POKHARA UNIVERSITY

SCHOOL OF ENGINEERING

Pokhara-30, Kaski, Nepal

B.E. Entrance Examination-Model (Fee Paying)

Name: _____

Registration/Roll No: _____

Question Book No: XXXX

Instructions for examinee

1. Students are not allowed to enter the examination hall after 15 minutes of commencement.
2. Use **separate answer sheet** provided to **TICK (√)** on the correct option for a respective question using only **ball pen** or **fountain pen**. **Pencil ticks will be invalid**. **More than one answers for a question will be invalid**.
3. Answers marked by tick (√) on the question sheet will not be considered.
4. Candidates can scribble on the question booklet for their use. The examiner may not look at it.
5. Candidates must put his/her admission card on the desk.
6. Candidates are not allowed to leave the examination hall within one hour from the commencement.
7. Use only scientific calculators (Programable calculators are not allowed).
8. Candidates are **strictly prohibited** to bring materials like programmable calculator, smart phones/devices, camera and other memory devices in the examination.
9. Any form of misconduct on the part of examinee shall result in the cancellation without warning.
10. Candidates **must follow** the assigned seat plan in the examination hall.
11. Any form of misconduct or incriminating activities found during or after examination shall result in the **cancellation** of his/her entrance examination without any warning.
12. **Return your question book and the answer sheet** before leaving the examination hall.

☺Good Luck☺

POKHARA UNIVERSITY
FACULTY OF SCIENCE AND TECHNOLOGY
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SET A

MODEL QUESTION PAPER (B.E. Entrance Examination)

- Choose the correct answer and tick (√) on the attached Answer Sheet.
- All questions carry equal marks.

Full Marks: 100
Time: 02:00 Hrs

Name: …….……..……..…….. Entrance Roll No.: ……..……..……..

Group A: Mathematics [40x1=40]								
1.	The relation R defined by x+5y=10 on the set of integers Z is							
	A	Symmetric	B	Non symmetric	C	Anti-symmetric	D	Equivalence
2.	Which of the following statement is true?							
	A	$\phi = \{0\}$	B	$\phi = \{,\}$	C	$\phi = \{\phi\}$	D	$\phi = \{\phi, \{0\}\}$
3.	The domain of the function $f(x) = \frac{1}{\sqrt{x^2 - 3x + 2}}$ is							
	A	$(-\infty, 1) \cup (1, \infty)$	B	(-∞ ,1)	C	(-∞,1)∪(2,∞)	D	(2,∞)
4.	Set A has 3 elements ad set B has 6 elements. Then the minimum number of elements is $(A \cup B)$ is							
	A	3	B	6	C	9	D	0
5.	There are 15 persons in a party and each person shakes hand with another. Then the total number of hand shaken is							
	A	205	B	105	C	120	D	15
6.	-7<x<1 implies							
	A	Ix+3I<4	B	Ix+3I>2	C	Ix-3I<2	D	Ix+3I<1
7.	The sum of n natural numbers is 36 then the value of n is							
	A	10	B	11	C	8	D	12
8.	If A is a square matrix, then $(A+A^T)$ is a							
	A	Diagonal matrix	B	Scalar matrix	C	Skew-symmetric matrix	D	Symmetric matrix
9.	The sum of the series $5 + \frac{5}{2} + \frac{5}{4} + \cdots$ to ∞ is,							
	A	$\frac{1}{2}$	B	Does not exist	C	15	D	10

10.	The value of $\left(\frac{-1+\sqrt{3}i}{2}\right)^{3n}+\left(\frac{-1-\sqrt{3}i}{2}\right)^{3n}$ equals to							
	A	0	B	1	C	3	D	2
11.	Let α and β are the roots of quadratic equation $ax^2+bx+c=0$ then the roots of the equation $ax^2+bx(x-1)+c(x-1)^2=0$ are:							
	A	$\frac{\alpha}{1-\alpha}$ and $\frac{\beta}{1-\beta}$	B	$\frac{\alpha}{1+\alpha}$ and $\frac{\beta}{1+\beta}$	C	$\frac{\alpha}{1+\alpha}$ and $\frac{\beta}{1-\beta}$	D	$\frac{\alpha}{1-\alpha}$ and $\frac{\beta}{1+\beta}$
12.	In triangle ABC the value of $a^2\sin 2C$and $c^2\sin 2A$ is							
	A	2Δ	B	Δ	C	4Δ	D	16Δ
13.	The ratio of the circum radius and in-radius of an equilateral triangle is							
	A	3:1	B	1:1	C	$2:\sqrt{3}$	D	2:1
14.	In the triangle ABC, $\cos A$ is equal to							
	A	$\frac{c^2+a^2-b^2}{2ca}$	B	$\frac{a^2+b^2-c^2}{2ab}$	C	$\frac{b^2+c^2-a^2}{2bc}$	D	none of these
15.	The value of $\frac{1}{ab}+\frac{1}{bc}+\frac{1}{ca}$ is							
	A	$\frac{1}{2Rr}$	B	$\frac{1}{2rs}$	C	$\frac{1}{2Rs}$	D	$\frac{1}{2R}$
16.	The area of the quadrilateral whose vertices are (2,1), (-1,3) (-3,-1) and (3,-4)							
	A	18	B	19	C	21.5	D	25
17.	The vertex of the parabola y=ax2-4x+3 is							
	A	(2,-1)	B	(0,0)	C	(2,0)	D	x=2
18.	The major axis of the ellipse $3x^2+4y^2-12x+8y+4=0$							
	A	x=0	B	y=0	C	y-1=0	D	x-2=0
19.	The distance between the parallel planes 2x-2y+z=1=0 and 4x-4y+2z+3=0 is							
	A	2\3	B	1\3.	C	1\6	D	1\2.
20.	If $\lim_{x\to 0}\frac{\sin 4x}{\tan ax}=5$, then the value of a is							
	A	4/5	B	5	C	1	D	5/4
21.	$\lim_{x\to\infty}\frac{2x^3-4x+7}{3x^3+5x^2-4}$ is equal to							
	A	$\frac{2}{3}$	B	$\frac{3}{2}$	C	$-\frac{4}{5}$	D	$-\frac{7}{4}$

22.	If y= $\tan^{-1}(\sec x + \tan x)$, then the value of $\frac{dy}{dx}$ is							
	A	1	B	1/2	C	cosx	D	secx
23.	$\int xsinhx dx$ is equal to							
	A	xcohx-sinhx+c	B	xcohx+sinhx+c	C	-xcohx+sinhx+c	D	-xcohx-sinhx+c
24.	The derivative of f(x)= 1/x at the point (1,1) is							
	A	1	B	-1	C	2	D	-2
25.	The derivative of an even function is always							
	A	an odd function	B	an even function	C	does not exist	D	none of these
26.	The differential coefficient of log tan($\frac{x}{2}+\frac{\pi}{4}$) is							
	A	2tanx	B	sec x	C	cos($\frac{x}{sinx}$)	D	$\frac{sinx}{2}$
27.	$\int lnxdx$ is							
	A	$xln\left(\frac{x}{e}\right)+c$	B	$xlnx+c$	C	$\frac{lnx}{x}+c$	D	$xln\left(\frac{e}{x}\right)+c$
28.	The value of $\int\left(\frac{2+\sin 2x}{1+\cos 2x}\right)e^x dx$ is equal to							
	A	e^xsecx+c	B	e^x(1+cos2x)+c	C	e^xsin2x+c	D	extanx+c
29.	The area bounded by the curve $y^2=8x$ and $x^2=8y$ is							
	A	16/3	B	64/3	C	32/5	D	8/3
30.	The differential coefficient of $\sin^{-1}x$ with respect to $(\sin^{-1}x)^2$ is							
	A	$2\sin^{-1}x$	B	2/x	C	$2/x\sin^{-1}x$	D	$1/2\sin^{-1}x$
31.	What is the value of $\int_{-1}^{1}\sin^3 x\cos^2 x dx$ is equal to							
	A	zero	B	one	C	One and half	D	Two
32.	The area of an expanding rectangle is increasing at the rate of $48cm^2$/sec. The length of the rectangle is equal to the square of its breath,, then the rate of increase of length at the instant when breadth is 4 cm is							
	A	16 cm/sec	B	4 cm/sec	C	8 cm/sec	D	12 cm/sec
33.	The value of $\lim_{x\to 0}\frac{logcosx}{x}$ is equal to							
	A	0	B	1	C	∞	D	-1
34.	The value of $\vec{a}x(\vec{b}+\vec{c})+\vec{b}x(\vec{c}+\vec{a})+\vec{c}x(\vec{b}+\vec{a})$ is							
	A	$\vec{a}x(\vec{b}x\vec{c})$	B	0	C	$2(\vec{b}+\vec{c})$	D	$2(\vec{a}x\vec{b})$

35.	The sum of two unit vectors is a unit vector then magnitude of their difference is						
	A	1	B	2	C	√2	D	√3
36.	The direction ratios of a line perpendicular to the two lines having direction ratios 1, 3, -2 and -2, 2, 4 respectively is:						
	A	1, 2, -5	B	2, 0, 1	C	1, 3, 5	D	3, 1, -5
37.	If $I\vec{a}I = 3, I\vec{b}I = 4\ and\ I\vec{a} + \vec{b}I = 5, then\ I\vec{a} - \vec{b}I\ is$						
	A	6	B	5	C	4	D	3
38.	The probability of a sure event is						
	A	0	B	1	C	1/2	D	2
39.	Three numbers are chosen at random without replacement from {1 , 2 , 3 , ... , 10}. Probability that the minimum of the chosen number is 3 or their maximum is 7 , is given by :						
	A	3/10	B	11/40	C	11/50	D	27/40
40.	If the roots of the equation $px^2+qx+r=0$ are in the ratio 3:4, then						
	A	$12p^2=49qr$	B	$4p^2=9rq$	C	$12q^2=49pr$	D	$7pq=12r^2$

Group B: Physics [30x1=30]

41.	A simple pendulum 1 m has a bob of 200 g. It is displaced through 60^0 and then released. What will be its kinetic energy when it passes through the mean position?						
	A	0.5 J	B	1.0J	C	1.5 J	D	2.0J
42.	A satellite is revolving around the earth in a circular orbit 4 times the radius of the parking orbit. What will be the time period of satellite?						
	A	2 days	B	4 days	C	16 days	D	None of these
43.	A ball is thrown vertically upwards in air. If the air resistance cannot be neglected, then the acceleration of the both at the highest point is						
	A	g	B	>g	C	<g	D	0
44.	If two ping pong balls are suspended near each other and a fast stream of air is produced within the space between balls .The balls						
	A	Come closer	B	move farther	C	remain at original position	D	fall down
45.	A bullet is fired from a rifle. If the rifle recoils freely, the kinetic energy of the rifle as compared to that of bullet is						
	A	Greater	B	Equal	C	Less	D	Nothing can be said
46.	In the relation (P + a / V^2) (V – b) = RT ; Where P,V and T are pressure ,volume and absolute temperature of a given mass of gas, R is gas constant . Dimension of a is						

	A	(ML^2T^{-3})	B	(ML^5T^{-2})	C	(L^2)	D	($ML^{-1}T^2$)
47.	If temperature difference on the two sides of a wall increases from 10^0 C to 20^0 C, its thermal conductivity							
	A	Remains unchanged	B	Is doubled	C	Is halved	D	Becomes four times
48.	The temperature of sun is doubled than heat energy incident on earth's surface will increase by a factor of							
	A	16	B	4	C	8	D	2
49.	The charge in entropy of working substance in Carnot's cycle is							
	A	zero	B	Negative	C	positive	D	depend on temperature of source & sink
50.	The graph between the object distance along x-axis and the image distance along y-axis for a convex lens is							
	A	a straight line	B	a parabola	C	a circle	D	a rectangular hyperbola
51.	When source and observer approach each other with half velocity of sound .the change in frequency detected by observer is							
	A	200 %	B	50 %	C	25 %	D	none of above
52.	What is the distance at which the eye can in principle resolve two truck headlights separated d = 2.0 m? Take the pupil of the eye to be circular aperature of diameter D = 3 mm and the relevant wavelength to be ʎ = 6000 A0.							
	A	4.1 km	B	8.2 km	C	2.0 km	D	12 km
53.	What should be the refractive index of a completely transparent medium for it to be invisible in vacuum?							
	A	Less than 1	B	1	C	Greater than 1	D	The medium cannot be invisible whatever the value of the refractive index
54.	Doppler shift in frequency is independent of							
	A	the frequency of wave produced.	B	the speed of source	C	the speed of observer	D	distance from source to observer
55.	The frequency of the third harmonic of a closed organ pipe is equal to which of the overtone?							
	A	First	B	Second	C	Third	D	None of these
56.	If the intensity of sound is double , then the loudness will be increased nearly by							
	A	2 dB	B	3dB	C	5dB	D	4 dB
57.	The materials suitable for making electromagnets should have							

	A	high retentivity and high coercivity	B	low retentivity and low coercivity	C	high retentivity and low coercivity	D	low retentivity and high coercivity
58.	A capacitor is charged from 50v D.C supply is discharged across a charged measuring device and found to have charge 10 μ C . Then the energy stored in capacitor was							
	A	3×10^{-3} J	B	2×10^{-5} J	C	2.5×10^{-4} J	D	4×10^{-4} J
59.	Two charges are placed a certain distance a part. A metallic sheet is placed between them. What will happen to the force between the charges?							
	A	Increases	B	Decreases	C	Remains unchanged	D	May increase or decrease depends upon the nature of metal
60.	Two concentric coils of each of radius equal to 2π cm are placed at right angle to each other, 3A and 4A are the current flowing in each coil respectively. The magnetic induction at the centre of coil will be							
	A	12 x10 -5 wb/m2	B	5 x10 -5 wb/m2	C	10 -5 wb/m2	D	7x 10 -5 wb/m2
61.	A uniform wire has resistance 25 Ω . It is bent in the form of a circle . The effective resistance between the two end points on any diameter of the circle is							
	A	6 Ω	B	12 Ω	C	3 Ω	D	24 Ω
62.	If a star is moving towards earth, then the lines are shifted towards							
	A	Red	B	Infrared	C	Green	D	Blue
63.	What will be the ratio of the time periods of electron in the ground and first excited states of the hydrogen atom?							
	A	1/2	B	1/4	C	1/8	D	1/16
64.	In NPN transistor, the emitter current is							
	A	Slightly more than collector current.	B	Slightly less than collector current	C	equal to collector current	D	equal to base current
65.	The interval of time that elapses between two consecutive passages of a fixed star(other than the sun) across the meridian is called							
	A	Mean soar day	B	Mean sidereal day	C	Mean solar year	D	Mean sidereal year
66.	In a motion with constant acceleration the velocity is reduced to zero in 5 seconds and after covering the distance of 100m. the distance covered by the particle in the next 5 seconds will be							
	A	Zero	B	250m	C	100m	D	500m
67.	A piece of red glass is heated till it glows in dark. The color of the glowing glass will be							
	A	Red	B	Orange	C	Green	D	Violet
68.	If a star is moving towards earth, then the lines are shifted towards							
	A	red	B	infrared	C	green	D	blue.

69.	An air filled parallel plate condenser has a capacity of 2pF. The separation of the plates is doubled and the interspace between the plates is filled with wax. If the capacity is increased to 6 pF, what is dielectric constant of was						
	A	2	B	3	C	4	D	6
70.	What is the magnification when the object is placed at 2f from the pole of a concave mirror						
	A	1/3	B	2/3	C	1	D	3/2

Group C: English [10x1=10]

71.	Affluent						
	A	Purpose	B	Spoken	C	Educated	D	Wealthy
72.	The environmentalists have no political axe to grind – they just want to save the planet						
	A	To fail to arouse interest	B	To have a strong personal opinion for doing something	C	To have no result	D	To work for both side
73.	Please give me your pen and take your seat.						
	A	Let your pen given me and take your seat.	B	You are requested to give me your pen and take your seat.	C	You are wanted to give me your pen and wanted to take your seat.	D	You are ordered to give me your pen and take your seat.
74.	The children of the man who works with me ……broken the window this morning.						
	A	A. Were	B	Has	C	Had	D	Have
75.	The presence of sugar in the bloodstream directly affects the release of insulin; when more sugar is present, more insulin is released into the body. Yet those who regularly consume large amounts of sugar often have below-average levels of insulin in their blood. Which of the following, if true, most helps contribute to an explanation of the anomalous phenomenon described above?						
	A	The more overweight a person is, the lover the level of insulin in that person's blood.	B	Though considered healthier diet choices, many fruits contain as much sugar as candy does.	C	Consuming large amounts of sugar causes the receptors that trigger the release of insulin to become less sensitive to sugar.	D	Consuming large amounts of processed sugar can be much more dangerous than sugar found naturally in foods.
76.	Which of the following most logically completes the argument? Patent law exists to protect the rights of inventors to profit from their innovations, and copyright laws to protect those of artists from their art. While a chef who creates a new recipe might seem a similar case, a recipe is not a work of art, not is it an innovation, so neither law protects the rights of a chef to profit from an original recipe. Thus, chefs' rights to profit from new recipes will never be protected by the law, since						

	A	Chefs lack the social capital and economic clout to convince judges to throw these laws out.	B	There are no other laws outside the copyright and patent law systems that currently protect chefs' rights.	C	Most recipes are modifications of a previous chef's work.	D	Copyright and patent laws are considered to be so comprehensive by legislators that they will never address the gap.

77.	I don't believe in ghosts ……I haven't seen one yet.							
	A	I think	B	At least	C	In particular	D	In other words
78.	There is no homework tonight; ……there has been no homework all week							
	A	As a result	B	Therefore	C	Consequently	D	In fact
79.	A pronunciation variety used by a specific group of people:							
	A	Dialect	B	Coda	C	Accent	D	Voice
80.	Two syllable words are usually stressed on:							
	A	First	B	Second	C	Two syllables	D	Not stressed at all

Group D: Chemistry [20x1=20]

81.	Equivalent weight of crystalline oxalic acid is							
	A	53	B	93	C	63	D	45
82.	Which of the following species has largest size?							
	A	N^{3-}	B	O^{2-}	C	F^{-}	D	Na^{+}
83.	Which of the following set of quantum number is not possible?							
	A	n=2, L=1, m=0,s=+1/2	B	n=3, L=2, m=0,s=+1/2	C	n=3, L=3, m=1,s= -1/2	D	n=2, L=0, m=0, s=-1/2
84.	Oxidation number of Ni in $Ni(CO)_4$ is							
	A	+4	B	-2	C	0	D	None of them
85.	Oxidation is associated with							
	A	Loss of electrons	B	Increase in positive charge	C	both a & b	D	Gains of electrons
86.	For endothermic reaction							
	A	ΔH = 0	B	ΔH = +ve	C	ΔH = -ve	D	None
87.	2 litre of O_2 at NTP weights							
	A	0.71 gm	B	2.86 gm	C	2.3 gm	D	2.85 gm
88.	When zinc is allowed to react with very dilute HNO_3, then……is obtained							
	A	N_2O	B	NH_4NO_3	C	NO	D	NO_3

89.	Nonmetal that can conduct electricity at ordinary condition is							
	A	phosphorus	B	graphite	C	sulphur	D	chlorine
90.	Froath floatation process is used for the metallurgy of							
	A	Amalgams	B	Oxide ore	C	Sulphide ore	D	Chloride ore
91.	The reducing agent inside Bessemer converter during extraction of copper is							
	A	Cu	B	CO	C	Al	D	Cu_2S
92.	In hard steel the % of carbon is							
	A	0.1 - 0.4 %	B	0.2 - 0.5%	C	0.5 - 1.5%	D	0.2%
93.	Carbyl amine reaction is given by							
	A	1^0 amine	B	2^0 amine	C	3^0 amine	D	All
94.	Half life is independent to the initial concentration in							
	A	Second order	B	First order	C	Third order	D	Zero order
95.	Chromatography is a physical method that is used to separate and analyse							
	A	Complex mixture	B	Simple mixture	C	Viscous mixture	D	Metals and non metals
96.	Catalyst used in the manufacture of H2SO4 by contact process is							
	A	Finely divided Ni	B	NO	C	Fe	D	V_2O_5
97.	For ideal gas , the compressibility factor (Z) is equal to							
	A	0	B	1	C	2	D	3
98.	Benzene diazonium chloride is reduced benzene by							
	A	H_3PO_4	B	H_3PO_3	C	H_3PO_2	D	PH_3
99.	The compound ‘B’ formed in the following sequence of compound is $CH_3CH_2CH_2OH \xrightarrow{PCl_5} A \xrightarrow{alk.NaOH} B$							
	A	Propyne	B	Propene	C	Propane	D	Propanol
100.	Alcohol is soluble in water due to							
	A	H-bonding between water molecules	B	Intramolecular H-bonding between water and propane molecules	C	Intermolecular H-bonding between water and propane molecules	D	H-bonding between propane molecules

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SET A

MODEL ANSWER SHEET (B.E. /B.Arch. Entrance Examination)

Roll No.(In Figure):		**Code No.:**	
Roll No.(In Words):		**Question Book No:**	**XXXX**

Code No.:	

Q. No	A	B	C	D	Q. No	A	B	C	D	Q. No	A	B	C	D	Q. No	A	B	C	D
1					27					52					77				
2					28					53					78				
3					29					54					79				
4					30					55					80				
5					31					56									
6					32					57					81				
7					33					58					82				
8					34					59					83				
9					35					60					84				
10					36					61					85				
11					37					62					86				
12					38					63					87				
13					39					64					88				
14					40					65					89				
15										66					90				
16					41					67					91				
17					42					68					92				
18					43					69					93				
19					44					70					94				
20					45										95				
21					46					71					96				
22					47					72					97				
23					48					73					98				
24					49					74					99				
25					50					75					100				
26					51					76									

Math:		**Physics:**		**English:**		**Chemistry:**	
Grand total (In Figures):		**Grand total (In Words):**					

← Only for official use →

Marks obtained:		**Checked by:**	**Verified by:**