

Questions for Faculty:ENGINEERING and Level:BE Entrance Mock and

Exam Session date: NCE Mock Test 2

- 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.** 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

- 3.** If the absolute temperature of radiating body is suddenly halved, the radiating power will reduce approximately by

[1 Marks]

- a. 25%
- b. 12.5%
- c. 6.25%
- d. 3.125%

4. Which of the following is close to an ideal black body?

[1 Marks]

- a. Black lamp
- b. Cavity maintained at constant temperature
- c. Platinum black
- d. A lamp of black charcoal heated to high temperature

5. There is no transfer of in the direction of propagation of progressive wave.

[1 Marks]

- a. Medium
- b. Energy
- c. Kinetic energy
- d. Potential energy

6. Which of the following cannot be polarized

[1 Marks]

- a. Radio waves
- b. Sound wave
- c. X-rays
- d. Transverse waves

7. An endoscope is a

[1 Marks]

- a. Narrow telescope
- b. Type of camera
- c. Simple microscope
- d. Compound microscope

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. n equal capacitors are first connected in series and then in parallel. The ratio of maximum to minimum capacitance is:

[1 Marks]

- a. n^2
- b. n
- c. $1/n$
- d. $1/n^2$

10. A capacitor acts as perfect insulator in

[1 Marks]

- a. AC circuit
- b. DC circuit
- c. Both AC and DC circuit
- d. Neither AC nor DC circuit

11. A neutral point in the magnetic field is a point where

[1 Marks]

- a. Magnetic moment of the magnet is balanced by the magnetic field of earth
- b. Magnetic field due to the magnet is zero
- c. Magnetism is the strongest
- d. Earth's magnetic field is exactly neutralized by the field due to the magnet

12. A moving electric charge will produce

[1 Marks]

- a. Electric as well as magnetic field
- b. Magnetic field only
- c. Electric field only
- d. None of the two fields

13. A metal surface ejects electrons when hit by green light but non when hit by yellow light. The electrons will be ejected when the surface is hit by

[1 Marks]

- a. Red light
- b. Blue light
- c. Heat rays
- d. Infrared light

14. The value of fine structure constant is

[1 Marks]

- a. 1840
- b. $1/1840$
- c. 137
- d. $1/137$

15. Second generation of quark include

[1 Marks]

- a. up and down quark
- b. top and bottom quark
- c. charm and strange quark
- d. strange and bottom quark

16. The band gap in germanium and silicon in eV respectively is

[1 Marks]

- a. 1.1, 0.7
- b. 1.1, 0
- c. 0, 1.1
- d. 0.7, 1.1

17. A bag of mass M hangs by a long thread and a bullet of mass m comes horizontally with velocity v and gets caught in the bag. The kinetic energy of the combined system is

[2 Marks]

- a. $\frac{m^2 v^2}{2(M+m)}$
- b. $\frac{m^2 v^2}{(M+m)}$
- c. $\frac{2m^2 v^2}{(M+m)}$
- d. $\frac{4m^2 v^2}{(M+m)}$

18. A body of mass M and radius R , rolling on horizontal surface, without slipping, with velocity v , rises up an incline plane to maximum height $\frac{7v^2}{10g}$, the body is

[2 Marks]

- a. Hollow sphere
- b. Solid sphere
- c. Disc
- d. Ring

19. When the load of a wire is increased from 2kg to 4kg, elongation increases from 0.6mm to 1mm. Work done during this extension of wire is

[2 Marks]

- a. 10^{-3} J
- b. $40 \times 10^{-3} \text{ J}$
- c. $4 \times 10^{-3} \text{ J}$
- d. $14 \times 10^{-3} \text{ J}$

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

[2 Marks]

- a. $26.67 \times 10^{-6}^\circ\text{C}^{-1}$
- b. $13.33 \times 10^{-6}^\circ\text{C}^{-1}$
- c. $8.89 \times 10^{-6}^\circ\text{C}^{-1}$
- d. $6.67 \times 10^{-6}^\circ\text{C}^{-1}$

21. The intensity level from a loud speaker is 100dB at a distance of 10m. The intensity level at a distance of 100m is

[2 Marks]

- a. 110dB
- b. 90dB
- c. 80dB
- d. 70dB

22. Two sources of intensities $4I$ and I are used in an interference exp. The intensity at a point where waves from the two sources superimposed with phase difference π is

[2 Marks]

- a. I
- b. $3I$
- c. $4I$
- d. $5I$

23. A disc is placed on the surface of a pond having refractive index $5/3$. A source of light is placed 4m below the surface of liquid. The minimum area of disc needed so that light is not coming out of the liquid is

[2 Marks]

- a. 32.45m^2
- b. 28.28m^2
- c. 24.54m^2
- d. 17.27m^2

24. A parallel plate capacitor has a capacitance of $10\mu F$. The area of the capacitor is divided into two equal halves and filled with two media having dielectric constants $K_1 = 2$ & $K_2 = 4$. The capacitance of the system will be

[2 Marks]

- a. $30\mu F$
- b. $15\mu F$
- c. $25\mu F$
- d. $20\mu F$

25. A fuse wire with a radius of 0.1mm blows at 10A. The radius of wire made of same material which should melt at 20A is

[2 Marks]

- a. 0.362mm
- b. 0.213mm
- c. 0.199mm
- d. 0.159mm

26. Two identical coils carry equal currents and have a common center, but their planes are perpendicular to each other. If the field due to one coil is B , then resultant field at their center is

[2 Marks]

- a. Zero
- b. $\frac{B}{\sqrt{2}}$
- c. $\sqrt{2} B$
- d. $2B$

27. A perfectly reflecting mirror has an area 1 cm^2 . Light is allowed to fall on it for 1 hour at the rate of 10W/cm^2 . The force that acts on the mirror is

[2 Marks]

- a. $1.11 \times 10^{-6} N$
- b. $3.33 \times 10^{-7} N$
- c. $6.66 \times 10^{-7} N$
- d. $3.33 \times 10^{-6} N$

28. The activity of radioactive sample falls from 400/s to 200/s in 40 minutes. The half life of radioactive sample is

[2 Marks]

- a. 20min
- b. 30min
- c. 40min
- d. 50min

29. Identify the sentence that has an antecedent?

[1 Marks]

- a. I like apple.
- b. The girl was beautiful
- c. Always eat breakfast
- d. Remember to sit still.

30. An interrogative sentence ends with.

[1 Marks]

- a. a full stop
- b. a question mark
- c. an exclamatory mark
- d. a comma

31. Mick usually his dog in the afternoon.

[1 Marks]

- a. Walks
- b. Walk
- c. Is walking
- d. Walked

32. If I _____ a doctor, I would have treated you all.

[1 Marks]

- a. Were
- b. Would
- c. Am
- d. Could

33. The indirect speech for David said to Anna, "Mona will leave for her native place tomorrow" is:

[1 Marks]

- a. David told Anna that Mona will leave for her native place tomorrow.
- b. David told Anna that Mona left for her native place the next day.
- c. David told Anna that Mona would be leaving for her native place tomorrow.
- d. David told Anna that Mona would leave for her native place the next day.

34. Change the given sentence from assertive to exclamatory. "The sunrise is very beautiful."

[1 Marks]

- a. The sunrise is awesome!
- b. How beautiful the sunrise is!
- c. The sun is absolutely beautiful!
- d. The sunrise was good.

35. The content of the papers _____ not good.

[1 Marks]

- a. was
- b. were
- c. have been
- d. are

36. The first bell in our school rings _____ 7.30 a.m.

[1 Marks]

- a. For
- b. In
- c. At
- d. None of the above

37. Choose the correct statement:

[1 Marks]

- a. I met a beautiful, European woman.
- b. I met a beautiful European woman.
- c. I met a beautiful European, woman.
- d. I met a beautiful, European, woman.

38. Open to more than one interpretation, not having one obvious meaning.

[1 Marks]

- a. Alchemy
- b. Amateur
- c. Ambiguous
- d. Altercation

39. Identify the word in which the final sound is different from other words.

[1 Marks]

- a. Sleep
- b. Reap
- c. Teach
- d. Deep

40. "Kick the bucket" is an Euphemism that describes:

[1 Marks]

- a. Death of a person
- b. Illness of a person
- c. That the person is not available at the moment.
- d. Kicking the bucket

41. 4.5 g of a metal on reaction with acid gives 5.6 liters of hydrogen gas at STP. The equivalent weight of metal is

[1 Marks]

- a. 7
- b. 9
- c. 12
- d. 20

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 these is both Bronsted and Lewis acid?

[1 Marks]

- a. NH_3
- b. H_3O^+
- c. HSO_4^-
- d. CO_2

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. Representative elements are those which belong to

[1 Marks]

- a. p and d block
- b. s and d - block
- c. s and p block
- d. s and f – block

46. Oil of vitriol is:

[1 Marks]

- a. H_2SO_3
- b. H_2SO_4
- c. H_2SO_5
- d. $\text{H}_2\text{S}_2\text{O}_8$

47. Which of the following can be used as an anaesthesia?

[1 Marks]

- a. N_2O
- b. NO
- c. NCl_3
- d. NO_2

48. The flux used during extraction of copper is

[1 Marks]

- a. SiO_2
- b. CaO
- c. MgO
- d. P_2O_5

49. The IUPAC name of $\text{CH}_3 - \text{C} \equiv \text{C} - \text{CH}(\text{CH}_3)_2$ is:

[1 Marks]

- a. 4 – methyl – 2 – pentyne
- b. methyl isopropylacetylene
- c. 4, 4 – dimethyl – 2 – butyne
- d. 2 – methyl – 4 – pentyne

50. Total no. of isomers of formula $\text{C}_2\text{H}_4\text{O}_2$ is

[1 Marks]

- a. 1
- b. 2
- c. 3
- d. 4

51. A hydrocarbon containing 80% of carbon is:

[1 Marks]

- a. CH_4
- b. C_2H_6
- c. C_2H_3
- d. C_2H_4

52. Metal oxide contains 53% metal and formula of metal oxide is M_2O_3 . Atomic mass of metal is

[2 Marks]

- a. 24
- b. 27
- c. 39
- d. 55

53. 0.975 grams of metal were deposited by passing 193C charge through Mn^{+} ion. The value of n is (Atomic weight of M = 195) :

[2 Marks]

- a. 1
- b. 2
- c. 3
- d. 4

54. The volume of HCl gas at STP required to reduce the strength of 400 ml of N NaOH to 0.5N NaOH is

[2 Marks]

- a. 2.82 liters
- b. 3.58 liters
- c. 4.16 liters
- d. 4.48 liters

55. 100 ml of a solution having pH 1 is mixed with 100 ml of other solution having pH 2. The pH of resulting solution is :

[2 Marks]

- a. 1.1
- b. 1.26
- c. 1.5
- d. 2.0

56. An irritating gas which does not react with lead acetate but decolorize acidified KMnO_4 and turns acidic $\text{K}_2\text{Cr}_2\text{O}_7$ green, the gas is:

[2 Marks]

- a. NH_3
- b. H_2S
- c. SO_2
- d. PH_3

57. Stainless steel contains

[2 Marks]

- a. Fe + C + Ni
- b. Fe + Ni + Cu
- c. Fe + Cr + Cu
- d. Fe + Ni + Cr

58. A haloalkane (X), reacts with KCN to produce a nitrile, which on acidic hydrolysis gave propanic acid, the compound (X) must be:

[2 Marks]

- a. ethyl halide
- b. iso propyl halide
- c. methyl halide
- d. n – propyl halide

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

[1 Marks]

- a. n^{th} term
- b. $(\frac{n}{2})^{\text{th}}$ term
- c. $[(\frac{n}{2})-1]^{\text{th}}$ term
- d. $[(\frac{n}{2})+1]^{\text{th}}$ term

60. If S and P are the sum and the product of the roots of a quadratic equation, then quadratic equation is

[1 Marks]

a. $x^2 + Sx - P = 0$

b. $x^2 - Sx + P = 0$

c. $x^2 - Sx - P = 0$

d. $x^2 + Sx + P = 0$

61. The number of non zero rows in echelon form of a matrix is called

[1 Marks]

a. order of matrix

b. rank of matrix

c. row operation

d. none of these

62. $n_{p_n} =$

[1 Marks]

a. $n !$

b. 0

c. 1

d. none of these

63. The third term of the sequence $a_n = (-1)^{n-1}(n-7)$ is

[1 Marks]

a. 8

b. 4

c. -4

d. -8

64. $\int_{-8}^8 (\sin^{93} x + x^{295}) dx$ equals to
[1 Marks]

- a. 1
- b. -1
- c. 0
- d. 8/3

65. Area of the region bounded by the curve $x = 2y + 3$, the y-axis and between $y = -1$ and $y = 1$ is
[1 Marks]

- a. 6 sq. units
- b. 4 sq. units
- c. 8 sq. units
- d. 3/2 sq. units

66. $\frac{d}{dx} 10^{\sin x} =$
[1 Marks]

- a. $10^{\cos x}$
- b. $10^{\sin x} \cdot \cos x \cdot \ln 10$
- c. $10^{\sin x} \cdot \ln 10$
- d. $10^{\cos x} \cdot \ln 10$

67. The derivative of $\frac{1}{1+x}$ is:
[1 Marks]

- a. x
- b. $1 + x$
- c. $(1 + x)^2$
- d. $-(1 + x)^{-2}$

68. If $[x]$ is the greatest integer not greater than x , then $\lim_{x \rightarrow \frac{1}{2}} [x]$ is

[1 Marks]

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

b. 1

c. nonexistent

d. 0

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

[1 Marks]

a. 25 units

b. 20 units

c. 5 units

d. 10 units

70. The eccentricity of hyperbola $9x^2 - 16y^2 = 144$ is

[1 Marks]

a. $5/3$

b. $5/4$

c. $2/3$

d. $1/7$

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

72. If the lines $2x+3ay-1=0$ and $3x+4y+1=0$ are perpendicular then the value of a is

[1 Marks]

a. $1/2$

b. $3/2$

c. $-1/2$

d. 4

73. The equation of the plane having intercepts 2,-3,4 in order is

[1 Marks]

a. $x+2y+z=5$

b. $3x-4y=6z=9$

c. $6x-4y+3z=12$

d. $5x-y+4z=7$

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. Range of $\cot x$ is

[1 Marks]

a. $[-1,1]$

b. R

c. negative real no.

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

76. Two dice are tossed. The probability that the total score is a prime number is:

[1 Marks]

- a. $1/6$
- b. $5/12$
- c. $\frac{1}{2}$
- d. $7/9$

77. If mode of a series exceeds its mean by 12, then mode exceeds the median by

[1 Marks]

- a. 4
- b. 8
- c. 6
- d. 12

78. The variant value which divides the series in two equal parts is

[1 Marks]

- a. Mean
- b. Median
- c. Mode
- d. All of the above

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

80. If the matrix $\begin{bmatrix} k & 4 \\ 3 & 2 \end{bmatrix}$ is singular then $k =$

[2 Marks]

- a. 2
- b. 6
- c. 4
- d. 8

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. If 5 is the harmonic mean between 2 *and* b then $b =$

[2 Marks]

- a. 3
- b. 8
- c. 10
- d. -10

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 $f(x) = \sin x$ then $f'(\cos^{-1} 3x) =$

[2 Marks]

a. $\cos x$

b. $\frac{-3}{\sqrt{1-9x^2}}$

c. $\frac{3}{\sqrt{1-9x^2}}$

d. $3x$

85. If $a > 0, a \neq 1$, and $x = a^y$ then the function defined by $y = \log_a x (x > 0)$ is called a logarithmic function with base

[2 Marks]

a. 10

b. e

c. a

d. x

86. $\lim_{x \rightarrow 3} \frac{x-3}{x^2-2x-3}$ is

[2 Marks]

a. 1

b. $\frac{1}{4}$

c. ∞

d. none of these

87. A stick of length L rests against the floor and a wall of a room. If the stick begins to slide on the floor, then the locus of its middle point is:

[2 Marks]

a. an ellipse

b. a parabola

c. a circle

d. a straight line

88. The length of latus rectum of parabola $y^2=4ax$ if the line $2x+3y=1$ touches it is

[2 Marks]

- a. $4/3$
- b. 4
- c. 8
- d. $8/9$

89. The orthogonal projection of the point (2,-3) on the line $x+y = 0$ is

[2 Marks]

- a. $-\frac{1}{2}, \frac{3}{2}$
- b. (2,3)
- c. (-4,6)
- d. $\frac{5}{2}, -\frac{5}{2}$

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. The solution of $3x^2 - 12x = 0$ when

[2 Marks]

- a. $x \in N$ is $\{4\}$
- b. $x \in I$ is $\{0, 4\}$
- c. $x \in S = a + ib: b \neq 0, a, b \in R$ is ϕ
- d. All of these

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

a. $y = +1$

b. $y = 0$

c. $y = 2$

d. $y = -2$

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. Sugar in urine can be detected by
[2 Marks]

a. Baeyer's reagent

b. Benedict's reagent

c. Tollens' reagent

d. Schiff's reagent

95. Mercury is the only metal which is liquid at 0°C , this is due to its
[2 Marks]

a. high atomic weight

b. high vapours pressure

c. low ionization potential

d. very high ionization energy and weak metallic bond

96. which of the following is used as a dehydrating agent for alcohols?

[1 Marks]

- a. H_2SO_4
- b. Al_2O_3
- c. P_2O_5
- d. All of these

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