ASAT

(ALLEN Scholarship Cum Admission Test)

For

PRE-NURTURE & CAREER FOUNDATION : CLASS-X

(For IX to X Moving Students)

SAMPLE TEST PAPER

Time : 2 Hrs. **Maximum Marks : 300**

Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.

INSTRUCTIONS

1. The booklet is your Question Paper. Do not break the seal of this booklet before being instructed to do so by the invigilator.
2. Blank spaces and blank pages are provided in the question paper for your rough work. No additional sheets will be provided for rough work.
3. Blank papers, clipboards, log tables, slide rules, calculators, cameras, cellular phones, pagers and electronic gadgets are **NOT** allowed inside the examination hall.
4. The answer sheet, a machine-readable Optical Response Sheet **(ORS)**, is provided separately.
5. On breaking the seal of the booklet check that it contains **15** pages and all the **75** questions.
6. A candidate has to write his / her answers in the ORS sheet by darkening the appropriate bubble with the help of **Black ball point pen** as the correct answer of the question attempted.
7. **Question Paper Format :**

   The question paper consists of **2 parts. Part-I : IQ** (Mental Ability) & **Part-II :** Physics, Chemistry, Biology & Mathematics
8. **Marking Scheme :**

   Part-I : For each question of **Part-I**, you will be awarded **4 marks** if you darken the bubble corresponding to the correct answer and **zero mark** if no bubbles are darkened. **No negative** marks will be awarded for incorrect answers in this part.

   Part-II : For each question of **Part-II**, you will be awarded **4 marks** if you darken the bubble corresponding to the correct answer and **zero mark** if no bubbles are darkened. **No negative** marks will be awarded for incorrect answers in this part.

Path to Success ALLEN™ CAREER INSTITUTE KOTA (RAJASTHAN)

PART - I
IQ (MENTAL ABILITY)

This section contains **20 multiple choice questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

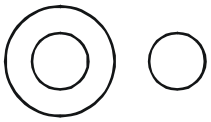
1. Five persons are sitting in a row. One of the two persons at the extreme ends is intelligent and other one is fair. A fat person is sitting to the right of a weak person. A tall person is to the left of the fair person and the weak person is sitting between the intelligent and fat person. Tall person is at which place counting from right ?

(1) first (2) second (3) third (4) fourth

2. Choose that set of numbers from the options that is similar to the given set (81, 77, 69).

(1) (56, 52, 44) (2) (46, 61, 53) (3) (75, 71, 60) (4) (92, 88, 79)

3. Which one of the following sets is best represented in the adjoining diagram?



(1) Animals, Insects, Cockroaches

(2) Country, States, Districts

(3) Animals, Males, Females

(4) States, Districts, Union territories

4. A matrix of certain characters is given. These characters follow a certain trend, row-wise or column-wise. Find out this trend and choose the missing character from the given options.

2	**2**	**256**
3	**2**	**?**
4	**2**	**46656**

(1) 2765 (2) 3125 (3) 8796 (4) 30008

SPACE FOR ROUGH WORK

5. The Sharmas have three children Sunita, Sanjay and Sheela. Sunita is married to Sonil Mahajan and they have a son Shoban. Sheela marries Sanjay Bhandari and Vinit and Lily are their children. Sanjay (Sunita's brother) is younger to Sunita but elder to Sheela. What is the surname of Shoban ?

(1) Bhandari (2) Sharma

(3) Mahajan (4) None of these

6. One evening before sunset two friends Sumit and Mohit were talking to each other face to face. If Mohit's shadow was exactly to his right side, which direction was Sumit facing?

(1) North (2) South

(3) West (4) None of these

7. In the given number sequence, how many such even numbers are there which are exactly divisible by its immediate preceding number but not exactly divisible by its immediate following number?

3 8 4 1 5 7 2 8 3 4 8 9 3 9 4 2 1 5 8 2

(1) One (2) Two (3) Three (4) Four

8. There are three pillars X, Y and Z of different heights. Three spiders A, B and C start to climb on these pillars simultaneously. In one chance A climbs on X 5 cm but slips down 1 cm. B climbs on Y 6 cm but slips down 3 cm. C climbs on Z 7 cm but slips down 2 cm. If each requires 50 chances to reach the top of the pillar, what is the height of the shortest pillar?

(1) 144 cm (2) 152 cm

(3) 153 cm (4) 141 cm

9. Find the missing term (?).

1, 1, 2, 6, 24, ?, 720

(1) 100 (2) 104 (3) 108 (4) 120

10. In a certain code CONCISE is written as FTJBBNM. How is FISHERY written in that code?

(1) ZSFIGJT (2) ZSFGIHR

(3) ZSFGEHR (4) ZSFEHGR

SPACE FOR ROUGH WORK

11. The diagram shows the top view of a structure built with identical cubes, as well as the number of cubes in each column of the structure. Which 3-dimensional view best represents the same structure ?

2	3	4
2	2	
4	2	1

Top view

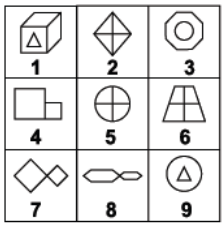
(1) 

(2) 

(3) 

(4) 

12. Group the given figures into three classes using each figure only once.



(1) 1, 3, 6; 2, 4, 9; 5, 7, 8
(2) 1, 5, 7; 2, 8, 9; 3, 4, 6
(3) 1, 3, 9; 2, 5, 6; 4, 7, 8
(4) 1, 3, 9; 2, 4, 7; 5, 6, 8

13. Select a figure from amongst the options, which when placed in the blank space of fig. (X) would complete the pattern.

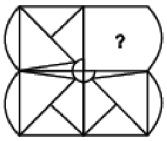


Fig. (X)

(1) 

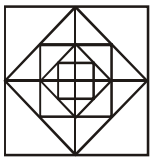
(2) 

(3) 

(4) 

SPACE FOR ROUGH WORK

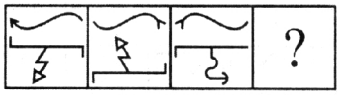
14. How many squares are there in the figure given below?



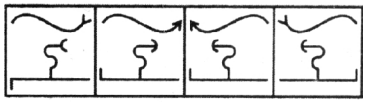
(1) 12 (2) 13 (3) 16 (4) 17

15. Question consists of two sets of figures. Figures A, B, C and D constitute the Problem Set while figures 1, 2, 3, and 4 constitute the Answer Set. There is a definite relationship between figures A and B. Establish a similar relationship between figures C and D by selecting a suitable figure from the Answer Set that would replace the question mark (?)

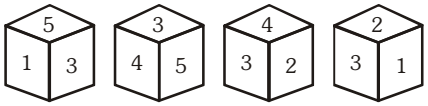
Problem Set



Answer Set



16. Some positions of a dice are shown below :



Which number is opposite to 4 ?

(1) 6 (2) 1 (3) 5 (4) 2

Directions (Q.17 to Q.20) : In the following questions below, some letters stands for arithmetic sign as indicated below. The remaining letters have their serial numbers in the alphabets. Decode the letters into number and then decide correct alternative.

A = × ; E = – ; O = ÷ ; U = +

17. TEF

(1) 14 (2) 12 (3) 16 (4) 18

18. SETUH

(1) 5 (2) 6 (3) 7 (4) 8

19. NACED

(1) 32 (2) 36 (3) 39 (4) 38

20. RUFOBEG

(1) 14 (2) 16 (3) 12 (4) 18

SPACE FOR ROUGH WORK

PART - II
SECTION-A : PHYSICS

This section contains **11 multiple choice questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

21. The firefighter feels the hose pushing backwards. What is the most likely cause of this?

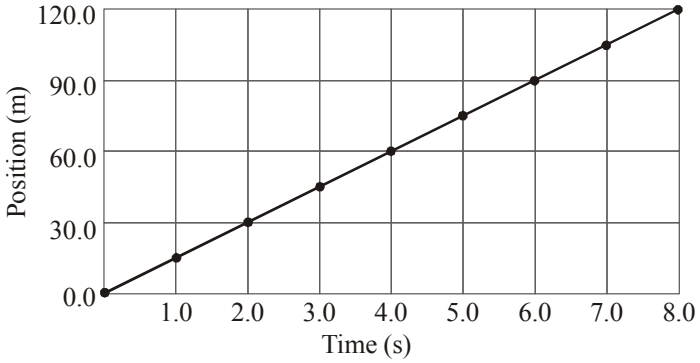
(1) The hose material is very elastic.

(2) Since the hose is at rest, it tends to stay at rest.

(3) The force exerted on the water equals the mass of the water times its acceleration.

(4) The escaping water exerts an equal and opposite force on the hose.

22. The position-time graph represents part of a car trip along a straight road.



What is the average velocity of the car for first 8.0 s?

(1) 20 m/s (2) 15 m/s (3) 12 m/s (4) 8 m/s

23. A planet has a mass of 8.4×10^{24} kg, which is about eight times the mass of its single moon. If the distance between the planet and the moon is about 4.2×10^{5} km, what is the gravitational pull of the planet on the moon?

(1) 3.3×10^{21} N (2) 2.1×10^{23} N (3) 3.3×10^{27} N (4) 2.1×10^{29} N

24. Which statement best explains reverberation?

(1) A reverberation is an echo.

(2) A reverberation occurs when a room with good acoustics does not reflect sound.

(3) A reverberation occurs when echoes are used to locate the source of a sound.

(4) A reverberation occurs when there are many reflections of a sound.

SPACE FOR ROUGH WORK

25. In 1 second, four crests of a wave pass a certain point. What is the wave's frequency?

(1) 2 Hz (2) 3 Hz (3) 4 Hz (4) 5 Hz

26. Air resistance is a form of friction that makes a moving object slow down. Which of these drawings shows a skier whose shape would allow him or her to move through the air with the LEAST resistance?

(1)  (2)  (3)  (4) 

27. Which statement is true about the image produced by a plane mirror?

(1) It appears to be located on the same side of the mirror as the object.

(2) It appears to be larger than the object.

(3) It appears to be inverted relative to the object.

(4) It appears to have reversed left and right, relative to the object.

28. The point where the seismic waves originate is called the _____of the earthquake.

(1) Centre (2) Epicenter (3) Focus (4) Origin

29. Ursa Major is

(1) a star (2) seen only with telescope

(3) a constellation (4) a satellite

30. Which of the following statements is true?

(1) Dry cells are rechargeable.

(2) During electrolysis of water, oxygen bubbles are formed at the negative electrode.

(3) LED can glow even by passing a weak electric current.

(4) The process of electrolysis is only a physical change.

31. A wooden cube just floats inside water when a 200 g mass is placed on it. When the mass is removed the cube is 2 cm above water level. The side of cube is

(1) 5 cm (2) 10 cm (3) 15 cm (4) 20 cm

SPACE FOR ROUGH WORK

SECTION-B : CHEMISTRY

This section contains **12 multiple choice questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

32. Which element makes up 8 percent of Earth's crust ?

(1) aluminium (2) iron (3) oxygen (4) silicon

33. Which term describes boron?

(1) Metal (2) Noble gas (3) Metalloid (4) Nonmetal

34. Which scientist proposed the idea that atoms make up all substances?

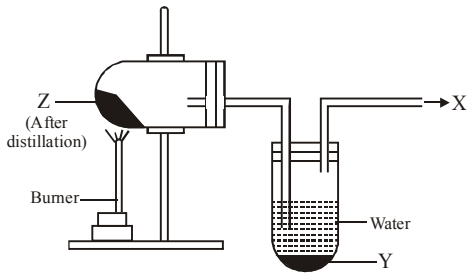
(1) Aristotle (2) Maharishi Kanad (3) Democritus (4) Galileo

35. What does the symbol Ca^{2+} represent?

(1) an isotope of calcium (2) a calcium atom

(3) a negative calcium ion (4) a positive calcium ion

36. Observe the figure of destructive distillation of coal. What are the three fractions X, Y, Z ?



	X	Y	Z
(1)	Coal gas	Coal tar	Coke
(2)	Coal gas	Coke	Coal
(3)	Coal gas	Coal tar	Impure coal
(4)	Carbon dioxide gas	Coal tar	Coal

37. The 'green house effect' refers to the

(1) building up of pollution in the atmosphere

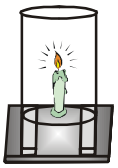
(2) gradual warming of the Earth's atmosphere

(3) hole in the ozone layer

(4) increase in human population on Earth

SPACE FOR ROUGH WORK

38. Neha took a burning candle and covered it with an empty glass by putting it upside down. She observed that the candle burns for some time before it finally goes off. What was the reason for this ?



(1) The candle keeps burning for some time as long as the air present in the glass is available to it and then it goes off.

(2) The ignition temperature of the candle becomes low due to glass cover hence it goes off.

(3) The candle keeps burning as long as the complete wax melts away and then goes off.

(4) Oxygen is produced when the candle burns. This oxygen keeps the candle burning for some time and then it goes off.

39. There is a mixture of three solid compounds A, B and C. Out of these compounds A and C are soluble in water and compound C is sublimable also. In what sequence the following techniques can be used for their effective separation?

(i) Filtration (ii) Sublimation

(iii) Crystallisation from water extract (iv) Dissolution in water

(1) (ii), (i), (iv), (iii) (2) (iv), (i), (ii), (iii)

(3) (i), (ii), (iii), (iv) (4) (ii), (iv), (i), (iii)

40. Which one of the following sets of phenomena would increase on raising the temperature ?

(1) Diffusion, evaporation, compression of gases

(2) Evaporation, compression of gases, solubility

(3) Evaporation, diffusion, expansion of gases

(4) Evaporation, solubility, diffusion, compression of gases

41. Which particle is the smallest ?

(1) electron (2) nucleus (3) proton (4) neutron

42. The constituent of haemoglobin is

(1) iron (2) sodium (3) copper (4) magnesium

43. What are the small units that make up polymers called?

(1) monomers (2) isomers (3) plastics (4) carbohydrates

SPACE FOR ROUGH WORK

SECTION-C : BIOLOGY

This section contains **15 multiple choice questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

44. How do the inner membrane of the mitochondria and the nuclear envelope differ?

(1) The nuclear envelope has pores and the mitochondrial membrane does not.

(2) The mitochondrial membrane is not permeable and the nuclear envelope is.

(3) The mitochondrial membrane has many folds and the nuclear envelope does not.

(4) The nuclear envelope has two phospholipid layers and the mitochondrial membrane does not.

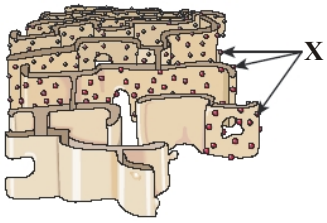
45. What produces the molecules of which structure X is composed ?

(1) nucleus

(2) vesicles

(3) nucleolus

(4) lysosomes



46. If a 0.9% solution is isotonic to a certain type of animal cell, the cell will lose mass if it is placed in which of the following liquids?

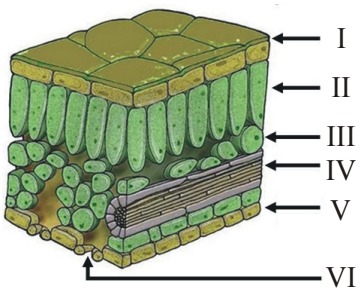
(1) 0.5% salt solution

(2) 0.9% salt solution

(3) 1.2% salt solution

(4) distilled (pure) water

47.



Which of them can be classified as dermal tissue or structures?

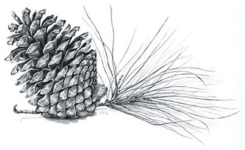
(1) I, II, III, V, and VI

(2) I, V, and VI

(3) VI

(4) II and III

SPACE FOR ROUGH WORK

48. 

Which has the most phylogenetic relatedness to what is seen above ?

(1) Pineapple (2) Monocots

(3) Gingkos (4) Mosses

49. Match the following

(a) Cholera	(i) Clostridium tetani
(b) Typhoid	(ii) Corynebacterium diptheria
(c) Diptheria	(iii) Salmonella typhi
(d) Whooping cough	(iv) Bordetella pertusis
(e) Tetanus	(v) Vibrio cholera

(1) a → v, b → iii, c → ii, d → iv, e → i (2) a → i, b → ii, c → iii, d → iv, e →v

(3) a → iii, b→ ii, c → i, d → iv, e →v (4) a → v, b → iv, c → iii, d → ii, e → i

50. The pre-historic evidences of human life is seen in this jungle

(1) Tawa reservior (2) Neemghan park

(3) Satpura national park (4) Pachmarhi sanctuary

51. **Statement I :-** Common cold, Diptheria, Influenza, Tuberculosis (T.B.) are "droplet infections".

Statement II :- These diseases spread by the patients through sneezing, coughing, spitting etc.

(1) Statement I is true but Statement II is false

(2) Statement I is false but Statement II is true

(3) Statement I is true, but Statement II does not give correct explanation

(4) Statement I and Statement II are true and reason gives correct explanation for Statement I

52. Match the following

(a) Vibrio	(i) Comma shaped bacteria
(b) Cocci	(ii) Round shaped bacteria
(c) Bacillus	(iii) Rod shaped bacteria
(d) Treponema	(iv) Spiral shaped bacteria
(e) Streptococcus	(v) Chain of cocci bacteria

(1) a → i, b→ ii, c → iii, d → iv, e → v (2) a → v, b → iv, c → iii, d → ii, e → i

(3) a → iii, b → ii, c → i, d → v, e → iv (4) a → iii, b → v, c → i, d → ii, e → iv

SPACE FOR ROUGH WORK

53. BCG vaccine is used to prevent _____.

(1) pneumonia (2) tuberculosis

(3) polio (4) amoebiasis

54. Example for leguminous plant

(1) pulses, beans & peas (2) maize, jowar

(3) groundnut, maize (4) All the above

55. Match the following

(a) Smoking	(i) Air tight preservation
(b) Salting	(ii) Microbial growth retards
(c) Freezing	(iii) Makes water to come over food
(d) Canning	(iv) Removes water completely

(1) a → iv, b → iii, c → ii, d → i (2) a → i, b → ii, c → iii, d → iv

(3) a → iv, b → i, c → iii, d → ii (4) a → ii, b → iv, c → iii, d → i

56. ____ cells lack nuclei at maturity

(1) Xylem cells of vascular plants

(2) Phloem cells of vascular plants

(3) Meristematic cells

(4) Sieve tubes of vascular plants

57. Golgi apparatus is specialised for

(1) Digestion of carbohydrates and proteins

(2) Glycosidation of protein and lipids

(3) Energy transduction

(4) Conversion of light energy to chemical energy

58. The stroma, lamellae and grana are found in

(1) Mitochondria (2) Chloroplast

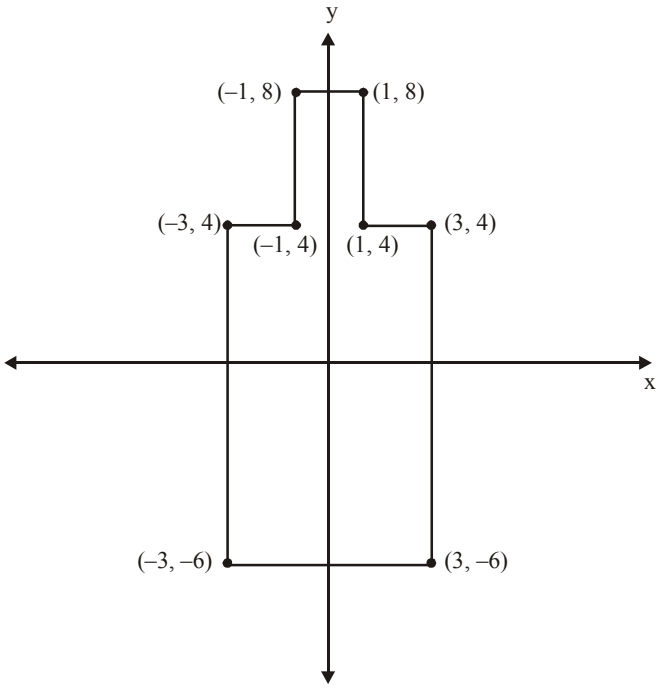
(3) Ribosomes (4) Golgi apparatus

SPACE FOR ROUGH WORK

SECTION-D : MATHEMATICS

This section contains **17 multiple choice questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

59. The design for a machine part is shown below.



Which of these is a correct statement about the symmetry of the design?

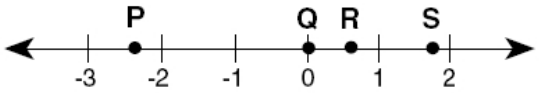
(1) The design is symmetrical only about the *y*-axis.

(2) The design is symmetrical only about the *x*-axis.

(3) The design is symmetrical about both the *y* and the *x*-axes.

(4) There is no symmetry in the design.

60. Which point on the number line represents a number that, when cubed, will result in a number greater than itself?



(1) P (2) Q (3) R (4) S

SPACE FOR ROUGH WORK

61. Albert wants to simplify the expression: $8(3 - y) + 5(3 - y)$

Which of the following is equivalent to the expression above?

(1) $39 - y$ (2) $13(3 - y)$ (3) $40(30 - y)$ (4) $13(6 - 2y)$

62. The population of a town is 13,000 and is increasing by about 250 people per year. This information can be represented by the following equation, where y represents the number of years and p represents the population.

$$p = 13{,}000 + 250y$$

According to the equation above, in how many years will the population of the town be 14,500 ?

(1) 5 years (2) 10 years (3) 6 years (4) 15 years

63. A rock climber burns 12 calories per minute of climbing. How many calories does the rock climber burn in **one-half hour** of climbing?

(1) 6 (2) 24 (3) 360 (4) 720

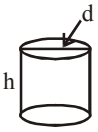
64. A rectangular field has its length and breadth in the ratio 5 : 3. Its area is 3.75 hectares. The cost of fencing it at Rs 5 per meter is

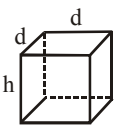
(1) Rs 400 (2) Rs 1000 (3) Rs 4000 (4) Rs 4500

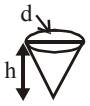
65. Taylor was earning an income of Rs.1,000 a week. Then his income was reduced by 10%. Two months later, his income increases by 10%. How much is Taylor earning, in rupees, after his income increases?

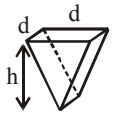
(1) Rs.990 (2) Rs.999 (3) Rs.1,000 (4) Rs.1,100

66. Which container holds the most water ?

(1) 

(2) 

(3) 

(4) 

67. Mehul plants 15376 apple trees in his garden and arranges them so that there are as many rows as there are apple trees in each row. The number of rows is _____.

(1) 124 (2) 126 (3) 134 (4) 144

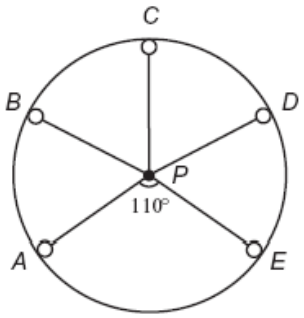
SPACE FOR ROUGH WORK

68. *A* can do a piece of work in 10 days, *B* can do it in 15 days. If they both work together they can finish the work in _____.

(1) 9 days (2) 8 days (3) 10 days (4) 6 days

69. Sergio works at his father's electronics shop after school. He needs to drill a hole at each of the points *A*, *B*, *C*, *D*, and *E* on circle *P*, as shown below.

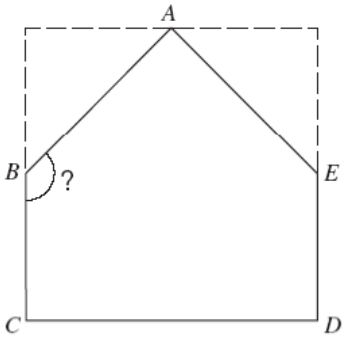
CIRCUIT BOARD



If Sergio drills the holes so that $\angle APE$ measures 110° and the other 4 central angles are congruent to each other, what will be the measure of $\angle CPD$?

(1) 60° (2) 65° (3) 62.5° (4) 70°

70. Home plate on a baseball field has a shape that is a square with two isosceles right triangles removed from 2 adjacent corners.



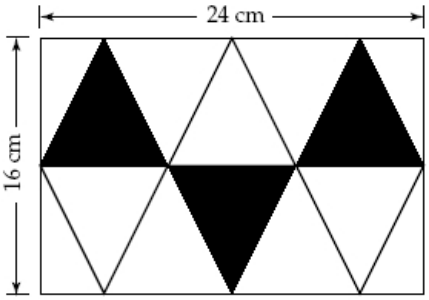
What is the measure of angle *ABC* ?

(1) 135° (2) 45°

(3) 90° (4) 180°

SPACE FOR ROUGH WORK

71. An artist is designing a pattern of triangular tiles to cover a wall. Each section of the pattern is identical to the section shown below.



If the wall is 576 cm long and 384 cm high, how many black tiles will the artist need to use on the wall?

(1) 72 (2) 576 (3) 1,152 (4) 1,728

72. Three numbers are in the ratio 1 : 2 : 3. The sum of their cubes is 98784. What is the biggest number ?

(1) 128 (2) 32 (3) 38 (4) 42

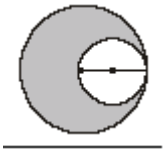
73. If $x \neq 0$ and when a polynomial is divided by $2x$, the quotient is $3x^4 - 9x^2 + 4$. Find the polynomial.

(1) $6x^4 - 18x^2 + 8$ (2) $6x^4 + 18x^2 + 8$ (3) $6x^5 - 9x^2 + 8$ (4) $6x^5 - 18x^3 + 8x$

74. A man wants to put carpet in the triangular showroom. He knows the width of the room is 3 metres more than 1/3 the length of the room. If the length of the room is 21 metres, how many square metres of carpet does he need ?

(1) 84 square metres (2) 105 square metres (3) 168 square metres (4) 210 square metres

75. The radius of the large circle is equal to the diameter of the small circle. If the area of the small circle is 13 m^2 , what is the area of the shaded region?



(1) 55 m^2 (2) 48 m^2 (3) 39 m^2 (4) 26 m^2

SPACE FOR ROUGH WORK

Corporate Office : "SANKALP", CP-6, Indra Vihar, Kota (Rajasthan)-324005

+91 - 744 - 2436001 **+91-744-2435003** **info@allen.ac.in**

ALLEN Ahmedabad Centre
"SADHYA"
Opp. TGB, Off S.G. Highway
Near Purshottam Bunglow, Bodakdev
Ahmedabad (Gujarat) 380054
Ph. : +91- 79-40306001
79-40306002
e-mail: infoadi@allen.ac.in

ALLEN Chandigarh Centre
"SIDDH"
SCO-354-355, Ground Floor
Sector 34-A
Chandigarh (UT) 160022
Ph. : +91- 172-5036443
172-5036444
e-mail: infocdg@allen.ac.in

ALLEN Jaipur Centre
11, Samachar Jagat Building,
Opp. Vidyashram School, JLN Marg
Jaipur (Rajasthan) 302017
Ph. : +91- 97996-34888, 97996-35888
97996-36888, 97996-37888
e-mail: jaipur@allen.ac.in