

... IITians creating IITians

JEE (MAIN & ADV.) / XI & XII / NTSE / KVPY / OLYMPIAD

TALENT SEARCH EXAMINATION

Time : 2 Hours

(Class IX)__PATNA STAGE - 1

Maximum Marks: 180

Name :

Reg. No.:

INSTRUCTIONS

Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose. You are not allowed to leave the examination hall before the end of the test.

[A] General :

- 1. Attempt ALL the questions. Answer have to be marked on the OMR sheets
- 2. This question paper contains 45 questions.
- 3. The question paper consists of FIVE Parts Physics (Q.No. 1 to 5), Chemistry (Q.No.6 to 10), Biology (Q.No. 11 to 15),

Mathematics (Q.No. 16 to 30), & Mental Ability (Q.No. 31 to 45)

- 4. Blank spaces are provided at the bottom of each page for rough work. No additional sheets will be provided for rough work.
- 5. Balnk paper, clipboard, log tabes, silde rules, calculators, cellular phones, pagers and electronic gadgets in any form are **NOT** allowed.
- 6. Do not Tamper / multilate the OMR sheet or this booklet.
- 7. Do not break the seals of the question-paper booklet before instructed to do so by the invigilator.
- 8. SUBMIT the OMR sheet to the invigilator after completing the test & take away the test paper with you.

[B] Filling of OMR Sheet

- 9. In all the parts, each question will have 4 choices out of which only one choice is correct
- 10. Use only Black/Blue ball point pen for filling the OMR sheet.
- 11. On the OMR sheet, darken the appropriate bubble for each character of your name, Registration No., Phone No. etc.

[C] Marking Scheme

- 12. For each correct response you will be awarded 4 marks and zero mark in all other cases
- 13. There is no negative marking in STAGE-1 exam.

Best of Luck

PART - I (PHYSICS)

This section contains (1-5) multiple choice questions.

Each questions has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

- Q.1 A car travels $\frac{1}{4}$ th of a circle with radius r. Find the ratio of its distance to displacement.
 - (A) $\pi: 2\sqrt{2}$ (B) $2\sqrt{2}:\pi$ (C) $\sqrt{2}:\pi$ (D) $\pi:\sqrt{2}$

Q.2 A body travels 200 cm in the first 2 sec and 220 cm in the next 5 sec. Calculate the velocity of the body at the end of the 7th sec from the start, assuming uniform acceleration throughout the journey.

(A) 2 cm/s (B) 5 cm/s (C) 8 cm/s (D) 4 cm/s

Q.3 A bullet of mass 4 g when fired with a velocity of 50 m/s, can enter a wall up to a depth of 10 cm. How much will be the average resistance offered by the wall ?

(A) + 50N (B) - 50N (C) -25N (D) -100N

Q.4 A body of mass 5.0 kg is moving with a uniform velocity of 10 m/s. It is acted upon by a force of 20 N, what will be its velocity after 1.0 s ?

- (A) 12 m/s (B) 7m/s (C) 14 m/s (D) 10m/s
- Q.5 The gravitational force between two objects is 49 N. How much distance between these objects be decreased so that the force between them becomes doubled.
 - (A) $\frac{1}{\sqrt{2}}$ (B) $\sqrt{2}$ (C) 2 (D) $2\sqrt{2}$

Space for rough work

(D) their heat content cannot be compared

(B) 10 g of water at 0°C

PART - II (CHEMISTRY)

This section contains (6-10) multiple choice questions.

Each questions has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

- Q.6 Which of the following has more heat content
 - (A) 10 g of ice at 0°C
 - (C) both have same heat content
- Q.7 A gas can be best liquefied
 - (A) by increasing the temperature
 - (B) by lowering the pressure
 - (C) by increasing the pressure and reducing the temperature
 - (D) None of these is correct
- Q.8 Simple distillation can be best used to separate
 - (A) a mixture of benzene (boiling point 80°C) and toluene (boiling point 110°C)
 - (B) a mixture of ether (boiling point 35°C) and toluene (boiling point 110°C)
 - (C) a mixture of ethanol (boiling point 78°C) and water (boiling point 100°C)
 - (D) None of these
- Q.9 Identify the false statement.
 - (A) colloids are homogeneous
 - (C) colloids show Brownian movement
- (B) colloids show Tyndall effect

(D) solubility in a alcohol

- (D) The size of colloidal particles ranges between 1 - 100 nm.
- Q.10 Purity of a solid substance can be checked by its characterstic
 - (A) boiling point (B) melting point
 - (C) solubility in water
- Space for rough work

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PART - III (BIOLOGY)

This section contains (11-15) multiple choice questions.

Each questions has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

Q.11	Dete	oxification is perform	ned b	y -					
	(A)	Plasma membran	Э		(B)	Cell membrane			
	(C)	SER			(D)	RER			
Q.12	Cen	triole is associated	with	-					
	(A)	DNA synthesis			(B)	Reproduction			
	(C)	Spindle formation			(D)	Respiration			
Q.13	Micr	ofilaments are com	posed	d mainly of a prote	in ca	lled –			
	(A)	Actin	(B)	Myosin	(C)	Tubulin	(D)	Keratin	
Q.14	Whi	ch of the following	tissue	es is composed of	main	ly dead cells ?			
	(A)	Phloem	(B)	Epidermis	(C)	Xylem	(D)	Endodermis	
Q.15	Aere	enchyma provides -				3			
	(A)	Flexibility of plants			(B)	Buoyancy to plan	its		
	(C)	Mechanical streng	th to	plants	<mark>(</mark> D)	None of these			
	PART - IV (MATHEMATICS)								
	This section contains (16-30) multiple choice questions.								
	Each questions has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.								
		/		-_2					
Q.16	The	real number $(\sqrt[3]{\sqrt{75}})$	-√12	when expresse	d in th	e simplest form is e	equal t	0	
	(A)	1/2	(E	3) 1/3	(C) 1/4	(D)) 1/5	
Q.17	Let	∆XOY be a right tria	ngle v	with $\angle XOY = 90^{\circ}$. L	et M a	and N be the midpo	oints o	f legs OX and OY	

respectively. If XN = 19 and YM = 22, then XY equals

Q.18	The continued fraction 2-	$\frac{1}{2-\frac{1}{2-\frac{1}{2-\dots,\dots,\dots}}}, \text{ has th}$	ne value equal to					
	(A) 1	(B) 5/4	(C) 3/2	(D) 7/4				
Q.19	Number of sides in a polyge	on if the sum of its interior	angles is 2520°, is					
	(A) 14	(B) 16	(C) 18	(D) 20				
Q.20	If the base of a triangle is in	creased 66. $\overline{6}\%$ and the a	ltitude to this base is de	ecreased 40% then the				
	change in the area of the tri	angle, is						
	(A) 1% increase	(B) 0% increase	(C) 1/2% decrease	(D) 1% decrease				
Q.21	Knowing that 2 is a solutio	n of the equation 6x ³ – 2	$5x^2 + 32x - 12 = 0$, the	e sum of the other two				
	solutions, is							
	(A) – 12/5	(B) 12/5	(C) -13/6	(D) 13/6				
Q.22	If $a + b = 1$ and $a^2 + b^2 = 85$	5, then the value of (a ³ + b	³), is					
	(A) 127	(B) 173	(C) 154	(D) 321				
Q.23	If $a/b = 3/4$ and $b/c = 8/9$ ar	$d c/d = 2/3$, then ad/b^2 is	equal to					
	(A) $\frac{64}{24}$	(B) $\frac{61}{24}$	(C) $\frac{81}{21}$	(D) $\frac{84}{24}$				
0.04	81	84	64 (1 0) 0 (1 0) D (1	61				
Q.24	Area of Quadrilateral formed by points A (1, 7), B (1, 2), C (4, 2), D (4, 6) is equal to							
0.05	(A) 30 sq. units	(B) 14.5 sq. units	(C) 13.5 sq. units	(D) 15 sq. units				
Q.25	In an equilateral triangle the incentre, circumcentre, orthocentre and centroid are							
	(A) Collinear		(B) forms a Quadrila	ateral				
0.26	(C) lies outside the thang	JIE roopoot to line mirror v	(D) Coincident					
Q.20			= 10 IS	(D) (6 16)				
0.27	The four triangles formed	by joining the pairs of m	id-point of the sides (of a given triangle are				
Q.21	congruent if the given tria	ngle is						
	(A) an isosceles triangle	only	(B) an equilateral tra	aingle only				
	(C) a right angled triangle	e only	(D) of any shape					
	Space for rough work							

IITi	an's TAPAS		LENT SEARCH EXAM 201	6-17_STAGE-1/CLASS IX [6]
Q.28	Find the sum : $\sqrt{1+\frac{1}{2}}$	$\frac{1}{1^2} + \frac{1}{2^2} + \sqrt{1 + \frac{1}{2^2} + \frac{1}{3^2}} + \sqrt{1 + \frac{1}{2^2} + \frac{1}{3^2}} + \sqrt{2}$	$1 + \frac{1}{3^2} + \frac{1}{4^2} + \dots + \sqrt{1 + \frac{1}{4^2}}$	$\frac{1}{2015)^2} + \frac{1}{\sqrt{(2016)^2}}$
	(A) 2015- $\frac{1}{2015}$	(B) 2016-1/2015	(C) 2016-1/2016	(D) 2015 – <u>1</u> 2016
Q.29	Which among $\frac{1}{2^2}, \frac{2}{3^2}$	$\frac{1}{6}, \frac{1}{4^4}, \frac{1}{6^6}$ is the largest		
	(A) $\frac{1}{2^2}$	(B) $\frac{1}{3^3}$	(C) $\frac{1}{4^4}$	(D) $\frac{1}{66}$
Q.30	The unit digit of 2^{3^4}	$\times 3^{4^{5}} \times 4^{5^{6}} \times 5^{6^{7}} \times 6^{7^{8}} \times 7^{8^{9}}$	is	
	(A) 0	(B) 5	(C) 6	(D) None of these
 Q.31	Each questions h Botany : Plants : : Ente	as four choices (A), (B), (C) a	nd (D) out of which ONLY (ONE is correct
Q.01	(A) Snakes	(B) Insects	(C) Birds	(D) Germs
Q.32	Five bells begin to toll many times will they to	together and toll respectiv Il together in one hour exc	ely at intervals of 6, 5, 7 luding the one at the sta	, 10 and 12 seconds. How rt?
	(A) 7 times	(B) 8 times	(C) 9 times	(D) 11 times
Q.33	Vikas walked 10m two walked 10m and stop stopped walking	oards north, took a left tur ped walking. Towards whi	n and walked 15m and ch direction was he fro	again took a left turn and m starting point when he
0.24	(A) south	(B) south-west	(C) south-east	(D) None of these
Q.34	If 1 is added to seco	and digit in each number	and 1 is subtracted fr	om the first digit in each
	number, which of the	following will be the thrid	d digit of the second hi	ighest number?
	(A) 9	(B) 8	(C) 6	(D) 4
		Space for roud	ah work	

Q.35	Statements : Some cars are roads					
	All cars are homes.; All rooms are roads					
	Conslusion :(i) Some ho	mes are roads	(ii) Some rooms are homes			
	(iii) All Roads	s are homes				
	(A) All conclusions follow	V	(B) only conclusion	(i) follows		
	(C) only conclusion (ii) for	ollows	(D) None of these			
Q.36	Among P, Q, R, S, T and	U, R is taller than only	P and U. S is shorter	than only T and Q. If		
	each of them has a differ	ent height, who among th	nem will be the third fro	om top when they are		
	arranged in descending o	rder of their heights?				
	(A) R	(B) P	(C) S	(D) Q		
Q.37	Count the number of triar	gles in the following figu				
	(A) 23	(B) 27		\mathbf{h}		
	(C) 29	(D) None of these				
Q.38	'Fire' is related to 'Ashes'	in the same way as 'Ex	plosion' is related to-			
	(A) Sound	(B) Debris	(C) Explosive	(D) Flame		
Q.39	In the following question,	four words are given, out	of which three are sar	me in one way, Select		
	the odd one :					
	(A) Rigveda	(B) Yajurveda	(C) Atharveda	(D) Ayurveda		
Q.40	If NOCIE is written as \$@	# ? %, and SCENT is writh	ten as # % * ^ @, then	COIN will be coded as:		
	(A) #?\$@	(B) #?@%	(C) @^?\$	(D) None of these		
	None - for 0 44 to 0 40					

Directions : for Q.41 to Q.42

Read the following information carefully and answer the questions given below it.

- (i) Seven books (history, civics, geography, english, economics, science, mathematics) are placed one above the other in a particular way.
- (ii) The history book is placed directly above the civics book.
- (iii) The geography book is fourth from the bottom and the english book is fifth from the top.
- (iv) There are two books in between the civics and economics books.

Space for rough work

- Q.41 To find the number of books between the civics and the science books, which other extra piece of information is required from the following ?
 - (A) There are two books between the geography and the science books
 - (B) There are two books between the mathematics and the geography books
 - (C) There is one book between the english and the science books
 - (D) The civics book is placed before two books above the economics book
- Q.42 To know which three books are kept above the english book, which of the following infomation, If any, is required ?
 - (A) The econoics book is between the english and the science books
 - (B) There are two books between the english and the history books
 - (C) The geography book is above the english book
 - (D) No other information is required

Directions for Q.43 to Q.45

Give the answer on the basis of the following alphabets : A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Q.43 Four of the following are alike in regard to their position in the alphabet and hence form a group. Which is the one that does not belong to the group ?

(A) FE (B) ML (C) JK (D) VX

Q.44 Which letter is 9th to the left of 9th letter from your right ?

- (A) J (B) K (C) H (D) None of these
- Q.45 If the above alphabets, are divided in two equal halves from A to M and N to Z, which letter in the later half would be corresponding to the letter J ?
 - (A) Q (B) V (C) X (D) W

Space for rough work

TALENT SEARCH EXAM 2016 -17

(Class IX)_STAGE - 1

ANSWER KEYS

1.	(A)	2.	(D)	3.	(B)	4.	(C)	5.	(A)
6.	(B)	7.	(C)	8.	(B)	9.	(A)	10.	(B)
11.	(C)	12.	(C)	13.	(A)	14.	(C)	15.	(B)
16.	(B)	17.	(A)	18.	(A)	19.	(B)	20.	(B)
21.	(D)	22.	(A)	23.	(C)	24.	(C)	25.	(D)
26.	(C)	27.	(D)	28.	(C)	29.	(B)	30.	(B)
31.	(B)	32.	(B)	33.	(D)	34.	(D)	35.	(B)
36.	(C)	37.	(C)	38.	(B)	39.	(D)	40.	(A)
41.	(C)	42.	(D)	43.	(D)	44.	(D)	45.	(D)

Space for rough work