KANTIPUR ENGINEERING COLLEGE

Model Questions for B.E. Entrance Test (2074)

Set: 3 (A)   **Time: 2 hours**   **Date: 2074/03/10**

Section: I Select the Best Alternative on the answer sheet given   60×1 = 60

1. The pair …………. has the same pronunciation.
    (A) hate, hat   (B) gait, gate   (C) beat, bit   (D) lead, lid

2. Which of the following words has its primary stress on the second syllable?
    (A) privilege   (B) private   (C) priority   (D) principle

3. No one wants to <u>jeopardize</u> his career. The synonyms of the underlined word is ………….
    (A) endanger   (B) wear away   (C) belittle   (D) unbalance

4. It is not possible to …………. the suffering.
    (A) instigate   (B) propitiate   (C) masticate   (D) mitigate

5. The boy said to his sister, "Don't try to be funny!" The indirect speech of this sentence is
    (A) The boy said to his sister not to try to be funny.
    (B) The boy told his sister not try to be funny.
    (C) The boy told his sister to try to be funny.
    (D) The boy told his sister not to try to be funny.

6. Which of the following is acceptable?
    (A) If I saw him, I will call him.   (B) If I saw him, I called him.
    (C) If I see him, I would call him.   (D) If I saw him, I would call him.

7. Which one of the following is correct?
    (A) Neither Hari nor his brother has a book. (B) Neither Hari nor his brother have had a book.
    (C) Neither Hari nor his brother have read the book.
    (D) Neither Hari nor his brother have a book.

8. Which of the following is not acceptable?
    (A) sleep off   (B) get off   (C) put off   (D) see off

9. I am really tired, ………….?
    (A) aren't I   (B) amn't I   (C) am I not   (D) am not I

10. A state in which all religions are equal is called …………..
    (A) democratic   (B) kingdom   (C) secular   (D) religious

11. The president presided …………. the meeting.
    (A) at   (B) in   (C) over   (D) at

12. Which of the following is incorrect?
    (A) They told me not to speak loudly.   (B) She congratulated him.
    (C) He asked me where I was going?   (D) Ram wished me good morning.

13. Neither of the boys had …………. homework checked.
    (A) their   (B) his   (C) her   (D) hers

14. They …………. that they had already finished their meal.
    (A) says   (B) said   (C) had said   (D) has said

15. The quantum number values of the designation 3d are
    (A) $n = 3, l = 0$ (B) $n = 3, l = 2$ (C) $n = 3, l = 1$ (D) $n = 3, l = 3$

16. Mass of 0.1 mole of CH_4 is
    (A) 1 g   (B) 1.6 g   (C) 16 g   (D) 0.1 g

17. pH of 0.0001 M HCl is
    (A) 4   (B) 2   (C) 6   (D) 7

18. If three electrons are lost by a metal ion M^{3+}, its final oxidation number would be
(A) 0   (B) + 4   (C) + 6   (D) + 5

19. Lithium shows the diagonal relationship with
(A) Na   (B) Al   (C) Si   (D) Mg

20. If red hot steel rod is suddenly immersed in water, the steel becomes
(A) soft and malleable   (B) fibrous   (C) tough and ductile   (D) hard and brittle

21. The bond angle of H-N-H in ammonia molecule and structure are
(A) 107.8°, Pyramidal   (B) 90°, Tetrahedral
(C) 120°,Triogonal bipyramidal   (D) $109^{\circ}28'$, Trigonal

22. Oxidation number of chlorine in ClO_3^- is
(A) 4   (B) 6   (C) 5   (D) 7

23. The waste material in an ore is called
(A) matte   (B) gangue   (C) flux   (D) mineral

24. Nitrates of all metals are
(A) unstable   (B) soluble in water   (C) coloured   (D) insoluble in water

25. Nitration of benzene is
(A) nucleophilic addition   (B) nucleophilic substitution
(C) electrophilic addition   (D) electrophilic substitution

26. Isopentane and neopentane are
(A) metamers   (B) position isomers   (C) chain isomers   (D) tautomers

27. If a current is passed in a spring, it
(A) gets compressed   (B) remains same   (C) oscillates   (D) gets expanded

28. If an electron has an initial velocity is perpendicular to the direction of electric field, the path of the electron is
(A) an ellipse   (B) a straight line   (C) a circle   (D) a parabola

29. The sensitivity of moving coil galvanometer can be increased by decreasing
(A) the magnetic field   (B) The couple per unit twist of suspension
(C) the area of the coil   (D) the number of turns in the coil

30. The motion of projectile is represented by $y = R \sin(\omega t + \phi)$. The motion is
(A) oscillatory with SHM   (B) uniform circular motion
(C) oscillatory but not SHM   (D) neither oscillatory nor SHM

31. The dimension of impulse is
(A) $[M^0L^3T^{-1}]$ (B) $[ML^2T]$ (C) $[MLT^{-1}]$ (D) $[M^{-1}LT^{-1}]$

32. A particle is orbiting in vertical plane, its momentum will be
(A) directed horizontally   (B) directed vertically
(C) tangential to the orbit   (D) at 60° to the vertical

33. Absolute temperature of the gas is determined by
(A) the speed of the gas   (B) ther.m.s. velocity of the molecules
(C) the momentum of the molecules   (D) the number of molecules in the gas

34. A musical scale is constructed by providing intermediate frequencies between a note and its octave which
(A) form a geometric progression   (B) form a harmonic progression
(C) form an arithmetic progression   (D) bear a simple ratio with their neighbors

35. In young's double slit experiment, the separation between the slits is halved and the distance between the slits and screen is doubled. The fringe width is
(A) quadrupled   (B) unchanged   (C) halved   (D) doubled

36. A ray of light travelling in a transparent medium falls on a surface separating the medium from air at an angle of incidence 45°. The rays undergoes total internal reflection. If n is the refractive index of the medium with respect to air, the possible value of n is
   (A) 1.3   (B) 1.6   (C) 1.4   (D) 1.8

37. If $A \subseteq B$, $\bar{B} - \bar{A}$ is
   (A) $\bar{A}$ (B) $\bar{B}$ (C) $A - B$ (D) φ

38. The general solution of $2\cos^2 x + \sin x \cos x - \sin^2 x = 0$ is
   (A) $n\pi + \dfrac{\pi}{4}$ (B) $2n\pi \pm \dfrac{\pi}{4}$ (C) $n\pi - \dfrac{\pi}{4}$ (D) $n\pi + \dfrac{\pi}{6}$

39. The value of 'a' for which the vectors $3\vec{i} + 4a\vec{j} + \vec{k}$ and $-2\vec{i} + \vec{j} + 5\vec{k}$ are orthogonal is
   (A) $\dfrac{-11}{4}$ (B) $\dfrac{7}{13}$ (C) $\dfrac{-2}{7}$ (D) $\dfrac{-3}{2}$

40. The equation of the straight line passing through the intersection of $3x - y + 2 = 0$ and $5x - 2y + 7 = 0$ and having infinite slope is
   (A) x = 2   (B) x = 3   (C) x + y = 3   (D) x = 4

41. The projection of a line on axes are 6, 2, 3 then length of line is
   (A) 1   (B) 3   (C) 5   (D) 7

42. If A. adjA= $\begin{pmatrix} 10 & 0 \\ 0 & 10 \end{pmatrix}$, then |A| equals
   (A) 10   (B) 0   (C) 100   (D) 2×10

43. The value of k for which the one root of the equation $3x^2 + 7x + 6-k = 0$ is equal to zero is
   (A) 3   (B) 2   (C) 6   (D) -5

44. $\lim\limits_{x \to \infty} x \tan \dfrac{1}{x}$ is
   (A) 1   (B) ∞ (C) 0   (D) -1

45. The differential coefficient of sinx with respect to cosx is
   (A) $- \cot x$ (B) $2\tan x$ (C) $2\cot x . \csc x$ (D) $\cos x . \sin x$

46. The value of $\int_{-\pi}^{\pi} \sin^3 x \ \cos^2 x \ dx$ is
   (A) $\dfrac{\pi^4}{2}$ (B) 1   (C) $\dfrac{\pi^4}{4}$ (D) 0

47. Which of the following controls air fuel ratio in petrol engine?
   (A) injector   (B) carburetor   (C) choke   (D) All of the above

48. Biogas is mainly used as…………
   (A) automobiles   (B) lighting purpose   (C) heating purpose   (D) none

49. Which of the following is the smallest power plant?
   (A) Marsyangdi   (B) Trisuli   (C) Kaligandaki   (D) Kulekhani

50. Wattmeter measures……………
   (A) active power   (B) effective power   (C) apparent power   (D) both a and b

51. A natural material of construction obtained from rocks by any suitable method is called.
   (A) brick   (B) iron   (C) timber   (D) stone

52. Refractory bricks resist ………..
   (A) higher temperature   (B) chemical action   (C) dampness   (D) lower temperature

53. The dis-continuous white line in between lanes indicate….the lane.
   do-not cross   (B) don't turn   (C) may cross   (D) all of the above

3

54. The Upper Tamakoshi 456 MW(under-construction) Power Plant is in….. district.
(A) Dolakha   (B) Sindhupalchowk   (C) Ramechhap   (D) Makwanpur

55. MAN stands for …………
(A) metropolitan area network   (B) metropolitan answer network
(C) medium area network   (D) middle area network

56. Which of the following contains highest memory?
(A) Tera bit   (B) mega byte   (C) kilo byte   (D) Giga byte

57. FTTP represents …………
(A) Unix   (B) Hyper text   (C) protocal   (D) LiNc

58. Zener diode is connected with load in …………..
(A) series   (B) across   (C) depends upon situation   (D) parallel

59. Which of the following is sequential device?
(A) mouse   (B) magnetic tape   (C)pen drive   (D) printer The OR gate

60. The thickness of a 50 Hz transformer lamination is ………….
(A) 0.35 cm   (B) 0.30cm   (C) 0.33 m   (D) 0.35 mm

Section: II Select the Best Alternative on the answer sheet given   **40×2 = 80**

**Read the passage and answer the questions from 61 to 64.**

Experiments with the sulphonamides have made clear a fact about germs which is gaining increasing importance in fighting them. Germs, it seems, have the same ability as all the other living things gradually to change themselves to suit new conditions. But, as the generation of germs lasts only twenty-five or thirty minutes, before all the germs divide to form new ones, changes that would take many years in animals can be achieved by germs in a few hours. Perhaps, then, you give the attacking germ a dose of sulphonamides which upsets them somewhat but is not strong enough to prevent them from multiplying; if so, they very rapidly develop new powers which enable them to resist the effects of the drug. After this has happened, even the strongest dose will fail to disturb them.

61. Like all living things, germs can change themselves to suit new conditions. This adjustment is possible because the germs have …………..
(A) the power of adaptability   (B) the power of compliance
(C) the power of adoptability   (D) the power of fluctuation

62. Since germs can change themselves to suit new conditions, the task of fighting them has become …………..
(A) absolutely impossible   (B) much easier
(C) much more difficult   (D) increasingly important

63. Germs which are not disturbed even by the strongest possible dose of the sulphonamides are said to have become …………..
(A) immune   (B) immortal   (C) improvised   (D) immobile

64. One generation of germs expires, bringing into existence the next generation …………..
(A) in not more than half an hour   (B) in twenty-five minutes
(C) in twenty minutes   (D) in a few hours

65. IUPAC name of isohexane is
(A) 2-methyl hexane   (B) 2-methyl pentane   (C) 3-methyl pentane   (D) 4-methyl pentane

66. The gas formed by hydrolysis of aluminium carbide when passed into steam can form
(A) producer gas   (B) marsh gas   (C) laughing gas   (D) water gas

67. An electric current is passed through three cells in series containing respectively solution of copper sulphate, silver nitrate and potassium iodide. What weight of iodine will be liberated while 1.25 g of copper being deposited?
(A) 5 g   (B) 7 g   (C) 6 g   (D) 10 g

4

68. The normality of a solution containing 32.5 g of $(COOH)_2 \cdot 2H_2O$ per 0.5 L is
(A) 1 N   (B) 10 N   (C) 2N   (D) 0.1 N

69. Given that $F = at + bt^2$, where F denotes force, t time, then dimensions of a and b are
(A) LT^{-2} and T^{-2} (B) T and T^{-2} (C) MLT^{-3} and MLT^{-4} (D) LT^{-1} and T^{-2}

70. The equation of motion of a projectile is $y = 12x - \dfrac{3}{4}x^2$. The range of projectile is

(A) 36 m   (B) 21 m   (C) 16 m   (D) 48 m

71. If the momentum of a body is increased by 50% then the percentage increases in its kinetic energy
(A) 50%   (B) 100%   (C) 200%   (D) 125%

72. A stone is dropped into a lake from a tower of 500 m height. The sound of the splash will be heard by man often.
(A) 11 sec   (B) 14 sec   (C) 4 sec   (D) 11.5 sec

73. A steel tape measure is accurate at 20^0C. It is used at 10^0C to measure a distance of 1 km. The reading of tape will be (α for steel $= 12 \times 10^{-60\,\circ}C^{-1}$)
(A) 0.99988 km   (B) 1.00012 km   (C) 1 km   (D) 1.00024 km

74. If room temperature is found to be equal to dew point, then relative humidity is
(A) 10%   (B) 100%   (C) 75%   (D) 50%

75. The electric potential as a function of distance is given by $v = 5x^2 + 10x - 9$ volt. The electric field at $x = 1$ m will be
(A) – 23 v/m   (B) 6 v/m   (C) 11 v/m   (D) – 20 v/m

76. A 4μF capacitor is charged to 400 V and then its plates are joined through a resistance of 1kΩ. The heat produced in the resistor is
(A) 0.16 J   (B) 1. 28 J   (C) 0.64 J   (D) 0.32 J

77. A wire has a resistance 10 Ω. It is stretched by one-tenth of its original length then its resistance will be
(A) 10 Ω   (B) 12 Ω   (C) 9 Ω   (D) 11Ω

78. A straight wire of length 0.5 m and carrying a current of 1.2 A is placed in a uniform magnetic field of induction 2 T. The magnetic field is perpendicular to the length of the wire. The force on the wire is
(A) 2.4 N   (B) 3 N   (C) 1.2 N   (D) 2 N

79. A step up transformer operates on a 230 V line and supplied a current of 2 A. The ratio of primary and secondary windings is 1:25. The primary current is
(A) 50 A   (B) 12.5 A   (C) 8 A   (D) 25 A

80. An air bubble in glass slab(μ=1.5) from one side is 6 cm and from other side in 4 cm. The thickness of slab is
(A) 15 cm   (B) 12 cm   (C) 10 cm   (D) 18 m

81. The intensity ratio at a point of observation due to two coherent waves is 100:1. The ratio between their amplitudes is
(A) 1:1   (B) 10:1   (C) 1:100   (D) 1:10

82. If a sample o 16 gm radioactive substance disintegrate to 1 gm in 120 days, then what will be the half-life of the sample?
(A) 15 days   (B) 7.5 days   (C) 30 days   (D) 60 days

83. The energy required to remove an electron in hydrogen atom from n = 10 slate is
(A) 13.6 eV   (B) 1.36 eV   (C) 0.0136 eV   (D) 0.136eV

84. The domain and range of $\sqrt{4-x^2}$ are

(A) [0, 2], [0, 2]   (B) [-2, 2], [0,2]   (C) R, [0,2]   (D) [0,2], [0,4]

5

85. In $\triangle ABC$, if $a = 4, b = 3$ and $A = 60^0$, then C is the root of the equation

(A) $x^2 + 3x - 7 = 0$ (B) $x^2 + 3x + 7 = 0$ (C) $x^2 - 3x + 7 = 0$ (D) $x^2 - 3x - 7 = 0$

86. Let $\vec{a}, \vec{b}, \vec{c}$ be the three vectors such that $\vec{a}.(\vec{b} + \vec{c}) = \vec{b}.(\vec{c} + \vec{a}) = \vec{c}.(\vec{a} + \vec{b}) = 0$ and $|\vec{a}| = 1, |\vec{b}| = 4, |\vec{c}| = 8, then\ |\vec{a} + \vec{b} + \vec{c}|$ is

(A) 9   (B) 81   (C) 16   (D) 5

87. Slope of the lines represented by $x^2 + hxy + 2y^2$ are such that one is double of other, then h equals

(A) $\pm\sqrt{2}$ (B) $\pm\sqrt{3}$ (C) ± 3 (D) $\dfrac{1}{\sqrt{3}}$

88. A circle touches the x-axis and cuts off a constant length $2l$ from y – axis, then the locus of its centre is

(A) $y^2 = 2x^2 - l^2$ (B) $x^2 + y^2 = l^2$ (C) $y^2 = x^2 + l^2$ (D) $y^2 = x^2 + \dfrac{l^2}{2}$

89. The equation of the directrix of the parabola $5y^2 = 4x$ is

(A) $5x + 1 = 0$ (B) $4x + 1 = 0$ (C) $4x - 1 = 0$ (D) $5x - 1 = 0$

90. A plane π makes intercepts 4 and 3 respectively on x-axis and z-axis. If it is parallel to y-axis, then its equation is

(A) $3z + 4x = 12$ (B) $3x + 4z = 12$ (C) $3y + 4z = 12$ (D) $3z + 4y = 12$

91. If the 3rd term of G.P is 4, then the product of first 5 terms is

(A) 4^3 (B) 4^4 (C) 5^4 (D) 4^5

92. The value of $\dfrac{(-1+\sqrt{3}i)^{3n}}{2} + \left(\dfrac{-1 - \sqrt{3}i}{2}\right)^{3n}$ is

(A) 2   (B) 1   (C) 0   (D) 3

93. The number of ways in which we can select three numbers from 1 to 30 so as to exclude every selection of three consecutive number is

(A) 4032   (B) 2163   (C) 2040   (D) 4010

94. The value of $\log_e (1 + x + x^2 + x^3 + \ldots\ldots)$ is equal to

(A) $\dfrac{x}{1!} - \dfrac{x^2}{2!} + \dfrac{x^3}{3!} - \dfrac{x^4}{4!} + \ldots\ldots\ldots\ldots$

(B) $x - \dfrac{x^2}{2} + \dfrac{x^3}{3} - \dfrac{x^4}{4} + \ldots\ldots\ldots$

(C) $\dfrac{x}{1} + \dfrac{x^2}{2} + \dfrac{x^3}{3} \dfrac{x^4}{4} + \ldots\ldots\ldots\ldots$

(D) $\dfrac{x}{1!} + \dfrac{x^2}{2!} + \dfrac{x^3}{3!} + \dfrac{x^4}{4!} + \ldots\ldots\ldots\ldots$

95. If $y = \dfrac{x}{1} + \dfrac{x^2}{2} + \dfrac{x^3}{3} + \ldots\ldots\ldots\ldots$, then $\dfrac{dy}{dx}$ is

(A) 0   (B) $\log_e (1-x)$ (C) $\dfrac{1}{1-x}$ (D) e^x

96. $\displaystyle\int_0^{\frac{\pi}{2}} \dfrac{\sin x}{\sin x + \cos x} dx$ is

(A) π (B) $\dfrac{\pi}{2}$ (C) $\dfrac{\pi}{6}$ (D) $\dfrac{\pi}{4}$

97. The rate of change of volume of the sphere with respect to its surface area when the radius is 2 cm is

(A) 4   (B) 2   (C) 3   (D) 1

98. The area between $y^2 = 4ax$ and its latus rectum is

(A) $\dfrac{8}{3}a$ (B) $\dfrac{8}{3}a^2$ (C) $\dfrac{4}{3}a^2$ (D) $4a^2$

6

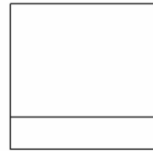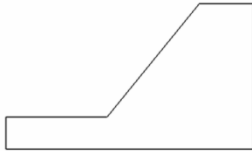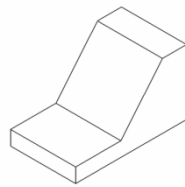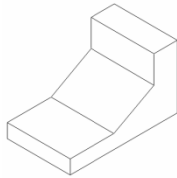**99.** What is the wrong in front view of the given figure?
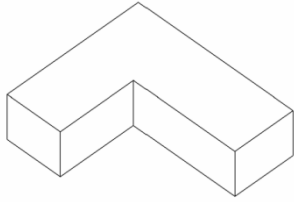
Front view

(A) vertical hidden line
(B) vertical solid line
(C) horizontal solid line
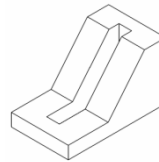(D) horizontal hidden line

100. Select the correct Isometric view of the solid for the given orthographic views.

(A)   (B)   (C)   (D)

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(3A)