KANTIPUR ENGINEERING COLLEGE

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

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

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

1. Which of the following are the solar thermal applications?
   (A) solar cooker   (B) solar dryer   (C) solar heater   (D) all of the above

2. Otto cycle also known as ……..cycle?
   (A) diesel   (B) petrol   (C) carnot   (D) breton

3. Which of the following is carried out in anaerobic condition?
   (A) hydroelectricity   (B) solar heater   (C) Bio gas plant   (D) wind plants

4. The continuous white line in between lanes indicate….the lane.
   (A) do-not cross   (B) carefully cross   (C) may cross   (D) don't turn

5. Quartzite is a … ……
   (A) siliceous rock   (B) calcareous rock   (C) sedimentary rock   (D)argillaceous rock

6. The electrical energy stored in micro hydropower project is stored in………..
   (A) kinetic energy   (B) potential energy   (C) geothermal   (D) none of the above

7. The efficiency of a transformer is usually in the range of ……….
   (A) 50–60%   (B) 65–75%   (C) 90–98 %   (D) 70–90 %

8. Largest hydropower plant is in………..
   (A) China   (B) Brazil   (C) Nepal   (D) USA

9. What is the unit if electrical energy?
   (A) ampere   (B) watt hour   (C) watt   (D) VAR

10. In binary system, 4 bits is called………….
    (A) watt   (B) byte   (C) kilo bytes   (D) nibble

11. The full form of ISP is ……………
    (A) internet service provider   (B) internet security provider
    (C) internet server provider   (D) internet server procedure

12. Which of the following is other than operating system?
    (A) Linux   (B) windows   (C) Google chrome   (D) Mac OS

13. VOIP is used for………
    (A) Video call in internet   (B) video gaming in internet
    (C) voice call in internet   (D) voice of internet protocol

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

15. $\int_{-1}^{1} (\sin x)^{11} \, dx$ is

    (A) $\dfrac{2}{3}$ (B) 0   (C) $\dfrac{\pi}{2}$ (D) 1

16. If $y = \log_{\sqrt{x}} x$, then $\dfrac{dy}{dx}$ is

    (A) $\dfrac{1}{x}$ (B) 1   (C) $\dfrac{1}{x \log \sqrt{x}}$ (D) 0

(2B)

17. $\lim\limits_{x \to 0} \dfrac{3^x - 2^x}{x}$ is

    (A) $\log \dfrac{3}{2}$ (B) $\dfrac{3}{2}$ (C) $\log\left(\dfrac{2}{3}\right)$ (D) 0

18. If $x = \sqrt{2 + \sqrt{2 + \sqrt{2 + \ldots\ldots}}}$ to ∞, then x is

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

19. A is square matrix of order 3 and $|A| = 4$ then $|\text{adj } A|$ is
    (A) 12   (B) 20   (C) 16   (D) 8

20. A plane meets the co-ordinate axes at A, B, C and (α, β, γ) be the coordinates of the centroid of the triangle, then the equation of the plane is

    (A) $\dfrac{x}{\alpha} + \dfrac{y}{\beta} + \dfrac{z}{\gamma} = 1$ (B) $x\alpha + y\beta + z\gamma = 3$ (C) $\dfrac{x}{3\alpha} + \dfrac{y}{3\beta} + \dfrac{z}{3\lambda} = 1$ (D) $x\alpha + y\beta + z\gamma = 1$

21. The sum of the distance of a point from two perpendicular axes in a plane is 1, then its locus is
    (A) two intersecting lines (B) circle   (C) st. line   (D) square

22. If the angle between two vectors $\vec{i} + \vec{k}$ and $\vec{i} - \vec{j} + a\vec{k}$ is $\dfrac{\pi}{3}$, then the value of a equals

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

23. The general solution of $\tan m\theta - \cot n\theta = 0$ is

    (A) $n\pi + \dfrac{\pi}{6}$ (B) $\dfrac{(2n+1)\pi}{2(m+n)}$ (C) $2n + 1)\dfrac{\pi}{2}$ (D) $\dfrac{(2n+1)\pi}{6(m+n)}$

24. For any real x,
    (A) $|x| = x$ (B) $|x| = \max \{x, -x\}$ (C) $|x| = -x$ (D) $|x| = \min \{ x, -x\}$

25. Which of the following pairs has the same pronunciation?
    (A) pull, pool   (B) full, fool   (C) quiet, quite   (D) two, too

26. The word 'deteriorate' has its primary stress on the ………….. syllable.
    (A) first   (B) second   (C) third   (D) fourth

27. The meaning of the underlined expression in the sentence " I am sure he will show white feather" is ………….
    (A) courage   (B) cunningness   (C) cowardice   (D) shrewdness

28. The conceited man was forward and ………… in his attitude.
    (A) thrasonical   (B) mundane   (C) laconic   (D) gratuitous

29. The direct speech of "He thanked me" is ………….
    (A) I said, "Thank you".   (B) I said to him, "Thank you".
    (C) You said, "Thank him".   (D) He said to me, "Thank you".

30. The passive voice of "The dangerous dog bit me" is …………
    (A) I bit the dangerous dog   (B) He was bitten by the dangerous dog
    (C) The dangerous dog has been bitten by me   (D) I was bitten by the dangerous dog

31. Which of the following is correct?
    (A) My uncle lives in London who loves me   (B) My uncle lives in London where loves me
    (C) My uncle which lives in London loves me.   (D) My uncle who lives in London loves me

32. Which one is acceptable?
   (A) He asked me where I lived   (B) He asked me where I lived?

(C) He asked me where do you live   (D) He asked me where do you live?

33. The teacher and the principal ………… arrived.
(A) have   (B) has   (C) is   (D) was

34. He will come soon, …………?
(A) won't he   (B) will he   (C) will not he   (D) wouldn't he

35. The small baby died ………… pneumonia.
(A) from   (B) with   (C) of   (D) by

36. You can pass the exam ………….
(A) unless you work hard   (B) unless you don't work hard
(C) if you work hard   (D) if you don't work hard

37. A place where weapons are stored is called ………….
(A) arm-store.   (B) armour   (C) arsenal   (D) allegory

38. I look forward to ………… from you soon.
(A) hear   (B) hearing   (C) heard   (D) be hearing

39. Work function is the energy required
(A) to excite an electron   (B) to eject an electron just out of the surface
(C) to produce x-rays   (D) to study the atomic structure

40. A dip needle in a plane perpendicular to magnetic meridian will remain;
(A) horizontal   (B) vertical   (C) in any direction
(D) at the same angle as in magnetic meridian

41. Two charges are at certain distance apart in air. A glass sheet is inserted between them, the force between them will
(A) increase   (B) decrease   (C) remains same   (D) zero

42. The work done by the string of a simple pendulum during one complete oscillation is equal to
(A) zero   (B) kinetic energy of the pendulum
(C) potential energy of the pendulum   (D) total energy of the pendulum

43. In the Young's double slit experiment, the distance between screen and slit is doubled and the distance between two slits is reduced to half. The fringe width is
(A) doubled   (B) is halved   (C) becomes 4 times   (D) remains the same

44. The long-sightedness is corrected by using
(A) cylindrical lens   (B) concave lens   (C) plano-convex lens   (D) convex lens

45. It is difficult to see through fog because
(A) light is absorbed   (B) all of fog is infinity
(C) light suffers total reflection   (D) light is scattered by it

46. According to the kinetic theory the collisions between the molecules of a gas are
(A) perfectly elastic   (B) partially elastic   (C) perfectly inelastic   (D) none of the above

47. A person is sitting in a train and is facing the engine. He tosses up a coin and coin falls behind him. It can be concluded that the train is:
(A) moving forward with uniform speed   (B) moving forward and losing speed
(C) moving forward and gaining speed   (D) moving backwards with uniform speed

48. The dimension of pressure and stress is
(A) $[MLT^{-2}]$ (B) $[ML^{-1}T^{-2}]$ (C) $[ML^{-1}T^{-1}]$ (D) $[ML^{-1}T^{2}]$

49. The value of m (magnetic quantum no.) for the valence shell of sodium atom is
(A) 1   (B) 0   (C) 2   (D) 5

50. Which one of the following chemical substances is primary standard?

(A) $Na_2S_2O_3$ (B) HCl   (C) $KMnO_4$ (D) Na_2CO_3

51. Molecular weight of tribasic acid is 69, its equivalent weight is
(A) 27   (B) 30   (C) 23   (D) 45

52. 4.8 g of a metal reacts completely with 9.8 g of H_2SO_4, the equivalent wt. of metal is
(A) 24   (B) 36.5   (C) 49   (D) 98

53. An example of a lewis acid is
(A) $MgCl_2$ (B) NaCl   (C) $SnCl_4$ (D) $AlCl_3$

54. Bleaching action of sulphur dioxide is due to
(A) complex formation   (B) reduction   (C) oxidation   (D) displacement

55. In Calgon process hardness is removed by the formation of
(A) complex   (B) precipitate   (C) double salt   (D) simple salt

56. Which of the salts will produce an acidic solution when dissolved in water?
(A) NaCl   (B) $CaCl_2$ (C) $CuSO_4$ (D) $ZnCl_2$

57. Anode used in Down' cell is
(A) iron   (B) carbon rod   (C) graphite rod   (D) platinum

58. During the extraction of iron, limestone acts as
(A) a flux   (B) a slag   (C) an oxidant   (D) a reductant

59. Acetic acid and methyl formate are
(A) position isomers   (B) functional isomers   (C) chain isomers   (D) metamers

60. Δ is a member of
(A) aromatic compounds   (B) homocyclic compounds
(C) closed chain compounds   (D) alicylclic compounds

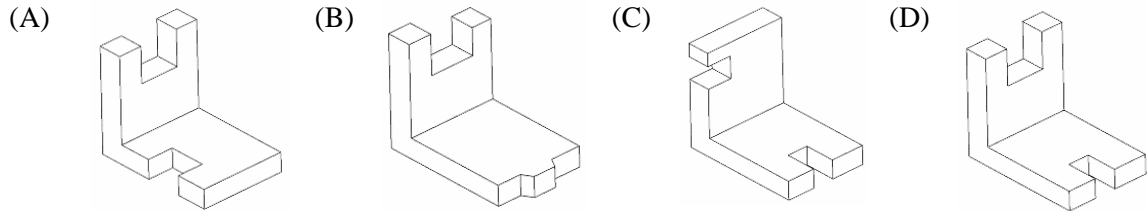**Section: II Select the Best Alternative on the answer sheet given**   **40 × 2 = 80**

61. Which line is missing in right side view of the following solid?
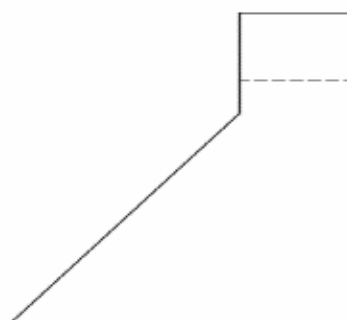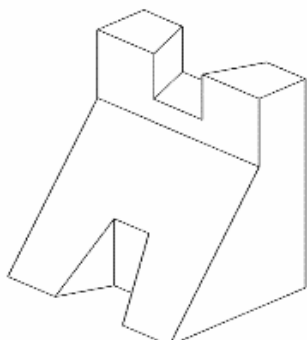
(A) horizontal solid line   (B) vertical hidden line
(C) vertical solid line   (D) horizontal solid line

62. Select the correct Isometric view of the solid for the given orthographic view.

(A) (B) (C) (D)
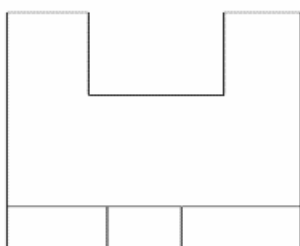
63. If $\vec{a} + \vec{b} + \vec{c} = 0$, $|\vec{a}| = 3, |\vec{b}| = 5, |\vec{c}| = 7$ then the angle between $\vec{a}$ and $\vec{b}$ is:

(A) $\dfrac{\pi}{6}$ 　　　(B) $\dfrac{5\pi}{3}$ 　　　(C) $\dfrac{2\pi}{3}$ 　　　(D) $\dfrac{\pi}{3}$

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

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

65. In $\triangle ABC$, if $\left(1 - \dfrac{r_1}{r_2}\right)\left(1 - \dfrac{r_1}{r_3}\right) = 2$, then the Δ is

(A) equilateral 　　　(B) rt. Angled 　　　(C) isosceles 　　　(D) scalene

66. If the sum of the slopes of the lines $x^2 + kxy - 3y^2 = 0$ is twice the product of the slopes, then k is

(A) 1 　　　(B) 2 　　　(C) 0 　　　(D) – 2

67. The line $y = mx + c$ is a tangent to the parabola $y^2 = 4a(x + a)$, then

(A) $C = ma + \dfrac{a}{m}$ 　　(B) $C = \dfrac{a}{m}$ 　　(C) $C = ma - \dfrac{a}{m}$ 　　(D) $C = a^2m - \dfrac{a}{m}$

68. The circles $x^2 + y^2 - 6x + 5 = 0$ and $x^2 + y^2 - 8x + 7 = 0$ are:

(A) Concentric 　　　　　　　　　　(B) touch each other externally
(C) touch each other internally 　　　(D) do not touch each other

69. The direction cosines of the line which is perpendicular to the lines with direction cosines proportional to 3, -1, 1 and -3, 2, 4 is:

(A) $\dfrac{2}{\sqrt{30}}, \dfrac{5}{\sqrt{30}}, \dfrac{-1}{\sqrt{30}}$ 　(B) $\dfrac{-3}{\sqrt{30}}, \dfrac{2}{\sqrt{30}}, \dfrac{1}{\sqrt{30}}$ 　(C) $\dfrac{-2}{\sqrt{15}}, \dfrac{-3}{\sqrt{15}}, \dfrac{5}{\sqrt{15}}$ 　(D) 1, 2, 3

70. The number of ways of arranging 6 players to throw the cricket ball so that the oldest player may not throw first is:

(A) 600 　　　(B) 720 　　　(C) 1050 　　　(D) 120

71. The coefficient of x^9 in the expansion of $\log(1 + x + x^2)$ is

(A) $\dfrac{2}{9}$ 　　　(B) $\dfrac{9}{2}$ 　　　(C) $\dfrac{-2}{9}$ 　　　(D) $\dfrac{-9}{2}$

72. The value of $\left(\dfrac{-1 + \sqrt{-3}}{2}\right)^{40} + \left(\dfrac{-1 - \sqrt{-3}}{2}\right)^{40}$ is

(A) 0 　　　(B) - 1 　　　(C) 2 　　　(D) 1

73. Three consecutive terms of a progression are 30, 24, and 20. The next term of the progression is:

(A) $\dfrac{16}{5}$ 　　　(B) 12 　　　(C) $\dfrac{120}{7}$ 　　　(D) $\dfrac{50}{3}$

74. The differential coefficient of $\operatorname{Sin}^{-1}\left(\dfrac{2x}{1 + x^2}\right)$ with respect to $\operatorname{Cos}^{-1}\left(\dfrac{1 - x^2}{1 + x^2}\right)$ is

(A) $2\tan^{-1}x$ 　　　(B) 1 　　　(C) $\dfrac{1 - x^2}{1 + x^2}$ 　　　(D) $\dfrac{1}{1 + x^2}$

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75. $\int_0^\infty \text{sechx} \, dx$ is

(A) π (B) 1   (C) $\dfrac{\pi}{2}+1$ (D) $\dfrac{\pi}{2}$

76. The area bounded by $y = e^x$, $y = e^{-x}$ and x-axis is

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

77. If h (x) = f(x) + f(-x), then h (x) has got an extreme value at a point where f ΄(x) is:
(A) periodic   (B) odd function   (C) constant   (D) even function

Read the passage and answer the questions from 78 to 81.

The artificial ways of inducing sleep are legion, and are only alike in their ineffectuality. In Lavengro there is an impossible character, a victim of insomnia, who finds that a volume of Wordsworth's poem is the only sure soporific, but that was Borrow's Malice. The famous old plan of counting sheep jumping over a stile has never served a turn. I have herded imaginary sheep until they insisted on turning themselves into white bears or blue pigs, and I defy any reasonable man to fall asleep while mustering a herd of stupid swine.

78. The author points out that …………
(A) artificial ways of inducing sleep are ineffective
(B) the artificial means of inducing sleep are not good   (C) sleep can easily be induced
(D) artificial ways of inducing sleep are expensive

79. According to the author the character in Lavengro ………….
(A) resorts to external aids to get some sleep   (B) is an admirer of Wordsworth
(C) is an avid reader of poetry   (D) spends sleepless nights reading Wordsworth

80. The author uses "impossible" for the character of Lavengro in the sense of ………….
(A) funny   (B) unrealistic   (C) queer   (D) imaginary

81. Borrow's malice is most probably directed at …………
(A) sleeplessness   (B) Wordsworth's poetry
(C) the artificial ways of inducing sleep   (D) poetry in general.

82. A force has magnitude 20 N. One rectangular component is 12N, the other rectangular component must be
(A) 8N   (B) 14 N   (C) 32 N   (D) 16 N

83. A spring obeys Hook's law and has a force constant K. Now the spring is cut into two equal parts, the force constant of each part will be
(A) K   (B) K/2   (C) 2 K   (D) 4 K

84. A constant torque acting on a uniform circular wheel changes its angular momentum from L_0 to $4L_0$ in 4 second. The magnitude of this torque is
(A) ¾ L_0 (B) L_0 (C) $4L_0$ (D) 12 L_0

85. A car travels at a speed of 20 m/s towards a high wall. The driver sounds a horn of frequency 124 Hz. If the velocity of sound in air is 330 m/s, the frequency of reflected sound heard by driver is
(A) 140 Hz   (B) 280 Hz   (C) 148 Hz   (D) 109 Hz

86. A faulty thermometer has its fixed point marked 5° and 95°. This thermometer reads the temperature of body 59°C. The correct temperature on Celsius scale is
(A) 59° C   (B) 48.66° C   (C) 58° C   (D) 60° C

87. A man can melt 60 gm of ice by chewing in one minute. The power of man is
(A) 80 W   (B) 336 W   (C) 4800 W   (D) 19 W

88. The electric potential in a region is given by $V = 6x - 8xy^2 - 8y + 6y \, z - 4x^2$ volt. Then electric force acting on a point charge 2C placed at origin will be

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(A) 2N   (B) 6N   (C) 20N   (D) 8 N

89. A condenser is charged through a potential difference of 200 volt and possesses charge of 0.1C. When discharged, it will release energy of
(A) 1 J   (B) 2 J   (C) 20 J   (D) 10 J

90. Two heater wires of equal length are first connected in series and then in parallel. The ration of heat produced in two case is
(A) 2:1   (B) 3:2   (C) 4:3   (D) 1:4

91. The strength of the magnetic field at a point distance R near a long straight current carrying wire is B. The field at a distance R/2 will be
(A) B/2   (B) B/4   (C) 2B   (D) 4B

92. In a LCR circuit having L = 8 H, C = 0.5 μF and R = 100Ω in series, the resonant frequency is
(A) 2.5×10^5 rad s^{-1} (B) 500 rad s^{-1} (C) 250 Hz   (D) 600 Hz

93. The angle of prism is 60° for $\mu = \sqrt{2}$ the angle of minimum deviation is
(A) 45°   (B) 30°   (C) 60°   (D) 90°

94. In Young's double slit experiment, the separation between the slits is halved and the whole apparatus is immersed in water of refractive index 4/3, the fringe width becomes
(A) 3/2 times   (B) unchanged   (C) doubled   (D) 3/8 times

95. The binding energy of deuteron is 2.2 MeV and that f $_2H_e^4$ is 28 MeV, then the energy released is
(A) 30. 2 MeV   (B) 25.8 MeV   (C) 23.6 MeV   (D) 19.2 MeV

96. The radio-active substance has a half-life of four months. Three fourths of the substance will decay in
(A) 8 months   (B) 4 months   (C) 3 months   (D) 12 months

97. The amount of current required to liberate 2.24 liters of Cl_2 gas at NTP in one hour during the electrolysis of NaCl solution is
(A) 1.56 amp   (B) 2.53 amp   (C) 4.56 amp   (D) 5.36 amp

98. The gas formed by hydrolysis of calcium carbide on reaction with ammoniacal cuprous chloride forms
(A) brown ppt.   (B) red ppt.   (C) black ppt.   (D) yellow ppt.

99. IUPAC name of CH_3- CO- CH_2- CO - CH_3 is
(A) pentane,2-3- dione   (B) butane-2,3-dione
(C) pentane -2,3-dione   (D) pentane-2, 3-diketone

100. The volume of water that should be added to 0.6 litres of 0.205N solution to make 0.1N is
(A) 630 ml   (B) 500ml   (C) 400ml   (D) 360ml

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