

TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
KANTIPUR ENGINEERING COLLEGE

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

Set: II (A)

Time: 2 hours

Date: 2073/04/08

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

60×1 = 60

1. You spoke to him in belligerent tone. The synonym of 'belligerent' is
(A) courageous (B) cowardly (C) effortless (D) hostile
2. All his neighbors are aware of his 'acrimonious' nature. The antonym of 'acrimonious' is:
(A) informal (B) sympathetic (C) uncooperative (D) charitable
3. The word 'spontaneous' has its primary stress on its syllable.
(A) first (B) third (C) second (D) fourth
4. Which of the following words contains the vowel sound /ɜ:/?
(A) curd (B) but (C) put (D) cut
5. A number of visitors visited this place.
(A) have (B) has (C) was (D) are
6. Sita got her brother her clothes.
(A) wash (B) to wash (C) washing (D) washed
7. My sister loves
(A) to sing. (B) to have sung. (C) singing. (D) to be singing.
8. Rosemary said to me, "Thank you". The reported speech form of this sentence is:
(A) Rosemary told me thank you. (B) Rosemary told me that thank you.
(C) Rosemary wished thank you. (D) Rosemary thanked me.
9. I saw Daffodil
(A) danced (B) dance (C) dancing (D) to have danced
10. Do you want us it right now?
(A) do (B) doing (C) done (D) to do
11. He has his breakfast at 5.30 a.m.,?
(A) doesn't he (B) does he (C) hasn't he (D) has he
12. Two-third of the work accomplished.
(A) have been (B) were (C) has been (D) have
13. If I you, I would decide instantly.
(A) am (B) was (C) were (D) had been
14. Which of the following is simple sentence?
(A) He worked hard to pass the examination. (B) I saw a football match which was thrilling.
(C) Waste not, want not. (D) Do as I tell you, or you will regret it.
15. The value of azimuthal quantum number for the electrons present in 5s orbital is
(A) 1 (B) 0 (C) 2 (D) 5
16. An aqueous solution with pH = 0 is
(A) neutral (B) basic (C) amphoteric (D) acidic
17. No. of molecules present in 5 g of hydrogen is
(A) 1.505×10^{24} (B) 1.505×10^{23} (C) 1.505×10^{-21} (D) 5×10^{24}
18. Eq.wt. of KMnO_4 in acidic medium is
(A) M/5 (B) M / 1 (C) M / 4 (D) M / 2 [M = Mol.wt.]

19. A lewis acid is
(A) Proton donor (B) Proton acceptor
(C) An electron pair acceptor (D) An electron pair donor
20. Bleaching action of chlorine is due to
(A) reduction (B) complex formation (C) oxidation (D) displacement
21. Which of the following has the highest energy?
(A) 6s (B) 4d (C) 5p (D) 4f
22. Which of the salts will produce an alkaline solution when dissolved in water?
(A) NaC (B) NH_4Cl (C) NaNO_3 (D) Na_2CO_3
23. Blister copper is
(A) pure copper (B) copper containing impurities and dissolved SO_2
(C) alloy of copper (D) ore of copper
24. A Bessemer converter is used in the manufacture of
(A) cast iron (B) steel (C) pig iron (D) silver
25. Isobutane and n-butane are
(A) position isomers (B) metamers (C) tautomers (D) chain isomers
26. Acetylene on ozonolysis produces
(A) ethanediol (B) ethanedial (C) methanal (D) ethanal
27. Two pendulums oscillate with a constant phase difference of 90° and same amplitude. The maximum velocity of one v. The maximum velocity of the other will be
(A) $2v$ (B) $v\sqrt{2}$ (C) v (D) $\sqrt{2}v$
28. Which of the following is not the characteristic of displacement?
(A) it is always positive (B) it can be represented geometrically
(C) it has both magnitude and direction
(D) its magnitude is equal to the shortest distance between the initial and final positions of the particle
29. An electric fan is switched on in a closed room. The air in the room is
(A) cooled (B) heated or cooled depending on the atmospheric pressure
(C) maintains the same temperature (D) heated
30. What is the main cause of the shining of diamond?
(A) reflection (B) refraction (C) dispersion of light (D) total internal reflection
31. Huygens wave theory cannot explain
(A) diffraction (B) interference (C) polarization (D) photoelectric effect
32. A charged conductor has charge on its
(A) outer surface (B) inner surface (C) middle point (D) surrounding
33. Resistance of conductor is doubled keeping potential difference across it constant. The rate of generation of heat will
(A) be halved (B) become one-fourth (C) be doubled (D) becomes four times
34. The area enclosed by a hysteresis loop is a measure of
(A) energy loss per cycle (B) susceptibility (C) permeability (D) retentivity
35. The frequency of the fundamental note produced by closed organ pipe is f. If the diameter of the pipe is doubled, the frequency of the fundamental note produced by it will be
(A) 4f (B) 2f (C) f (D) 0.5f

36. Cathode rays enter a magnetic field making oblique angle with the lines of magnetic induction. What will be the nature of the path followed
 (A) parabola (B) circle (C) helix (D) straight line
37. If $A \subseteq B$ then $B' - A'$ equals
 (A) A' (B) B' (C) ϕ (D) $B - A$
38. If $x \in \mathbb{R}$ then the value of $x^2 - 6x + 13$ will not be less than
 (A) 6 (B) 4 (C) 7 (D) 8
39. The general values of x which satisfies $\sin x = -\sqrt{3/2}$ and $\cos x = 1/2$ are
 (A) $2\pi + (5\pi/4)$ (B) $2\pi + (5\pi/3)$ (C) $2\pi - (7\pi/6)$ (D) $2\pi + (7\pi/6)$
40. If A is a square matrix of order 3 with $|A| = 4$ then $|\text{adj.}A|$ is
 (A) 8 (B) 16 (C) 12 (D) 20
41. $\lim_{x \rightarrow \infty} \frac{\sin x}{x}$ is
 (A) 1 (B) 0 (C) ∞ (D) -1
42. If $y = 1 - \frac{x}{1!} + \frac{x^2}{2!} - \frac{x^3}{3!} + \frac{x^4}{4!} - \dots$ to ∞ then $\frac{d^2y}{dx^2}$ is
 (A) y (B) $-y$ (C) $2y$ (D) $y/2$
43. $\int \frac{3 \tan \frac{x}{3} - \tan^3 \frac{x}{3}}{1 - 3 \tan^2 \frac{x}{3}} dx$ is
 (A) $-\log \sec x + c$ (B) $\log \sin x + c$ (C) $-\log \cos x + c$ (D) $\log \tan x + c$
44. If $\vec{a} \cdot \vec{b} = |\vec{a}| |\vec{b}|$ then the vectors \vec{a} and \vec{b} are
 (A) null vectors (B) coincident (C) perpendicular (D) parallel
45. If the centroid of the triangle formed by the points $(1, a)$, $(2, b)$ and $(c, -3)$ lies on the x-axis then
 (A) $a = 3$ (B) $b = 3$ (C) $a - b = 3$ (D) $a + b = 3$
46. If $k, -2k, 3k$ denote the direction cosines of a line then the value of k is
 (A) $\pm \frac{1}{\sqrt{14}}$ (B) ± 14 (C) $\pm \sqrt{14}$ (D) $\pm \frac{1}{14}$
47. In an IC engine, the motion of piston is type.
 (A) Oscillating (B) circular (C) reciprocating (D) all of above
48. In diesel engine, suction process consists of.....
 (A) fuel & air mixture (B) air only (C) fuel only (D) none
49. Water is first converted into steam in Engines.
 (A) internal combustion (B) external combustion
 (C) four stroke diesel (D) two stroke petrol
50. In vertically placed traffic light signals, which color is on the top?
 (A) yellow (B) black (C) green (D) red
51. The rounded aggregate is obtained from.....
 (A) volcano (B) crusher (C) river (D) lake

52. In construction material, OPC is a type of.....
 (A) cement (B) brick (C) sand (D) iron rod
53. No parking is a/ansign.
 (A) none (B) warning (C) information (D) regulatory
54. Series circuit is..... divider circuit.
 (A) Current (B) Voltage (C) Charge (D) power
55. What type of energy is derived from heated groundwater?
 (A) geothermal energy (B) solar energy (C) hydroelectric energy (D) nuclear energy
56. Transformer changes in electricity supply.
 (A) only power (B) Power & resistance (C) voltage & current (D) resistance
57. The total resistance in series connection.
 (A) Remains same (B) less than half of minimum resistor
 (C) Increases (D) decreases
58. The current gain of the common emitter transistor amplifier is
 (A) zero (B) more than 1 (C) 1 (D) less than 1
59. FTP stands for
 (A) file to protect (B) file to pass
 (C) file trap protocol (D) file transfer protocol
60. The following is an output device.
 (A) printer (B) pendrive (C) mouse (D) keyboard

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.

Cave men roaming on earth thought that the moon changes its shape by seeing its different shapes in the sky. Sometimes, it is seen as a thin white curve, sometimes half circle, and sometimes as a full orange disc. How must have our ancestors explained this fascinating behavior?

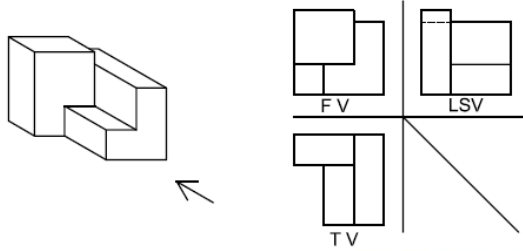
But now, we are confident why our satellite changes its shape. The moon revolves round the earth once in a month regularly and we only see a part of it. What that we see is that section of moon which catches the sun's light.

61. Our satellite means the
 (A) sun (B) moon (C) earth (D) satellite
62. The moon's fascinating behaviour implies that
 (A) it catches light (B) seeing of different shapes
 (C) half circle (D) revolving around
63. To our eyes at the earth, the moon changes in
 (A) colour only (B) shape only (C) both colour and shape (D) circle
64. The reason of changing shape that we know is
 (A) the portion catching the sunlight (B) fascinating behaviour
 (C) revolving around the earth (D) our inability to see the moon during day
65. What current strength in amperes will be required to liberate 10 g of iodine from potassium iodide solution in one hour?
 (A) 2.5 ampere (B) 2.11 ampere (C) 3.5 ampere (D) 4 ampere
66. 250 ml of 0.4M H₂SO₄ is mixed with 600ml of 0.25M KOH. The normality of the resulting solution is
 (A) 0.0625N (B) 0.12N (C) 0.625N (D) 0.0588N

67. The gas formed by heating ethanol with conc. H_2SO_4 on passing into alkaline solution of KMnO_4 gives
 (A) ethylene glycol (B) ethyl alcohol (C) acetic acid (D) acetaldehyde
68. The gas formed by heating ammonium chloride and slaked lime on reaction with Nessler's reagent forms
 (A) brown ppt. (B) black ppt. (C) reddish brown ppt. (D) yellow ppt.
69. If two vectors are equal and their resultant is also equal to one of them, then the angle between two vectors is
 (A) 120° (B) 60° (C) 90° (D) 0°
70. A particle is projected vertically upward and it reaches the maximum height H in time T seconds. The height of the particle at any time t will be
 (A) $H - \frac{1}{2}g(T - t)^2$ (B) $g(t - T)^2$ (C) $\frac{1}{2}g(t - T)^2$ (D) $H - g(t - T)$
71. How much work must be done by a force on 100kg body in order to accelerate it from 0 to 20m/s in 10 second?
 (A) $2 \times 10^3 \text{ J}$ (B) $4 \times 10^3 \text{ J}$ (C) $2 \times 10^4 \text{ J}$ (D) $4 \times 10^4 \text{ J}$
72. A ring starts from rest and acquires an angular speed of 10 rad/s in 2 second. The mass of the ring is 500gm and its radius is 20cm. The torque on the ring is
 (A) 0.02 Nm (B) 0.10 Nm (C) 0.20 Nm (D) 0.01Nm
73. Two rain drops of same radius coalesce. Before doing so, each was moving with terminal velocity v . what is the terminal velocity of the single drop so formed?
 (A) $v / 2$ (B) $2v$ (C) $2^{2/3}v$ (D) $v / 3$
74. A difference of temperature of 25°C is equivalent to a difference of
 (A) 72°F (B) 45°F (C) 32°F (D) 25°F
75. The pressure (P) of an ideal gas and its mean kinetic energy (E) per unit volume are related
 (A) $P = E/2$ (B) $P = E$ (C) $P = 3E/2$ (D) $P = 2E/3$
76. Two waves of equal frequencies have their amplitude in the ratio 3:5. They superimpose on each other. The ratio of maximum to minimum intensities of the resultant wave is
 (A) $\sqrt{3}:\sqrt{5}$ (B) 3:5 (C) 9:25 (D) 16:1
77. A ray of the light enters from a denser medium into rarer medium. The speed of light in rarer medium is twice than in denser medium. What is the critical angle for total internal reflection to take place
 (A) 75° (B) 45° (C) 60° (D) 30°
78. A person cannot see the objects clearly placed at a distance more than 40cm. He is advised to use lens of power
 (A) -2.5 D (B) +2.5 D (C) -6.25 D (D) +1.5 D
79. If the total magnetic field due to earth is 28Am^{-1} , then the total magnetic induction due to earth is
 (A) 28T (B) 28 gauss (C) 0.352 gauss (D) 0.352 T
80. F_G and F_E represent gravitational and electrostatic force respectively between electrons situated at a distance of 10 cm, the ratio of F_G / F_E is of the order of
 (A) 10^{42} (B) 10^{-42} (C) 1 (D) 10
81. A coil of the area 100cm^2 has 500turns. Magnetic field of 0.1Weber/m^2 is perpendicular to the coil. The field is reduced to zero in 0.1s. The induced e.m.f. in the coil is
 (A) 1V (B) 5V (C) 50V (D) zero

82. The energy required to reduced remove an electron in a hydrogen atom from $n = 10$ state is
 (A) 13.6eV (B) 1.36eV (C) 0.0136eV (D) 0.136eV
83. The binding energy of deuteron is 2.2MeV and of that of ${}^4_2\text{He}$ is 28 MeV, then the energy released is
 (A) 30.2MeV (B) 25.8MeV (C) 23.6MeV (D) 19.2MeV
84. The domain and range of the function $f(x) = \frac{1}{3 - \cos 2x}$ are
 (A) $\mathbb{R}, [1/4, 1/2]$ (B) $\mathbb{R}, \mathbb{R} - \{-1, 1\}$ (C) $\mathbb{R}, [-1, 1]$ (D) $\mathbb{R}, [-1/2, 1/2]$
85. In ΔABC , if $a = 2c$ and $b = 3c$ then $\cos B$ is
 (A) -1 (B) $1/2$ (C) $1/3$ (D) 1
86. If a polygon has the same number of sides as the diagonals then the number of sides is
 (A) 3 (B) 4 (C) 6 (D) 5
87. The fourth, seventh and tenth terms of G.P are p, q, r respectively, then
 (A) $p^2 = q^2 + r^2$ (B) $q^2 = pr$ (C) $r^2 = p + q$ (D) $p^2 + q^2 + r^2 = 1$
88. If $z = x + iy = (k + 3) + i\sqrt{5 - k^2}$ then the locus of z is
 (A) a straight line (B) a parabola (C) a circle (D) an ellipse
89. The coefficient of x^3 in the expansion of $\log(1 - 5x + 6x^2)$ is
 (A) $-17/3$ (B) $1/2$ (C) $-1/8$ (D) $-35/3$
90. $\vec{a} = 3\vec{i} - 5\vec{j}$ and $\vec{b} = 6\vec{i} + 3\vec{j}$ are two vectors and \vec{c} is a vector such that $\vec{c} = \vec{a} \times \vec{b}$ then $|\vec{a}|:|\vec{b}|:|\vec{c}|$ is
 (A) $\sqrt{34} : \sqrt{45} : \sqrt{39}$ (B) 39:35:34 (C) 34:39:45 (D) $\sqrt{34} : \sqrt{45} : 39$
91. If coordinate axes are the angle bisectors of the pair of lines $ax^2 + 2hxy + by^2 = 0$ then
 (A) $A = b$ (B) $a^2 + b = 0$ (C) $h = 0$ (D) $a + b^2 = 0$
92. The centre of a circle is $(2, -3)$ and the circumference is 10π . Then the equation of the circle is
 (A) $x^2 + y^2 + 4x + 6y + 12 = 0$ (B) $x^2 + y^2 - 4x + 6y - 12 = 0$
 (C) $x^2 + y^2 - 4x + 6y + 12 = 0$ (D) $x^2 + y^2 - 4x - 6y - 12 = 0$
93. The line $lx + my + n = 0$ will touch the parabola $y^2 = 4ax$ if
 (A) $mn = al^2$ (B) $ln = am^2$ (C) $lm = an^2$ (D) $mn = al$
94. If P be the point $(2, 6, 3)$ then the equation of the plane through P at right angles to OP, O being the origin, is
 (A) $2x + 6y + 3z = 49$ (B) $2x - 6y + 3z = 7$ (C) $2x + 6y - 3z = 49$ (D) $2x + 6y + 3z = 7$
95. If $y = \sin x - \cos x$ then $\frac{d^{17}y}{dx^{17}}$ is
 (A) $\sin x - \cos x$ (B) $\cos x - \sin x$ (C) $\sin x + \cos x$ (D) $-\sin x - \cos x$
96. The function $f(x) = x^x$ has a stationary point at
 (A) $x = 1/e$ (B) $x = e$ (C) $x = 1$ (D) $x = \sqrt{e}$
97. $\int_0^{\frac{\pi}{2}} \frac{(\sin x + \cos x)^2}{\sqrt{1 + \sin 2x}} dx$ is
 (A) 0 (B) $1/2$ (C) 1 (D) 2
98. The area of the region bounded by the curves $y = x^2$ and $y = |x|$ lying in first quadrant is
 (A) $1/3$ sq. Units (B) $1/6$ sq. units (C) $5/6$ Sq. units (D) $5/3$ sq. units

99. In the given orthographic projection what is wrong in the front view? (FM 2)



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

100. In first angle orthographic projection the position of top view is always on the of the front view. (FM 2)

- (A) bottom (B) Right side (C) top (D) left side

