

Kantipur Engineering College

Dhapakhel, Lalitpur Tel: 01-5229204/01-5229005

TRIBHUVAN UNIVERSITY INSTITUTE OF ENGINEERING

Model Questions for B.E. Entrance Test (2075)

Set: I (A)

Time: 2 hours

Date: 2075/04/05

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

1. The word 'cushion' has
(A) one vowel and three consonants
(B) three consonants and two vowels
(C) three vowels and two consonants
(D) four consonants and three vowels
2. The word 'Never-the-less' gets its primary stress on itssyllable.
(A) second (B) fourth (C) third (D) first
3. A vivacious person is one who is
(A) talkative (B) kind (C) lively (D) well-dressed
4. The parties should not escape.
(A) harmless (B) condign (C) tractable (D) culpable
5. He said, "How amazing is the spirit of man!"
(A) He exclaimed the spirit of man was amazing.
(B) He told in excitement that the spirit of man was amazing.
(C) He asked with surprise if the spirit of man was amazing.
(D) He exclaimed with amazement that the spirit of man was amazing.
6. He is the devil and the deep sea.
(A) into (B) under (C) between (D) with
7. Which of the following is not a passive sentence?
(A) The book sells well.
(B) I have appeared in the examination.
(C) His words sound harsh. (D) Let it be done.
8. The acceptable negative of 'There must be a mistake' is
(A) There cannot be a mistake.
(B) There mustn't be a mistake.
(C) There must not be a mistake.
(D) Cannot be a mistake.
9. Which of the following is a complex sentence?
(A) The girl who is in black is soft-spoken.
(B) The girl in black is soft-spoken.
(C) The girl is in black and she is soft-spoken.
(D) The girl is in black but she is soft-spoken.

Kantipur Engineering College

Dhapakhel, Lalitpur Tel: 01-5229204/01-5229005

10. Pick out the most correct option for “The dangerous dog bit me”.
- (A) I was bitten by the dangerous dog.
(B) I had been bitten by the dangerous dog.
(C) The dangerous dog was bitten by me.
(D) Me bitten by the dangerous dog.
11. You can write a letter
- (A) if you learnt to do so (B) unless you learn to do so
(C) if you learn to do so (D) if you would learn to do so
12. Ten kilometers a great distance.
- (A) was (B) are (C) is (D) were
13. Which of the following is correct?
- (A) When since you have been working for her?
(B) Since have you been working for her?
(C) When have you been working for her since?
(D) Since when have you been working for her?
14. Queen Mary sailed off at 10 today.
- (A) no article (B) A (C) An (D) The
15. Azimuthal quantum number gives
- (A) size of orbital (B) shape of orbital
(C) spin of orbital (D) orientation of orbital
16. Which one of the following can be used as primary standard solution?
- (A) KMnO_4 (B) Na_2CO_3 (C) $\text{Na}_2\text{S}_2\text{O}_3$ (D) NaOH
17. 4 liters of water are added to 2 liters of 6 M HCl. The molarity of resulting solution is
- (A) 4 M (B) 5M (C) 3 M (D) 2 M
18. In cell, oxidation takes place at
- (A) cathode (B) electrolyte (C) anode (D) none of these
19. Oxidation number of chromium in potassium dichromate is
- (A) +4 (B) +6 (C) +8 (D) +12
20. The character of hydrogen which is different from halogen is
- (A) electropositive nature (B) ionization energy
(C) electronegativity (D) reaction with alkali metals
21. When ammonia is passed over heated CuO , it is oxidised to
- (A) N_2 (B) HNO_3 (C) NO_2 (D) N_2O
22. Which of the following does not participate in the Solvay’s process for the manufacture of Na_2CO_3 ?
- (A) NH_3 (B) NaCl solution (C) H_2SO_4 (D) CO_2
23. Which one of the following is not ore of copper?
- (A) Malachite (B) Cuprite (C) Azurite (D) Limonite

Kantipur Engineering College

Dhapakhel, Lalitpur Tel: 01-5229204/01-5229005

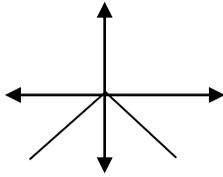
24. Bleaching action of sulphur dioxide is due to
(A) oxidation (B) reduction (C) hydrolysis (D) dehydration
25. Ethyne on ozonolysis forms
(A) ethanedial (B) ethanol (C) ethanediol (D) ethanol
26. The isomerism shown by alkyl cyanide and alkyl isocyanide is
(A) Metamerism (B) Position (C) Tautomerism (D) Functional
27. The square root of the product of inductance and capacitance has the dimension of
(A) length (B) time (C) no dimension (D) mass
28. In gravity free space, the liquid in a capillary tube will rise to
(A) lightly move height than that on earth (B) less height as on earth
(C) infinite height (D) same height as on earth
29. Absolute temperature can be calculated by
(A) direction of the molecule (B) motion of the molecule
(C) mean square velocity (D) none of these
30. In the production of beats by 2 waves of same amplitude and nearly same frequency, the maximum intensity to each of the constituent waves is
(A) Same (B) 2 times (C) 4 times (D) 8 times
31. 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
32. A convex lens is dipped in a liquid refractive index equal to the refractive index of the lens. Then its focal length will
(A) become zero (B) become small but non-zero
(C) remains unchanged (D) become infinite
33. When the length of a microscope tube increases, its magnifying power
(A) increase (B) decrease (C) does not change (D) zero
34. If a soap bubble is charged with negative charge, its radius
(A) will increase (B) will decrease
(C) will remain same (D) data is not sufficient
35. If a copper rod carries a direct current, the magnetic field associated with the current will be
(A) only inside the rod
(B) both inside & outside the rod
(C) only outside the rod
(D) neither inside nor outside the rod
36. In forward bias, the width of potential barriers in a P-N junction diode
(A) increases (B) decreases
(C) remains constant (D) first increase & then decrease

Kantipur Engineering College

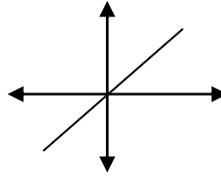
Dhapakhel, Lalitpur Tel: 01-5229204/01-5229005

37. Which of the following is the graph of $y = |x|$?

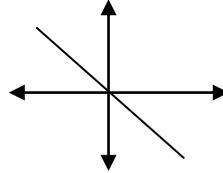
(A)



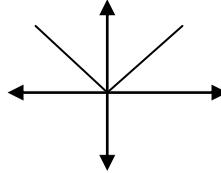
(B)



(C)



(D)



38. What is the point of intersection of the line $y = x + 1$ and $y = x^2 - 3x + 4$?

(A) (1, 2) and (-3, 4)

(B) (1, 2) and (3, -4)

(C) (1, 2) and (3, 4)

(D) (1, -2) and (3, 4)

39. How many different sequences of heads and tails are possible if a coin is tossed 5 times?

(A) 32

(B) 8

(C) 16

(D) 2

40. What is the gradient of the tangent to the curve $y = x^3 - 12x + 20$ at $x = -2$?

(A) -24

(B) 0

(C) 12

(D) 5

41. In which interval the function $f(x) = x^2 - 6x + 4$ is increasing?

(A) $x > 2$

(B) $x < 2$

(C) $x < 3$

(D) $x > 3$

42. What is the value of $\lim_{x \rightarrow 0} \frac{e^{\sin x} - 1}{x}$?

(A) -1

(B) 0

(C) 2

(D) 1

43. What is the value of k for which the equation $5x^2 - (k + 4)x = 20$ has the roots numerically equal but opposite in sign?

(A) 2

(B) -2

(C) 4

(D) -4

44. What is the angle between the lines whose direction ratios are 2, 3, 4 and 1, -2, 1?

(A) $\pi/3$

(B) $\pi/2$

(C) $\pi/6$

(D) $\pi/4$

45. What is the derivative of $\frac{d}{dx} \log|x|$?

(A) $\frac{1}{|x|}$

(B) $\frac{1}{x}$

(C) $\frac{-1}{|x|}$

(D) $|x|$

46. If $\begin{bmatrix} 0 & 2k-3 \\ 1-k & 0 \end{bmatrix}$ is a skew symmetric matrix, what is the value of k ?

(A) -1

(B) 2

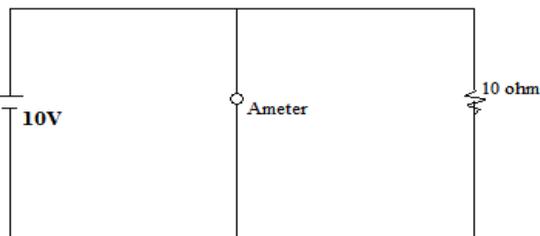
(C) 1

(D) -2

Kantipur Engineering College

Dhapakhel, Lalitpur Tel: 01-5229204/01-5229005

47. Ignition quality of Petrol is expressed by.....?
(A) octane no. (B) cetane no. (C) choke (D) all of the above
48. Which unit is used to measure power in micro hydropower?
(A) Kilowatt (B) Mill watt per hour (C) HP (D) Megha watt
49. Solar cell is
(A) biased (B) unbiased (C) alternating (D) none
50. Width of zebra crossing is.....
(A) 2m (B) 2.5m (C) 3.5m (D) 4.5m
51. When water is added to cement.....
(A) chemical reaction is absorbed (B) heat is absorbed
(C) heat is generated (D) impurities are wash out
52. For a stone to be resistant to fire, it shouldn't be made from.....
(A) Silt (B) Alumina (C) CaCO₃ (D) clay
53. Wattmeter measures.....
(A) active power (B) effective power
(C) apparent power (D) both A and B
54. Which of the following hydropower is storage type?
(A) Kulekhani Hydropower Plant (B) Sundarijal Hydropower Plant
(C) Sunkoshi Hydropower Plant (D) Pharping Hydrpower Plant
55. What is the unit of electrical energy?
(A) ampere (B) watt (C) watt hour (D) VAR
56. What happens in the following circuit?
(A) Ammeter shows 1A (B) Circuit burnt out
(C) Ammeter shows 0A (D) Ammeter shows 10 A



57. How many Internet are there in the world?
(A) 3 (B) 2 (C) many (D) 1
58. Which of the following is other than operating system?
(A) Google chrome (B) Linux (C) windows (D) Mac OS
59. In 2^{32} how many bits are there?
(A) 2 bits (B) 16 bits (C) 32 bits (D) 64 bits

Kantipur Engineering College

Dhapakhel, Lalitpur Tel: 01-5229204/01-5229005

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

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.

The fact that everyone is selfish may mean that selfishness is natural, but it does not follow that it is needful. The very evils it creates should be enough to make us realize, it is not in the interest of the individual or of his society. In fact the men who are completely self-centred have to be kept away from their fellow men in institutions provided for the purpose. We have not yet found a wave of dealing with completely self-centred nations. Is it possible for ordinary man consistently to prefer others to himself - to live to make the other fellow great? To be genuinely more concerned with the welfare of people than with profits? To consider seriously and intelligently the needs and feelings of other classes, races and nations as well as his own? Can men live above differences of party, class, race, point of view and national advantage? If the answer is 'yes' a new world society and philosophy uniting all men can be constructed.

61. The writer presupposes that:
(A) Selfishness is inhuman. (B) Selfishness is natural.
(C) Selfishness is inborn. (D) Man is selfish.
62. The writer means to say that man cannot
(A) consistently prefers others to himself (B) persistently prefers himself
(C) always prefer others to himself (D) none of these
63. Construction of new world society depends on
(A) nothing (B) recognition of needs
(C) many things (D) a few conditions
64. "Genuinely more concerned" means
(A) really worried (B) sincerely more troubled
(C) dependable concern (D) really related
65. The amount of Pure H_2SO_4 present in 250 ml of 0.1N H_2SO_4 is
(A) 3.15 gm (B) 2.5 gm (C) 1.225 gm (D) 1.35g
66. 0.1978g of copper is deposited by a current of 0.2 ampere in 50 minutes.
The electrochemical equivalent of copper is
(A) 0.000987 (B) 0.0003296 (C) 0.0007764 (D) 0.00984
67. An organic compound formed by dehydration of ethanol with concentrated H_2SO_4 on treatment with Baeyer's reagent forms
(A) oxalic acid (B) glycerol (C) ethylene glycol (D) formic acid

Kantipur Engineering College

Dhapakhel, Lalitpur Tel: 01-5229204/01-5229005

68. Excess amount of the gas formed by heating a mixture of ammonium chloride and slaked lime is passed into copper sulphate solution forms
(A) bluish white ppt. (B) deep blue solution
(C) red ppt (D) blue ppt.
69. The sum of two Vectors A and B is at right angles to their difference, then
(A) $A = B / \sqrt{2}$ (B) $A = 2 B$ (C) $B = 2A$ (D) $A = B$
70. When the speed of a car is v , the minimum distance over which it can be stopped is s . If the speed becomes nv , what will be the minimum distance over which it can be stopped during same time
(A) n^2s (B) ns (C) $\frac{s}{n^2}$ (D) $\frac{s}{n}$
71. A radio-active material has a half-life of 10 days. What fraction of the material would remain after 30 days?
(A) 0.5 (B) 0.25 (C) 0.33 (D) 0.125
72. Given that in a hydrogen atom the energy of the n^{th} orbit $E_n = -\frac{13.6}{n^2} \text{ eV}$.
The amount of energy required to send electron from first orbit to second orbit is
(A) 10.2 eV (B) 2.1 eV (C) 13.6 eV (D) 3.4 eV
73. A pendulum is undergoing simple harmonic motion. The velocity of bob in mean position is v . If now its amplitude is doubled, keeping the length same, its velocity in mean position will be
(A) $2v$ (B) v (C) $\frac{v}{2}$ (D) $4v$
74. Input power at 22000 V is to be stepped down to 220 V by a transformer with a winding of 4400 turns in the primary, what should be the number of turns in the secondary of the transformer?
(A) 440 (B) 200 (C) 220 (D) 44
75. The period of oscillations of a magnetic needle in a magnetic field is 1.0 s. If the length of the needle is halved by cutting it then the time period will be
(A) 1.0 s (B) 0.5 s (C) 0.25 s (D) 2.0 s
76. A capacitor of capacitance $6\mu \text{ F}$ is charged to 100 volt. The energy stored in the capacitor is
(A) 0.6 J (B) 0.3 J (C) 0.03 J (D) 0.06 J
77. In Young's experiment, the ratio of maximum to minimum intensities of the fringe system is 4:1. The amplitude of the coherent sources are in the ratio
(A) 4 : 1 (B) 2 : 1 (C) 3:1 (D) 1 : 1

Kantipur Engineering College

Dhapakhel, Lalitpur Tel: 01-5229204/01-5229005

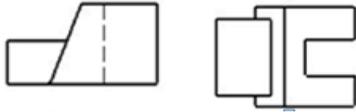
78. If the tube length of astronomical telescope is 105 cm and magnifying power is 20 for normal setting. The focal length of objective is
(A) 25 cm (B) 10 cm (C) 20 cm (D) 100 cm
79. The heat required to raise temperature from 30°C to 35°C for 2 moles of an ideal gas is 70 cal at constant pressure, then heat required for the same gas to raise the temperature of the same range but at constant volume will
(A) 30 cal (B) 50 cal (C) 70 cal (D) 60 cal
80. The 22 gm of CO₂ at 27°C is mixed with 16 gm of O₂ at 37°C. the temperature of the mixture is
(A) 32°C (B) 27°C (C) 30°C (D) 37°C
81. Two soap bubbles have radii in the ratio 2:1. What is the ratio of excesses pressure inside them?
(A) 1:2 (B) 2 : 1 (C) 1:4 (D) 4:1
82. Two wires of same material and length but diameter in the ratio 1:2 are stretched by the same force. The potential energy per unit volume for the two wires when stretched will be in the ratio
(A) 16 : 1 (B) 1:1 (C) 2:1 (D) 4:1
83. The kinetic energy of a satellite in its orbit around the earth is E. What should be the kinetic energy of the satellite so as to enable it escape from the gravitational pull of the earth?
(A) 4 E (B) $\sqrt{2}$ E (C) 2E (D) E
84. If $(x - a)$ is a factor of $x^2 - 3x - 4 = 0$, what is the value of a?
(A) -1 or -4 (B) -1 or 4 (C) 1 or -4 (D) 1 or 4
85. If $\frac{\sqrt{3}}{2}$ is the geometric mean between $\cos \theta$ and $\sin \theta$. $\tan \theta$, what is the value of θ ?
(A) 0° (B) 60° (C) 30° (D) 150°
86. If $2x - 3y = 0$ is the equation of the common chord of the circle $x^2 + y^2 + 4x = 0$ and $x^2 + y^2 + 2\alpha y = 0$, what is the value of α ?
(A) 1 (B) 2 (C) 3 (D) 4
87. In a triangle ABC if $\frac{\cos A}{a} = \frac{\cos B}{b} = \frac{\cos C}{c}$ and $b = \frac{8}{\sqrt{3}}$, what is the area of the triangle ABC
(A) 8 sq. units (B) $\frac{8}{\sqrt{3}}$ sq. units (C) $16\sqrt{3}$ sq. units (D) $\frac{16}{\sqrt{3}}$ sq. units
88. Which of the following is the correct representation for $x^2 + 9y^2 - 6xy + 3x - 9y = 0$?
(A) A pair of parallel lines (B) A pair of perpendicular lines
(C) A hyperbola (D) An ellipse

Kantipur Engineering College

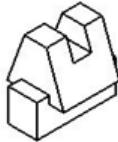
Dhapakhel, Lalitpur Tel: 01-5229204/01-5229005

89. What is the angle between the tangents drawn from the origin to the parabola $y^2 = 4a(x - a)$?
(A) $\frac{\pi}{2}$ (B) $\frac{\pi}{3}$ (C) $\frac{\pi}{4}$ (D) π
90. For $x \neq 0$, what is the value of $\tan\left(\frac{\pi}{4} - \frac{1}{2}\cos^{-1}x\right) + \tan\left(\frac{\pi}{4} + \frac{1}{2}\cos^{-1}x\right)$?
(A) $\frac{1}{x}$ (B) $\frac{1}{1+x}$ (C) $\frac{2}{1+x}$ (D) $\frac{2}{x}$
91. What is the co-efficient of x^6 in the expansion of $(1 + x)^{25} + (1 + x)^{26} + \dots + (1 + x)^{40}$?
(A) $\binom{41}{6} - \binom{25}{7}$ (B) $\binom{40}{7} - \binom{25}{7}$
(C) $\binom{41}{7} - \binom{25}{7}$ (D) $\binom{41}{7} - \binom{25}{6}$
92. What are the equations of the directrices to the ellipse $3x^2 + 2y^2 = 6$?
(A) $x = \pm 3$ (B) $y = \pm 3$ (C) $y = \pm \frac{3}{4}$ (D) $x = \pm \frac{3}{4}$
93. What is the value of $\int_{-1}^1 \sec x \log\left(\frac{1+x}{1-x}\right)$
(A) 0 (B) 1 (C) -1 (D) 2
94. What is the smaller area enclosed between the circle $x^2 + y^2 = 4$ and the line $x + y = 2$?
(A) $\pi - 2$ (B) $\pi - 1$ (C) π (D) $-\pi$
95. The volume of a cylinder is given by the formula $V = \pi r^2 h$. What is the greatest value of V if $r + h = 6$?
(A) 40π (B) 36π (C) 32π (D) 44π
96. The value of $\int \sqrt{\frac{1+x}{1-x}} dx$ is
(A) $2\sin^{-1}x - \sqrt{1-x^2} + c$ (B) $\frac{1}{2}\sin^{-1}x - \sqrt{1-x^2} + c$
(C) $\sin^{-1}x - \sqrt{1-x^2} + c$ (D) $\sin^{-1}x + \sqrt{1-x^2} + c$
97. If $\vec{a} + \vec{b} + \vec{c} = 0$, $|\vec{a}| = 5$, $|\vec{b}| = 4$, $|\vec{c}| = 3$ then what is the angle between \vec{b} and \vec{c} ?
(A) 30° (B) 60° (C) 45° (D) 90°
98. What is the value of $\lim_{x \rightarrow \infty} \frac{2^{x+1} - 3^{x+1}}{2^x - 3^x}$?
(A) 1 (B) 2 (C) -1 (D) 3

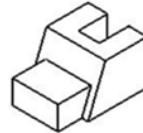
99. Which is the correct solid object for the given orthographic projection?



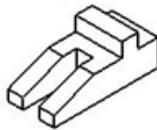
(A)



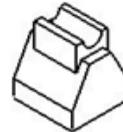
(B)



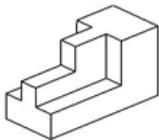
(C)



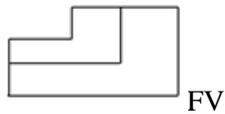
(D)



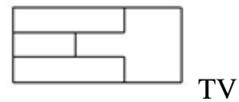
100. Which orthographic projection is incorrect?



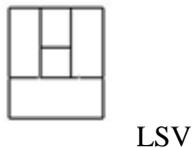
(A)



(B)



(C)



(D)

none
