MATHEMATICS

1) If $a = 0$ *or* $b = 0$ then the conic $ax^2 + by^2 + 2gx + 2fy + c = 0$ will be
   a) circle
   b) ellipse
   c) hyperbola
   d) parabola
2) The eccentricity of rectangular hyperbola is
   a) 1
   b) 0
   c) $\sqrt{3}$
   d) $\sqrt{2}$
3) The point of concurrence of right bisectors of sides of a triangle is
   a) centroid
   b) orthocenter
   c) excentre
   d) circum-center
4) If $A = \begin{pmatrix} \tau^2 & 4 \\ 25 & 4 \end{pmatrix}$ is a singular matrix the $\tau =$
   a) 5
   b) - 5
   c) Both a & b
   d) 10
5) The distance between the lines $3x + 4y + 3 = 0$ and $3x + 4y - 7 = 0$ is
   a) 1
   b) 2
   c) 3
   d) none

6) The rank of column matrix is
   a) 0
   b) 1
   c) 2
   d) none of these

7) Odd function is always symmetric to
   a) origin
   b) x-axis
   c) y-axis
   d) none

8) The sum of all binomial coefficients of $(3x + 2y)^7$ is
   a) 32
   b) 64
   c) 128
   d) none of these

9) The number of diagonals in Heptagon is
   a) $\binom{6}{2}$
   b) $\binom{7}{2}$
   c) $\binom{7}{2} - 7$
   d) $\binom{6}{2} - 7$

10) $\lim_{x\to 0} \frac{cosx - {}^{10x}}{e^{5x}-cosx} =$

a) 2
b) -2
c) 0
d) none of these

11)The period of $6sin\ 8x$ is
a) $\frac{\pi}{8}$
b) 8π
c) $\frac{\pi}{3}$
d) $\frac{\pi}{4}$

12)$\int e^x\ (tan\ x + \sec^2 x)dx =$
a) $e^x cotx + c$
b) $e^x \sec^2 x + c$
c) $e^x tanx + c$
d) None of these

13)$\binom{9}{3} + \binom{9}{4} + \binom{10}{3} + \binom{11}{5} =$
a) $\binom{13}{4}$
b) $\binom{12}{5}$
c) $\binom{11}{5}$
d) $\binom{23}{4}$

14)The circle concentric to $x^2 + y^2 + 2x - 3y + 5 = 0$ is
a) $x^2 + y^2 + 2x - 3y + 7 = 0$
b) $x^2 + y^2 - 2x - 3y + 3 = 0$
c) $x^2 + y^2 + 2x + 3y + 1 = 0$
d) None

15)The number of arrangements using all letters of "MOBILE" is _____ if each starts with E
a) 6!
b) 5!
c) 7
d) $6! - 1$

16)If the roots of quadratic equation are complex and unequal then
a) $\Delta > 0$
b) $\Delta = 0$
c) $\Delta < 0$
d) None of these

17)If $y = \sqrt{cot2x}$ then $\frac{dy}{dx} =$
a) $\frac{cosec^2 x}{\sqrt{cot2x}}$
b) $-\frac{cos\ {}^2x}{\sqrt{cot2x}}$
c) $-\frac{2cose\ {}^2 2x}{\sqrt{cot2x}}$
d) None of these

18)In equilateral triangle $r_3 : r : R =$
a) 1 : 2 : 3
b) 2 : 1 : 3
c) 3 : 1 : 2
d) 3 : 2 : 1

19)The function $f(x)$ has relative maximum at c if
a) $f''(c) = 0$
b) $f''(c) < 0$
c) $f''(c) > 0$
d) None of these

20)If A, G, H are arithmetic, geometric and harmonic means between x and y respectively then A, G, H are in
a) H.P
b) A.P
c) G.P
d) none

21)Formula for finding angle between lines of the pair $ax^2 + 2hxy + by^2 = 0$ is
a) $\frac{\sqrt{h^2-a}}{a+b}$
b) $\frac{2\sqrt{h^2+ab}}{a+b}$
c) $\frac{2\sqrt{h^2-ab}}{a+b}$
d) None

22)The range of $5sinx$ is
a) $(-5, 5]$
b) $[-5, 5]$
c) $[-5, 5)$
d) $[-1, 1]$

23)$\frac{\sqrt{-36}+\sqrt{-8}}{\sqrt{-22}} =$
a) 0
b) 1
c) i
d) 2

24)If $cos\theta = \frac{3}{5}$ then $cot\theta =$
a) $\frac{5}{4}$
b) $\frac{3}{4}$
c) $\frac{4}{3}$
d) None of these

25)If $A^2 = A$ then matrix A is called _____ matrix
a) involutory
b) idempotent
c) periodic
d) none

PHYSICS

26)A man moves with a speed of sound waves towards stationary source of sound. The frequency of sound waves heard by the man will be?
a) Remain same
b) Becomes half
c) Becomes doubled
d) Decreases four times

27)It is possible to distinguish b/w transverse and longitudinal waves from the property of
a) Refraction
b) Reflection
c) Diffraction
d) Polarization

28)Newton's second and third laws of motion lead to the conservation of
a) Kinetic energy
b) Charge
c) Linear momentum
d) Potential energy

29)When the string vibrates in two loops then the length of L of the string is expressed as:
a) 2λ
b) λ
c) λ/2
d) λ/4

30)The frequency of first harmonic of a stretched string b/w two points is 100Hz, the frequency of 3rd overtone is
a) 200hz
b) 300hz
c) 400hz
d) 600hz

31)At what angle does $\vec{A}.\vec{B} = \vec{A} \times \vec{B}$
a) 45^o
b) 60^o
c) 90^o
d) 180^o

32)Which of the following waves can be transmitted through solids, liquids and gases?
a) Transverse waves
b) Electromagnetic waves
c) Mechanical waves
d) Longitudinal waves

33)Power of a water pump is 2kW, the amount of water it can raise in one minute to a height of 10m.
a) 2000liter
b) 1000 liter
c) 1200liter
d) 100liter

34)The product of force and time is equal to:
a) Angular momentum
b) Change in momentum
c) Force
d) Work

35)The velocity –time graph of a motion starting from rest and moving with uniform acceleration is straight line:
a) Not passing through origin
b) Parallel to velocity axis
c) Parallel to time axis
d) Passing through origin

36)Which of the following pair of angles have same range for a projectile?
a) 10^0 and 20^0
b) 15^0 and 75^0
c) 45^0 and 60^0
d) 0^0 and 30^0

37)Two balls collide each other; it has been observed that be collision is elastic. Which statement advocates the observation?
a) K.E before collision = K.E after collision
b) Momentum before collision =Momentum after collision
c) K.E before collision is greater the K.E after collision
d) a & b Both

38)Law of inertia satisfies:
a) Condition of equilibrium
b) Condition of force in contact
c) Condition of variable force
d) Condition of conservation of mass

39)Which one of the following is greater work?
a) +100j
b) - 1000j
c) -100j
d) +200j

40)if the successive overtones of a vibrating string clamped at its ends are 280hz and 350hz, the fundamental frequency is:
a) 350hz
b) 140hz
c) 280hz
d) 70hz

41)If two waves of equal frequency travelling in opposite direction said to form:
a) Beats
b) Interference
c) Diffraction
d) Stationary waves

42)The linear and angular velocity of a particle moving about the center of circle of radius r, are related by?
a) $v = \omega \times r$
b) $v = r \times \omega$
c) $v \times \omega = r$
d) $\omega \times v = r$

43)The force which provides the necessary centripetal force to keep the mud in circular path:
a) Cohesive force
b) Adhesive force
c) Frictional force
d) Gravitational force

44)A body moving in a circular path with a constant speed has a:
a) Constant Velocity
b) Constant kinetic energy
c) Constant Acceleration
d) Constant displacement

45) A child swinging on a swing in sitting position, stands up. Then the time period of swing will:
a) decrease
b) remain same
c) increase
d) None of these

46)Which of the following are example of electrical resonance?
a) Radio & Tv tunning
b) Micro-oven
c) Hanging bridge
d) a& b

47)A mass 'm' has velocity 'u'. It collides with another mass '2m' inelastically. Find their combined velocity if initially 2 m mass was at rest.
a) 3u
b) 2u
c) u/2
d) u/3

48)Relationship b/w Range and Height is:
a) 4R= H Tan θ
b) H = 4RTan θ
c) H/R = Tanθ/4
d) R/H=Tanθ/4

49)At what angle the range will be half of it's maximum range?
a) 15^0
b) 30^0
c) 45^0
d) 6^0

50)When one joule work is done on a body in one second Power is said to be?
a) one watt
b) 0.5 watt
c) Zero
d) 100Watt

CHEMISTRY (25 MCQS)

51)0.1 moles of Carbonyl chloride ($COCl_2$) consists of mass:
A) 99 g
B) 9.9 g
C) 0.99 g
D) 4.95 g

52)133.75 g of ammonium chloride decomposed to produce:
A) 56 dm^3 of NH_3
B) 42.5 g of NH_3
C) 2.5 moles of NH_3
D) All of these

53)The following is present in 1 mole of CO_2:
A) 6.02×10^{22} molecules
B) 1.204×10^{24} atoms of oxygen
C) 3.01×10^{23} molecules
D) 12.04×10^{23} molecules of oxygen

54)Canal ray with one proton bears charge:
A) -1.602×10^{-19} C/kg
B) -1.602×10^{-19} C
C) $+1.602 \times 10^{-19}$ C/mol
D) $+1.602 \times 10^{-19}$ C

55) Second line of Balmer series corresponds to transition:
- A) $3 \rightarrow 1$
- **B) $4 \rightarrow 2$**
- C) $6 \rightarrow 3$
- D) $5 \rightarrow 3$

56) Electron in d orbital of M shell has:
- **A) n=3, l=2**
- B) n=3, l=1
- C) n=2, l=1
- D) n=2, l=0

57) Which atom does NOT obey octet rule?
- A) C in CH_4
- B) O in H_2O
- C) F in HF
- **D) P in PCl_5**

58) Shape of PCl_3 is:
- A) Tetragonal
- B) Trigonal planar
- **C) Trigonal pyramidal**
- D) Angular

59) Correct bond energy order:
- A) C≡C < C=C < C–C
- B) C=C < C≡C < C–C
- **C) C–C < C=C < C≡C**
- D) C≡C < C–C < C=C

60) Bond angle in $BeCl_2$:
- A) 109.5°
- B) 104.5°
- C) 120°
- **D) 180°**

61) Volume change (2: 10K → 30K):
- A) 1.2 dm^3
- B) 2.4 dm^3
- C) 3.0 dm^3
- **D) 4.0 dm^3**

62) Nearest to ideal gas:
- A) N_2
- B) CO_2
- **C) He**
- D) None

63) Cohesive force due to electronegativity difference:
- **A) Dipole-dipole**
- B) London forces
- C) Covalent
- D) None

64) Correct stability order:
- **A) H-bond > Dipole > London**
- B) Dipole > London > H-bond
- C) London > H-bond > Dipole
- D) All

65) Crystal system ($a \neq b \neq c$, $\alpha=\beta=\gamma=90°$):
- A) Cubic
- B) Tetragonal
- **C) Orthorhombic**
- D) Rhombohedral

66) Oxidation number of Mn in MnO_4^-:
- A) +2
- B) +4
- C) +5
- **D) +7**

67) Highest pH:
- **A) 0.1 M HCl**
- B) 1.0 M HCl
- C) Gastric juice
- D) Lemon

68) Acidic buffer:
- A) $NH_4OH + NH_4Cl$
- **B) $CH_3COOH + CH_3COONa$**
- C) $NH_4OH + CH_3COONH_4$
- D) NaOH + HCl

69) Alkali metal forming superoxide:
- A) Na
- B) Li
- **C) K**
- D) Fr

70) Not a metalloid:
- A) B
- **B) C**
- C) Ge
- D) Sb

71) Formula for Sandhur:
- **A) Pb_3O_4**
- B) Pb_2O_3
- C) PbO_2
- D) PbO

72) Correct EN order:
- A) Na > Mg > Al > Si
- **B) Na < Mg < Al < Si**
- C) Mg > Na > Si > Al
- D) Al < Si < Na < Mg

73) Dehydration of ethanol (160°C, conc. H_2SO_4):
- A) Ethyne
- **B) Ethene**
- C) Ethane
- D) Butene

74) Common name of ethoxy ethane:
- **A) Diethyl ether**
- B) Ethyl methyl ether
- C) Ethyl propyl ether
- D) Ethyl ethyl ether

75) Sweetest carbohydrate:
- A) Glucose
- **B) Fructose**
- C) Sucrose
- D) Maltose

ENGLISH

76) Each of the players, along with their coach, ___ responsible for the loss.
A) are
B) were
C) is
D) have been

77) Neither of the boys ___ completed ___ assignment on time.
A) have / his
B) has / their
C) has / his
D) have / their

78) The number of applicants ___ increasing, but a number of them ___ unqualified.
A) are / is
B) is / are
C) are / are
D) is / is

79) Each boy and each girl ___ required to submit ___ form.
A) are / their
B) is / their
C) is / his or her
D) are / his or her

80) Everyone must bring ___ own lunch.
A) his
B) their
C) his or her
D) both B and C

81) If anyone calls, tell ___ I am busy.
A) them
B) him or her
C) him
D) both A and B

82) It is ___ who is responsible for the mistake.
A) me
B) I
C) mine
D) myself

83) Between you and ___, this plan will fail.
A) I
B) me
C) myself
D) mine

84) If he ___ harder, he would have passed the exam.
A) studies
B) had studied
C) studied
D) has studied

85) If I ___ you, I would not accept the offer.
A) am
B) was
C) were
D) be

86) Had she known the truth, she ___ differently.
A) will act
B) would act
C) would have acted
D) acts

87) When she was younger, she ___ five kilometers a day.
A) Walked
B) Was walking
C) Has been walking
D) Walk

88) He made me ___ the work again.
A) to do
B) doing
C) do
D) did

89) She got her brother ___ the car.
A) wash
B) to wash
C) washing
D) washed

90) I enjoy ___ tennis.
A) To playing
B) Playing
C) To play
D) None

91) The man ___ you met is an anchor-person.
A) Who
B) Whose
C) Whom
D) None

92) He is ___ honest man.
A) a
B) an
C) the
D) no article

93) ___ earth revolves around ___ sun.
A) A / a
B) The / the
C) An / a
D) The / a

94) He chose tea ___ coffee.
A) instead
B) instead of
C) despite
D) in spite

95) ___ all his efforts, he failed.
A) Instead
B) Instead of
C) Despite
D) Instead that

96) White ball _____ for the first time in the 1992 Cricket World Cup.
A) Used
B) Was used
C) Had used
D) Has been used

97) It is our problem, not _____.
A) Their
B) Theirs
C) There
D) There's

98) A remedy that stops the effect of poison is:
A) Antedote
B) Antivirus
C) Antibiotic
D) Antidote

99) Inquisitive means:
A) Complex
B) Brilliant
C) Mature
D) Curious

100) Antonyms of ABSURD
A) Endowment
B) Rational
C) Senseless
D) Upward