

TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
KANTIPUR ENGINEERING COLLEGE

Model Questions for B.E. Entrance Test (2073)

Set: I (A)

Time: 2 hours

Date: 2073/04/08

Section: I Select the Best Alternative on the answer sheet given

60×1 = 60

1. He was acquitted of the crime. The synonym of 'acquitted' is
(A) accused (B) killed (C) humiliated (D) released
2. Which of the following words has /η/ sound in the final position?
(A) think (B) wing (C) sign (D) sink
3. The word 'engineer' has its primary stress on its syllable.
(A) first (B) second (C) third (D) fourth
4. Which of the following words ends at a vowel sound?
(A) flow (B) find (C) wine (D) fine
5. Two and two four.
(A) makes (B) make (C) have made (D) will be made
6. She got him hard.
(A) work (B) to work (C) working (D) worked
7. She said to me, "Hellow!" The reported speech form of this sentence is
(A) She said hellow to me (B) She remarked hellow
(C) She greeted me (D) She wished me hellow
8. Unless you work hard, you
(A) can succeed (B) could have succeeded
(C) could succeed (D) can't succeed
9. I feel the room
(A) moving (B) move (C) have been moving (D) moved
10. He thanked me for what
(A) I have done for him (B) I did for him (C) I do for him (D) I had done for him
11. I congratulated her her success.
(A) on (B) in (C) for (D) at
12. The passive voice of 'The farmers are planting rice' is
(A) rice was being planted by the farmers (B) rice has been planted by the farmers
(C) rice is being planted by the farmers (D) rice is planted by the farmers
13. No one helps her,?
(A) does he (B) does she (C) do they (D) don't they
14. Which of the following is a simple sentence?
(A) The earth revolves round the sun.
(B) The students worked hard in order that they might pass.
(C) He is not only famous but also intelligent.
(D) He finished watching television and went to bed.
15. Which strength does not change with temperature?
(A) Normality (B) Molality (C) Molarity (D) gm / liter
16. The amount of H₂SO₄ present in 200 ml of 2N H₂SO₄ is
(A) 39.2 g (B) 49 g (C) 98 g (D) 19.6 g

17. pH of 0.2 N H_2SO_4 is
 (A) 0.69 (B) 1.2 (C) 0.76 (D) 0.56
18. During electrolysis, electrons are
 (A) gained by cations and lost by anions (B) lost
 (C) gained (D) lost by cations and gained by anions
19. How many litres of O_2 at NTP are required to burn completely 2.2 g of propane?
 (A) 44 L (B) 22.4L (C) 5.6 L (D) 84 L
20. Aqueous solution of sodium carbonate is
 (A) acidic (B) neutral (C) alkaline (D) amphoteric
21. Catalytic oxidation of ammonia in air forms
 (A) NO_2 (B) N_2O_5 (C) N_2O (D) NO
22. Producer gas is a mixture of
 (A) $\text{CO} + \text{H}_2$ (B) $\text{CO} + \text{N}_2 + \text{CO}_2$ (C) $\text{NH}_3 + \text{N}_2$ (D) $\text{CO} + \text{N}_2$
23. Malachite is the ore of
 (A) Zn (B) Cu (C) Fe (D) Na
24. Ammonia reacts with copper sulphate solution to form
 (A) Deep blue precipitate (B) Blueish white precipitate
 (C) Black precipitate (D) Yellow precipitate
25. Benzene is less reactive due to
 (A) twelve sigma bonds (B) three pi bonds
 (C) six C-atoms & six H-atoms (D) delocalization of Pi electrons
26. A hydrocarbon having molecular formula C_3H_6 forms isomers equal to
 (A) 4 (B) 2 (C) 5 (D) 6
27. If the unit of length, mass and time each be doubled, the unit of work is increased by
 (A) six times (B) four times (C) two times (D) no change
28. In gravity free space, the liquid in a capillary tube will rise to
 (A) infinite height (B) less height as on earth
 (C) slightly more height than that on earth (D) same height as on earth
29. Two bars of copper having same length but unequal diameter are heated to the same temperature. The change in length will be
 (A) more than thinner bar (B) more than thicker bar
 (C) determined by the ratio of length and diameter of the bars
 (D) same for both bars
30. When light passes from one medium to another medium, the physical quantity which remains unchanged is
 (A) velocity (B) wavelength (C) refractive index (D) frequency
31. Which of the following is conserved when light waves interfere?
 (A) intensity (B) momentum (C) amplitude (D) energy
32. A charge q_1 exerts some force on a second charge q_2 . If third charge q_3 is brought near, the force of q_1 exerted on q_2
 (A) remains unchanged (B) increases (C) decreases
 (D) increases if q_3 is of same sign of q_1 and decreases if q_3 is of opposite sign
33. At the temperature of inversion, the emf in a thermocouple is
 (A) zero (B) maximum
 (C) minimum (D) half its maximum value

34. The magnetism of the magnet is due to
 (A) the spin motion of electron (B) cosmic ray
 (C) the earth (D) pressure of big magnet inside the earth
35. As an empty vessel is filled with water, frequency
 (A) remains same (B) decreases (C) increases (D) none of above
36. Cathode rays can be deflected by
 (A) magnetic field only (B) electric field only (C) both type of field (D) none
37. The mechanical efficiency of a two stroke cycle engine isthe mechanical efficiency of a four stroke cycle engine.
 (A) half of (B) two times less than (C) more than (D) equal to
38. The pressure at the end of compression process in diesel engines compared to that of petrol engines would be.
 (A) half (B) higher (C) same (D) less
39. The source of energy from biomass is considered as a type of source of energy.
 (A) Non renewable (B) Renewable (C) both (D) all of the above
40. The maximum percentage of ingredients in cement is that of
 (A) magnesia (B) lime (C) alumina (D) silica
41. In concrete 1:2:4 indicates the ratio between cement, sand and
 (A) water (B) coarse aggregate (C) reinforcement (D) gypsum
42. In brick masonry the frog of the brick is generally kept on
 (A) top face (B) bottom face (C) exposed face (D) interior face
43. Which of the following sign denotes that pedestrian are prohibited from crossing the road.
 (A) Flashing Green Man (B) Green Walking Man
 (C) Red Standing Man (D) none
44. In circuits, a capacitor allows to pass through it.
 (A) Both AC & DC (B) neither DC nor AC (C) DC only (D) AC only
45. Which of the following is non-renewable type source of energy?
 (A) Solar energy (B) geothermal energy (C) ocean energy (D) Coal energy.
46. A step-down transformer increases
 (A) current (B) voltage (C) power (D) frequency
47. A Wattmeter is a device to measures real
 (A) voltage (B) AC current (C) power (D) DC current
48. In n-p-n transistor the p-type crystal act as
 (A) emitter only (B) base only
 (C) collector only (D) either emitter or collector
49. ISP stands for provider.
 (A) intranet service (B) internet service (C) internet security (D) intranet security
50. Magnetic disk contains
 (A) tracks and colony (B) lane and sectors (C) lane and colony (D) tracks and sectors
51. If $a > b > 0$ and $a, b \in \mathbb{R}$ then which of the following is not true?
 (A) $a - b > 0$ (B) $\frac{1}{a} < \frac{1}{b}$ (C) $b - a > 0$ (D) $\frac{1}{b} - \frac{1}{a} > 0$
52. If one root of the equation $x^2 - ax + 1 = 0$ is α then the other root is
 (A) $\frac{1}{\alpha}$ (B) $-\frac{1}{\alpha}$ (C) $1 - \alpha$ (D) $1 + \alpha$

53. If $\operatorname{cosec}^2 x = \operatorname{cosec}^2 \alpha$ then general value of x is
 (A) $n\pi + \alpha$ (B) $n\pi + (-1)^n \alpha$ (C) $2n\pi \pm \alpha$ (D) $n\pi \pm \alpha$
54. If $A^2 - A + I = 0$ then A^{-1} equals
 (A) A (B) $I - A$ (C) $A + I$ (D) A^{-2}
55. $\lim_{x \rightarrow 0} \frac{\sin 2x + \sin 6x}{\sin 5x - \sin 3x}$
 (A) 4 (B) $1/2$ (C) 2 (D) 1
56. The second derivative of $f(x) = 1/x$ at point (1,1) is equal to
 (A) 1 (B) -1 (C) 2 (D) -2
57. $\int \frac{dx}{\sqrt{1-x^2}}$ equals
 (A) $\tan^{-1} x + c$ (B) $\frac{\pi}{2} + \cos^{-1} x + c$ (C) $\frac{\pi}{2} - \cos^{-1} x + c$ (D) $\frac{\pi}{2} - \sin^{-1} x + c$
58. The number of unit vectors perpendicular to \vec{a} and \vec{b} are
 (A) 1 (B) 2 (C) 3 (D) 4
59. If the line $2x + 3y + 4 + k(-x + y + 5) = 0$ is horizontal then the value of k is
 (A) 0 (B) 1 (C) 3 (D) 2
60. If two vectors whose direction ratios are 1, 2, 3 and $-k, 2, 1$ are perpendicular to each other then
 (A) $k = 7$ (B) $k = 4$ (C) $k = 6$ (D) $k = 3$

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.

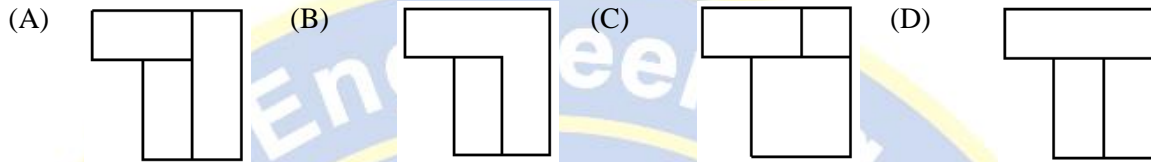
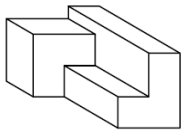
In the twentieth century, architects in large cities designed structures in a way that reduced noise and yet made living as comfortable as possible. They used such techniques as making walls hollow and filling this wall space with materials that absorb noise. Thick carpets and heavy curtains were used to cover floors and windows. Air conditioners and furnaces were designed to filter air through sound proofing materials. However, after much time and effort had been spent in making building less noisy, it was discovered that people also reacted adversely to the lack of sound. Now, architects are designing structures that reduce undesirable noise, but retain the kind of noise that people seem to need.

61. In the second sentence, the word 'they' refers to
 (A) cities (B) architects (C) structures (D) techniques
62. Which of the following is not mentioned as absorbing sound?
 (A) filled hollow walls (B) thick carpets and heavy curtains
 (C) air conditioners and fillers (D) air filter
63. Architects are now designing
 (A) new techniques sound proofing (B) the ideal noise
 (C) structure with some noise (D) adverse buildings
64. According to the passage, people live most comfortably with
 (A) certain noises (B) silence (C) reduced noise (D) noisy furnaces
65. The pH of 0.001 M HCl solution will be
 (A) 0.001 (B) 3 (C) 10^{-3} (D) 2
66. A current of 0.75 ampere is passed through a solution of a salt of a metal for 45 min, and the increase in wt. of cathode is 0.6662 g, the eq.wt. of metal is
 (A) 32.5g (B) 75 g (C) 37.5 g (D) 31.75 g
67. IUPAC name of $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH(OCH}_3\text{)-CO Br}$ is
 (A) 2- methoxypentanoyl bromide (B) 3- methoxypentanoyl bromide
 (C) 3-methoxyhexanoyl bromide (D) 2-methoxyhexanoyl bromide

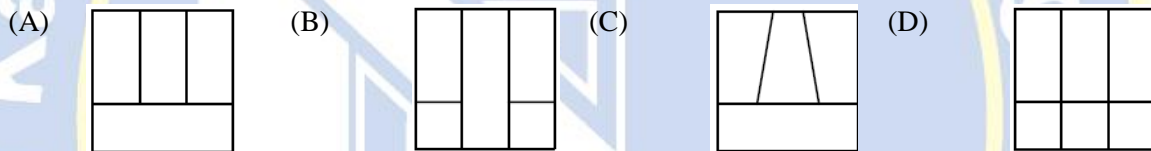
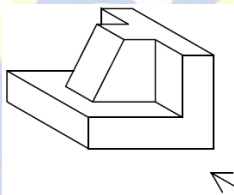
68. A gas formed by treating iron sulphide and dilute sulphuric acid on reaction with copper sulphate in acidic medium forms
 (A) White ppt. (B) Yellow ppt. (C) Black ppt. (D) Red ppt.
69. Given that $\vec{A} \cdot \vec{B} = 0$. Also, $\vec{A} \times \vec{C} = 0$. What is the angle between \vec{B} and \vec{C} ?
 (A) 90° (B) 0° (C) 135° (D) 145°
70. A car is moving along a straight line whose equation of motion is $s = 12t + 3t^2 - 2t^3$, where s is in meter and t is in seconds. The velocity of the car at start will be
 (A) 12 m/s (B) 9 m/s (C) 7 m/s (D) 13 m/s
71. A marble block of mass 2 kg lying on ice when given a velocity of 6 m/s is stopped by friction in 10 s. Then the coefficient of friction is
 (A) 0.01 (B) 0.02 (C) 0.06 (D) 0.03
72. Angular momentum of a wheel changes from $2L$ to $5L$ in 3 seconds. The magnitude of torque acting on it is
 (A) $L/5$ (B) L (C) $L/2$ (D) $L/3$
73. A big drop of radius R is formed by 1000 small droplets of water, then radius of small drop is
 (A) $R/2$ (B) $R/5$ (C) $R/10$ (D) $R/6$
74. The temperature coefficient of resistance of the material of wire is $0.00125 \text{ per } ^\circ\text{C}$. Its resistance at 300K is 1Ω . At what temperature will the resistance of the wire will be 2Ω ?
 (A) 1154K (B) 1127K (C) 1400K (D) 1100K
75. A perfect body emits radiation at temperature $T_1^\circ\text{K}$. If it is to radiate 16 times this power, its temperature T_2 will be
 (A) $T_2 = 16 T_1$ (B) $T_2 = 8 T_1$ (C) $T_2 = 4 T_1$ (D) $T_2 = 2 T_1$
76. A sound wave of frequency 500Hz covers a distance of 1 km in 5 second between points x and y . The number of waves between x and y are
 (A) 500 (B) 1000 (C) 5000 (D) 2500
77. The distance between object and image in a displacement method is D . The distance through which the lens is displaced is d . The ratio of the magnifications of the two images is
 (A) $\frac{D-d}{2}$ (B) $\frac{D+d}{D+d}$ (C) $\frac{D+d}{2}$ (D) $\left(\frac{D-d}{D+d}\right)^2$
78. A ray of light incident on a 60° angled prism of refractive index $\sqrt{2}$ suffers minimum deviation. The angle of incidence is
 (A) 45° (B) 0° (C) 70° (D) 60°
79. The periods of oscillation of two magnets in the same field are in the ratio $2:1$. If their moments of inertia are equal, ratio of their magnetic moment is
 (A) $1:2$ (B) $2:1$ (C) $1:4$ (D) $4:1$
80. A $10 \mu\text{F}$ capacitor is charged to a potential difference of 50V and is connected to another uncharged capacitor in parallel. Now, the common potential difference between 20volts . The capacitance of second capacitor is
 (A) $30\mu\text{F}$ (B) $15\mu\text{F}$ (C) $20\mu\text{F}$ (D) $10\mu\text{F}$
81. In step-up transformer, the turn ratio is $1:2$. A Leclanche cell (emf 1.5V) is connected across the primary. The voltage developed in the secondary would be
 (A) 3.0V (B) 0 (C) 1.5V (D) 0.75V
82. In a photo-electric cell, the wavelength of incident light is changed from 4000\AA to 3000\AA then change in stopping potential will be
 (A) 0.66V (B) 1.49V (C) 0.33V (D) 1.03V

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

84. For the object shown select the correct top view.



85. For the object shown here select the correct left side view.



86. If $f(x) = 1 + \alpha x$, $\alpha \neq 0$ and $(f \circ f)(x) = x$ then α is equal to
 (A) -2 (B) 1 (C) 2 (D) -1
87. If A_1, A_2, A_3 are the areas of excircles and A be the area of incircle then $\frac{1}{\sqrt{A_1}} + \frac{1}{\sqrt{A_2}} + \frac{1}{\sqrt{A_3}}$ equals
 (A) $\frac{A_1}{\sqrt{A}}$ (B) $\frac{1}{\sqrt{A}}$ (C) $\frac{1}{\sqrt{A_1 A_2 A_3}}$ (D) $\frac{A_2}{\sqrt{A}}$
88. The number of triangles that can be formed with 10 points as vertices, n of them being collinear is 110 then n is equal to
 (A) 3 (B) 4 (C) 5 (D) 6
89. If $a, 4, b$ are in A.P. ; $a, 2, b$ are in G.P. then $a, 1, b$ are in
 (A) A.P. (B) G.P. (C) A.G.P. (D) H.P.
90. If $z = \cos\theta + i \sin\theta$ then $z^n + \frac{1}{z^n}$ equals
 (A) $-2\sin n\theta i$ (B) $2\sin n\theta i$ (C) $-2\cos n\theta$ (D) $2\cos n\theta$
91. If $a = \sum_{n=1}^{\infty} \frac{2n}{(2n-1)!}$ and $b = \sum_{n=1}^{\infty} \frac{2n}{(2n+1)!}$ then ab equals
 (A) $e^2 - 1$ (B) e^2 (C) 1 (D) $e^2 + 1$
92. If θ be the angle between the vectors \vec{a} and \vec{b} and $|\vec{a} \times \vec{b}| = \vec{a} \cdot \vec{b}$ then θ equals
 (A) π (B) $\frac{\pi}{4}$ (C) $\frac{\pi}{2}$ (D) 0
93. If sum of the slopes of the lines $x^2 + \lambda xy - 3y^2 = 0$ is twice the product of the slopes then λ is equal to
 (A) 0 (B) -2 (C) 2 (D) 1

94. If the line $lx+my=1$ be a tangent to the circle $x^2+y^2=a^2$ then the locus of the point (l, m) is
 (A) a circle (B) a straight line (C) a parabola (D) an ellipse
95. The equation of directrix of the parabola $x^2 + 8y - 2x = 7$ is
 (A) $y = 2$ (B) $y = 0$ (C) $y = 3$ (D) $y = -3$
96. The plane $6x + 4y + 3z = 12$ cuts the axes in A, B, C ; then the area of the ΔABC is
 (A) $\sqrt{61}$ sq. units (B) $\sqrt{41}$ sq. units (C) $\sqrt{29}$ sq. units (D) $\sqrt{45}$ sq. Units
97. If $y = x^{x^{\dots\text{to } \infty}}$ then $\frac{dy}{dx}$ equals
 (A) $\frac{y^2}{x(1+y \log_e x)}$ (B) $\frac{y}{x(1-y \log_e x)}$ (C) $\frac{y}{x(1+y \log_e x)}$ (D) $\frac{y^2}{x(1-y \log_e x)}$
98. If the rate of change of volume of a sphere is equal to the rate of change of its radius then its radius is equal to
 (A) 1 (B) $\frac{1}{2\sqrt{\pi}}$ (C) $\frac{1}{2\pi}$ (D) $\frac{1}{\sqrt{2}}$
99. $\int \frac{(x+1)e^x}{\cos^2(xe^x)} dx$ equals
 (A) $\cos(xe^x) + c$ (B) $\sin^x + c$ (C) $\tan(xe^x) + c$ (D) $\tan e^x + c$
100. The area of the region between the curve $y = x^3$ and the line $y = x$ lying in the first quadrant is
 (A) $\frac{1}{4}$ sq. units (B) $\frac{1}{2}$ sq. units (C) 1 sq. unit (D) 2 sq. units
