.

◯ Geiger-Muller counter

◯ travelling microscope

◯ Cathode ray oscilloscope

◯ telescope

21.   13. The time period of a simple pendulum of infinite length is given by

Mark only one oval.

◯ finite

◯ zero

◯ infinite

◯ none of these

22. 14. In any damped oscillation the resisting force is proportional to

Mark only one oval.

◯ displacement

◯ acceleration

◯ velocity

◯ square of velocit

23. 15. The square of the magnitude of the wave function is called

Mark only one oval.

◯ current density

◯ probability density

◯ zero density

◯ volume density

24. 16. The total probability of finding the particle in space must be

Mark only one oval.

◯ zero

◯ unity

◯ infinity

◯ double

25.   17. For small value of damping constant, the resonance is

Mark only one oval.

○ flat

○ sharp

○ remains same

○ none of these

26.   18. In case of critical damping, the motion of a system is

Mark only one oval.

○ oscillatory

○ vibratory

○ harmonic

○ non-oscillatory

27.   19. The sum of all the microscopic form of energy is called

Mark only one oval.

○ total energy

○ phase energy

○ system energy

○ internal energy

28. 20. Which statistics will apply to deuterons and alpha particles

Mark only one oval.

○ M-B

○ B-E

○ F-D

○ none of these

29. 21. Six distinguishable particles are to be distributed into three cells. Find the number of different combinations of particles that can produce the distribution (4,1,1)

Mark only one oval.

○ 1

○ 12

○ 20

○ 30

30. 22. The change in entropy is

Mark only one oval.

○ positive in a reversible change

○ negative in an irreversible change

○ positive in an irreversible change

○ negative in a reversible change

31.   23. When applied to solar radiation, Planck's law reduces to Wien's law in the

Mark only one oval.

◯ ultraviolet region

◯ microwave region

◯ infrared region

◯ visible region

32.   24. Fermi-Dirac distribution approaches Maxwell-Boltzmann distribution at

Mark only one oval.

◯ low temperature and high pressure

◯ low temperature and low pressure

◯ high temperature and high particle mass

◯ high density and low energy range

33.   25. In BE statistics each quantum state can accommodate

Mark only one oval.

◯ only one particle

◯ one or more particle

◯ two particles

◯ none of these

34. 26. The number of macrostates for N particles in MB distribution are

Mark only one oval.

○ N

○ N-1

○ N+1

○ N/2

35. 27.

H^3 *and muon are*

Mark only one oval.

○ Fermions

○ Bosons

○ Fermions and bosons respectively

○ Bosons and fermions respectively.

36. 28. That radiation and matter have properties both of particles and of waves is

Mark only one oval.

○ wave-particle duality

○ mixing

○ confusion

○ entanglement

37. 29. Max Planck's great discovery was radiation energy is emitted in packets that he called

Mark only one oval.

- ⬭ photons
- ⬭ gamma rays
- ⬭ quanta
- ⬭ wave functions

38. 30. In the Heisenberg uncertainty principle, which two measurable properties of a particle cannot be observed precisely at the same time?

Mark only one oval.

- ⬭ spin and color
- ⬭ energy and torque
- ⬭ position and momentum
- ⬭ size and speed

39. 31. The square of a particle wave function describes the probability of what?

Mark only one oval.

- ⬭ Particle will disappear
- ⬭ Particle will decay
- ⬭ Particle is at a particular place
- ⬭ Particle has a specific spin

40.   32. In Relativistic case, as the velocity of the particle approaches the speed of light, the Kinetic energy approaches

Mark only one oval.

⚪ Zero

⚪ kinetic Energy as in Non-Relativistic case

⚪ rest Energy

⚪ infinite

41.   33. Energy released by a radiating surface is not continuous but is in the form of successive and separate packets of energy called

Mark only one oval.

⚪ Photons

⚪ Protons

⚪ electrons

⚪ neutrons

42.   34. As a radiator, the black body emits the maximum possible thermal radiation

Mark only one oval.

⚪ at a constant single wavelength

⚪ at the maximum wavelength

⚪ at all wavelengths

⚪ none of these

43.   35. The emissivity can be defined as the ratio of

Mark only one oval.

◯ emissive power of real body to the emissive power of black body

◯ emissive power of black body to the emissive power of real body

◯ reflectivity of real body to emissive power of black body

◯ reflectivity of black body to emissive power of real body

44.   36. The energy of a particle moving in a one dimensional potential box is

Mark only one oval.

◯ Directly Proportional to the quantum number

◯ Inversely Proportional to the quantum number

◯ Directly Proportional to the square of the quantum number

◯ Inversely Proportional to the square of the quantum number

45.   37. According to Schrodinger, a particle is equivalent to a

Mark only one oval.

◯ wave packet

◯ single wave

◯ light wave

◯ none of these

46. 38. Which among the following are responsible for generating attenuation of an optical power in fiber

Mark only one oval.

○ Absorption

○ Scattering

○ Waveguide effect

○ All of these

47. 39. In the structure of fiber optic cable refractive index of core is always --------- the refractive index of cladding

Mark only one oval.

○ less than

○ equal to

○ greater than

○ None of these

48. 40. Total internal reflection of light will take place if a ray of light is incident from

Mark only one oval.

○ air to water

○ air to glass

○ water to glass

○ glass to water

49.   41. In optical fibre, the principle of light applied is

Mark only one oval.

⬭ scattering

⬭ successive reflection

⬭ refraction

⬭ total internal reflection

50.   42. How does the refractive index vary in Graded Index fibre?

Mark only one oval.

⬭ tangentially

⬭ radially

⬭ longitudinally

⬭ transversely

51.   43.When a beam of light enters one medium from another, the quantity which will not change

Mark only one oval.

⬭ direction

⬭ speed

⬭ frequency

⬭ wavelength

52.   44. In He-Ne laser neon atoms get energy

Mark only one oval.

◯ on collision with He atoms

◯ from chemical reactions

◯ from electrical pumping

◯ from optical pumping

53.   45. In lasing action, the spontaneous emission does not depend on

Mark only one oval.

◯ the number of atoms present in the excited state

◯ the intensity of the incident light

◯ both intensity and number of atoms

◯ none of these

54.   46. In a ruby laser, population inversion is achieved by

Mark only one oval.

◯ optical pumping

◯ inelastic atom-atom collision

◯ chemical reaction

◯ applying strong electric field

55.   47. The wavelength of of He-Ne laser is

Mark only one oval.

◯ 632.8 nm

◯ 600 nm

◯ 532.8 nm

◯ 500 nm

56.   48. For laser action to occur, the medium used must have at least

Mark only one oval.

◯ 4 energy levels

◯ 2 energy levels

◯ 3 energy levels

◯ 5 energy levels

57.   49. The ratio of He to Ne in a He-Ne laser is of the order of

Mark only one oval.

◯ 1:15

◯ 1:1

◯ 1:10

◯ 5:1

58. 50. Emission of photons due to transition of an electron from a higher to a lower energy state caused by external energy is known as

Mark only one oval.

( ) stimulated absorption

( ) amplified emission

( ) stimulated emission

( ) spontaneous emission

59. 51. Which topology of feedback amplifier has very high input and output impedances

Mark only one oval.

( ) Voltage series feedback

( ) Voltage shunt feedback

( ) Current series feedback

( ) Current shunt feedback

60. 52. In a common emitter amplifier, the unbiased emitter resistance provides

Mark only one oval.

( ) voltage series feedback

( ) voltage shunt feedback

( ) current series feedback

( ) current shunt feedback

61.   53. Voltage shunt feedback amplifier is a

Mark only one oval.

◯ transconductance amplifier

◯ transresistive amplifier

◯ voltage amplifier

◯ current amplifier

62.   54. The material that has the piezoelectric effect

Mark only one oval.

◯ quartz

◯ Rochelle salt

◯ tourmaline

◯ all of these

63.   55. FET is advantageous over BJT because it is

Mark only one oval.

◯ thermally more stable

◯ it use one p-n junction

◯ it is a voltage controlled device

◯ none of these

64.　56. A FET operates on

Mark only one oval.

○ majority carriers only

○ minority carriers

○ positive and negative ions

○ positively charged ions

65.　57. The differential gain of OPAMP is

Mark only one oval.

○ very high

○ very low

○ dependent on input voltage

○ none of these

66.　58.

A certain non-inverting amplifier has R_i of 1 kΩ and R_f of 100 kΩ. The closed-loop voltage gain is

Mark only one oval.

○ 10000

○ 1000

○ 101

○ 100

67. 59. The phase difference between the driving force and the velocity of the forced oscillator is

Mark only one oval.

φ

Option 1

$\dfrac{\pi}{2} + \varphi$

Option 2

$-\varphi + \dfrac{\pi}{2}$

Option 3

none of these

Other: _____

68. 60. When angle of incidence is greater than Brewster's angle, the reflected ray suffers a phase change of

Mark only one oval.

- π
- $\pi/2$
- 0
- 2π

69. 61.

An amplifier has gain of -1000 and feedback of β = -0.1. If it had a gain change of 20 % due to temperature, what will be the change in gain of the feedback amplifier?

Mark only one oval.

- 0.01
- 0.02
- 0.005
- 0.002

70. 62.

An amplifier has an open loop gain of 100, an input impedance of 1 kΩ and an output impedance of 100 Ω. A feedback network with feedback factor of 0.5 is connected in a voltage series feedback mode. The new input and output impedance are

Mark only one oval.

- 51kΩ and 2Ω
- 510kΩ and 20Ω
- 5.10kΩ and 200Ω
- 5kΩ and 100Ω

71.   63. The transfer characteristic of a transconductance amplifier is

Mark only one oval.

$$g_m = \frac{I_0}{V_s}$$

Option 1

$$A_i = \frac{I_0}{I_s}$$

Option 2

$$A_v = \frac{V_0}{V_s}$$

Option 3

$$r_m = \frac{V_0}{I_s}$$

Option 4

72.   64. Barkhausen Criterion for sustained oscillation is

Mark only one oval.

   ◯ $A\beta=0$

   ◯ $A\beta=1$

   ◯ $-A\beta=1$

   ◯ $A = 1/\text{sqrt}(\beta)$

   ◯ Other: _____

73.   65. The quality factor Q for an L-C-R circuit is
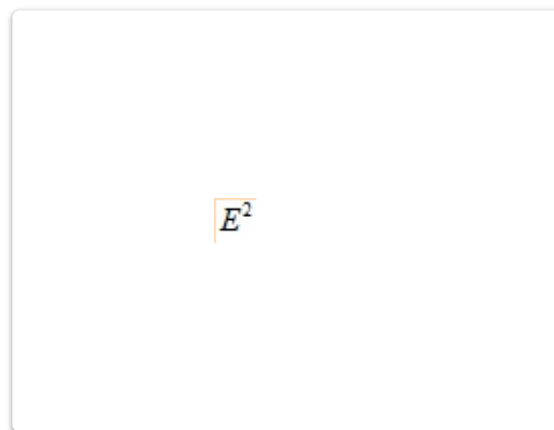
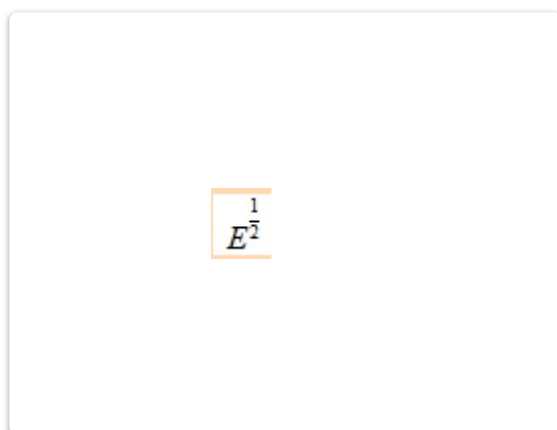*Mark only one oval.*

⚪ ωR/L

⚪ ω/LR

⚪ ωL/R

⚪ R/ωL

⚪ Other: _____

74.   66. For an energy state 'E' of a photon gas, the density of state is proportional to

Mark only one oval.

$$E^2$$

⚪ E   ⚪ Option 2

$$E^{\frac{1}{2}}$$

⚪ Option 3   ⚪ None of these

75.   67.

In F-D statistics, the volume of phase cell is

Mark only one oval.

◯ h

◯ h^2

◯ h^3

◯ not fixed

◯ Other: _____

76.   68. The energy of the particle is proportional to (if n is the quantum state)

Mark only one oval.

◯ n

◯ n^(-1)

◯ n^2

◯ n^(-2)

◯ Other: _____

77.   69.

For the function $e^{\beta^2 x}$, the eigen value of the operator $\dfrac{d^2}{dx^2}$ is given by

Mark only one oval.

◯ β

◯ β^2

◯ β^3

◯ β^4

78.   70. The Schrodinger time independent equation can be written as

Mark only one oval.

$$H\psi = E\psi$$

Option 1

$$H\psi = (E - V)\psi$$

Option 2

$$H\psi = (E + V)\psi$$

Option 3

$$H\psi + E\psi = 0$$

Option 4

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