GREENLAND INT'L S.S.

Second Terminal Examination - 2074

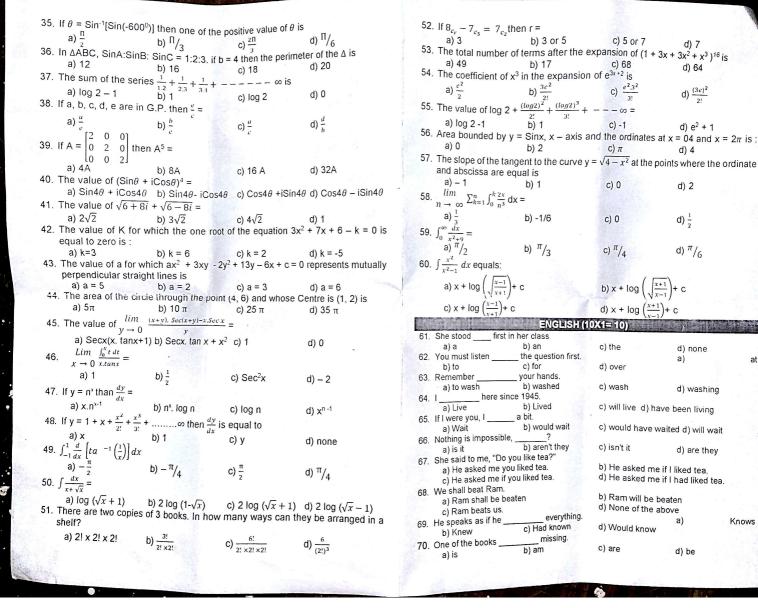| Class : XI	**OBJECTIVE EXAM**	F.M. 100
Time : 100 mins	Group : Math	Set–B

ENGLISH (10X1=10)

1. I know how to play _____ piano.
   a) a   b) an   c) the   d) none

2. I was astonished _____ the sad news.
   a) at   b) in   c) with   d) to

3. He enjoys _____ novels.
   a) read   b) to read   c) have read   d) reading

4. I wish that I _____ the work today.
   a) did   b) had done   c) will do   d) have done

5. Let's move now, _____?
   a) will you   b) won't you   c) shan't we   d) shall we

6. He said, "Bring your book Ram".
   a) He said to bring his book.   b) He told Ram to bring your book.
   c) He told Ram to bring his book.   d) He told Ram not to bring his book.

7. Two lions were killed.
   a) Someone kills two lions.   b) Someone killed two lions.
   c) Someone had killed two lions   d) someone will kill to lions.

8. Either of the two boys _____ willing to work.
   a) is   b) am   c) are   d) be

9. Mary and _____ would rather go to the movies.
   a) me   b) I   c) we   d) my

10. I don't know anything, and she _____
    a) doesn't neither   b) does too   c) does not either   d) neither did

CHEMISTRY (30X1= 30)

11. Magnetic quantum number is related to
    a) Size   b) Shape   c) orientation   d) spin

12. In an oxidation reaction, the oxidation number
    a) increases   b) decreases   c) doesnot charge   d) both a &b

13. O.N. of O m OF_2 is
    a) O   b) -1   c) -2   d) +2

14. Oxidation state of oxygen atom in potassium super oxide is
    a) 0   b) $-\frac{1}{2}$ c) – 1   d) -2

15. Which is reducing agent?
    a) Sn   b) NO_3^- c) Cl^- d) H^+

16. Equal wt. of CH_4 & O_2 are mixed in a empty container at 25°C, the fraction of total pressure exerted by oxygen is
    a) $1/3$ b) $2/3$ c) $8/9$ d) $9/8$

17. Which of the following mixture of gases donot obey Dalton's law of partial

18. Vol. of a gas at 27°C is 47 litres. If temperature of gas is lowered to 150K, at same pressure, its volume will be
    a) 0.5L   b) 1.0L   c) 2.0L   d) 4.0L

19. Which gas has density 1.6 gm/l at 26.5°C under 680.2 mm.Hg pressure?
    a) CH_4 b) C_2H_6 c) CO_2 d) SF_6

20. The solubility of which solute decreases on increasing temperature?
    a) KCl   b) NaOH   c) Nacl   d) $K_2Cr_2O_7$

21. The Solubility of gases in liquids increase with increase of
    a) Pressure   b) temperature   c) concⁿ of gases in liquid
    d) Volume

22. The solubility of a salt at 90°C is 80 & at 30°C is 20. The wt. of crystals formed.
    a) 20gm   b) 40gm   c) 500 gm   d) 30 gm

23. Freshly prepared $FeSO_4$ solution + dil.H_2SO_4 + dil. salt solution gives brown ring. It is due to
    a) NO_3^- b) I^- c) Br^- d) SO^{--}

24. C_7H_7Cl represents how many isomers?
    a) 2   b) 3   c) 4   d) 5

25. IUPAC name of $(CH_3)_2 CH CH = CH CH_3$ is
    a) 2- Methyl pentene-3   b) 4- Methyl pentene -2
    c) 1, 2 – Isopropyl propene -1   d) 3 – Isopropyl propene – 2

26. Which of the following is not a nucleophile?
    a) CN^- b) OH^- c) NH_3 d) BF_3

27. The spectrum of Li^+ is expected to be similar to that of
    a) H   b) Fe^{++} c) Na^+ d) Be^{++}

28. Wave nature of electron was experimentally verified by
    a) Bohr   b) Rutherford   c) de Broglie   d) Dalton

29. Diamond is used in glass cutting due to its
    a) hard nature   b) high refractive index   c) high m.p.
    d) high metallic bonding

30. Carbon atoms in diamond are bonded with each other in a configuration
    a) Linear   b) tetrahedral   c) Planner   d) Octahedral

31. Amongst the oxides of nitrogen, the neutral oxide is
    a) NO   b) N_2O_5 c) N_2O_3 d) NO_2

32. Ammonia can't be dried by
    a) Conc. H_4SO_4 b) P_4O_{11} c) CaO   d) Anhyd.$CaCl_2$

33. Isomer of ethanol is
    a) Methanol   b) dimethyl ether   c) diethyl ether   d) Acetaldehyde

34. No of isomers shown by $C_4H_{10}O$ is
    a) 3   b) 5   c) 7   d) 4

35. Maximum derivation from ideal behavior is shown by
    a) N_2 b) NO   c) NH_3 d) NF_3

36. The temperature at which volume of gas becomes theoretically zero is
    a) 273K   b) $1/273$K   c) -273K   d) -273°C

37. A gas is heated in such a way that its volume & absolute temperature both are double the pressure of the gas
    a) becomes 2 times   b) becomes 4 times

38. Gases deviate from ideal behavior only at
   a) high P & low T   b) Low P & high T c) high P & high T d) low P and low T
39. Gases deviate from ideal behaviour because molecules
   a) contain covalent bonds   b) attract each other
   c) repel each other   d) are colourless
40. Who propounded law of multiple proportion?
   a) Lavoisier   b) Dalton   c) Proust   d) Richter

PHYSICS (30X1= 30)

41. The relation $3t = \sqrt{3x} + 6$ describe the displacement of a particle in one direction where x is in meter and t in sec. The displacement, when velocity is zero is
   a) 24m   b) 12m   c) 5m   d) 0
42. A projectile is fired with velocity μ making angle θ with horizontal. What is the change in velocity when it is at highest point?
   a) $\mu Cos\theta$ b) μ c) $\mu Sin\theta$ d) 0
43. A particle travel 10m in first 5 sec and 10m in the next 3sec. If acceleration be constant, what is the distance travelled in next 2 Sec.
   a) 8.3   b) 9.3   c) 10.3   d) 5
44. A body freely falling from the rest has a velocity 'v' after it falls through height 'h'. The distance it has to fall for its velocity to become double is
   a) 2h   b) 4h   c) 6h   d) 8h
45. A fixed volume of iron is drawn into a wire of length L. The extension produced in the wire by a constant force f is proportional to
   a) L^{-2} b) L^{-1} c) L^2 d) L
46. To break a wire, a force of 10^6 Nm^{-2} is required. If the density of the material is 3×10^3 kg m^{-3} then the length of the wire which will break by its own weight will be
   a) 34m   b) 30m   c) 300m   d) 43m
47. The pressure applied from all direction on a cube is P, how much its temperature should be increased to maintain the original volume? If Bulk elasticity is β and Volume expansicity is α
   a) $P/3\alpha\beta$ b) $P/\alpha\beta$ c) $\frac{P\alpha}{\beta}$ d) $3P\alpha\beta$
48. Work done in terms of surface tensions S in order to increase radius of soup bubble from R to 2R is
   a) $24\ \pi R^2 s$ b) $48\ \pi R^2 s$ c) $12\ \pi R^2 s$ d) $36\ \pi R^2 s$
49. Excess pressure inside two soap bubble are 0.1 and 0.2 atmospheric pressure. Radio between their volume is
   a) 1:2   b) 2:1   c) 4:1   d) 8:1
50. A which temperature, the value of surface tension of water is minimum
   a) 4ºC   b) 25ºC   c) 0ºC   d) 26ºC
51. A hollow sphere of volume V is floating on water surface with half immersed in it. What should be the minimum volume of water poured inside the sphere so that it may sink.
   a) $V/2$ b) $V/3$ c) $V/4$ d) V
52. Water flows through a tube of non-uniform cross section with ratio of radius at two end is 3:2 What will be the ratio of velocity at entry and exit of liquid
   a) 4:9   b) 3:2   c) 2:3   d) 9:4

53. The relative velocity of two consecutive layers is 8cm/s and their separa 0.1cm. Their velocity gradient will be
   a) 0.08 sec⁻ᶜ   b) 0.8 Sec⁻¹   c) 8Sec⁻¹   d) 80 Sec⁻¹
54. Water flows in a streamlined manner through a pipe of radius a, pressu difference being P and the rate of flow Q. If the radius is reduced to $a/2$ and pressure increased to 2P, the rate of flow becomes
   a) 8Q   b) Q   c) $Q/4$ d) $Q/8$
55. A convex mirror has a focal length 'f'. A real object is placed at a distance f in front of it from the pole produces an image at
   a) infinity   b) pole   c) 2f   d) $f/2$
56. A convex mirror of focal length f forms an image which is $1/n$ times the object. The distance of object from the mirror is
   a) (n-1) f   b) $\left(\frac{n-1}{n}\right) f$ c) $\left(\frac{n+1}{n}\right) f$ d) (n + 1) f
57. A plane mirror and a person are moving towards each other with same speed V. Then the velocity of the image is
   a) V   b) 2V   c) 3V   d) 4V
58. A boy is in a room whose ceiling and two adjacent walls are mirror. How many image are formed
   a) 3   b) 5   c) 7   d) 9
59. Two equal masses (m) are projected at the same angle θ from two points separated by their range with equal velocity V. The momentum at the point of collision is
   a) Zero   b) $2mvCos\theta$ c) $2mvSin\theta$ d) $-2mvCos\theta$
60. For a projectile the ratio of maximum height reached to the square of flight time is (g = 10ms⁻²)
   a) 5:4   b) 5:2   c) 5:1   d) 10:1
61. A liquid with coefficient of volume expansion γ is filled in a container with coefficient of linear expansion α, If the liquid overflows on heating then,
   a) $\gamma = 3\alpha$ b) $\gamma > 3\alpha$ c) $\gamma < 3\alpha$ d) $\gamma > \alpha$
62. The coefficient of expansion is a α per degree Celsius. It is _____ per degree Fahrenheit.
   a) α b) $(5/9)\ \alpha$ c) $(9/5)\ \alpha$ d) 0.5 α
63. The volume of a gas at t_1ºC and t_2ºC are V_1 and V_2 respectively. The volume coefficient of expansion of gas is
   a) $\frac{V_1 - V_2}{t_2 - t_2}$ b) $\frac{V_2}{V_1 t_1} - \frac{V_1}{V_2 t_2}$ c) $\frac{V_1}{V_2 t_2} - \frac{V_2}{V_1 t_2}$ d) $\frac{V_2 - V_1}{V_1 t_2 - V_2 t_1}$
64. Cylindrical vessel of volume v and linear coefficient of expansion α contains a liquid. On providing heat the level of liquid remains constant. The volume coefficient of expansion of liquid is
   a) $\frac{V - \alpha}{V}$ b) $\frac{V + \alpha}{V}$ c) α d) 3 α
65. The image formed by a convex mirror of focal length 10cm is half the size of the object. Then the distance of the object from the mirror is
   a) 10cm   b) 5cm   c) 15cm   d) 30cm
66. An isolated conductor is given positive charge, its mass
   a) increases   b) remains same   c) decreases
   d) mass 1ˢᵗ increase then decreases

A hollow sphere of charge does not produce electric field at any
a) interior point   b) outer point   c) surface point   d) all of the above

8. The sure test of electrification is
a) attraction   b) Repulsion   c) does not depend on either
d) remaining neutral

69. When the distance between two charged particle is halved, the coulomb force between them becomes
a) One-fourth   b) One-half   c) double   d) four times

70. A positively charged glass rod attracts an object. The object must be
a) negatively charged   b) neutral
c) either negatively charged or neutral   d) a magnet

MATHEMATICS (30X1=30)

71. Which is a null set?
a) $\{x: x = x\}$ b) $\{x: x \neq x\}$ c) $\{x: x = x^2\}$ d) $\{x: x \neq x^2\}$

72. Two sets A = {2, 3} and B= $\{x: x^2 - 5x + 6 = 0\}$ are
a) Equal sets   b) intersecting sets   c) subsets   d) disjoint sets

73. If $x + y = \frac{\pi}{4}$ then the value of (1 +tanx) (1 +tany) =
a) 1   b) 2   c) -1   d) -2

74. If $\theta = -1125^0$ then the value of the expression $(\sin\theta + \cos\theta)$ is
a) zero   b) positive   c) negative   d) None

75. The sum of 40 A.M.^{s} between two numbers is 120. Then the sum of 50 A.M.^{s} between them is equal to:
a) 150   b) 120   c) 140   d) 130

76. If $S_n = n^3 - 100$ then t_{10}=
a) $10^3 - 9^3$ b) 200   c) $9^3 - 8^3$ d) 1000

77. The sum of the series $\frac{1}{1.2} + \frac{1}{2.3} + \frac{1}{3.4} + \cdots \ldots \ldots \ldots$ upto ∞ is
a) log 2-1   b) log 2   c) 1   d) 0

78. If a, b, c are in A.P. then 3^a, 3^b, 3^c are in
a) A.P.   b) G.P.   c) H.P.   d) None

79. If 1 + 6+ 11 + 16 + --------- +x = 148 then x is equal to
a) 36   b) 8   c) 30   d) 20

80. A is a matrix of 3 x 4. both A^TB and BA^T are defined then the order of B is:
a) 3x 3   b) 3x 4   c) 4x 3   d) 4x 4

81. If A = $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ then $A^2 + 2A$ equals.
a) A   b) 2A   c) 3A   d) 4A

82. The value of the determinant $\begin{vmatrix} a+x & a & x \\ a-x & a & x \\ a-x & a & x \end{vmatrix}$ =
a) 0   b) 2a   c) 2   d) 1

83. If $\begin{vmatrix} x & 2 & 3 \\ 2 & x+3 & 6 \\ 3 & 6 & x+5 \end{vmatrix} = 0$ then x =
a) 1   b) 0   c) -1   d) 3

84. If $i = \sqrt{-1}$ then the value of i^{469} is :
a) i   b) – i   c) 1   d) – 1

85. If $x - iy = \frac{3-2i}{3+2i}$ then the value of $x^2 + y^2$=
a) 1   b) $^2/_9$ c) $^3/_5$ d) $^4/_3$

86. Amplitude of i =
a) π b) $\frac{\pi}{2}$ c) $\frac{\pi}{3}$ d) $^\pi/_4$

87. The value of $(1 + i)^{20}$ =
a) 2^{10} b) 2^{15} c) 2^{20} d) -2^{10}

88. The value of $\omega^{66} + \frac{1}{\omega^{66}}$ =
a) 1   b) -1   c) 0   d) 2

89. The roots of the equation $5x^2 - px + 30 = 0$ are equal then p =
a) ±15   b) ±30   c) ±45   d) ± 20

90. $\lim\limits_{x \to 0} \frac{\sin x^0}{x}$ =
a) $\frac{\pi}{180}$ b) $\frac{180}{\pi}$ c) 1   d) – 1

91. $\lim\limits_{x \to \infty} \frac{2x^2+3x-4}{3x^2+5x+7}$ =
a) 0   b) ∞ c) $\frac{2}{3}$ d) 1

92. Which of the following is not an indeterminate form
a) $\frac{\infty}{\infty}$ b) $0 - 0$ c) $\frac{0}{0}$ d) $(\infty - \infty)$

93. $\lim\limits_{x \to \infty} \frac{\sin x}{x}$ =
a) 1   b) 0   c) -1   d) ∞

94. $\lim\limits_{x \to 0^-} \frac{2x}{|x|+x^2}$ =
a) 1   b) -2   c) 2   d) 0

95. If $y = \tan^{-1}\left(\frac{1+\tan x}{1-\tan x}\right)$ then $\frac{dy}{dx}$ =
a) $\frac{1}{2}$ b) 1   c) -1   d) $\sec^2(^\pi/_4 + x)$

96. The derivative of $\log\left[\tan(^\pi/_4 + ^x/_2)\right]$ is :
a) 2tanx   b) $\frac{1}{2}$ Sinx   c) Secx   d) tanx

97. $\frac{d}{dx}\left[\cos^{-1}(\sin x)\right]$ =
a) x   b) -1   c) Cosx   d) 0

98. The differential coefficient of $\log_a x$ w.rt.x is
a) $\frac{\log_a e}{x}$ b) $\frac{x}{\log a}$ c) $\frac{\log x}{a}$ d) $\frac{1}{x}$

99. $\frac{d}{dx}\left[\log\sqrt{\frac{1-\cos x}{1+\cos}}\right]$ =
a) Sec x   b) Cosecx   c) $\frac{1}{2}$ Secx   d) $\frac{1}{2}$ Cosecx

100. If $y = \log(\log x)$ then $e^y \frac{dy}{dx}$ =
a) 1   b) x c) $\frac{1}{x}$ d) $2x^2$

GREENLAND INT'L S.S.

Second Terminal Examination - 2074

Class : XII	OBJECTIVE EXAM	F.M. 100
Time : 100 mins	Group : Math	Set-A

CHEMISTRY (30X1= 30)

1. 1 amu is equal to
   a) $N_A (6.023 \times 10^{23})$ b) $\frac{1}{N_A}$ c) $\frac{12}{N_A}$ d) $12 \times N_A$

2. The total no. of electrons present in 1.6 gm of methane is
   a) N_A b) $\frac{N_A}{10}$ c) $N_A \times 10$ d) $1.6 \times N_A$

3. Air contains 78% air by mass. The volume at STP of oxygen in 7.8 gm air is
   a) $(22.4 \times 3.042)/16$ b) $(11.2 \times 3.042)/16$
   c) $(22.4 \times 8)/16$ d) $(22.4 \times 32)/16$

4. A electron jumps from higher orbit, then energy of electron
   a) increase   b) decreases   c) remains constant
   d) 1st increases & then decreases

5. The bonds present in N_2O_5 are
   a) only ionic   b) covalent & dative   c) only covalent   d) covalent & ionic

6. In an oxidation reaction, oxidation number
   a) increases   b) decreases   c) doesnot change   d) Both a and b

7. Which is reducing agent?
   $8H^+ + 4HNO_3 + 6Cl^- + Sn \rightarrow SnCl_6^{2-} + 4NO_2 + 4H_2O$
   a) Sn   b) NO_3^- c) Cl^- d) H^+

8. The conjugate base of NH_4^+ is
   a) NH_3 b) NH_4OH c) H_3O^+ d) OH^-

9. Equal wt. of methane & oxygen are mixed in an empty container at 25^0C. The fraction of total pressure exerted by oxygen is
   a) 1/3   b) 2/3   c) 8/9   d) 9/8

10. Which of the following is not a crystalline solid?
    a) KCl   b) CsCl   c) glass   d) Rhombic Sulphur

11. What volume of water should be added to make 25ml of 6F HNO_3 to 0.5F HNO_3?
    a) 275ml   b) 80ml   c) 300ml   d) 350ml

12. 200ml of 1N–H_2SO_4 (f=1.05) has........... gm of H_2SO_4.
    a) 200   b) 96   c) 48   d) 10.299

13. The reaction: Graphite + 186 kj $\rightleftharpoons$ Diamond, shifts forward direction at
    a) low pressure   b) High pressure
    c) Low temperature   d) Inert atmosphere

14. When NH_4OH is reacted with acid, at the end point, the pH of the solution will be.
    a) 0   b) 11   c) 7   d) 13

15. If a solution of pH = 0, 100 ml of pure water is added, then the mixture will be
    a) acidic (pH = 2)   b) alkaline (pH = 8)   c) amphoteric   d) Neutral (pH = 7)

16. The pH of a solution prepared by dissolving 2gm of NaOH in water & diluting to 500 ml is
    a)1.3   b) 3.1   c)13   d)7

17. A child is going with his father & mother. The speed of father is 5 km/h & that of mother is 4km/h & that of child is 3 km/h. What is the speed of the party?
    a) 5 km/h   b) 3 km/h   c) 4 km/h   d) 12 km/h

18. Electrolytic reduction method is used in the extraction of
    a) Highly electropositive metals   b) Highly electronegative
    c) inert metals   d) transition metals

19. The smallest one is
    a) N^{3-} b) O^{2-} c) F^- d) N^+

20. The core of electromagnets is prepared from
    a) Pig iron   b) Steel   c) Stainless steel   d) Wrought iron

21. An isomer of ethanol is
    a) methanol   b) diethyl ether   c) dimethyl ether   d) acetaldehyde

22. Which is insoluble in water?
    a) CH_3OH b) C_6H_6 c) CH_3NH_2 d) CH_3CONH_2

23. Anti Markovnikov's addition of HBr is not observed in
    a) Propene   b) Pentene   c) 2-butene   d) butane

24. Nitroglycerine is
    a) alcohol   b) am ester   c) an acid   d) a soap

25. When calcium formate is distilled, the product formed is
    a) H_2 b) CO & H_2O c) HCHO   d) CH_3CHO

26. Which of the following reagent reacts readily with both aldehyde & Ketone?
    a) Fehling's Solution   b) Tollen's reagent
    c) Schiff's reagent   d) Grignard's reagent

27. Methyl amine reacts with nitrous acid to form
    a) CH_3OH b) $CH_3{-}O{-}N = O$ c) $CH_3 - N{\diagdown}^{O}_{O}$ d) NH_3

28. $R - X \xrightarrow{AqCN} B \xrightarrow{Na/C_2H_5OH} C$, the compound C in above reactions is
    a) Primary amine   b) Secondary amine   c) tertiary amine   d) ester

29. Reaction of primary amine with aldehyde is
    a) amide   b) amine   c) nitrile   d) nitro-compound

30. Who propounded law of multiple proportion?
    a) Lavoisier   b) Dalton   c) Proust   d) Richter

MATHEMATICS (30X1= 30)

31. Range of the function $y = e^x$ is
    a) $[0, \infty)$ b) $(0, \infty)$ c) $(o, 1)$ d) $[o, 1]$

32. If $A \cap B = \phi$, then A-B =
    a) A   b) B   c) B – A   d) ϕ

33. If $3^x - 3^{x-1} = 6$ then the value of log x^x is equal to
    a) 9   b) log 4   c) log 3   d) $\frac{2}{3}$

34. The inverse of the function $f(x) = x^2$ is
    a) $\sqrt{x}$ b) $x^{1/2}$ c) x   d) does not exist

35. If $\theta = \sin^{-1}[\sin(-600^0)]$ then one of the positive value of θ is
a) $\frac{\pi}{2}$
b) $\pi/3$
c) $\frac{2\pi}{3}$
d) $\pi/6$

36. In $\triangle ABC$, $\sin A : \sin B : \sin C = 1:2:3$. if $b = 4$ then the perimeter of the $\triangle$ is
a) 12
b) 16
c) 18
d) 20

37. The sum of the series $\frac{1}{1.2} + \frac{1}{2.3} + \frac{1}{3.4} + \cdots \infty$ is
a) $\log 2 - 1$
b) 1
c) $\log 2$
d) 0

38. If a, b, c, d, e are in G.P. then $\frac{e}{c} =$
a) $\frac{a}{c}$
b) $\frac{b}{c}$
c) $\frac{a}{c}$
d) $\frac{d}{b}$

39. If $A = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{bmatrix}$ then $A^5 =$
a) 4A
b) 8A
c) 16 A
d) 32A

40. The value of $(\sin\theta + i\cos\theta)^4 =$
a) $\sin 4\theta + i\cos 4\theta$
b) $\sin 4\theta - i\cos 4\theta$
c) $\cos 4\theta + i\sin 4\theta$
d) $\cos 4\theta - i\sin 4\theta$

41. The value of $\sqrt{6+8i} + \sqrt{6-8i} =$
a) $2\sqrt{2}$
b) $3\sqrt{2}$
c) $4\sqrt{2}$
d) 1

42. The value of K for which the one root of the equation $3x^2 + 7x + 6 - k = 0$ is equal to zero is :
a) k=3
b) k = 6
c) k = 2
d) k = -5

43. The value of a for which $ax^2 + 3xy - 2y^2 + 13y - 6x + c = 0$ represents mutually perpendicular straight lines is
a) a = 5
b) a = 2
c) a = 3
d) a = 6

44. The area of the circle through the point (4, 6) and whose Centre is (1, 2) is
a) 5π
b) 10π
c) 25π
d) 35π

45. The value of $\lim\limits_{y \to 0} \frac{(x+y).\sec(x+y) - x\sec x}{y} =$
a) $\sec x(x. \tan x + 1)$
b) $\sec x. \tan x + x^2$
c) 1
d) 0

46. $\lim\limits_{x \to 0} \frac{\int_0^x t\, dt}{x.\tan x} =$
a) 1
b) $\frac{1}{2}$
c) $\sec^2 x$
d) -2

47. If $y = n^x$ than $\frac{dy}{dx} =$
a) $x.n^{x-1}$
b) $n^x. \log n$
c) $\log n$
d) x^{n-1}

48. If $y = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \cdots \infty$ then $\frac{dy}{dx}$ is equal to
a) x
b) 1
c) y
d) none

49. $\int_{-1}^{1} \frac{d}{dx}\left[ta^{-1}\left(\frac{1}{x}\right)\right] dx$
a) $-\frac{\pi}{2}$
b) $-\pi/4$
c) $\frac{\pi}{2}$
d) $\pi/4$

50. $\int \frac{dx}{x + \sqrt{x}} =$
a) $\log(\sqrt{x} + 1)$
b) $2\log(1-\sqrt{x})$
c) $2\log(\sqrt{x} + 1)$
d) $2\log(\sqrt{x} - 1)$

51. There are two copies of 3 books. In how many ways can they be arranged in a shelf?
a) 2! x 2! x 2!
b) $\frac{3!}{2! \times 2!}$
c) $\frac{6!}{2! \times 2! \times 2!}$
d) $\frac{6}{(2!)^3}$

52. If $8_{c_r} - 7_{c_3} = 7_{c_2}$ then r =
a) 3
b) 3 or 5
c) 5 or 7
d) 7

53. The total number of terms after the expansion of $(1 + 3x + 3x^2 + x^3)^{16}$ is
a) 49
b) 17
c) 68
d) 64

54. The coefficient of x^3 in the expansion of e^{3x+2} is
a) $\frac{e^2}{2}$
b) $\frac{3e^2}{2!}$
c) $\frac{e^2.3^2}{3!}$
d) $\frac{(3e)^2}{2!}$

55. The value of $\log 2 + \frac{(\log 2)^2}{2!} + \frac{(\log 2)^3}{3!} + \cdots \infty =$
a) $\log 2 - 1$
b) 1
c) -1
d) $e^2 + 1$

56. Area bounded by $y = \sin x$, x – axis and the ordinates at $x = 04$ and $x = 2\pi$ is :
a) 0
b) 2
c) π
d) 4

57. The slope of the tangent to the curve $y = \sqrt{4 - x^2}$ at the points where the ordinate and abscissa are equal is
a) -1
b) 1
c) 0
d) 2

58. $\lim\limits_{n \to \infty} \sum_{k=1}^{n} \int_0^k \frac{2x}{n^3}\, dx =$
a) $\frac{1}{3}$
b) -1/6
c) 0
d) $\frac{1}{2}$

59. $\int_0^\infty \frac{dx}{x^2+9} =$
a) $\pi/2$
b) $\pi/3$
c) $\pi/4$
d) $\pi/6$

60. $\int \frac{x^2}{x^2-1}\, dx$ equals:
a) $x + \log\left(\sqrt{\frac{x-1}{x+1}}\right) + c$
b) $x + \log\left(\sqrt{\frac{x+1}{x-1}}\right) + c$
c) $x + \log\left(\frac{x-1}{x+1}\right) + c$
d) $x + \log\left(\frac{x+1}{x-1}\right) + c$

61. She stood ____ first in her class.
a) a
b) an
c) the
d) none

62. You must listen _____ the question first.
a) ___
b) to
c) for
d) over

63. Remember _____ your hands.
a) to wash
b) washed
c) wash
d) washing

64. I _____ here since 1945.
a) Live
b) Lived
c) will live
d) have been living

65. If I were you, I _____ a bit.
a) Wait
b) would wait
c) would have waited
d) will wait

66. Nothing is impossible, _____?
a) is it
b) aren't they
c) isn't it
d) are they

67. She said to me, "Do you like tea?"
a) He asked me if I liked tea.
b) He asked me if I liked tea.
c) He asked me if you liked tea.
d) He asked me if I had liked tea.

68. We shall beat Ram.
a) Ram shall be beaten
b) Ram will be beaten
c) Ram beats us.
d) None of the above

69. He speaks as if he _____ everything.
a) ___
b) Knew
c) Had known
d) Would know

Knows

70. One of the books _____ missing.
a) is
b) am
c) are
d) be

71. A body is projected at an angle θ with vertical, with kinetic energy E. the potential energy at the topmost point of the path, neglecting air resistance is
    a) Zero b) E c) E Cos²θ d) E Sin² θ

72. Density of gold is 19.3 gm/cc and that of copper is 8.9 gm/cc. 10 gm of gold and 10gm of copper is mixed to form an alloy. The density of alloy is
    a) 10.4 gm/cc b) 11.4 gm/cc c) 12.4 gm/cc d) 9.4 gm/cc

73. 8 mercury drops coalesce to form one mercury drop. The energy change by a factor of
    a) 1 b) 2 c) 4 d) 6

74. A particle is thrown vertically upward. If its velocity at half of the maximum height is 10 m/s, then maximum height attained by it is (g = 10 ms⁻²)
    a) 8m b) 10 m c) 12m d) 20 m

75. For a given angle of projection, The horizontal range is doubled, the time of flight becomes
    a) 4 times b) 2 times c) $\sqrt{2}$ times d) $1/\sqrt{2}$ times

76. A planet has mass 1/10 of that of earth, while radius is 1/3 that of earth. If a person can throw a stone on earth surface to a height of 90m. then he will be able to throw the stone on that planet to a height
    a) 90m b) 40 c) 100 m d) 45m

77. Two block of masses m_1 and m_2 are joined by a wire of young's modulus Y via a massless pulley. The area of cross-section of the wire is 'S' and its length 'L'. When the system is released, increased in length of the wire is
    a) $\dfrac{m_1 m_2 gl}{YS(m_1+m_2)}$ b) $\dfrac{2m_1 m_2 gl}{YS(m_1+m_2)}$ c) $\dfrac{(m_1-m_2)gl}{YS(m_1+m_2)}$ d) $\dfrac{4m_1 m_2 gl}{YS(m_1+m_2)}$

78. Moment of inertia of a uniform circular disc about a diameter is I. Its moment of inertia about an axis perpendicular to its plane and passing through a point on its rim will be
    a) 5I b) 6I c) 3I d) 4 I

79. Air is filled at 60°C in a vessel of open month. The vessel is heated to a temperature T, so that 1/4ᵗʰ part of air escapes, The value of T is
    a) 80°C b) 44°C c) 333°C d) 171°C

80. When I mole of a monoatomic gas is mixed with 3 moles of a diatomic gas, the value of adiabatic expansion γ for the mixture is
    a) $5/3$ b) 1.5 c) 1.4 d) $13/9$

81. 80 gm of water at 30°C is poured on a large block of ice at 0°C. The mass of ice that melt is
    a) 30gm b) 50gm c) 150g d) 1600g

82. The speed of a wave in a certain medium is 960 ms⁻¹. If 3600 waves pass over a certain point of the medium in 1 minute, the wave length is
    a) 2m b) 4m c) 8m d) 16m

83. If amplitude of wave of distance r from a point source is A, the amplitude at a distance 2r will be
    a) 2A b) A c) $A/2$ d) $A/4$

84. A wave is reflected from a rigid support the change in phase on reflection will be
    a) $\pi/4$ b) $\pi/2$ c) π d) 2π

85. Light of wave length 720nm in air has wavelength in glass equal to
   a) 720nm
   b) 480nm
   c) 800nm
   d) 540nm
86. A convex lens of focal length F_1 is placed in contact with a concave lens of focal length f_2. The combination will act as a convergent lens if
   a) $f_1 < f_2$
   b) $f_1 > f_2$
   c) $f_1 = f_2$
   d) $1f_1 < 2f_2$
87. Two lenses in contact form an achromatic doublet. Their focal length are in the ratio 2:3. Their dispersive power must be in the ratio
   a) 2:3
   b) 3:2
   c) 1:3
   d) 3:1
88. The speed of electron having wave length 10^{-10}m is
   a) 7.25×10^6 ms^{-1}
   b) 6.26×10^6 ms^{-1}
   c) 5.25×10^6ms^{-1}
   d) 4.24×10^6 ms^{-1}
89. An electron and a photon have same wave length. It P is the momentum of electron and E the energy of photon. The magnitude of P/E in S.I. unit is
   a) 3×10^8
   b) 3.33×10^{-9}
   c) 9.1×10^{-31}
   d) 6.64×10^{34}
90. Photo-energy 6 ev are incident on a surface of wave function 2.1 ev. What are the stopping potential
   a) -5V
   b) -1.9V
   c) -3.9V
   d) -8.1V
91. Doubly ionized helium atom and hydrogen ions are accelerated from rest through the same potential drop. The ratio of their final velocity is
   a) $1/2$
   b) 2
   c) $1/\sqrt{2}$
   d) $\sqrt{2}$
92. The ratio of area with in the electron orbits for the 1st excited state to ground state for H-atom is
   a) 2:1
   b) 4:1
   c) 8:1
   d) 16:1
93. Which of the following radiation is not emitted by electronic transition of atoms?
   a) UV rays
   b) X-ray
   c) γ-ray
   d) Visible ray
94. Two charges q_1 and q_2 are placed in vacuum at a distance d and the force acting between them is f. If a medium of dielectric constant 4 is introduced around them, the force now will be
   a) 4f
   b) 2f
   c) f/2
   d) f/4
95. A change q is placed at the Centre of the joining two equal changes Q. The system of three changes will be in equilibrium if q is equal to
   a) 4Q
   b) $-Q/4$
   c) -2Q
   d) $-Q/2$
96. n equal capacitor are first connected in series and then in parallel. The ratio of maximum to minimum capacitance is
   a) n^2
   b) $1/n$
   c) n
   d) $1/n^2$
97. Two wires of same material have length L and 2L and cross-section areas 4A and A respectively. The ratio of their specific resistance would be
   a) 1:1
   b) 1:8
   c) 8:1
   d) 1:2
98. A wire of resistance 12Ω is bent in the form of circle. The resistance between the ends of any diameter is
   a) 3 Ω
   b) 6 Ω
   c) 9 Ω
   d) 12 Ω
99. The magnetic field due to a long solenoid carrying a current I is proportional to
   a) I
   b) I^2
   c) $\sqrt{I}$
   d) I^{-1}
100. A changed particular enters at 30^0 to the magnetic field. Its path becomes
   a) Circular
   b) Straight line
   c) elliptical
   d) helical