ENTRANCE EXAMINATION FOR ADMISSION, MAY 2011.

M.Tech. (ELECTRONICS)

COURSE CODE : 304

Register Number :

Signature of the Invigilator
(with date)

COURSE CODE : 304

Time : 2 Hours Max : 400 Marks

Instructions to Candidates :

1. Write your Register Number within the box provided on the top of this page and fill in the page 1 of the answer sheet using pen.
2. Do not write your name anywhere in this booklet or answer sheet. Violation of this entails disqualification.
3. Read each question carefully and shade the relevant answer (A) or (B) or (C) or (D) in the relevant box of the ANSWER SHEET using HB pencil.
4. Avoid blind guessing. A wrong answer will fetch you –1 mark and the correct answer will fetch 4 marks.
5. Do not write anything in the question paper. Use the white sheets attached at the end for rough works.
6. Do not open the question paper until the start signal is given.
7. Do not attempt to answer after stop signal is given. Any such attempt will disqualify your candidature.
8. On stop signal, keep the question paper and the answer sheet on your table and wait for the invigilator to collect them.
9. Use of Calculators, Tables, etc. are prohibited.

1. Each of three coins has two sides, heads and tails. Represent the heads or tails status of each coin by a logical variable (A for the first coin, B for the second coin and C for the third) where the logical variable is 1 for heads and 0 for tails. Then a logic function F (A,B,C) which is 1 iff exactly one of the coins is heads after a toss of the coins can be written in terms of a minterm expansion

(A) $\sum m(1,2,4)$ (B) $\sum M(1,2,4)$

(C) $\prod m(1,2,4)$ (D) $\prod M(1,2,4)$

2. BCD + C'D' + B'C'D' + CD is equal to

(A) (C' + D) + (C' + D' + B) (B) (C + D) (C' + D' + B)

(C) (C' + D) (C + D' + B') (D) None of the above

3. The company safe should be unlocked (U) only when Mr. Jones (J) is in the office or Mr. Evans (E) is in the office, and only when the company is open for business (B), and only when the security guard (S) is present. This can be represented by a Boolean equation

(A) U = (J.E)(B + S) (B) U = (J + E)(B + S)

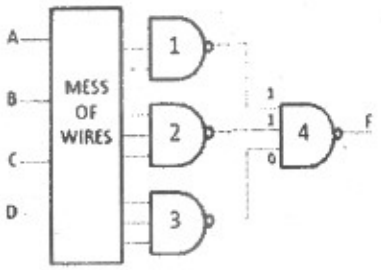
(C) U = (J' + E) BS (D) U = (J + E) BS

4. If the function $f_1(a,b,c) = m_0 + m_2 + m_5 + m_6$. Using a Karnaugh map the minimum sum of products can be written as

(A) f = b'c + a'c' + ab'c (B) f = bc' + a'c' + ab'c

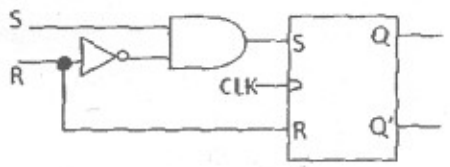
(C) f = bc' + a'c' + abc' (D) f = bc' + a'c + ab'c

5. The circuit below was designed to implement the logic equation F = AB'D + BC'D' + BCD, but it is not working properly. The input wires to gates 1,2 and 3 are so tightly packed, it would take you a while to trace them all back to see whether inputs are correct. It would be nice to only have to trace whichever one is incorrectly wired. When A = B = 0 and C = D = 1, the inputs and outputs of gate 4 are as shown. Then, which of the gates either is connected incorrectly or is malfunctioning



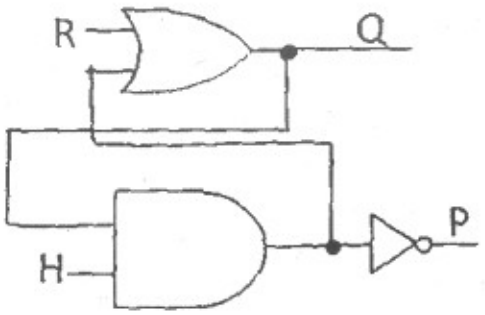
(A) Gate 1 (B) Gate 2 (C) Gate 3 (D) Gate 4

6. Flip-flop shown in figure behaves as



(A) Reset dominant flip flop
(B) RS flip flop
(C) Set dominant flip flop
(D) Master-slave flip flop

7. A latch can constructed from an OR gate, an AND gate and an inverter connected as follows. What restriction must be placed on R and H so that P will always equal Q' under steady state conditions?



(A) R = 1 and H = 0 cannot occur at the same time
(B) R = 1 and H = 1 cannot occur at the same time
(C) R = 0 and H = 0 cannot occur at the same time
(D) None of the above

8. $A'C + B'C' + AB$ is equal to

(A) (A + B)'C
(B) AB + B'C' + AC'
(C) A'B' + BC + A'C
(D) A'B' + BC + AC'

9. Binary equivalent of 0.625_{10}

(A) .101
(B) .110
(C) .011
(D) None of the above

10. How many switching functions of two variables (x and y) are there?

(A) 8 (B) 24 (C) 16 (D) 32

11. The Laplace transform of $(t^2 - 2t)u(t-1)$ is

(A) $2/s^3 e^{-s} - 2/s^2 e^{-s}$ (B) $2/s^3 e^{-2s} - 2/s^2 e^{-s}$

(C) $2/s^3 e^{-s} - 1/s^2 e^{-s}$ (D) None of the above

12. The auto-correlation of the signal $x(t) = e^{-t} u(t)$ is

(A) $\frac{1}{2}e^{t} u(-t) + 1/2 e^{t} u(t)$ (B) $\frac{1}{2}e^{t} + 1/2(e^{-t} - e^{t})u(t)$

(C) $\frac{1}{2}e^{-t} u(-t) + 1/2 e^{-t} u(t)$ (D) $\frac{1}{2}e^{t} u(-t) - 1/2 e^{-t} u(t)$

13. The energy of a signal $n\,u[t]$ is

(A) $n(n+1)/2$ (B) $n(n+1)(2n+1)/6$

(C) $(n(n+1)/2)^2$ (D) ∞

14. The period of the function cos $\pi/4(t-1)$ is

(A) 1/8 s (B) 8s (C) 4s (D) ¼ s

15. The Z-transform F(z) of $f(nT) = a^{nT}$ is

(A) $z/z-a^{T}$ (B) $z/z+a^{T}$ (C) $z/z-a^{-T}$ (D) $z/z+a^{-T}$

16. A coil with large distributed capacitance has a

(A) High Q (B) Low Q

(C) Low resonant frequency (D) High resonant frequency

17. The copper armature winding of a motor is subjected to an operating temperature of 80° C. The room temperature is 20° C. The percentage change in resistance of the armature winding from cold starting condition to normal running will be nearly

(A) 10% (B) 16% (C) 20% (D) 24%

18. The current through an electrical conductor is 1 ampere when the temperature of the conductor is 0 o C and 0.7 ampere when the temperature is 100 o C. The current when the temperature of the conductor is 1200 o C must be

(A) 0.08 A (B) 0.16 A (C) 0.32 A (D) 0.64 A

19. Two coils in different connection have self inductance of 2 mH and 4 mH and amutual inductance of 0.15 mH. The equivalent inductance of the combination is

(A) 5.7 mH (B) 5.85 mH (C) 6 mH (D) 6.15 mH

20. At a certain current, the energy stored in iron cored coil is 1000J and its copper loss is 2000w. The time constant (in seconds) of the coil is

(A) 0.25 (B) 0.5 (C) 1 (D) 2

21. The actual gain of a parabolic antenna of diameter D = 10 meters can be approximated by $G=2\pi(D/\lambda)^2$. What is the effective area of the antenna?

(A) 100 m^2 (B) 75 m^2 (C) 50 m^2 (D) 25 m^2

22. A most antenna consisting of a 50 meter long vertical conductor operates over a perfectly conducting ground plane. It's base-fed at a frequency of 600 KHz. The radiation resistance of the antenna in ohms is

(A) $2\pi^2/5$ (B) $\pi^2/5$ (C) $4\pi^2/5$ (D) $20\pi^2$

23. Characteristic impedance of a transmission line is 50 Ω. Input impedance of the open circuited line is Zoc = 100 + j150 Ω. When the transmission line is short-circuited, then value of the input impedance will be

(A) 50 Ω (B) 100+j150 Ω

(C) 7.69+j11.54 Ω (D) 7.69-j11.54 Ω

24. When a plane wave travelling in free-space is incident normally on a medium having $\varepsilon_r = 4$, then fraction of power transmitted into the medium is given by

(A) 8/9 (B) 1/2 (C) 1/3 (D) 5/6

25. A rectangular waveguide having TE10 mode as dominant mode is having a cut-off frequency of 18 GHz for the TE30 mode. The inner broad-wall dimension of the rectangular waveguide is

(A) 5/3 cm (B) 5 cm (C) 5/2 cm (D) 10 cm

26. In a two-element series circuit, the applied voltage and the resulting current are respectively v(t) = 50 + 50 sin(5×10^3 t)v and i(t) = 11.2 sin(5×10^3 t + 63.4°)A. The nature of the element would be

(A) L-L (B) R-C

(C) L-C (D) Neither R nor L nor C

27. Give two coupled inductors L1 and L2, their mutual inductance M satisfies

(A) $M=\sqrt{L_1^2+L_2^2}$ (B) $M>\frac{(L1+L2)}{2}$ (C) $M>\sqrt{L1\,L2}$ (D) $M\le\sqrt{L_1\,L_2}$

28. A voltage waveform v(t) = 12t 2 is applied across a 1H inductor for $t \geq 0$, with initial current through it being zero. The current through the inductor for $t \geq 0$, is given by

(A) 12 t (B) 24 t (C) $12\ t^3$ (D) $4\ t^3$

29. A series R-L-C circuit has R = 50 Ω, L = 100 μF and C = 1 μF. The lower half power frequency of the circuit is

(A) 30.55 KHz (B) 51.92 KHz (C) 3.055 KHz (D) 1.92 KHz

30. The power in a series R-L-C circuit will be half of that at resonance when the magnitude of the current is equal to

(A) $V/2R$ (B) $V/3R$ (C) $V/\sqrt{2}R$ (D) $\sqrt{2}V/R$

31. A voltage $v(t)=6e^{-2t}$ is applied at $t = 0$ to series R-L circuit with L = 1H. If $i(t)=6[\exp(-2t)-\exp-(-3t)]$ then R will have a value of

(A) 2/3 Ω (B) 1Ω (C) 3 Ω (D) 1/3 Ω

32. The value of current at resonance in a series RLC circuits is affected by the value of

(A) R (B) C (C) L (D) All of these

33. The thevenin resistance of the network comprising of a resistor of 1 Ω in series with a parallel communication of a current source of 21 amperes and a resistor of 1 Ω through which 1 ampere of current flow is

(A) 2 (B) 0.5 (C) 4/3 (D) 1

34. A ramp voltage v(t) = 100 volts, is applied to an RC differentiating circuit with R = 5 K Ω and C =4 μF. The maximum output voltage is

(A) 0.2 v (B) 2 v (C) 10 v (D) 50 v

35. Two 2-potrt networks are connected in cascade. The combination is to be represented as a single two-port network. The parameters of the network are obtained by multiplying the individual

(A) Z-parameter (B) h-parameter

(C) y-parameter (D) ABCD-parameter

36. Evaluate $\int_1^9 \sqrt{x}\ln(x)dx$

(A) 28 (B) 0.444 (C) $\frac{2}{3}\sqrt{9^3}\ln(9)$ (D) 25.5

37. Calculate the linear correlation coefficient for the data points

10	20	30	40	50	60	70
0.22	0.40	0.61	0.85	1.20	1.45	1.70

(A) 0.99633 (B) 0.91919 (C) 0.99268 (D) 0.82900

38. Consider the function $f(x)=\begin{cases}1 \text{ when } x \text{ is irrational,}\\ -1 \text{ when } x \text{ is rational.}\end{cases}$

(A) The function is differentiable everywhere

(B) The function is continuous everywhere

(C) The function is discontinuous at all rational points

(D) The function is continuous but not differentiable at rational points

39. Consider a right angled triangle whose hypotenuse is h and base is x. For what value of x, the area of the triangle will be a maximum?

(A) $x = \sqrt{3}\,h/2$ (B) $x=h/\sqrt{2}$ (C) $x=h^2/4$ (D) $x=h^2/\sqrt{2}$

40. Which one of the following statements is true?

(A) The eigenvalues of skew-hermitian matrix cannot be zero

(B) A symmetric square matrix cannot be always diagonalizable.

(C) The eigenvectors corresponding to distinct eigenvalues are not linearly independent.

(D) The eigenvalues of Hermitian matrix are real.

41. The differential equation $\left|\frac{dy}{dx}\right|+|y|+c=0, c>0$

(A) Has no solution (B) Has only one trivial solution

(C) Does not have a unique solution (D) Has a unique solution

42. The Laplace transform of $\left[\frac{\sin(wt)}{t}\right]$ is equal to

(A) $\cot^{-1}(s/w)$ (B) $\tan^{-1}(s/w)$ (C) $\cot^{-1}(w/s)$ (D) $\tan^{-1}(w/s)$

43. Let the complex number $z = u + iv$. Then, the Cauchy-Riemann equations in polar coordinates are

(A) $\frac{\partial v}{\partial r} = r\frac{\partial u}{\partial \theta}$, and $\frac{\partial v}{\partial \theta} = -\frac{1}{r}\frac{\partial u}{\partial r}$

(B) $\frac{\partial u}{\partial \theta} = r\frac{\partial v}{\partial \theta}$, and $\frac{\partial u}{\partial r} = -\frac{1}{r}\frac{\partial v}{\partial \theta}$

(C) $\frac{\partial v}{\partial r} = -\frac{1}{r}\frac{\partial u}{\partial \theta}$, and $\frac{\partial v}{\partial \theta} = r\frac{\partial u}{\partial r}$

(D) $\frac{\partial u}{\partial \theta} = -\frac{1}{r}\frac{\partial v}{\partial r}$, and $\frac{\partial u}{\partial r} = r\frac{\partial v}{\partial \theta}$

44. The residue at $z = \infty$ of the complex function $f(z) = z^3 \cos\left(\frac{1}{z}\right)$ is

(A) Zero (B) One (C) Infinity (D) -1

45. The Wronskian of the functions e^x, e^{2x}, e^{3x} is equal to

(A) e^{6x} (B) $6e^{2x}$ (C) $2e^{6x}$ (D) $2e^{3x}$

46. A 90kHz bandwidth is to accommodate 6 Am broadcasts simultaneously. What maximum modulating frequency must each station be limited to?

(A) 1500 Hz (B) 5500 Hz (C) 7500 Hz (D) 3500 Hz

47. What function is served by the limiter in an FM receiver?

(A) to remove the noise variation
(B) to remove frequency variation
(C) to remove amplitude variation
(D) to remove interference signal

48. Due to refraction of TV signal in troposphere, the range

(A) increases
(B) decreases
(C) may increase or decrease
(D) remains unaffected.

49. Which of the following represents the noise figure?

(A) $\frac{S_i/N_i}{S_0/N_0}$ (B) $\frac{S_0/N_0}{S_i/N_i}$ (C) $\frac{S_0/N_0}{\sqrt{Si/Ni}}$ (D) $\frac{S_i/N_i}{\sqrt{S_0/N_0}}$

50. The order of error in the Simpson's rule for numerical integration with a step size is

(A) h (B) h^2 (C) h^3 (D) h^4

51. Phase margin of a system is used to specify

(A) frequency response
(B) time response
(C) relative stability
(D) absolute stability

52. A system has poles at -1 and -5 and zeros at 1 and -2 the system is

(A) marginally stable (B) highly stable

(C) unstable (D) stable

53. The Bode plot of the transfer function G(s)=s

(A) constant magnitude and constant phase shift angle

(B) -20 dB/decade and constant phase shift angle

(C) 20 dB/decade and phase shift of $\pi/2$

(D) zero magnitude and phase shift

54. An instruction used to the carry flag in a computer can be classified as

(A) data transfer (B) arithmetic

(C) logical (D) program control

55. The number of memory cycles required to execute the 8085 instruction LDA 3000H would be

(A) 4 (B) 2 (C) 3 (D) 5

56. The length of Program Counter of 8085 microprocessor is

(A) 16 bits (B) 6 bits (C) 8 bits (D) 12 bits

57. The following program starts at location 0100H.

LXI SP, 00FF

LXI H, 0701

MVI A, 20H

SUB M

The content of accumulator when the program counter reaches 0109H is

(A) .20H (B) .02H (C) .00H (D) .FFH

58. Modern computer possess

(A) decimal numbers (B) hexadecimal numbers

(C) digits and strings (D) binary numbers

59. Flowchart is a diagrammatic representation

(A) indicating the events occurring in the logical sequence and showing the inter-relation between them

(B) indicating the events of physical system

(C) of a chart indicating the flow of process

(D) any of the above

60. Who is regarded as a father of computer?

(A) Pascal (B) Charles Babbage

(C) John Napier (D) Abacus

61. Flag bits in arithmetic unit provide which of the following?

(A) Facilities for re-check (B) Repeatability

(C) Status type information (D) All of the above.

62. The limitation of e-beam lithography is

(A) less resolution (B) less throughput

(C) less current densities (D) none of the above

63. The disadvantage of Ion Implantation is

(A) high vaccum conditions (B) high temperature

(C) expensive (D) none of the above

64. NMOS is preferred than PMOS

(A) high switching speed (B) less power dissipation

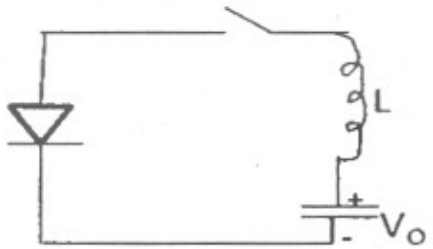
(C) high package density (D) all the above

65. The open loop transfer function of a feedback control system is $G(s) = K/ s^2(1+s)$

(A) type zero system (B) type-1 system

(C) type-2 system (D) type-3 system

66. A diode circuit with an LC load is shown in Figure with the capacitor having an initial voltage of V_0 = 220V, Capacitance = 20 μF and inductance L = 80 μH. If switch is closed at t = 0, then the peak current through the diode and the conducting time of a diode is



(A) 110 A, 125.66 s
(B) 110A, 125.66 ms
(C) 110 A, 125.66 minutes
(D) 100 A, 125.66 μs

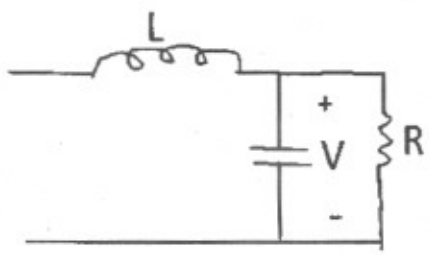
67. The lowering of the energy barrier at the cathode because of the positive gradient of potential at cathode is commonly known as

(A) Skin effect
(B) Johnson effect
(C) Avalanch mechanism
(D) Schotkky effect

68. An operational amplifer having a slew rate of 2 V/μs. The maximum closed loop voltage gain that can be used when the input single varies by 0.5 V in 10 μs is

(A) 20 (B) 30 (C) 40 (D) 50

69. An LC filter shown in figure is used to reduce the ripple constant of the output voltage for a single phase full wave rectifier. The nth harmonic ripple current to pass through the filter capacitor, the load impedance must be ———— that of the capacitor



(A) Much greater than
(B) Much lower than
(C) Equal to
(D) None of the above

70. A capacitive transducer is made up of two capacitive cylindrical electrodes. The outer diameter of the inner cylinder electrode is 3 mm and the dielectric medium is air. The inner diameter of electrode is 3.1 mm. The dielectric stress when a voltage of 100 V is applied across electrode is

(A) 2 kV/hour (B) 2 kV/min (C) 2 kV/sec (D) 2 kV/m

71. For a practical amplifier, the overall gain is greater if the internal resistance of the signal source is

(A) Small (B) High

(C) Infinite (D) None of the above

72. The ———— feedback circuit is used to decrease gain and increases both the input and output impedance of the amplifier

(A) Voltage series (B) Current series

(C) Voltage shunt (D) Current shunt

73. A bipolar junction transistor has beta (β) value of 62, then alpha (α) is given by

(A) 0.0984 (B) 9.84

(C) 0.984 (D) Data is not enough

74. The frequency of oscillation of three stage ladder network oscillator in which C = 10 nF & R= 10 k Ω is

(A) 674 kHz (B) 647 khz (C) 674 Hz (D) 647 Hz

75. The amplifer utilizes n-channel FET for which Vp = -2.0V, g_{mo} = 1.6 mA/V & I_{DSS} =1.65 mA. It is designed to bias the circuit at I_D = 0.8 mA using V_{DD} = 24 V. Assume $r_d >> R_d$, then V_{GS} is equal to

(A) -0.62 V (B) 0.62 V (C) - 6.2 V (D) 6.2 V

76. Hysteresis is desirable in Schmitt-trigger, because

(A) energy is to be stored/discharged in parasitic capacitances

(B) effects of temperature would be compensated

(C) devices in the circuit should be allowed time for saturation and desaturation

(D) it would prevent noise from causing false triggering

77. The control terminal (pin5) of 555 timer IC is normally connected to ground through a capacitor (~ 0.01 μF). This is to

(A) protect the IC from inadvertent application of high voltage

(B) prevent false triggering by noise coupled onto the pin

(C) convert the trigger input to sharp pulse by differentiation

(D) suppress any negative triggering pulse

78. The reverse – saturation current of a silicon diode

(A) doubles for every 10°C increase in temperature

(B) does not change with temperature

(C) halves for every 1°C decrease in temperature

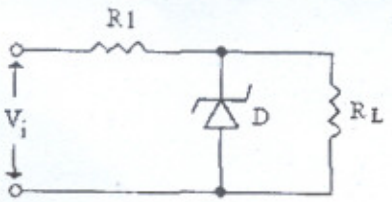
(D) increases by 1.5 times for every 2°C increment in temperature

79. Wien bridge oscillator can typically generate frequencies in the range of

(A) 1 KHz – 1 MHz (B) 1 MHz – 10 MHz

(C) 10 MHz – 100 MHz (D) 100 MHz – 150 MHz

80. In the voltage regulator shown below, if the current through the load decreases,



(A) The current through R1 will increase

(B) The current through R1 will decrease

(C) Zener diode current will increase

(D) Zener diode current will decrease

81. The main advantage of a crystal oscillator is that its output is

(A) 50Hz to 60Hz (B) variable frequency

(C) d.c (D) a constant frequency

82. Just as a voltage amplifier amplifies signal-voltage, a power amplifier

(A) Merely converts the dc power into useful ac power

(B) Amplifies power

(C) Amplifies signal current

(D) Merely converts the signal ac power into the dc power

83. The forward characteristic of a diode has a slope of approximately 50mA/V at a desired point. The approximate incremental resistance of the diode is

(A) 50 Ω (B) 35 Ω (C) 20 Ω (D) 10 Ω

84. The width of depleted region of a PN junction is of the order of a few tenths of a

(A) Millimeter (B) Meter (C) Nanometer (D) Micrometer

85. The important characteristic of emitter-follower is

(A) high input impedance and high output impedance

(B) high input impedance and low output impedance

(C) low input impedance and low output impedance

(D) low input impedance and high output impedance

86. A straight horizontal length of copper wire has a current i=28 A through it. The mass per unit length of copper is 46.6 gm^{-1}. What is magnitude of the magnetic field **B** needed to suspend the wire in air (that is to balance gravitational force on it)?

(A) 0.16 T

(B) 28 times the strength of earth's magnetic field

(C) 0.28 T

(D) 1.6×10^{-2} T

87. The moment of inertia I of a solid sphere of mass M and radius R about any diameter is

(A) $I = \frac{2}{3}MR^2$ (B) $I = \frac{1}{2}MR^2$ (C) $I = MR^2$ (D) $I = \frac{2}{5}MR^2$

88. A uniform solid cylindrical disk of mass M=1.4 kg and radius R=8.5 cm rolls smoothly across a horizontal table at a speed of 15 cm s^{-1}. The kinetic energy K of the disk is

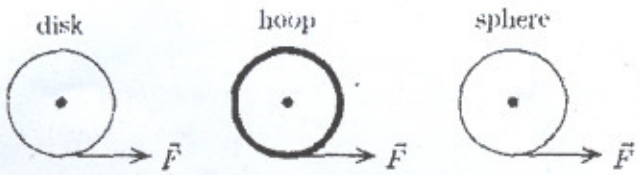
(A) K = .01575 (B) K = 157.5 J (C) K = 0.24 J (D) K = 0.024J

89. The potential energy of a particle in a field is of the form $U(r) = \left(\frac{a}{r^2} - \frac{b}{r}\right)$ where the constants are a>0 and b> 0 and r is the distance of the particle from the center of the field. The maximum force is

(A) $F_{max} = \frac{b^3}{27a^2}$ and is repulsive (B) $F_{max} = \frac{b^3}{27a^2}$ and is attractive

(C) $F_{max} = \frac{b^2}{27a^2}$ and is repulsive (D) $F_{max} = \frac{b^2}{27a^2}$ and is attractive

90. A uniform disk, a thin hoop and a uniform sphere, all with the same mass and same outer radius, are each free to rotate about a fixed axis through its center (see below figure). Assume the hoop is connected to the rotation axis by light spokes. With the objects starting from rest, identical forces are simultaneously applied to the rims, as shown. Rank the objects according to their angular acceleration, least to greatest



(A) Disk, hoop, sphere
(B) Hoop, disk, sphere
(C) Hoop, sphere, disk
(D) Disk, sphere, hoop

91. Two ideal monoatomic gases are in thermal equilibrium with each other. Gas A is composed of molecules with mass m while gas B is composed of molecules with mass 4 m. The ratio of the average molecular speeds v_A/v_B is

(A) $\frac{1}{4}$ (B) $\frac{1}{2}$ (C) 2 (D) 1

92. The pressure of an ideal gas is doubled in an isothermal process. The root-mean-square speed of the molecules

(A) Increase by a factor of $\sqrt{2}$
(B) Does not change
(C) Decrease by a factor of $\frac{1}{\sqrt{2}}$
(D) Increase by a factor of 2

93. The Maxwellian speed distribution provides a direct explanation of

(A) Evaporation
(B) Boiling
(C) Thermal expansion
(D) Ideal gas law

94. The molar mass of a certain gas is 32 mol^{-1}. The root mean square speed v_{rms} of the gas at 30 °C is

(A) 483 ms^{-1} (B) 4.83 ms^{-1} (C) 152.92 ms^{-1} (D) 4830 ms^{-1}

95. A thermal nutron has a speed v that corresponds to room temperature T = 300 K. What is the deBroglie wavelength of thermal neutron?

(A) 1.4 nm (B) 14 nm (C) 0.4 Å (D) 1.4 Å

96. Calculate Compton wavelength for a proton whose rest mass is 938.3 MeV.

(A) 1320 Å (B) 4860 Å (C) 1.32×10^{-5} m (D) 0.1726 Å

97. Calculate the momentum of a photon whose wavelength is 10 Å

(A) 0 kg ms^{-1} (B) 1.24×10^{-34} kg ms^{-1}

(C) 1.24 MeV/c (D) 4.14×10^{3} MeV/c

98. Half wave plate will introduce a phase difference of ———— between ordinary and extraordinary waves

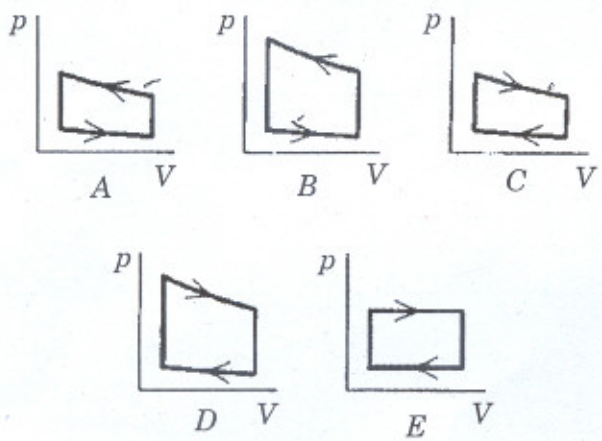
(A) 180° (B) 90° (C) 270° (D) 360°

99. Diffraction of light can be understood by

(A) Wave nature of light (B) Particle nature of light

(C) Both (A) and (B) (D) None of the above

100. The pressure vs. volume graphs for a certain gas undergoing five different cyclic processes shown in Figure. During which cycle (s) does the gas do the greatest positive



(A) Processes B and D (B) Processes A and C

(C) Process D (D) Process E