SET IX

1. The apparent weight of a man in a lift is less than real weight when the lift is going

[1 Marks]

a. Up with acceleration

b. Down with acceleration

c. Up with uniform speed

d. Down with uniform speed

2. A cylinder fixed at one end has a tangential force applied to its other end. The shape and volume of the cylinder remain unaltered. The strain produced in the cylinder is

[1 Marks]

a. Longitudinal

b. Volumetric

c. Shear

d. Zero

3. The volume strain along a three mutually perpendicular direction is v. It will be equivalent to linear strain

[1 Marks]

a. 3/v

b. v/3

c. 3v

d. V

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4. 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

5. In the equation of progressive wave $y = Rsin\omega t - kx$ the maximum transverse speed of wave is

[1 Marks]

a. $\frac{\omega}{k}$

b. $\frac{d\omega}{dk}$

c. $R\omega$

d. k / ω

6. No fringes are seen in a single slit diffraction if

[1 Marks]

a. The screen is far away

b. The wavelength is less than slit width

c. The wavelength is greater than slit width

d. The wavelength is less than the distance to the screen

7. A convex lens has focal length 20cm.The power is

[1 Marks]

a.-5.0D

b. +5.0D

c.-0.05D

d. +0.05D

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8. In a thermodynamic process, if the volume remains constant, then the process is known as
[1 Marks]

a. Isothermal

b. Isobaric

c. Isochoric

d. Adiabatic

9. Six charges +Q each are placed at the corners of a regular hexagon of side a. the electric field at the center of hexagon is:
[1 Marks]

a. Zero

b. $\frac{1}{4\pi\varepsilon_0}\frac{Q^2}{a^2}$

c. $\frac{1}{4\pi\varepsilon_0}\frac{6Q^2}{a^2}$

d. $\frac{1}{4\pi\varepsilon_0}\frac{Q^2}{\sqrt{2}a^2}$

10. An isolated conducting sphere is given a positive charge. It's mass
[1 Marks]

a. Get decreased

b. Get decreased

c. Remains the same

d. Mass is not involved during the electrification

11. The current in an alternating current circuit is equal to the voltage divided by the
[1 Marks]

a. Impedance

b. Capacitance

c. Inductance

d. Reactance

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12. The sensitivity of moving coil galvanometer is not affected by a.

[1 Marks]

a. The number of turns in the coil

b. Magnetic field of permanent magnet

c. The current that the galvanometer measures

d. Restoring couple per unit twist of the suspension fibre

13. A proton moving with a constant velocity passes through a region of space without change in velocity. If E and B represent electric and magnetic fields respectively, this region of space may have

[1 Marks]

a. $E = 0, B \neq 0$

b. $E = 0, B = 0$

c. $E \neq 0, B = 0$

d. $E \neq 0, B \neq 0$

14. The ratio of kinetic energy of an electron in hydrogen atom in n=1 to n=4 is

[1 Marks]

a. 1:4

b. 4:1

c. 1:16

d. 16:1

15. The ratio of the energy of the orbital electron in first orbit of Bohr and that of second orbit of Bohr is

[1 Marks]

a. 2:1

b. 4:1

c. 1:2

d. 1:4

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16. 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

17. The velocity of a particle is $v = (3t + 1)$ m/s. When the particle starts from rest, the distance travelled by the particle when $t = 4s$ is
[2 Marks]

a. 7m

b. 14m

c. 21m

d. 28m

18. An artificial satellite moving in a circular orbit at a distance h from the center of earth has total energy E_0. Its potential energy is
[2 Marks]

a. $-E_0$

b. $1.5E_0$

c. E_0

d. $2E_0$

19. The breaking stress of a material is$10^6\ Nm^{-2}$. If the density of the material is $3 \times 10^3 kgm^{-3}$,the length of material so that it breaks by its own weight is
[2 Marks]

a. 33.33cm

b. 42.61cm

c. 26.80cm

d. 32.30cm

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20. Air is filled in a container at 60℃. The temperature should it be heated in order that 1/3 of air may escape out of the container is

[2 Marks]

a. 444℃

b. 121℃

c. 222℃

d. 171℃

21. The speed of sound in gas in which two sound waves of wavelengths 1.00m and 1.01 m produces 24 beats in 6 seconds is

[2 Marks]

a. 330m/s

b. 360m/s

c. 390m/s

d. 404m/s

22. A double slit arrangement produces interference fringes for sodium light (λ=589nm) that are 0.2º apart. The angular fringes separation if the entire arrangement is immersed in water (μ=1.33) is

[2 Marks]

a. 1.5°

b. 0.15°

c. 0.10°

d. 0.266°

23. An astronomical telescope of magnifying power 10 consists of two thin lenses 55cm apart. The focal length of objective lens is

[2 Marks]

a. 5cm

b. 20cm

c. 25cm

d. 50cm

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24. A parallel plate capacitor has capacitance C. If half the separation between the plates is filled with a copper sheet, the new capacitance would be

[2 Marks]

a. C/2

b. C

c. 2C

d. Between C and 2C

25. The wire of a fuse in an electric circuit melts when the current density increases to $600 Am^{-2}$. The diameter of the wire so that it may limit the current to 0.4A is

[2 Marks]

a. 0.04A

b. 0.08A

c. 0.12A

d. 0.16A

26. A 200km long wire has capacity $0.014 \mu F$ per km. It carries an alternating current of frequency 5kHz. The inductance to be connected in series so that the impedance is minimum is

[2 Marks]

a. $360 \mu H$

b. 700 μH

c. 175 μH

d. 1 mH

27. In Millikan's oil drop experiment, a charge drop of mass 1.8×10^{-14} kg is stationary between its plates. The distance between its plate is 0.9cm and P.D. is 2kilo volts. The no. of electrons on the drop is

[2 Marks]

a. 500

b. 50

c. 5

d. 0

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28. In a transistor, the collector current is 0.95mA and the base current is 50mA. The value of α is
[2 Marks]

a. 0.85

b. 0.88

c. 0.91

d. 0.95

29. Identify the sentence with a preposition?
[1 Marks]

a. We will talk.

b. Keep working hard

c. The cat ran.

d. She asked about the dog.

30. I hear that you are having a house built. Is it finished yet? "No, but it is ..... completion."
[1 Marks]

a. Close To

b. Almost At

c. Nearly To

d. Must About It

31. More than half the drain..... been desilted.
[1 Marks]

a. Have

b. Is

c. Was

d. Has

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32. _____he stood first, he would have gone to America.

[1 Marks]

a. If

b. Had

c. Have

d. Anyways

33. The indirect speech for He said to me, "I have often told you not to play with fire" is:

[1 Marks]

a. He said that he has often been telling me not to play with fire.

b. He told me that he had often told me not to play with fire.

c. He reminded me that he often said to me not to play with fire.

d. He said to me that he often told me not to play with fire.

34. "Do you know where my iPod is?" is an example of what kind of sentence?

[1 Marks]

a. Imperative

b. Exclamatory

c. Interrogative

d. Declarative

35. Either the executive or the assistant _____been here.

[1 Marks]

a. have

b. has

c. was

d. are

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36. We arrived _____the station an hour late.
[1 Marks]

a. about

b. in

c. at

d. of

37. Choose the correct statement:
[1 Marks]

a. My aunt who lives in Mumbai is a doctor.

b. My aunt, who lives in Mumbai, is a doctor.

c. My aunt, who lives in Mumbai is a doctor.

d. My aunt who lives in Mumbai, is a doctor.

38. What is the synonym for Objective?
[1 Marks]

a. Determined

b. Active

c. Target

d. Obvious

39. Which of the following does not have / ia / sound?
[1 Marks]

a. Near

b. Deer

c. Ear

d. Pray

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40. Which of the following words has its primary stress on the third syllabus?
[1 Marks]

a. beneficial

b. beneficent

c. benefactor

d. benevolent

41. Total no. of molecules of O_2 at NTP required to burn 1 mole of propane completely is
[1 Marks]

a. $5 \times N_A$

b. 5

c.

d. N_A

42. Which of the following species has max. no. of unpaired electron?
[1 Marks]

a. Cr^{+++}

b. Fe^{+++}

c. Ni

d. Cr

43. Which of the following acid has lowest pKa value?
[1 Marks]

a. CH_3COOH

b. HCOOH

c. $(CH_3)_2 - CH - COOH$

d. $CH_3 - CH_2 - CH_2 - COOH$

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44. In reaction $Cr_2O_7^{--} + H^+ + ne \longrightarrow Cr^{++\,+} + H_2O$ the value of n in balanced equation is

[1 Marks]

a. 6

b. 4

c. 5

d. 9

45. Which of these is called anomalous pair in Mendeleev's periodic table?

[1 Marks]

a. N & O

b. Li & Na

c. Te & I

d. Hg & Cu

46. Boric acid is polymeric due to

[1 Marks]

a. Its acidic nature

b. The presence of hydrogen bonds

c. Its monobasic nature

d. Its geometry

47. HNO_3 is stored in vessel made up of:

[1 Marks]

a. Al

b. Fe

c. Ni

d. Zn

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48. Which of these is ore of gold?
[1 Marks]

a. Cassetterite

b. Azurite

c. Pitch blend

d. Calverite

49. The IUPAC name of glyoxal is
[1 Marks]

a. Ethane dioic acid

b. Ethane dial

c. Ethane dione

d. Ethanediol

50. Which of the following is an electrophile?
[1 Marks]

a. Lewis acid

b. Lewis base

c. Negatively charged species

d. None of the above

51. Kerosene oil is the mixture of :
[1 Marks]

a. aromatic compounds

b. aliphatic acids

c. alkanes

d. alcohols

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52. Metal oxide having formula M_2O_3 is reduced by H_2 gives free metal and water. If 0.232gm of the metallic oxide required 12mg of hydrogen for its reduction, the atomic weight of metal is

[2 Marks]

a. 63.5

b. 56

c. 27

d. 24

53. What current strength in ampere will be required to liberate 10g of copper from copper sulphate solution in one hour?

[2 Marks]

a. 507.4

b. 8.5

c. 304

d. 0.85

54. 0.5 g of NaOH is added to 100ml of 0.25N HCl solution. The pH of the resulting solution is

[2 Marks]

a. 0.3

b. 0.9

c. 1.3

d. 1.9

55. 50cc saturated solution of $BaSO_4$ on heating to dryness left 0.0037 grams of solid residue. The solubility product of $BaSO_4$ is (at. wt. of Ba = 137) :

[2 Marks]

a. 1.28×10^{-13}

b. 1×10^{-9}

c. 2.52×10^{-10}

d. 1.6×10^{-14}

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56. Which of the following mixture liberates Nitrogen gas on heating?
[2 Marks]

a. NH_3 + HCl

b. NH_4Cl + CaO

c. Zn + dil. HNO_3

d. NH_4Cl + $NaNO_2$

57. Fire extinguishers contain H_2SO_4 and
[2 Marks]

a. $NaHCO_3$ and Na_2CO_3

b. $NaHCO_3$

c. Na_2CO_3

d. $CaCO_3$

58. Which isomerism is present in n-butyl alcohol and iso-butyl alcohol?
[2 Marks]

a. positional

b. chain

c. optical

d. geometrical

59. In the expression $(a + b)^7$, the 2nd term is
[1 Marks]

a. a^7

b. $7a^6b$

c. $7ab^6$

d. None

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60. If ω is complex cube root of unit then $\omega =$

[1 Marks]

a. 0

b. 1

c. ω^2

d. ω^{-2}

61. If determinant of $\begin{vmatrix} k & 4 \\ 4 & k \end{vmatrix} = 0$, then k =

[1 Marks]

a. ∓ 4

b. 0

c. 16

d. none of there

62. When a selection of objects is made without paying regard to the order of selection, it is called

[1 Marks]

a. sequence

b. series

c. combination

d. permutation

63. A sequence of the numbers whose reciprocals form an arithmetic sequence is called

[1 Marks]

a. geometric series

b. arithmetic sequence

c. harmonic sequence

d. harmonic series

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64. $\int \frac{dx}{x^2+2x+2}$ equals
[1 Marks]

a. $x\tan^{-1}x+1+c$

b. $\tan^{-1}x+1+c$

c. $x+1\tan^{-1}x+c$

d. $\tan^{-1}x+c$

65. The area of the region bounded by the curve $y^2 = x$, the y-axis and between $y = 2 \; and \; y = 4$ is
[1 Marks]

a. 52/3 sq. units

b. 54/3 sq. units

c. 56/3 sq. units

d. None of these

66. Let f be differentiable function in neighborhood of c and $f'(c) = 0$ then $f(x)$ has relative maxima at c if
[1 Marks]

a. $f''(c) > 0$

b. $f''(c) < 0$

c. $f''(c) = 0$

d. $f''(c) \neq 0$

67. If $y = \cot^{-1}x$, then $\frac{dy}{dx} =$
[1 Marks]

a. $\frac{1}{1-x^2}$

b. $\frac{-1}{1+x^2}$

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

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

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68. $\lim_{x \to 0} \frac{\tan \pi x}{x}$ is

[1 Marks]

a. $\frac{1}{\pi}$

b. 0

c. 1

d. π

69. If a circle pass through (4, 0) and (0, 2) and center at y-axis then find the radius of the circle.

[1 Marks]

a. 25 units

b. 20 units

c. 5 units

d. 10 units

70. The centre of the hyperbola whose foci are (6,4) and (-4,4) is

[1 Marks]

a. (1,2)

b. (-2,0)

c. (3,4)

d. (1,4)

71. The three lines given by $y^3-9x^2y = 0$

[1 Marks]

a. are all parallel

b. are such that two of them parallel

c. form of triangle

d. are concurrent

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72. Mid points of the sides AB and AC of a ΔABC are (3,5) and (-3,-3) respectively then the length of the sides BC is
[1 Marks]

a. 5

b. 10

c. 20

d. 25

73. If the planes x+2y+kz = 0 and 2x+y-2z=0 are at right angle then k=
[1 Marks]

a.-1/2

b. ½

c.-2

d. 2

74. $Let\ f\ (x)\ =\ 5x\ +\ 1,\ x\ \in R$ then value of $f^{-1}\ (6)\ is,$
[1 Marks]

a. 31

b. 1

c. 6

d. 1/6

75. For the graph of the trigonometric functions the measures of the angles are taken along the
[1 Marks]

a. x-axis

b. y - $axis$

c. z - axis

d. none of these

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76. Events A, B, C are mutually exclusive events such that $P(A) = \frac{3x+1}{3}, P(B) = \frac{1-x}{4}$, and $P(C) = \frac{1-2x}{2}$. The set of possible values of x are in the interval

[1 Marks]

a. $\frac{1}{3}, \frac{1}{2}$

b. $\frac{1}{3}, \frac{2}{3}$

c. $\frac{1}{3}, \frac{13}{3}$

d. $[0,1]$

77. If $mean = (3\,median - mode)\,x$, then the value of x is

[1 Marks]

a. 1(

b. 1/2(

c. 3/2(

d. 2

78. The measure of dispersion is changed by a change of

[1 Marks]

a. Origin

b. Scale

c. Algebraic Signs

d. None

79. If α and β are roots of $2x^2 - 4x + 5 = 0$ then $\alpha^2 + \beta^2$ is

[2 Marks]

a.-1

b. 0

c. 2

d. 1

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80. $\begin{vmatrix} 1 & a & b+c \\ 1 & b & c+a \\ 1 & c & a+b \end{vmatrix}$ is

[2 Marks]

a) $a+b+c$

b) 0

c) 1

d) none of these

81. How many signals can be given by 5 flags of different colors, using 3 at a time

[2 Marks]

a. 120

b. 60

c. 24

d. 15

82. The harmonic mean between 3 and 7 is

[2 Marks]

a. 5

b. $\pm\sqrt{21}$

c. $\frac{21}{5}$

d. none of these

83. $\int_0^{\frac{\pi}{8}} \cos^3 4x dx$ is

[2 Marks]

a. 5/3

b. 5/4

c. 1/3

d. 1/6

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84. If $f(x) = x^3 + 2x + 9$ then $f''(x) =$

[2 Marks]

a. $3x^2 + 2$

b. $3x^2$

c. $6x$

d. $2x$

85. $\lim_{x \to 0} \frac{a^x - 1}{x}$ is equal to

[2 Marks]

a. $\log_{e^x}$

b. $\log_{a^x}$

c. a

d. $\log_e a$

86. If $[x]$ is the greatest integer not greater than x, then $\lim_{x \to 2} [x]$ is

[2 Marks]

a. 0

b. 1

c. 2

d. none of these

87. An equation of the form $Ax^2 + By^2 + Gx + Fy + C = 0$ represents a circle if

[2 Marks]

a. $A = 0 \; or \; B = 0$

b. $A = B \neq 0$

c. $A \neq B$

d. None of these

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88. The straight line $y=2x+\lambda$ does not meet the parabola $y^2=2x$ if
[2 Marks]

a. $\lambda<1/4$

b. $\lambda=1/4$

c. $\lambda>1/4$

d. $\lambda = 4$

89. The general equation of second degree in x and y, $ax^2+2hxy+by^2+2gx+2fy+c=0$ represents a pair of straight line if
[2 Marks]

a) $af^2+2fgh + 2g +2f +c =0$

b) $\begin{vmatrix} a & g & f \\ g & b & h \\ f & h & c \end{vmatrix}$

c) $abc+ 2fgh+-af^2-bg^2-ch^2=0$

d) $af^2+bg^2+ch^2-2fgh+abc=0$

90. The equation of the plane through (0,0,0) and through the intersection of the planes 5x-3y+2z+5=0 and 3x-5y-2z-7=0 is
[2 Marks]

a. 23x-25y+2z=0

b. 25x-23y+2z=0

c. 15x+12y+6z=1

d. 7x+3y+4z=5

91. If A = {1, 3, 5, 7, 9, 11, 13, 15, 17}, B = {2, 4... 18} and N is the universal set, then $A' \cup ((A \cup B) \cap B')$ is
[2 Marks]

a. A

b. N

c. B

d. None of these

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92. Period of $\cot\frac{x}{2}$ is

[2 Marks]

a. π

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

c. $\frac{\pi}{4}$

d. 2π

93. If $\vec{AB} = \vec{i} + 2\vec{j} - 2\vec{k}$ and $\vec{AC} = -2\vec{i} + 2\vec{j} + \vec{k}$ are two adjacent sides of a triangle then area of triangle

[2 Marks]

a. $\frac{8}{2}$

b. $\frac{9}{2}$

c. $\frac{7}{2}$

d. None of these

94. Zwitter ion is formed when aniline is heated with

[2 Marks]

a. fuming H_2SO_4 at 200°C

b. conc. HNO_3

c. aq. Br_2

d. conc. H_2SO_4

95. Tarnishing of silver is due to the formation of

[2 Marks]

a. AgCl

b. Ag_2S

c. Ag_2O

d. Ag_2SO_4

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96. the blood red coloration is given by..... In Victor-Meyer's test.

[1 Marks]

a. primary alcohol

b. secondary alcohol

c. tertiary alcohol

d. ethyl amine

97.

Read the following passage and answer the four question that follow:

It is not luck but labour that makes fortune, says an American writer, sometimes something is waiting to happen: Labor with sharp eyes and strong will makes something happen. Fortune lies in bed and the postman wants to bring him news of the inheritance, labor turns to six o'clock and lays the foundation of skill with a busy pen and ringing hammer. Fortune moans, labour watches, fortune depends on chance, labour depends on character. Fortune slides down into self-indulgence; Labor moves upward and aspires to freedom. Conviction, therefore, is the mother of good fortune. In other words, a man's success in life will be proportional to his efforts, his art and his attention to the little things.

Q. Who said, "It is not luck but labour that makes fortune"?

[2 Marks]

a. An American writer

b. An English writer

c. A French writer

d. A German writer

98. According to the writer, what makes something happen?

[2 Marks]

a. Luck

b. Labour with sharp eyes and strong will

c. Chance

d. Self-indulgence

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99. What does the writer say about fortune and labour?

[2 Marks]

a. Fortune depends on chance and labour depends on luck

b. Fortune depends on chance and labour depends on character

c. Fortune depends on luck and labour depends on chance

d. Fortune depends on the character and labour depends on luck

100. What is the mother of good fortune according to the writer?

[2 Marks]

a. Conviction

b. Luck

c. Labour

d. Attention to the little things

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