SET VIII

1. If the error in the measurement of radius of sphere is 0.2% then the percentage error in the calculation of volume of sphere is

[1 Marks]

a. 0.2

b. 0.4

c. 0.6

d. 0.8

2. Bernoulli's theorem is applicable to

[1 Marks]

a. Streamline flow of ideal liquid

b. Turbulent flow of ideal liquid

c. Flow of any liquid

d. Streamline flow of actual liquid.

3. On a cold morning, a metal surface on touching is felt colder than a wooden surface, because the metal has

[1 Marks]

a. Low thermal conductivity

b. High thermal conductivity

c. High specific heat

d. Low specific heat

4. The rms speed of gas is v_0. When initial pressure is doubled at constant temperature, then new rms speed will be
[1 Marks]

a. v_0

b. $\frac{v_0}{2}$

c. $2v_0$

d. $4v_0$

5. There is no transference of energy across any section of medium in case of
[1 Marks]

a. Progressive wave

b. Beats

c. Standing wave

d. Radio wave

6. Which of the following does not support the wave nature of light
[1 Marks]

a. Interference

b. Diffraction

c. Photoelectric effect

d. Polarization

7. Air bubble in water behaves as
[1 Marks]

a. Converging lens

b. diverging lens

c. convex mirror

d. concave mirror

8. A closed vessel containing ideal gas is maintained at a certain temperature and pressure. If both temperature and pressure are doubled, then volume will be

[1 Marks]

a. Remains same

b. Double

c. Quadrupled

d. Halve

9. The quantity $\frac{1}{2}\varepsilon_0 E^2$ has a significance of:

[1 Marks]

a. Energy/farad

b. Energy/coulomb

c. Energy/volume

d. Energy/volt

10. A hollow charged sphere does not produce an electric field at any

[1 Marks]

a. Inner point

b. Outer point

c. Surface point

d. None of above

11. The material suitable for making electromagnet should have

[1 Marks]

a. High retentivity and high coercivity

b. Low retentivity and low coercivity

c. High retentivity and low coercivity

d. Low retentivity and high coercivity

12. The lines of force around an infinite straight conductor carrying current are

[1 Marks]

a. Parallel to conductor

b. Concentric circles

c. Perpendicular to the conductor

d. Vertically downward

13. A copper ring is held horizontally and a bar magnet is dropped through the ring with the length along the axis of the ring. The acceleration of the falling magnet is

[1 Marks]

a. Equal to that due to gravity

b. Less than that due to gravity

c. More than that due to gravity

d. Depends on diameter of ring and the length of the magnet

14. If total energy of an electron is E_0, then its potential energy is

[1 Marks]

a. E_0

b. $2E_0$

c. $\frac{E_0}{2}$

d. $4E_0$

15. the biggest earthquake in the world was Chilean earthquake occurred in 1960 whose magnitude was

[1 Marks]

a. 10.4 Richter

b. 9.9 Richter

c. 9.5 Richter

d. 9.1 Richter

16. Which of the following is weakest kind of bonding in solids

[1 Marks]

a. Ionic

b. Metallic

c. Vander Waal

d. Covalent

17. A lift is moving up with an acceleration of 3.675$m\ s^{-2}$. The % increase in weight of man is

[2 Marks]

a. 12.5%

b. 25%

c. 37.5%

d. 50%

18. The amplitude of the vibrating particle due to the superposition of two simple harmonic motion $y_1 = \sin\omega t + \frac{\pi}{3} and\ y_2 = \sin\omega t$ is

[2 Marks]

a. 1

b. $\sqrt{2}$

c. 2

d. $\sqrt{3}$

19. If T is surface tension of a liquid, the energy needed to break a liquid drop of radius R into 64 drops is

[2 Marks]

a. $6\pi R^2T$

b. πR^2T

c. $12\pi R^2T$

d. $8\pi R^2T$

20. On heating a glass block of 100cm^3, from 25℃ to 40℃, its volume increases by 4cm^3. The coefficient of linear expansion of glass is

[2 Marks]

a. 26.67 × $10^{-6}℃^{-1}$

b. 13.33 × $10^{-6}℃^{-1}$

c. 8.89 × $10^{-6}℃^{-1}$

d. 6.67 × $10^{-6}℃^{-1}$

21. Two strings are made of same material. String 1 has twice the diameter of string 2, but is under half the tension then $\frac{v_2}{v_1}$ is

[2 Marks]

a. $\sqrt{2}:1$

b. $\sqrt{8}:1$

c. $1:\sqrt{2}$

d. $1:\sqrt{8}$

22. Light of wavelength 600nm is incident normally on a slit of width 0.1mm. The position of the second order minimum on a screen 3m from the slit is

[2 Marks]

a. 36cm

b. 0.36cm

c. 18cm

d. 0.18cm

23. The relation between magnification m, image distance v, and focal length of a convex mirror is

[2 Marks]

a. $m = \frac{f}{v-f}$

b. $m = \frac{f-v}{f}$

c. $m = \frac{f}{v}$

d. $m = \frac{v}{f}$

24. Three charges $-q, Q\ and\ -q$ are placed at equal distances on a straight line. If the total potential energy of the system of three charges is zero, the ratio of $Q: q\ is$

[2 Marks]

a. 1:2

b. 2:1

c. 1:4

d. 4:1

25. A given wire of resistance R and diameter d is stretched to reduce its diameter to half its original value. The resistance of wire becomes

[2 Marks]

a. 8R

b. 16R

c. 32R

d. 64R

26. A coil of cross-sectional area A lies in a uniform magnetic field B with its plane perpendicular to the field. In this position the normal to the coil makes an angle of 0^0 with the field. The coil rotates at a uniform rate with period T. The induced emf in the coil during the interval when the coil rotates from $270^0\ to\ 360^0$ is

[2 Marks]

a. $-\frac{4BA}{T}$

b. $\frac{4BA}{T}$

c. $-\frac{BA}{T}$

d. $\frac{BA}{T}$

27. The number of electrons emitted per second from the heated cathode is 1.8×10^{17}. These electrons are accelerated by a P.D. between cathode and anode. The maximum anode current is

[2 Marks]

a. 1mA

b. 2.3mA

c. 2.9mA

d. 4.3mA

28. In a npn-transistor, 10^{10}electrons inter the emitter in 10^{-10}s. If 2% of the electrons are lost in the base, the value of β is
[2 Marks]

a. 45

b. 47

c. 49

d. 51

29. Which of the following is the collective noun?
[1 Marks]

a. Love

b. Italy

c. Choir

d. More than one of the above

30. They _____very happy seeing you here.
[1 Marks]

a. Shall

b. Will

c. Will be

d. Were be

31. The old Peepal tree which..... in our compound for fifty years suddenly crashed to the ground last night.
[1 Marks]

a. Had stood

b. Has stood

c. Is standing

d. Stands

32. If you _____my advice, you _____accept it.
[1 Marks]

a. Took- will

b. Take- will

c. Take – would

d. Takes – could

33. The indirect speech for “The customer said to the tailor, "Will you make the suit ready by tomorrow?" is:
[1 Marks]

a. The customer asked the tailor that he will have the suit ready by the next day.

b. The customer asked the tailor that he would have the suit ready by the next day.

c. The customer asked the tailor if he would make the suit ready by the next day.

d. The customer asked the tailor if he would make the suit ready by the next day ?

34. "The house is on fire!" is an example of what kind of sentence?
[1 Marks]

a. Imperative

b. Exclamatory

c. Interrogative

d. Declarative

35. My family _____coming to the city tomorrow.
[1 Marks]

a. is

b. are

c. be

d. am

36. That child died _____heavy fever.

[1 Marks]

a. At

b. For

c. Of

d. With

37. Which of these is used between sentences which are grammatically independent?

[1 Marks]

a. Colon

b. Semicolon

c. Comma

d. Hyphen

38. The antonym of the word Absence is.

[1 Marks]

a. Presence

b. Existence

c. Both a and b

d. None of the above

39. Which of the following contains the same vowel sound?

[1 Marks]

a. Kid-beat-tight

b. Deep-keep-sweep

c. Find-seat-kite

d. Feed-fine-mean

40. Which is the stressed syllable in the word “demonstration”?

[1 Marks]

a. ‘de-mon-stra-tion

b. de-‘mon-stra-tion

c. de-mon-‘stra-tion

d. de-mon-stra-‘tion

41. The number of electrons present in 3.6g of water is

[1 Marks]

a. 0.2 N_A

b. 0.5 N_A

c. 2 N_A

d. 5 N_A

42. Octet rule is violated in.

[1 Marks]

a. IF7

b. SF6

c. BeCl2

d. All

43. Which of these is both Bronsted and Lewis acid?

[1 Marks]

a. NH_3

b. H_3O^+

c. HSO_4^-

d. CO_2

44. In the following rxn: $P + NaOH + H_2O \leftrightarrow PH_3 + NaH_2PO_2$
[1 Marks]

a. P is oxidizing and NaOH is reducing agent.

b. P is reducing agent and NaOH is oxidizing agent.

c. P is both oxidizing and reducing agent.

d. P is oxidizing and H_2O is reducing agent.

45. An atom with atomic number 21 belongs to the category of
[1 Marks]

a. s-block elements

b. p-block elements

c. d-block elements

d. f-block elements

46. Halide(Cl^-,Br^-,I^-) can be detected in the lab using
[1 Marks]

a. $AgNO_3$

b. Conc. H_2SO_4

c. Both a. and b.

d. HCl

47. Which of these is not ion-exchanger for removing hardness of water?
[1 Marks]

a. Organic process

b. Permutit process

c. Calgon process

d. None

48. Very dil. HNO_3 is reduced by zinc to
[1 Marks]

a. NO_2

b. NO

c. N_2O

d. NH_3

49. IUPAC name of CH_3 CH=CH – C ≡ CH is:
[1 Marks]

a. pent – 3 – ene – 1 – yne

b. pent – 2 – ene – 4 – yen

c. pent – 3 – yn – 1 – ene

d. pent – 2 – yn – 1 – ene

50. How many isomers of C_3H_2O are possible?
[1 Marks]

a. 2

b. 3

c. 4

d. 5

51. Pure methane can be produced by
[1 Marks]

a. Wurtz reaction

b. Kolbe's electrolytic method

c. Soda-lime decarboxylation

d. Reduction with H_2

52. The mass of KOH required to absorb all CO_2 produced by burning 3 grams of ethane as K_2CO_3 is

[2 Marks]

a. 11.2 gm

b. 22.4 gm

c. 5.6 gm

d. 56 gm

53. An electric current of 1A was passed through acidulated water for 30 minutes. Calculate the volume of the hydrogen at NTP produced. (Z for Hydrogen = 0.00001)

[2 Marks]

a. 0.1008 litre

b. 0.2016 litre

c. 0.4032 litre

d. 0.8064 litre

54. 9.6 gm of an acid was dissolved in 250 ml of solution. 25 ml of the acid solution required 32 ml of 0.5 N NaOH. The equivalent weight of acid is

[2 Marks]

a. 49

b. 60

c. 63

d. 90

55. What will be the resultant pH when 200mL of an aqueous solution of HCl (pH 2.0) is mixed with 300mL of an aqueous solution of NaOH (pH = 12)?

[2 Marks]

a. 2.699

b. 13.3

c. 11.3010

d. 1.330

56. The brown ring test for NO^{2-} and NO^{3-} is due to the formation of a complex ion with formation of:
[2 Marks]

a. $[Fe (H_2O)_6]^{++}$

b. $[Fe (NO) C (N)_5]^{++}$

c. $[Fe (H_2O)_5 NO]^{++}$

d. $[Fe (H_2O) (NO)_5]^{++}$

57. What is the chemical formula for Prussian blue?
[2 Marks]

a. $Fe_4 [Fe (CN)_6]_3$

b. $Fe [Fe (CN)_6]$

c. $Fe_3 [Fe (CN)_6]_2$

d. $K_2Fe [Fe (CN)_6]$

58. Which of the followings can distinguish ethane & ethyne?
[2 Marks]

a. Tollen's reagent

b. Baeyer's reagent

c. Bromine solution

d. All

59. If n is even in the expansion of $(a+b)^n$, the middle term is:
[1 Marks]

a. n^{th} term

b. $(\frac{n}{2})^{th}$ term

c. $[(\frac{n}{2})-1]^{th}$ term

d. $[(\frac{n}{2})+1]^{th}$ term

60. $w^4 =$

[1 Marks]

a. 0

b. 1

c. w

d. w^2

61. If order of a is $m \times n$, then order of A' is

[1 Marks]

a. $m \times \mathrm{m}$

b. $n \times n$

c. $m \times n$

d. $n \times m$

62. Find the number of 5 letter words that can be formed from word **IMAGE** using permutations if repetition is allowed.

[1 Marks]

a. 25

b. 120

c. 125

d. 3125

63. The sum of the infinite geometric series exist if

[1 Marks]

a. $|r| < 1$

b. $|r| > 1$

c. $r = 1$

d. $r = -1$

64. The area of the figure bounded by the curve $y = \log_e x$, the x - axis and the straight line $x = e$ is
[1 Marks]

a. 1(

b. 5- e(

c. $3 + e$(

d. none of these

65. The area of the region bounded by the curve $y = x^2$ and the line $y = 16$ is
[1 Marks]

a. $\frac{32}{3}$

b. $\frac{256}{3}$

c. $\frac{64}{3}$

d. $\frac{128}{3}$

66. The radius of air bubble is increasing at the rate of $0.25\ \text{cm}/\text{s}$. At what rate the volume of the bubble is increasing when the radius is 1 cm.
[1 Marks]

a. $4\pi\text{cm}^3/\text{s}$

b. $22\pi\text{cm}^3/\text{s}$

c. $2\pi\text{cm}^3/\text{s}$

d. $\pi\text{cm}^3/\text{s}$

67. $\frac{d}{dx}2^x =$
[1 Marks]

a. $\frac{2^x}{\ln 2}$

b. $\frac{\ln 2}{2^x}$

c. $2^x \ln 2$

d. 2^x

68. $\lim_{x \to 2} \frac{x^2 - 4}{x^2 + 4}$ is

[1 Marks]

a. 1

b. 0

c. $-\frac{1}{2}$

d.-1

69. The straight line $x - 2 + y + 3 = 0$ cuts the circle $x - 2^2 + y - 3^2 = 11$at

[1 Marks]

a. No point

b. Two point

c. One point

d. None of these

70. The equation of the ellipse having eccentricity is ½ and foci (± 1,0) is

[1 Marks]

a. $\frac{x^2}{4} + \frac{y^2}{3} = 1$

b. $\frac{x^2}{2} + \frac{y^2}{4} = 1$

c. $\frac{x^2}{9} + \frac{y^2}{16} = 1$

d. $\frac{x^2}{1} + \frac{y^2}{1} = 1$

71. Equation of vertical line to the right of y-axis at 5 units from y-axis is _____.

[1 Marks]

a. x=5

b. x=-5

c. y=5

d. y=-5

72. The coordinates of P and Q are (–3, 4) and (2, 1), respectively. If PQ is extended to R such that PR = 2QR, then what are the coordinates of R ?

[1 Marks]

a. (3, 7)

b. (2, 4)

c. (1/2, 5/2)

d. (7, – 2)

73. The Z co-ordinate of any point in the xy plane is

[1 Marks]

a. 1

b.-1

c.-2

d. 0

74. The graph of a linear function represents a

[1 Marks]

a. circle

b. line

c. parabola

d. ellipse

75. Range of $\cos x$ is

[1 Marks]

a. $[-1,1]$

b. R

c. negative real no.

d. $R - \{x \mid -1 < x < 1\}$

76. Five horses are in a race. Mr. A selects two of the horses at random and bets on them. The probability that Mr. A selected the winning horse, is

[1 Marks]

a. $\frac{4}{5}$

b. $\frac{3}{5}$

c. $\frac{1}{5}$

d. $\frac{2}{5}$

77. If the coefficient of variation is 100 the mean of the data is 25, then find the standard deviation.

[1 Marks]

a. 5

b. 10

c. 15

d. 25

78. The mean proportion of 0.16 and 0.01 is:

[1 Marks]

a. 0.4

b. 0.17

c. 0.085

d. 0.04

79. If the polynomial $x^3 + 4x^2 - 2x + 5$ is divided by $x + 1$, then the remainder is

[2 Marks]

a. 4

b. 6

c. 8

d. 10

80. $n(n-1)(n-2)\ \ldots\ (n-r+1) =$

[2 Marks]

a. $n!r!$

b. $\frac{n!}{r!}$

c. $\frac{n!}{(n-r)!}$

d. $\frac{(n-2)!}{n!}$

81. The 6^{th} term of the arithmetic sequence whose 1^{st} term is 3 and common difference is zero is

[2 Marks]

a. 18

b. 6

c. 3

d. 0

82. $\int e^x \sec x\,(1+\tan x)dx$ equals

[2 Marks]

a. $e^x \cos x + c$

b. $e^x \sec x + c$

c. $e^x \sin x + c$

d. $e^x \tan x + c$

83. $\frac{d}{dx}(\cos x) - \frac{d^2}{dx^2}(\sin x) =$

[2 Marks]

a. $2\sin x$

b. $2\cos x$

c. 0

d. $-2\sin x$

84. $(fog)'(x) =$

[2 Marks]

a. $f'g'$

b. $f'g(x)$

c. $f'(g(x))g'(x)$

d. cannot be calculated

85. $\lim_{x \to \infty} \frac{3x^2 + 27}{x^3 - 27}$ is

[2 Marks]

a. ∞

b. 1

c.-1

d. 0

86. If the straight-line y=mx is outside the circle $x^2+y^2-20y+90=0$, then

[2 Marks]

a. $m < 3$

b. $m < 3$

c. $m > 3$

d. $m > 3$

87. The number of real tangents that can be drawn to the ellipse $3x^2+5y^2=32$, passing through (3,5) is

[2 Marks]

a. 0

b. 1

c. 2

d. none

88. The area of the square ABCD whose two sides are $5x + 12y - 26 = 0$ and $5x + 12y + 39 = 0$ are

[2 Marks]

a. 125

b. 100

c. 169

d. 25

89. The planes 3x-4y=6,x=0,y=0 meet

[2 Marks]

a. in a line

b. in a unique point

c. taken two at aline in parallel lines

d. none

90. If A, B and C are non-empty subsets of a set, then $(A - B) \cup (B - A)$ equals

[2 Marks]

a. (A ∩ B) ∪ (A ∪ B)

b. (A ∪ B) – (A ∩ B)

c. A – (A ∩ B)

d. (A ∪ B) – B

91. $\tan^{-1}\frac{1}{4} + \tan^{-1}\frac{1}{5} =$

[2 Marks]

a. $\tan^{-1}\frac{9}{19}$

b. $\tan^{-1}\frac{19}{9}$

c. 0

d. none of these

92. The projection of $\vec{a} = \vec{i} - 2\vec{j} + \vec{k}$ along $\vec{b} = 4\vec{i} - 4\vec{j} + 7\vec{k}$ is

[2 Marks]

a. $\frac{19}{8}$

b. $\frac{9}{19}$

c. $\frac{8}{19}$

d. $\frac{19}{9}$

93. Which of the following is tear producing?

[2 Marks]

a. Ester

b. Ketone

c. Acid Chloride

d. Amide

94. What is the chemical formula for Prussian blue?

[2 Marks]

a. $Fe_4[Fe(CN)_6]_3$

b. $Fe[Fe(CN)_6]$

c. $Fe_3[Fe(CN)_6]_2$

d. $K_2Fe[Fe(CN)_6]$

95. Diazotisation reaction gives:

[1 Marks]

a. aniline

b. azo dye

c. benzene diazonium salt

d. chlorobenzene

96.

Read the following passage and answer the four questions that follow.

A recent investigation by scientists at the USA Geological Survey shows that strange animal behavior might help predict future earthquakes. Investigators found such occurrences in a ten-kilometers radius of the epicenter of a fairly recent quake. Some birds screeched and flew about wildly, and dogs yelped and ran uncontrollably. Scientists believe that animals can perceive these environmental changes as early as several days before the mishap. In 1976, after observing the animal behavior, the Chinese were able to predict a devastating quake. Although hundreds of thousands of people were killed, the government was able to evacuate millions of others and thus keep the death toll at a lower level.

97. What can help predict future earthquakes according to a recent investigation?

[2 Marks]

a. strange animal behavior

b. Weather patterns

c. Earth's magnetic field

d. Volcanic eruptions

98. What was the radius around the epicenter of a recent earthquake where strange animal behavior was observed?

[2 Marks]

a. 10 km

b. 20 km

c. 5 km

d. 50 km

99. What kind of animal behavior was observed before a recent earthquake?

[2 Marks]

a. Birds screeching and flying about wildly

b. Dogs barking and lying down

c. Cats meowing and hiding

d. Fish swimming calmly

100. How long before the earthquake did animals perceive environmental changes according to scientists?
[2 Marks]

a. Several hours

b. Several days

c. Several minutes

d. Several weeks