# EVEREST ENGINEERING COLLEGE

(Former Everest Engineering & Management College)

*(Affiliated to Pokhara University)*

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## Entrance Model Question

Programs

BE – CIVIL

BE – IT (Information Technology)

BE - COMPUTER

*Directions: There are 100 multiple choice questions of equal weightage. Every question or incomplete statement below is followed by four suggested lettered choices or completions. Choose the one lettered choice that is best in each case and then fill in the corresponding circle in the answer sheet provided.*

**Time: 2Hrs**

**Full Marks: 1x100=100**

## Mathematics

1. If $A = [-3, 4)$ and $B = [2, 6]$, then $A \cap B$ is
   a. $[2, 4)$ b. $(2, 4]$
   c. $(2, 4)$ d. $[2, 4]$
2. The expression $|2x + 1| < 3$ is same as
   a. $-2 < x < -1$ b. $-2 < x < 1$
   c. $2 < x < 3$ d. $-1 < x < 2$
3. The range of the function $f(x) = \sqrt{\frac{3-x}{x}}$ is
   a. $\{0, 3\}$ b. $(0, 3]$
   c. $[0, \infty)$ d. $(0, \infty)$
4. The domain of $\frac{|x-2|}{x-2}$ is
   a. $\{1, -1\}$ b. $R - \{2\}$
   c. $[-1,1]$ d. $(-1,1)$
5. If $f(x) = x + 1$, $g(x) = x^2 - 1$ and $f[g(x)] = 16$, then the value of x is
   a. $\pm 1$ b. $\pm 2$
   c. $\pm 3$ d. $\pm 4$
6. The value of $sin\left(\frac{3\pi}{2} + x\right)$ is
   a. $sinx$ b. $-sinx$
   c. $cosx$ d. $-cosx$
7. The general solution of $4 \sin^2 x = 1$ is
   a. $n\pi \pm \frac{\pi}{3}$ b. $n\pi \pm \frac{\pi}{6}$
   c. $2n\pi \pm \frac{\pi}{3}$ d. $2n\pi \pm \frac{\pi}{6}$
8. In $\Delta ABC$, if $a = 3$, $b = 4$, $c = 5$, then the value of $cos\frac{C}{2}$ is
   a. $\frac{1}{\sqrt{2}}$ b. $\frac{1}{2}$
   c. $\frac{\sqrt{3}}{2}$ d. $\frac{\sqrt{3}}{4}$

9. The sum of the infinite geometric series is $\frac{3}{4}$ and the common ratio is $\frac{1}{3}$ then its first term is

a. $\frac{4}{3}$ b. $\frac{1}{4}$

c. $\frac{1}{2}$ d. $\frac{1}{3}$

10. In the series $1+6+11+16+\ldots\ldots\ldots$ the eighth term is

a. 36 b. 48

c. 32 d. 39

11. Let P(n) be the statement: "n(n +1) is divisible by 4". Which of the following is not true?

a. P(5) b. P(4)

c. P(3) d. P(7)

12. If $A = \begin{bmatrix} 0 & 2x-1 & y \\ 3 & 0 & -5 \\ 2 & 5 & 0 \end{bmatrix}$ is a skew symmetric matrix then

a. $x = 1, y = -3$ b. $x = -2, y = -2$

c. $x = -1, y = -2$ d. $x = 1, y = -3$

13. The value of the determinant $\begin{vmatrix} 3 & 34 & 49 \\ 0 & 4 & 15 \\ 0 & 0 & 2 \end{vmatrix}$ is

a. 9 b. 24

c. 0 d. none of these

14. The equation of the line through the intersection of the lines $x + 3y = 4$ and $x + y = 2$ and having slope 2 is

a. $2y - x = 1$ b. $2x + y = 1$

c. $2x - y = 1$ d. $2y + x = 1$

15. The value of k for which the equation $4x^2 + 24x + k = 0$ has equal roots is

a. 12 b. 36

c. – 36 d. – 12

16. The cube roots of 1 are

a. $1, \frac{1+i\sqrt{3}}{2}, \frac{1-i\sqrt{3}}{2}$ b. $1, \frac{1+i\sqrt{3}}{2}, \frac{-1-i\sqrt{3}}{2}$

c. $1, \frac{\sqrt{3}+i}{2}, \frac{\sqrt{3}-i}{2}$ d. $1, \frac{-1+i\sqrt{3}}{2}, \frac{-1-i\sqrt{3}}{2}$

17. The polar form of the complex number 2 + 2i is

a. $2\sqrt{2}\,(\cos\frac{\pi}{4}+i\sin\frac{\pi}{4})$ b. $2(\cos\frac{\pi}{4}+i\sin\frac{\pi}{4})$

c. $\sqrt{2}\,(\cos\frac{\pi}{4}+i\sin\frac{\pi}{4})$ d. $\frac{1}{\sqrt{2}}(\cos\frac{\pi}{4}+i\sin\frac{\pi}{4})$

18. If the roots of $ax^2 + bx + c = 0 (a \neq 0)$ are reciprocal to each other then

a. $c = a$ b. $b = c$

c. $a = b$ d. $ca = 1$

19 The quadratic equation whose roots are – 3 and – 4 is,

a. $x^2 - 7x + 12 = 0$ b. $x^2 + 7x + 12 = 0$

c. $x^2 + 7x - 12 = 0$ d. $x^2 - 7x - 12 = 0$

20. If the three points (2, 1), (– 2, 5) and (k, 4) are collinear then k =

a. 1 b. – 1

c. 2 d. – 2

21. The length of perpendicular from (1,1) upon 3x+4y+3=0 is

a. 10 b. 5

c. 7 d. 2

22. The radius of the circle $x^2 + y^2 - 2x + 6y - 15 = 0$ is

a. 3 b. 5

c. 15 d. $\sqrt{15}$

23. $\lim_{x \to \infty} \frac{2x^2+3x+7}{3x^2+5x+6}$ is

a. $\frac{2}{3}$ b. $\frac{3}{5}$

c. $\frac{7}{6}$ d. 1

24. $\lim_{x \to \infty} \frac{sinx}{x}$ is equal to

a. 1 b. – 1

c. 0 d. can not be found

25. If the function $f(x) = \begin{cases} 3x-4, & for\ x \leq 2 \\ 2x+k, & for\ x > 2 \end{cases}$ is continuous at x = 2, then the value of k is

a. – 4 b. 4

c. 2 d. – 2

26. $\frac{d}{dx}(sin^3 x)$ is

a. $3\sin^2 x$ b. $\cos^3 x$

c. $-\cos^3 x$ d. $3\sin^2 x \cos x$

27. $\frac{d}{dx}(tan^{-1}x)$ is

a. $sec^{-2}x$ b. $\frac{1}{\sqrt{1-x^2}}$

c. $\frac{1}{1+x^2}$ d. $-\frac{1}{1+x^2}$

28. $\frac{d}{dx}(e^{x^2})$ is

a. $e^{x^2}$ b. $2xe^{x^2}$

c. $e^{2x}$ d. $2e^{x^2}$

29. If x = a cos nt – b sin nt, then $\frac{d^2x}{dt^2}$ is equal to

a. $n^2x$ b. $-n^2x$

c. nx d. – nx

30. The maximum value of f(x) = 1+ cos x +sin x is

a. 2 b. $\sqrt{2}+1$

c. $\sqrt{2}$ d. $2\sqrt{2}$

31. The slope of the tangent to the curve $y = 5 + 8x - 2x^2$ at x = 2 is

a. 0 b. – 2

c. 2 d. 16

32. The acceleration of a particle whose space- time equation is given by $s = 2t^3 + 5t - 2$ at t = 1, is

a. 12 b. 16

c. 17 d. 2

33. The circumference of a circle is increasing at the rate of 3cm/sec, then the rate of increase of radius is

a. $\frac{3}{2\pi}cm/sec$ b. $\frac{2\pi}{3}cm/sec$

c. $\frac{3\pi}{2}cm/sec$ d. $\frac{2}{3\pi}cm/sec$

34. $\int \frac{1}{\sqrt{1-x^2}}dx$ is equal to

a. $log\{x+\sqrt{1-x^2}\}$ b. $sin^{-1}x$

c. $tan^{-1}x$ d. $log\sqrt{1-x^2}$

35. $\int cotx\,dx =$

a. $-cosec^2x$ b. $log(tanx)$

c. $logsinx$ d. $logcosx$

36. $\int \frac{1}{x^2+a^2}dx$ is equal to

a. $log(x^2+a^2)$ b. $\frac{1}{a}tan^{-1}\frac{x}{a}$

c. $\frac{1}{x}tan^{-1}\frac{a}{x}$ d. $\frac{1}{2}log(x^2+a^2)$

37. If $\int f(x)dx = \frac{1}{x} + c$ then f(x) =

a. $logx$ b. $-logx + c$

c. $-\frac{1}{x^2}$ d. $\frac{1}{x^2}$

38. $\int sin^2 x dx$ is

a. $cos^2 x$ b. $\frac{sin^3 x}{3}$

c. $\frac{1}{2}x - \frac{sin2x}{2}$ d. $\frac{1}{2}x - \frac{sin2x}{4}$

39. The area bounded by $y = x^3$ and x axis in the interval $x = 2$ to $x = 4$ is

a. 60 b. 12

c. 24 d. 16

40. The area in the first quadrant between y- axis and the curve $2x = 3\sqrt{y}$ in the interval $0 \leq y \leq 4$ is

a. 4 b. 1

c. 2 d. 8

## Physics

41. The distance moved by a uniform accelerating body starting from rest in time t is proportional to

a. $t^{1/2}$ b. t

c. $t^2$ d. $t^{3/2}$

42. If a force F is applied on a body and it moves with velocity v, the power will be

a. Fv b. F/v

c. $Fv^2$ d. $F/v^2$

43. A particle executing SHM has time period 0.05 sec and amplitude 4cm. The maximum velocity of the particle is

a. $1.6\pi\ ms^{-1}$ b. $2\pi\ ms^{-1}$

c. $3.1\ ms^{-1}$ d. $4\pi\ ms^{-1}$

44. The temperature of a patient is 40°C, his temperature on Fahrenheit scale will be

a. 104°F b. 72°F

c. 96°F d. 100°F

45. At what temperature the speed in air will become double of its value at 27°C ?

a. 927°C b. 327°C

c. 627°C d. 54°C

46. If critical angle for a material to air is 30°, the refractive index will be

a. 1 b. 1.5

c. 2 d. 2.5

47. In an interference pattern minima are obtained when phase difference betwee interfering waves is

a. $\pi/2$ b. $2\pi$

c. $2n\pi$ d. $(2n-1)\pi$

48. Two capacitors of capacitances C and nC are connected in parallel, the equivaler capacitance is

a. $\frac{nC}{(n+1)}$ b.(n-1)c

c. (n+1)c d. $\frac{nC}{(n-1)}$

49. The resistance of a conductor of length l, cross-sectional area A and resistivity ρ i given by

a. $\frac{\rho A}{l}$ b. $\frac{l}{\rho l}$

c. $\frac{A}{\rho l}$ d. $\frac{\rho l}{A}$

50. A bulb has Specification 1 kilowatt and 250volt.the resistance of bulb is

a. 125Ω b. 62.5Ω

c. 0.25Ω d. 625Ω

51. A proton of charge +e enters in a magnetic field of strength B (Tesla) with speed v parallel to the direction of magnetic lines of force. The force of proton is

a. evB b. Zero

c. infinity d. evB/2

52. A bar Magnet of magnetic moment M is cut into two parts of equal length. Th magnetic moment of either part is

a. M b. 2M

c. M/2 d. Zero

53. Dimensions of LC(product of self inductance and capacitance) are

a. $[M^0L^0T^2]$ b. $[M^0L^0T^{-2}]$

c. $[M^0L^2T^{-2}]$ d. $[M^0L^0T^0]$

54. The threshold frequency of potassium is $3X10^{14}$ HZ .The work function is

a. $1X10^{-19}$ J b. $2X10^{-19}$ J

c. $4X10^{-19}$ J d. $0.5X10^{-19}$ J

55. To minimize spherical aberration two lenses of focal lengths $f_1$ and $f_2$ are place with a distance of separation equal to

a. $f_1-f_2$ b. $f_1+f_2$

c. $(f_1-f_2)/2$ d. $(f_1+f_2)/2$

56. A wheel of moment of inertia $5X10^{-3}Kg\text{-}m^2$is making 20 rev/sec. The torque required to stop in it in 10 sec is

a. $2\pi X10^{-2}N\text{-}m$ b. $\pi X10^{-2}N\text{-}m$

c. $2\pi X10^{2}N\text{-}m$ d. $4\pi X10^{-2}N\text{-}m$

57. Which of the following is a vector quantity

a. Electric current b. Weight

c. temperature d. pressure

58. The mean free path of a gas varies with absolute temperature as

a. T b. $T^{-1}$

c. $T^2$ d. $T^4$

59. In a moving coil galvanometer, a current( I) produces a deflection θ then

a. $I \propto Tan\theta$ b. $I \propto \theta$

c. $I \propto \theta^2$ d. $I \propto \theta^{1/2}$

60. A current of 10 A is flowing through a circular coil of diameter 1cm. What is the magnetic induction at its centre?

a. $4\pi X10^{-4}$ Tesla b. $2\pi X10^{-4}$ Tesla

c. $4\pi X10^{-8}$ Tesla d. $4\pi X10^{-4}$ Tesla

61. A box of mass 50kg is pulled up from the hold of a ship with a uniform velocity of $1ms^{-1}$ by a vertical rope attached to it. The tension of the rope is

a. 550N b. 500N

c. 50n d. 5000n

62. The excess pressure inside an air bubble of radius 0.2mm, situated inside the water of surface tension $0.07Nm^{-1}$ IS

a. $400N/m^2$ b. $700N/m^2$

c. $1000N/m^2$ d. $1400N/m^2$

63. A ray of light is refracted through a prism of angle 70°.If the angle of refraction in the glass at the first face is 28°,the angle of refraction in the second face will be

a. 22° b. 32°

c. 42° d. 52°

64. A ray of light travelling in an optical fiber is due to

a. refraction b. total internal reflection

c. diffraction d. polarization

65. Magnetic lines of force

a. cannot intersect at all b. intersect at infinity

c. intersect within the magnet d. intersect at the neutral point

66. The writer and editor_____ wearing same jacket.
a. has
b. have
c. are
d. is

67. The denouement in my family affair made me_____ social novel.
a. writing
b. to write
c. write
d. write

68. If had written a poem, I_____ it on the stage.
a. would recite
b. would have recited
c. will have recited
d. will recite

69. I have to finish my work,_____?
a. haven't I
b. hasn't I
c. don't I
d. do I

70. Hari as well as his friends_____going to temple.
a. is
b. am
c. are
d. has

71. He is recalcitrant. The synonyms of the underlined word is_____.
a. deplore
b. conciliate
c. delicate
d. obstinate

72. They said. "We have completed our assignment ourselves". The indirect narration of this sentence is_____.
a. They said that we had completed our assignment ourselves.
b. They said that they had completed their assignment themselves.
c. They said that they completed their assignment themselves
d. They said that we completed our assignment ourselves.

73. 'Have you eaten rice?' the passive form of this sentence is _____.
a. Let the rice be eaten.
b. Is the rice been eaten?
c. Has the rice been eaten?
d. Have the rice been eaten?

74. 'The belief in God' is known as_____.
a. Socialism
b. pantheism
c. Godism
d. egoism

75. How many syllables are there in a word 'fundamental'?
a. three
b. four
c. five
d. six

76. _____her labor hard, she passed the exam.

a. Because of
b. Despite
c. In spite of
d. Therefore

77. The underlined word conduct takes the prefix_____.

a. un
b. en
c. mis
d. de

78. The word 'subdue' receives primary stress on its_____ syllable.

a. first
b. second
c. third
d. fourth

79. 'I indulge in this film industry to uplift my social status.' Is a _____ sentence.

a. compound
b. complex
c. simple
d. none

80. The pay, we receive is not commensurate_____ the work we do.

a. for
b. about
c. with
d. to

**Read the passage carefully and answer the following questions:**

At this stage of civilization, when many nations are brought in to close and vital contact for good and evil, it is essential , as never before, that their gross ignorance of one another should be diminished, that they should begin to understand a little of one another's historical experience and resulting mentality. It is the fault of the English to expect the people of other countries to react as they do, to political and international situations. Our genuine goodwill and good intentions are often brought to nothing, because we expect other people to be like us. This would be corrected if we knew the history, not necessary in detail but in broad outlines, of the social and political conditions which have given to each nation its present character.

81. According to the passage ' Mentality' of a nation is mainly product of its

a. history
b. international position
c. politics
d. present character

82. The need for a greater understanding between nations

a. was always there
b. is no longer there
c. is more today than ever before
d. will always be there

83. The character of a nation is the result of its

a. mentality
b. cultural heritage
c. gross ignorance
d. socio-political conditions

84. According to the author his countrymen should

a. read the story of other nations
b. have a better understanding of other nations
c. not react to other actions
d. have vital contacts with other nations

85. Englishmen like others to react to political situations like

a. us
b. themselves
c. others
d. each others

## Chemistry

86. 50ml of 0.4N HCL was mixed with 100ml of 0.8N $H_2SO_4$.The normality of resulting mixture is:

a. 0.66
b. 1.0
c. 1.5
d. 2.0

87. Dehydrohalogination reaction is the example of

a. Elimination reaction
b. Addition reaction
c. Sulphonation reaction
d. Nucleophilic reaction

88. When a neutral atom is converted into its anion, its

a. Size does not change
b. Atomic weight deceases
c. Size increases
d. Size decreases

89. Which of the following has hydrogen bond?

a. Benzene
b. Buffer solution
c. Water
d. HCl

90. Electron has maximum energy when it is at

a. n=1
b. n=2
c. n=infinity
d. Has same energy in all level

91. The maximum capacity of electrons in an orbital is

a. 2
b. 6
c. 10
d. 14

92. Which one is the lightest metal in the periodic table?

a. Na
b. K
c. Li
d. Rb

93. Kanchan filter is used for

a. Removal of iron from water
b. Removal of arsenic from water
c. Removal of MnO2 from water
d. Removal of arsenic from soil

94. Coal tar used in the construction of roads, has the chemical mixtures of
    a. Different types of Phenols
    b. Phenols, polycyclic aromatic hydrocarbons and heterocyclic compounds
    c. Different types of heterocyclic compounds
    d. Aromatic hydrocarbons and heterocyclic compounds
95. Which one of the following has isoelectronic configuration?
    a. $Fe^{+2}$, $Fe^{+3}$
    b. $Ca^{++}$, $K^{+}$, $Cl^{-}$
    c. $N^{+3}$, $F^{-}$, Ne, $Na^{+}$
    d. $SO_4^{-2}$, $SeO_4^{-2}$, $TeO4^{-2}$
96. Which one of the following is the major pollutant in the drinking water in our country?
    a. E.Coli and Total coliform bacteria
    b. Arsenic
    c. Lead
    d. Acidic pH
97. When tertiary butyl bromide is reacted with a nucleophile in presence of suitable solvent, what will be the intermediate step generated?
    a. Carbocation
    b. Carbanion
    c. Carbon free radical
    d. Leaving group
98. The mechanism of addition polymerization is
    a. free radical addition
    b. condensation
    c. Electrophilic addition
    d. Nucleophilic reaction
99. The main constituents of cement is
    a. Calcium silicate
    b. Barium silicate
    c. Iron
    d. Alumina
100. Nowadays Mobile phones, TV, Laptops are replacing plastic body with Aluminium ones, the reason is
    a. It is most recycled and easiest to reprocess
    b. It is stronger and most reliable than plastic and abundantly available
    c. It can absorb and dissipate heat
    d. All the above