IOE Entrance Mock Test Question

Set II

1. If a cycle wheel of radius 4m completes one revolution in two seconds, the acceleration of the cycle is
[1 Marks]

a. $2\pi\ ms^{-2}$

b. $2\pi^2\ ms^{-2}$

c. $4\pi\ ms^{-2}$

d. $4\pi^2\ ms^{-2}$

2. Damping force depends only on
[1 Marks]

a. Displacement

b. Acceleration

c. Velocity

d. Displacement squared

3. 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.

4. Woolen clothes kept the body warm because the wool

[1 Marks]

a. Decreases the temperature of body

b. Is a good conductor of heat

c. Increases the temperature of body

d. Is a bad conductor of heat

5. Laplace correction in expression of velocity of sound given by newton is needed because of sound waves

[1 Marks]

a. Are longitudinal

b. Propagate isothermally

c. Propagate adiabatically

d. Are of long wavelength

6. A polarized beam is one in which

[1 Marks]

a. Electric field vector vibrates in all possible directions

b. Magnetic field vectors vibrates in all possible directions

c. Electric field vector vibrates in perpendicular direction to the direction of propagation of light

d. Electric field vector vibrates in parallel direction to the direction of propagation of light

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

8. Identify the wrong statement

[1 Marks]

a. For isothermal process, $\Delta T = 0$

b. For isochoric process, , $\Delta V = 0$

c. For isobaric process, , $\Delta P = 0$

d. For cyclic process, , $\Delta W = 0$

9. A soap bubble is given a negative charge then its radius:

[1 Marks]

a. Decreases

b. Increases

c. Remains unchanged

d. Nothing can be predicted as information is not sufficient

10. 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

11. In a purely capacitive circuit, the current

[1 Marks]

a. Lags behind the emf by $\pi/2$

b. Leads the emf by $\pi/2$

c. Is in phase with the emf

d. Lags behind the emf by $\pi/2$ at low frequencies and leads the emf by $\pi/2$ at high frequency

12. Which combination of metals in thermocouple gives the maximum thermo emf in equal temperature difference at the two ends?

[1 Marks]

a. Iron and Copper

b. Zinc and Iron

c. Antimony and Bismuth

d. Antimony and copper

13. If the threshold frequency is increased then the kinetic energy of emitted photoelectrons

[1 Marks]

a. Increases

b. Decreases

c. Constant

d. First increases than decreases

14. The de-Broglie wavelength of an electron at temperature T is

[1 Marks]

a. $\frac{h}{\sqrt{2mkT}}$

b. $\frac{h}{\sqrt{3mkT}}$

c. $\frac{h}{\sqrt{mkT}}$

d. $\frac{h}{2\sqrt{mkT}}$

15. The point where movement occurred which triggered the earthquake is

[1 Marks]

a. Dip

b. Epicenter

c. Focus

d. Strike

16. In general, the most destructive earthquake waves are
[1 Marks]

a. P waves

b. S waves

c. Surface waves

d. Q waves

17. For any vectors $\vec{A}\&\vec{B}$, if $\vec{A}.\vec{B} = \vec{A} \times \vec{B}$, the magnitude of $\vec{A} + \vec{B}$ is
[2 Marks]

a. $\sqrt{A^2 + B^2 + \sqrt{2}AB}$

b. $\sqrt{A^2 + B^2 + AB}$

c. $\sqrt{A^2 + B^2 + 2AB}$

d. $\sqrt{A^2 + B^2 - \sqrt{2}AB}$

18. When displacement in SHM is half of amplitude, the fraction of total energy is kinetic is
[2 Marks]

a. ¼

b. ¾

c. ½

d. 1/8

19. Two water pipes of diameter 2cm and 4cm are connected to main water source. Rate of water flow through 2cm pipe as compared to that of through 4cm pipe will be
[2 Marks]

a. One fourth

b. Double

c. Half

d. Four time

20. The horsepower applied by a person while chewing 100gm of ice per minute is
[2 Marks]

a. 0.7507H.P.

b. 0.1324H.P

c. 0.3243H.P

d. 0.9321H.P.

21. Two closed organ pipe gives 4 beats per second when sounded together at 5℃. The number of beats at 35℃ is
[2 Marks]

a. 3.6 beats/s

b. 3.8 beats/s

c. 4.2 beats/s

d. 4.4 beats/s

22. The distance between two coherent sources is 0.1mm. The fringe width on the screen 1.2m away from the source is 6mm. The wavelength of light used is
[2 Marks]

a. 4000$A°$

b. 5000 $A°$

c. 6000 $A°$

d. 7200 $A°$

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

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. Two resistances are in the ratio 1:4. If these are connected in parallel, their resistance becomes 20 Ω. The value of each resistance is

[2 Marks]

a. 25Ω & 100Ω

b. 20Ω & 80Ω

c. 15Ω & 60Ω

d. 12Ω & 48Ω

26. In an AC circuit, we have $V = 100\sin(100t)$ volt and $I = 100\sin 100t + \frac{\pi}{3}$ mA. The power dissipated in the circuit is

[2 Marks]

a. 10kW

b. 10W

c. 2.5W

d. 5W

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

28. If $\beta = 200$ and $I_C = 5mA$, the value of $I_E$is
[2 Marks]

a. $5.02 \times 10^{-3}A$

b. $5.02A$

c. $5.02 \times 10^{-4}A$

d. $5.02 \times 10^{-2}A$

29. Andy knocked on the door ..... nobody answered.
[1 Marks]

a. And

b. But

c. Therefore

d. While

30. Identify the structure of the given sentence: **It is difficult to learn German.**
[1 Marks]

a. It + be + gerundial phase

b. It + be + adjective + noun + to-infinitive

c. It + be + adjective + to-infinitive

d. It + be + adjective + Complement

31. If he had gone to Agra, he.....the Taj Mahal.
[1 Marks]

a. Have been seen

b. Saw

c. Had been seen

d. Would have seen

32. If I _____a doctor, I would have treated you all.
[1 Marks]

a. Were

b. Would

c. Am

d. Could

33. The direct speech for “Nita ordered her servant to bring her a cup of tea” is:
[1 Marks]

a. Nita told her servant, "Bring a cup of tea."

b. Nita said, "Bring me a cup of tea."

c. Nita said to her servant, "Bring me a cup of tea."

d. Nita told her servant, "Bring her that cup of tea."

34. Find out the subject in the following sentence: “On the top of the hill, there lives a hermit.”
[1 Marks]

a. The hill

b. A hermit

c. On the top

d. On the top of the hill

35. Either the executive or the assistant _____been here.
[1 Marks]

a. have

b. has

c. was

d. are

36. The children were freed _____the danger.

[1 Marks]

a. Of

b. From

c. With

d. In

37. Blood is _____than the water.

[1 Marks]

a. Thin

b. Thick

c. Thicker

d. Thinner

38. Pick out the word that is most nearly the same in meaning as the word VICARIOUSLY.

[1 Marks]

a. Loudly

b. Daringly

c. With deliberation

d. By substitute

39. How many voiced consonant sounds are there in English?

[1 Marks]

a. 9

b. 15

c. 24

d. 12

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. 1 amu is equal to
[1 Marks]

a. $\frac{1}{14}$ of O-16

b. $\frac{1}{12}$ of C-12

c. 1 g of H_2

d. 1.66×10^{-23} kg

42. The spectral line formed by returning of electron from higher energy level to K-Shell lies in
[1 Marks]

a. UV region

b. Visible region

c. IR region

d. Micro wave

43. Which of the following molecular hydrides act as Lewis acid?
[1 Marks]

a. NH_3

b. H_2O

c. B_2H_6

d. CH_4

44. Electronegativity values for the elements helps in predicting
[1 Marks]

a. Polarity of bonds

b. Dipole moments

c. Valency of elements

d. Position in the electrochemical series

45. Which one of the group VA elements is the most abundant in the earth's crust?
[1 Marks]

a. Nitrogen

b. Phosphorus

c. Arsenic

d. Antimony

46. Which of these can reduce both conc. H_2SO_4 and $FeCl_3$ solution?
[1 Marks]

a. HF

b. HCl

c. HBr

d. HI

47. The ammonia is dried over
[1 Marks]

a. the slaked lime

b. quick lime

c. calcium carbide

d. phosphorus pentachloride

48. Which of these is soluble in water?
[1 Marks]

a. $BaCO_3$

b. $BaSO_4$

c. $BaCl_2$

d. $PbSO_4$

49. The functional group of carbylamine is:
[1 Marks]

a. – CN

b. – NC

c. – $CONH_2$

d. – $CSNH_2$

50. Ethyne and ethene can be separated using
[1 Marks]

a. Baeyer's reagent

b. Br_2 water

c. Tollen's reagent

d. Conc. H_2SO_4

51. Which of these can be used to prepare methane gas?
[1 Marks]

a. Wurtz rxn

b. Kolbe's electrolysis

c. Decarboxylation of fatty acid

d. All of these

52. The volume of CO_2 gas obtained at STP when 3 grams of ethane is reacted with 5 grams of oxygen is

[2 Marks]

a. 1.21

b. 1.61

c. 1.81

d. 2.01

53. The volume of Cl_2 gas obtained at STP during electrolysis of NaCl by passing 0.5A current for 30 minutes. Assume current efficiency to be 80%,

[2 Marks]

a. 54.42 ml

b. 68.14 ml

c. 74.12 ml

d. 83.56 ml

54. 2.5 liters of 1 M NaOH solution are mixed with another 3 liters of 0.5 M NaOH solution. Then the molarity of the resulting solution is

[2 Marks]

a. 1.08M

b. 1.0M

c. 0.73M

d. 0.50

55. The pH of 0.1 M solution of hypochlorous acid ($K_a = 3.5 \times 10^{-8}$) is

[2 Marks]

a. 4.118

b. 4.338

c. 4.008

d. 4.228

56. A gas formed by reacting Fes with dilute H_2SO_4 doesn't give precipitate with
[2 Marks]

a. acidified $CuSO_4$

b. acidified $ZnSO_4$

c. alkaline $MnSO_4$

d. alkaline $NiSO_4$

57. A metal which turns to white on heating with air and becomes yellow on cooling it is:
[2 Marks]

a. Zn

b. Cu

c. Ag

d. Fe

58. An alkene is obtained by heating an alcohol with conc. H_2SO_4. The alkene on ozonolysis results aldehyde as main product. The alcohol is :
[2 Marks]

a. ethanol

b. 2-butanol

c. 1-butanol

d. 2-propanol

59. The middle term in the Expression $(a + b)^{12}$ is
[1 Marks]

a. 6th term

b. 7th term

c. 8th term

d. 9th term

60. $\sqrt{x+8}+\sqrt{x+3}=\sqrt{12x+13}$ is called
[1 Marks]

a. reciprocal eq

b. exponential eq

c. radical eq

d. none of these

61. If matrix $A=\begin{bmatrix}1\\2\\3\end{bmatrix}$ them order of A' is
[1 Marks]

a. 1×3

b. 3×3

c. 3×1

d. 1×1

62. If n is negative integer, then n! is
[1 Marks]

a. 1

b. 0

c. unique

d. not defined

63. The fifth term of the sequence $a_n=2n+3$ is
[1 Marks]

a. 13

b.-13

c. 8

d. 3

64. The area bounded by the curves $y^2 = 4x$ and $y = x$ is equal to
[1 Marks]

a. $8 / 3$

b. $35 / 6$

c. $1 / 3$

d. none of these

65. The area bounded by the curves $y^2 = x$ and $y = x^2$ is
[1 Marks]

a. $1 / 2$ sq. units

b. $2 / 3$ sq. units

c. 1 sq. units

d. none of these

66. A stationary point is called if it is either a maximum point or a minimum point
[1 Marks]

a. Stationary point

b. turning point

c. critical point

d. point of inflexion

67. If $\frac{d^2x}{dy^2}\left(\frac{dy}{dx}\right)^3 + \frac{d^2y}{dx^2} = k$, then k is equal to
[1 Marks]

a. 0

b. 1

c. 2

d. none of these

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

[1 Marks]

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

b. 0

c. 1

d. π

69. The point (1, 4) lies _____the circle $x^2 + y^2 - 2x - 4y + 2 = 0$.

[1 Marks]

a. inside circle

b. outside circle

c. on the circle

d. either inside or outside

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. An ellipse has _____vertices and _____foci.

[1 Marks]

a. two, one

b. one, one

c. one, two

d. two, two

72. A straight line meet the axes at A and B such that the centroid of ΔABC is (a,a). Then the equation of the line AB is
[1 Marks]

a. x+y =a

b. x-y = 3a

c. x-y = 2a

d. x+y = 3a

73. The angle between the pair of planes x+2y+3z = 5 and 3x-3y+z=1 is
[1 Marks]

a. 30

b. 60

c. 90

d. 45

74. The domain of binary relation $y^2 = -4x$ is,
[1 Marks]

a. R

b. Z

c. R^+

d. Negative real numbers including zero.

75. In $\sin 3\theta = 4\sin\theta\sin 2\theta\sin 4\theta$ in $0 \leq \theta \leq \pi$ has :
[1 Marks]

a. 2 real solutions

b. 4 real solutions

c. 6 real solutions

d. 8 real solutions.

76. If $A$and B are two mutually exclusive events, then

[1 Marks]

a. $P\ (A) < P(\bar{B})$

b. $P(A) > P(\bar{B})$

c. $P(A)\ < P(B)$

d. None of these

77. If the mean of first n natural numbers is 5n/9, then n =

[1 Marks]

a. 5

b. 4

c. 9

d. 10

78. Median divides the series in the ratio

[1 Marks]

a. 1:2

b. 1:4

c. 1:1

d. 1:5

79. If $\alpha\ and\ \beta$ are roots of $2x^2 - 4\ x + 5 = 0$ then $\frac{1}{\alpha} + \frac{1}{\beta} =$

[2 Marks]

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

b. $-\frac{5}{4}$

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

d. $-\frac{4}{5}$

80. If the area of triangle is 35 square units with vertices $(2,6),(5,4)$ and $(k,4)$ .Then *k* is

[2 Marks]

a. 12

b.-2

c.-12,-2

d. 12,-2

81. If $n_{C_8} = n_{C_{12}}$ then $n =$

[2 Marks]

a. 20

b. 4

c. 8

d. 12

82. If $a_n = \frac{1}{2^n}$, then first four terms are

[2 Marks]

a) $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}$

b) 2,4,8,16

c) 1,2,4,8

d) $1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}$

83. $\int_{\frac{1}{3}}^{1} \frac{(x - x^3)^{\frac{1}{3}}}{x^4}$ dx is

[2 Marks]

a. 6

b. 0

c. 3

d. 4

84. If $f'(c) = 0$ or $f'(c)$ is undefined, then the number c is called critical value and the corresponding point is called
[2 Marks]

a. Stationary point

b. turning point

c. critical point

d. point of inflexion

85. $y = \sinh^{-1}x$ if and only if $x = \sinh y$ is valid when
[2 Marks]

a. $x > 0, y > 0$

b. $x < 0, y < 0$

c. $x \in R, y > 0$

d. $x \in R, x > 0$

86. $\lim_{x \to \infty} \; x \sin\frac{1}{x}$ is
[2 Marks]

a. 0

b. ∞

c. non-existent

d. 1

87. If a cone is cut by a plane perpendicular to its axis, then section is
[2 Marks]

a. An ellipse

b. A parabola

c. A hyperbola

d. None of these

88. The equation of the hyperbola whose transverse eccentricity is $\frac{\sqrt{5}}{2}$ and length of axis is 1 is

[2 Marks]

a. $x^2-4y^2=1$

b. $4x^2-2y^2=1$

c. $x^2-y^2=1$

d. $16x^2-y^2=1$

89. If the line (2x-3y+4) + k(-x+y+5) = 0 is horizontal, then the value of k =

[2 Marks]

a. 0

b. 1

c. 2

d. 3

90. The direction cosine l,m,n of two lines are connected by the relation 3l+m+5n=0 and 6mn-2nl+5lm=0. The angle between them is

[2 Marks]

a. $\cos^{-1}(1/6)$

b. $\cos^{-1}(1/3)$

c. $\cos^{-1}(1/4)$

d. $\cos^{-1}(1/5)$

91. If sets *A* and *B* are defined as$A = \{(x, y) : y = e^x, x \in R\} B = \{(x, y) : y = x, x \in R\}$ *then*

[2 Marks]

a. $B \subset A$

b. $A \subset B$

c. $A \cap B = \phi$

d. $A \cup B =$ A

92. The graph of $y = \sin x$ lies between the horizontal lines $y = +1$ and
[2 Marks]

a. $y = +2$

b. $y = 0$

c. $y = 2$

d. $y = -1$

93. If $\vec{a} = 2\hat{i} - 3\hat{j} - \hat{k}$ and $\vec{b} = \hat{i} + 4\hat{j} - 2\hat{k}$ then $\vec{a} \times \vec{b} =$
[2 Marks]

a. $10\hat{i} + 3\hat{j} + 11\hat{k}$

b. $10\hat{i} - 3\hat{j} + 6\hat{k}$

c. $20\hat{i} + 6\hat{j} + 22\hat{k}$

d. None of these

94. Drinking of which alcohol may cause blindness?
[2 Marks]

a. Wood Spirit

b. Ethanol

c. Absolute Alcohol

d. Rectified Spirit

95. The trace metal present in insulin is
[2 Marks]

a. Fe

b. Cu

c. Zn

d. Hg

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

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