# **Tribhuvan University**

## **Institute of Engineering (IOE)**

## **BE Entrance Examination-2079**

Attempt all Questions. Time: 2 hrs

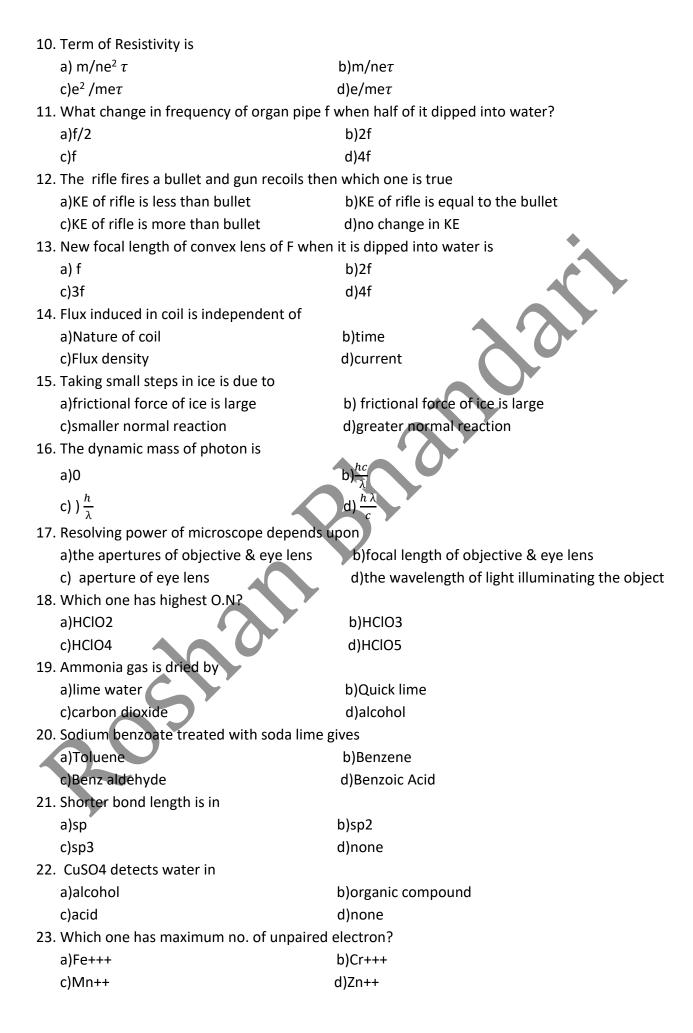
Full Marks: 140 Shift: Morning

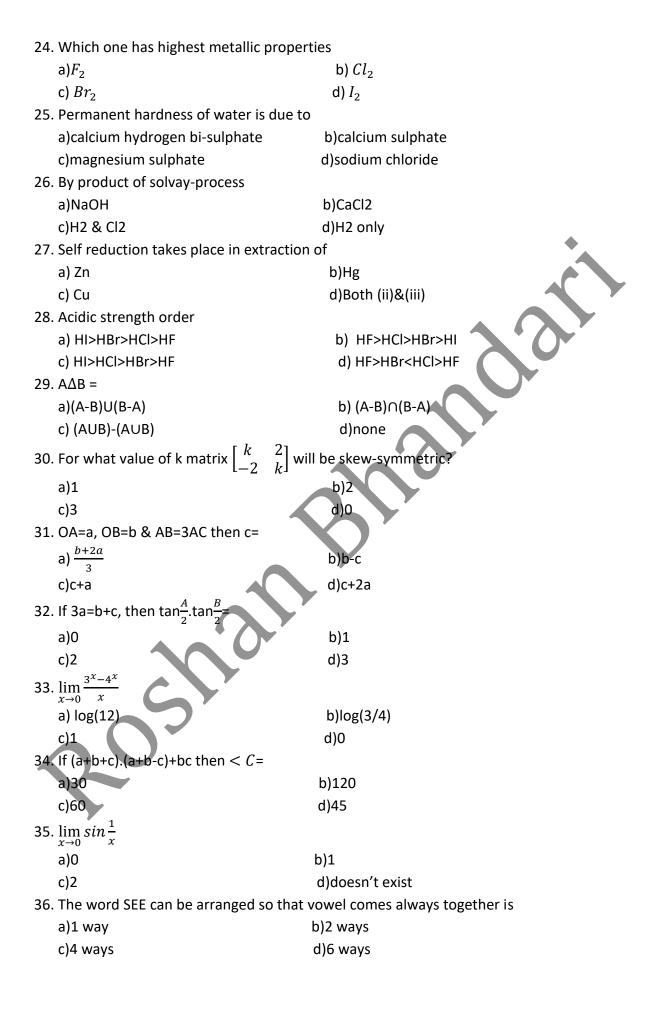
## Select the best alternatives:

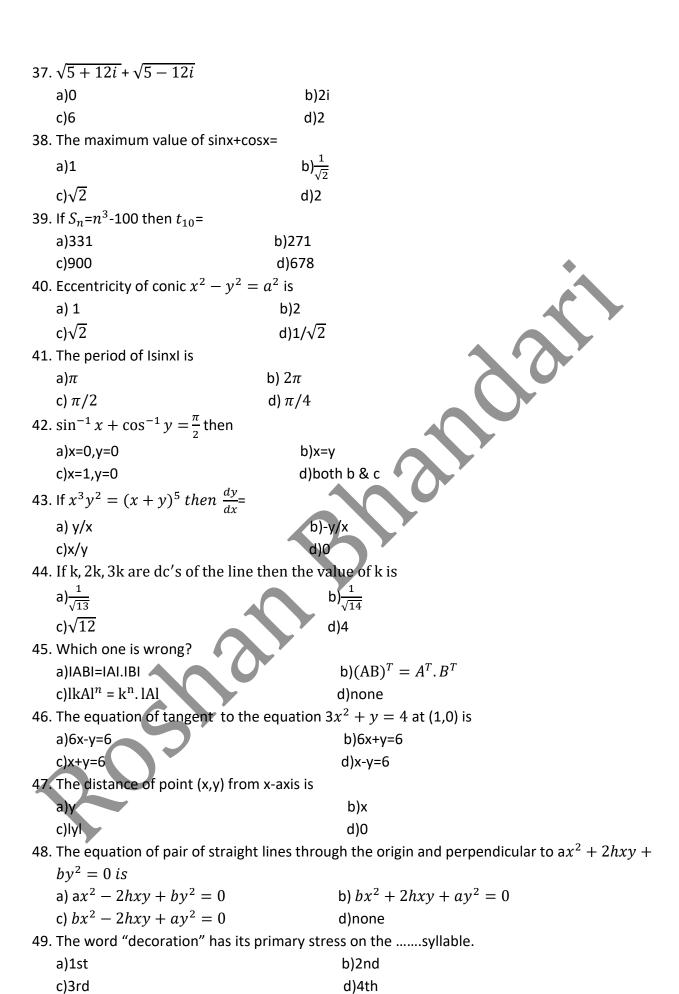
(60\*1=60)

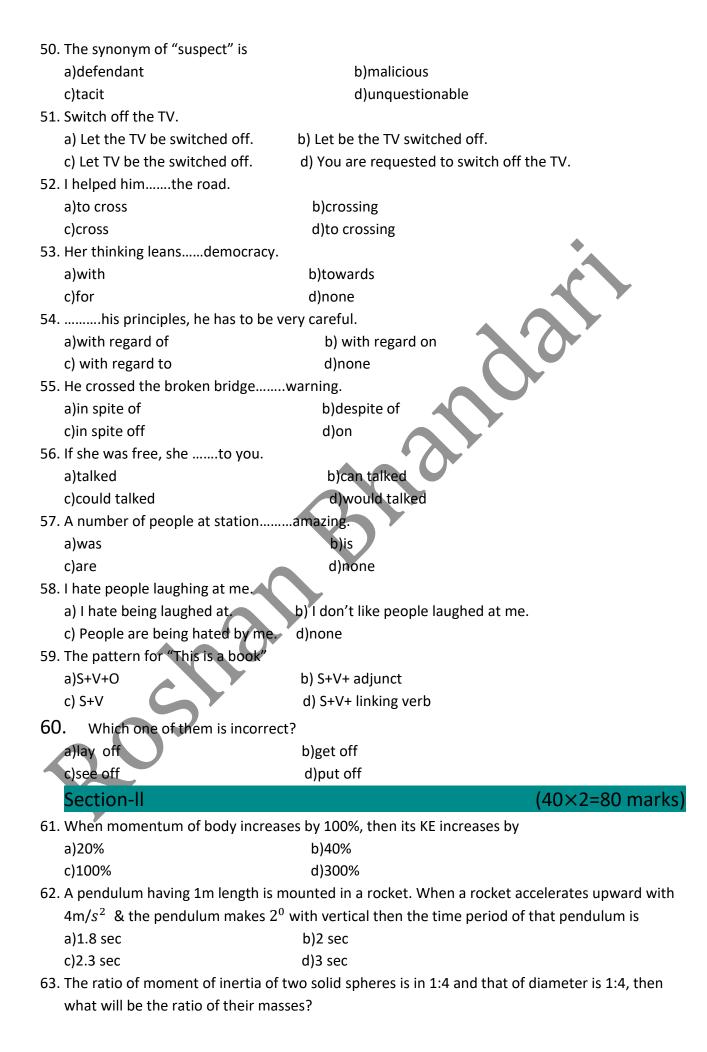
### Section-I

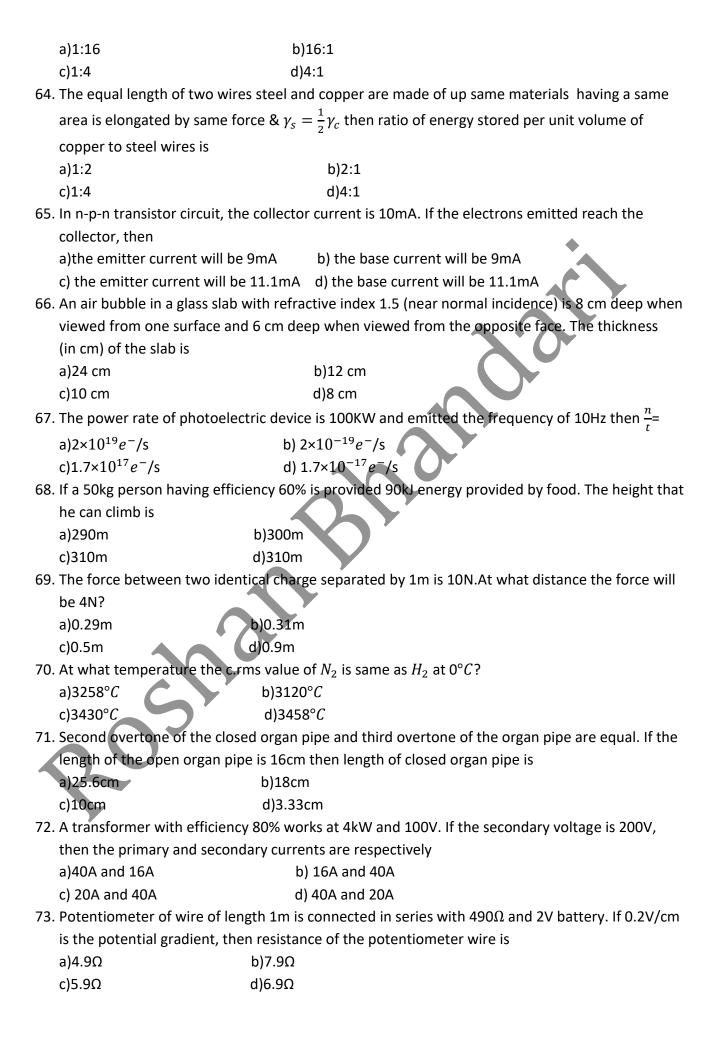
on-I		
1.	If the momentum of body is constant the	n which of the following will be constant?
	a)force	b)torque
	c) velocity	d)moment of inertia
2.	Dimension of G is	
	a) $[M^{-1}L^3T^{-2}]$	b) $[M^{-1}L^3T^2]$
	c) $[ML^3T^{-2}]$	$d)[ML^{-3}T^2]$
3.	The torque produced in current carrying	current depends upon
	a)Area	b)Shape of coil
	c)Nature of the coil	d)Perimeter of the coil
4.	Pressure exerted by gas molecules is dire	ectly proportional to
	a)No. of molecules	b) No. of molecules per unit volume
	c)1/3 No. of molecules	d)1/3 No. of molecules per unit volume
5.	When two moving waves of intensity I m	oving in opposite direction having same amplitude and
	frequency superimpose then intensity of	resultant wave is
	a)I	b)2I
	c)I/2	d)0
6.	Centripetal force from inertial frame is	
	a)along the radius	b)outwards the radius
	c)Along the direction of velocity	d)opposite to the direction of velocity
7.	Efficiency of X-ray experiment is	
	a) 99%	b)1%
	c)less than 1%	d)none
8.	The reading of voltameter is based on	
	a)P=I2RT	b)V=IR
	c)P=VI	d)V=V1+V2
9.	Unit of Heat Capacity is equal to	
	a)Work	b)Specific Heat capacity
	c)Gas constant	d)Heat











74. In Young's double-slit experiment, 0.28mm separation between the slits and the screen is			
placed 1.4m away. 1.2cm is t	placed 1.4m away. 1.2cm is the distance between the central bright fringe and the fourth bright		
fringe. Determine the wavele	fringe. Determine the wavelength of light used in the experiment.		
a)60nm	b)600nm		
c)70nm	d)700nm		
75. At 80°C distilled water has $H_3O^+$ concentration equal to 1 x 10 <sup>-6</sup> mol/L. The value of $K_w$ at this			
temperature will be			
a) $1 \times 10^{-12}$	b) 1×10 <sup>-15</sup>		
c) 1×10 <sup>-6</sup>	d) 1×10 <sup>-9</sup>		
76. Equal volume of solution pH=4 & pH=10 are mixed together. The resulting pH of solution is			
a)2	b)4.3		
c)7	d)8.2		
77. Lead acetate paper turns black when it contacts with			
a)S $O_3$	p)SO <sub>2</sub>		
$c)H_2S$	I)HCI		
78. The reaction taking place at t	he anode when a dilute aqueous solution of CuSO4 is electrolyzed		
using inert Pt electrodes			
a) Cu $\rightarrow Cu^{2++} + 2e^-$	b) $2SO_4^{-2} \rightarrow S_2O_3^{2-} + 2e^-$		
c) $2H_2O \rightarrow O_2 + 4H^+ + 4e^-$	d) $2H^++2e \rightarrow H_2$		
79. Addition of CCl4 in alkane is			
a) Nucle ophilic substitution	b)free radical substitution		
c)Oxidation	d)Electrophilic addition		
80. The metal like Cu and Zn react with conc. HN ${\it O}_{\it 3}$ to give			
a)N $O_2 + H_2$ O b)Metal Nitride+ N $O_2 + H_2$ O			
c)Metal Nitrite N $O_2$ + $H_2$ O	d)Metal Nitrate+ N $O_2$ + $H_2$ O		
31. The gas formed by AgI treated with chloroform passed through alkaline KMn ${\it O}_4$ gives			
a) Ethane	b)Ethanoic acid		
c)Ethane-1,2-dioic acid	d)Ethyl glycol		
82. The domain of $e^{5x}$ + $\log_5 x$ +3 is			
a)[1,∞]	b)[0,∞]		
c)(0,∞]	d)(1,∞)		
83. If s(s-a)=kbc, then k∈			
a) R b) (0	,∞)		
c)[0,1] d)[-1			
84. The coefficient of $a^3$ in the expansion of $\frac{3a^2+2a+1}{e^a}$ is			
a) $\frac{8}{5}$ b) $\frac{-8}{5}$			
c) $\frac{-7}{3}$ d) $\frac{7}{3}$			
3			
85. The value of $\tan^{-1}(\frac{\cos x+1}{\sin x})$			
a)- $\frac{\pi}{4} - \frac{x}{2}$	b)0		
c)1	d) $\frac{\pi}{4} - \frac{x}{2}$		

86. 
$$\int \tan^{-1} x$$

a) 
$$x \tan x + \log(1 + x^2) + C$$

b) 
$$x \tan x - \log(1 + x^2) + C$$

c) 
$$x \tan x + \frac{1}{2} \log(1 + x^2) + C$$

d)xtan 
$$x - \frac{1}{2} \log(1 + x^2) + C$$

87. Find the equation of the plane passing through the origin and perpendicular to each of the planes x + 2y - z = 1 and 3x - 4y + z = 5.

a) 
$$x - 2y - 5z = 0$$

b) 
$$x - 2y + 5z = 0$$

c) 
$$x + 2y + 5z = 0$$

d) 
$$x + 2y - 5z = 0$$

88. If y=sin 
$$x + \cos x$$
, then  $\frac{d^2y}{dx^2} + y =$ 

89. If 
$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$
, then  $A^2$ -5A is equal to

90. A person has got 12 acquaintances whom of 8 are relatives. In how many ways can he invite 7 guests so that 5 of them may be relatives?

a) 336

b)420

c)720

d)900

91. 
$$\lim_{x \to \frac{\pi}{4}} \frac{\tan x - 1}{x - \frac{\pi}{4}}$$

92. Find the area bounded by the line, y=2x-4, y=1 and y-axis

a)
$$\frac{25}{4}$$

b) 
$$\frac{7}{2}$$

c) 
$$\frac{-25}{4}$$

d) 
$$\frac{15}{4}$$

93. If a,b,c are in A.P. then the value of  $\frac{(a-b)^2}{(b^2-ac)^2}$ 

a) 1

b)2

c)3

d)4

94. The length of latus rectum of the ellipse  $4x^2 + 9y^2 = 36$  is

a)4/3

b)3/4

c)8/3

d)3/8

95. Find two numbers whose sum is 15 and when the square of one multiplied by the cube of the other is maximum

a)10 & 5

b)8 &7

c)8 & 7

d)6 & 9

#### A. Read the passage carefully and check the best option:

The achievement of science in the twentieth century has been very great. Its influence can be felt in every sphere of life. From the small pins and needles to the huge iron sheets and joints, most of the things we require for our everyday use, come out of factories where scientific principles are utilized for practical ends. Science has enabled man to bring forces of nature under control and to use them for his own advantage. It has brought the distant parts of the world close together. Our knowledge of the universe has been much widened

on account of the untiring efforts of the astronomers like Jeans and Eddington. Remarkable cures of human diseases have been possible owing to the discovery of some wonderful medicines.

#### 97. What is the main idea of the given passage?

- A. The impact of science can be felt in every sphere of life
- B. Science is an anathema
- C. Nothing is beyond the purview of science
- D. Science can work miracles

#### 98. The mode of approach is

- A. logical
- B. anatomical
- C. descriptive
- D. expository

#### 99. Science has proved a great boon for

- A. scientists
- B. artists
- C. explorers
- D. mankind

#### 100. What is the most appropriate title for the given passage?

- A. Science is a curse
- B. Science, a great boon
- C. Achievements of science
- D. None of these

