PART-I

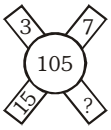
IQ (MENTAL ABILITY)

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. Pointing to a man in the photograph a lady said, "The father of his brother is the only son of my mother." How is that man related to that lady?

(1) Brother (2) Son (3) Cousin (4) Nephew

2. In the following question, Select from the answer choices an appropriate number to replace the question mark.



(1) 41 (2) 22 (3) 25 (4) 35

3. This question contains six statements followed by four sets of combination of three. Choose the set in which the statements are logically related.

(A) Painting and music is art. (B) Art is symptom of culture.

(C) Culture and art are complementary (D) Music is a form of art

(E) Painting is a form of art. (F) Music shows culture

(1) BDF (2) AEF (3) ACE (4) CEF

Direction : (Q.4 & Q.5) Read the given information carefully and answer the questions.

Six square states having equal area in a country are located in North-South direction in two columns next to each other. States are located in the given order. State 1, State 3 and State 5 are on the Western side and States 2, State 4 and State 6 are on the Eastern side. Within the six states, there are exactly four medical instiutes, two management instiutes and two technical instiutes. These eight institutions are located as follows.

(i) No institution is in more than one of the states.

(ii) None of the states contains more than one management institute and none contains more than one technical institute.

(iii) None of the states contains both a management institute and a technical institute.

(iv) Each management institute is located in a state that contains atleast one medical institute.

(v) The technical institutes are located in two states that do not share a common boundary. State 3 contains a technical institute and State 6 contains a management institute.

4. If one of the states contains exactly two medical institutes and exactly one technical institute, then which combination of three states might contain no medical institute ?

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

5. Which one of the following could be true ?

(1) State 1 contains exactly one medical institute

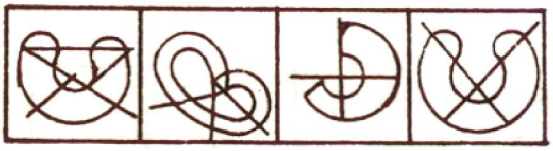
(2) State 1 contains exactly one techincal institute

(3) State 2 contains exactly one managment institute

(4) State 6 contains exactly one technical institute

6. In the following question, choose the alternative figure in which the question figure (X) is embedded.

(X)



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

Direction : (Q.7 to Q.9) A,B and D meet their relatives C,E,F and G while visiting the trade fair. A is the brother of B and D is the father of A,F is the only son of C and E,E, who is the brother-in-law of G, is the father-in-law of B.

7. How many female members are there ?

(1) 2 (2) 3 (3) 4 (4) Can't be determined

8. How is G related to A ?

(1) Uncle (2) Father-in-law (3) Mother-in-law (4) None of these

9. Who is the spouse of F ?

(1) B (2) E (3) C (4) G

Direction : (Q.10 to Q.12) : Study the following information carefully and answer the given questions: Four players A, B, C and D are holding 4 cards each. Each of them has an Ace, a King, a Queen and a Jack. All of them have all the suits (spades, hearts, club and diamonds).

I. A has Ace of spades and Queen of diamonds.

II. B has Ace of clubs and King of diamonds.

III. C has Queen of clubs and King of spades.

IV. D has Jack of clubs.

10. Ace of diamonds is with

(1) A (2) B (3) C (4) D

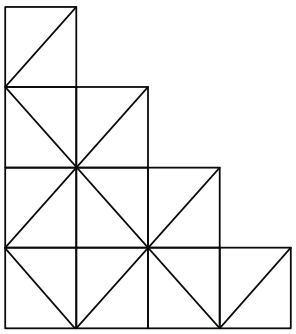
11. Jack of hearts is with

(1) A (2) B (3) C (4) D

12. Queen of spades is with

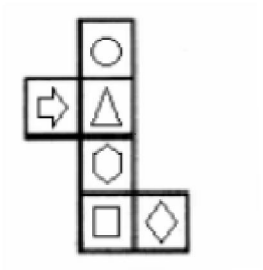
(1) A (2) B (3) C (4) D

13. What is the number of triangles in given figure ?



(1) 26 (2) 41 (3) 36 (4) 40

14. The figure given on the left hand side, in each problem, is folded to form a cube .Choose from amongst the alternatives (1), (2), (3) & (4) and the cubes that are similar to the cube formed.



(X)

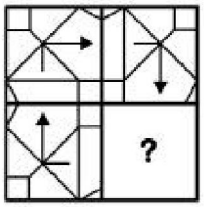
(1)

(2)

(3)

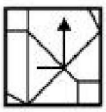
(4)

15. Find which shape should fill the empty square.

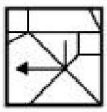


(1)

(2)



(3)



(4)

16. Find the missing number in the following series

78, 79, 81, ?, 92, 103, 119

(1) 88 (2) 85 (3) 84 (4) 83

17. Amit started at the intersection of streets number 7 and 8. he drove 3 km North, 3 km West and 4 km South. Which further route could bring him back to his starting point ?

(I) 3 km East, then 2 km South

(II) 1 km North, then 3 km East

(III) 1 km North, then 2 km West

(1) I only (2) II only (3) I and II only (4) II and III only

Direction : (Q.18 to Q.20) : A solid cube of each side 8 cms, has been painted red, blue and black on pairs of opposite faces. It is then cut into cubical blocks of each side 2 cms.

18. How many cubes have three faces painted with different colours?

(1) 0 (2) 4 (3) 8 (4) 1 2

19. How many cubes have two faces painted red and black and all other faces unpainted?

(1) 4 (2) 8 (3) 16 (4) 32

20. How many cubes are there in all?

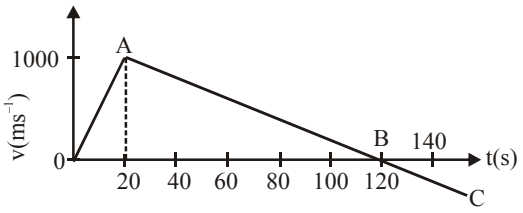
(1) 64 (2) 56 (3) 40 (4) 32

PART-II

SECTION-A : PHYSICS

This section contains **10 Multiple Choice Questions.** Each question has four choices (1), (2), (3) and (4) out of which ONLY ONE is correct.

21. A rocket is launched upward from the earth surface whose velocity-time graph shown in figure. Then maximum height attained by the rocket is



(1) 1 km (2) 10 km (3) 100 km (4) 60 km

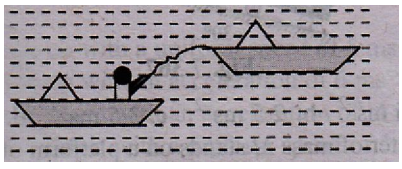
22. A car starts from rest and moves along the x-axis with constant acceleration 6 m s^{-2} for 10 seconds. If it then continues with constant velocity, what distance will the car cover in 15 seconds since it started from rest ?

(1) 180 m (2) 300 m (3) 320 m (4) 420 m

23. A bomb of mass 9 kg explodes into two pieces of 3 kg and 6 kg. The velocity of 3 kg piece is 16 m/s. The kinetic energy of 6 kg piece is

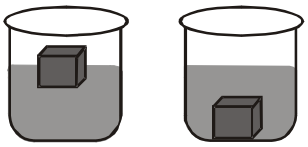
(1) 768 J (2) 786 J (3) 192 J (4) 687 J

24. A rope is stretched between two boats at rest. A sailor in the first boat pulls the rope with a constant force of 100 N. First boat with the sailor has a mass of 250 kg whereas the mass of second boat is double of this mass. If the initial distance between the boats was 30 m, the time taken for two boats to meet each other is (neglect water resistance between boats and water)



(1) 10 s (2) 14.14 s (3) 100 s (4) 141.4 s

25. Mr. Jain set up a demonstration for his science class using two beakers. Each beaker contained 50 ml of clear liquids. The temperature of each liquid was 25° C. Mr. Jain placed a cube into each beaker at the same time. Each cube measured 2 cm on all sides and had a mass of 5 grams.The results of the demonstration are shown in the figures below.



Beaker 1 Beaker 2

Which of the following statements would best explain the results of this demonstration?

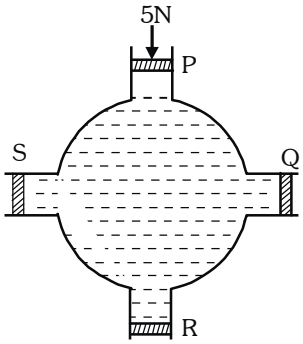
(1) The cube in Beaker 1 has a lower density than the cube in Beaker 2.

(2) The liquid in Beaker 1 has a higher density than the liquid in Beaker 2.

(3) The cube in Beaker 1 is made from a different material than the cube in Beaker 2.

(4) The liquid in Beaker 1 has the same chemical composition as the liquid in Beaker 2.

26. A container has 4 openings of equal area of cross-section. It is fitted with four pistons and a fluid is filled inside it. Now, a force of 5 N is applied on a confined fluid through piston P as shown in figure. The forces which should be applied on pistons Q, R and S to prevent them to come out respectively,are



(1) 1 N, 3 N, 1 N (2) 2 N, 1 N, 2 N (3) 5 N, 5 N, 5 N (4) 0 N, 5 N, 0 N

27. A person standing near the edge of the top of a building throws two balls A and B. The ball A is thrown vertically upward and B is thrown vertically downward with the same speed. The ball A hits the ground with a speed v_A and the ball B hits the ground with speed v_B , then

(1) $v_A > v_B$

(2) $v_A < v_B$

(3) $v_A = v_B$

(4) The relation between v_A and v_B depends on height of the building above the ground

28. Sphere A has a mass of 100 kg. It is 50 m away from sphere B, which has a mass of 25 kg. The force between them is F. The distance between them is halved and the mass of sphere A stays the same. What does the mass of sphere B have to be in order for the force to stay the same?

(1) 6.25 kg (2) 12.50 kg (3) 31.25 kg (4) 50.00 kg

29. A planet is revolving around the Sun in an elliptical orbit, then which physical quantity is/are constant?

(1) Kinetic energy (2) Potential energy (3) Mechanical energy (4) All are constant

30. The frequency of a sound wave in water is 5,000 Hz, and the sound wave travels through water at a speed of 1,500 m/s. What is the wavelength?

(1) 30 m (2) 75 m (3) 0.30 m (4) 7.5 m

SECTION-B : CHEMISTRY

This section contains **10 Multiple Choice Questions.** Each question has four choices (1), (2), (3) and (4) out of which ONLY ONE is correct.

31. Due to high specific heat of water, it is used in

(1) Radiators of car. (2) Hot water bags for pain relief.

(3) Both (1) and (2). (4) Thermometers.

32. Select the correct combination

	Alloys		**Composition**
(A)	Brass	(P)	Cu-Zn
(B)	Bronze	(Q)	Cu-Ni-Zn
(C)	German Silver	(R)	Cu-Sn

(1) A $\rightarrow$ R, B $\rightarrow$ P, C $\rightarrow$ Q (2) A $\rightarrow$ P, B $\rightarrow$ Q, C $\rightarrow$ R

(3) A $\rightarrow$ P, B $\rightarrow$ R, C $\rightarrow$ Q (4) A $\rightarrow$ R, B $\rightarrow$ Q, C $\rightarrow$ P

33. A student prepared a 2.5% (by mass) solution of glucose in water. Which of the following represents the correct composition of the solution?

(1) 2.5 g glucose + 100 g water (2) 2.5 g glucose + 98g water

(3) 2.5 g glucose + 97.5 g water (4) 2.5 g glucose + 90g water

34. Which of the following gases with a smell of rotten egg is evolved when sulphuric acid is treated with copper sulphide?

(1) Sulphur vapour (2) Sulphur dioxide (3) Hydrogen sulphide (4) Sulphur trioxide

35. Which of the following oxidises water to oxygen exothermally?

(1) Fluorine (2) Chlorine (3) Bromine (4) Iodine

36. Which of the following statement is incorrect ?

(1) The solubility of gases in liquids usually increases on increasing the temperature and decreases on decreasing the temperature.

(2) The solubility of gases in liquids usually increases on increasing the pressure and decreases on decreasing the pressure.

(3) The solubility of solids in liquids usually increases on increasing the temperature and decreases on decreasing the temperature.

(4) The solubility of solids in liquids almost remains unaffected by the changes in pressure.

37. Two substances A and B combine together to produce a new substance C. The properties of C do not tally with those of A and B. A & B cannot be separated into simpler substances by any chemical means. Which of the following statements is/are correct about the formation of C?

(A) A and B are elements

(B) A and B are compounds

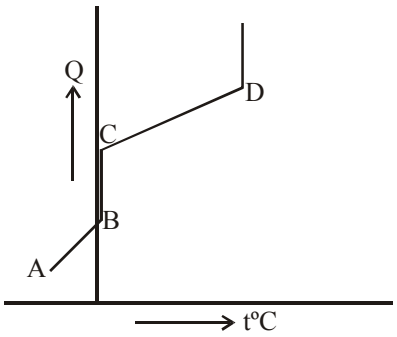
(C) C is a mixture of A and B

(D) A and B are present in C in a fixed ratio by mass

(1) Both (A) and (B) (2) Both (A) and (D)

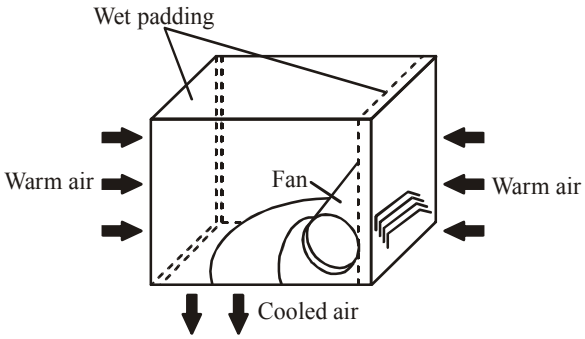
(3) (A), (C) and (D) (4) (A), (B), (C) and (D)

38. The graph given below represents the inter-conversion of ice to water vapour. Identify the point in the curve which indicates the boiling point of water.



(1) B (2) C (3) A (4) D

39. In the type of air conditioner shown in the figure below, warm dry air passes through water-soaked padding to become cool air. Which of the following statements correctly explains how this cooling occurs ?



(1) Water condenses, thus removing thermal energy from the hot air

(2) Water evaporates, thus removing thermal energy from the hot air

(3) Energy is removed from the air by thermal conductivity in the padding

(4) The air is cooled by being moved quickly through the air conditioner

40. In the following diagram ammonia gas obtained from ammonium hydroxide reacts with HCl (g) obtained from hydrochloric acid thus form white fumes of ammonium chloride. What will be the correct observation?

(1) White fumes ring will be formed at the centre

(2) White fumes ring will be formed near end 1

(3) White fumes ring will be formed near end 2

(4) White fumes ring will not be formed at all

SECTION-C : BIOLOGY

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

41. The equation below represents a biological process. Where is this process completed?
carbon dioxide + water ⟶ glucose + oxygen + water
(1) Mitochondria (2) Ribosomes (3) Cell membranes (4) Chloroplasts

42. Streptococcus pyogenes is the bacterium that causes strep throat. Based on its name, what is the shape of the individual bacterial cells?
(1) Round (2) Rod (3) Spiral (4) Polyhedral

43. Bombay duck and Hilsa are
(1) Breeds of fresh water fishes (2) Breeds of marine fishes
(3) Breeds of duck (4) Breeds of poultry

44. A cnidarian nervous system is called a nerve net. When touched, a cnidarian responds by contracting its body. Is this response regulated by the cnidarian's brain?
(1) Yes, all nerve impulses are transmitted through the brain.
(2) Yes, the brain controls the nerve net
(3) No, the cnidarian's brain is not involved in reflexive actions.
(4) No, cnidarians do not have brains.

45. Which of the following is the most abundant component of the human blood?
(1) Erythrocytes (2) Lymphocytes (3) Thrombocytes (4) Monocytes

46. Which description best fits the activity of a cell during interphase?
(1) The cell carries on metabolism.
(2) The cell differentiates to have a new function.
(3) The cell splits in two.
(4) The cell splits in two but with half the normal number of chromosomes.

47. Urochordate animals have
(1) notochord that extends from head to tail region
(2) notochord is present throughout larval stage and adult life
(3) notochord present only in adult stage
(4) notochord present only in larval stage

48. One variety of strawberry is resistant to a damaging fungus but produces small fruit. Another strawberry variety produces large fruit but is not resistant to the fungus. How might the desirable qualities of the two varieties be combined?
(1) Cloning (2) Asexual reproduction
(3) Direct harvesting (4) Selective breeding

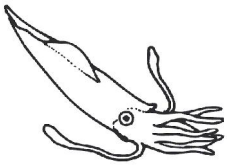
49. What do DNA and RNA have in common?
(1) Both are double stranded. (2) Both contain ribose molecules.
(3) Both contain phosphate groups. (4) Both contain uracil.

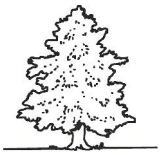
50. Periderm is produced by

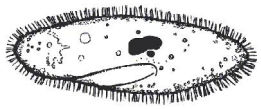
(1) Cork cambium (2) Procambium

(3) Secondary cortex (4) Vascular cambium

51. Which of the following organisms is eukaryotic, multicellular, and autotrophic?

(1) 

(2) 

(3) 

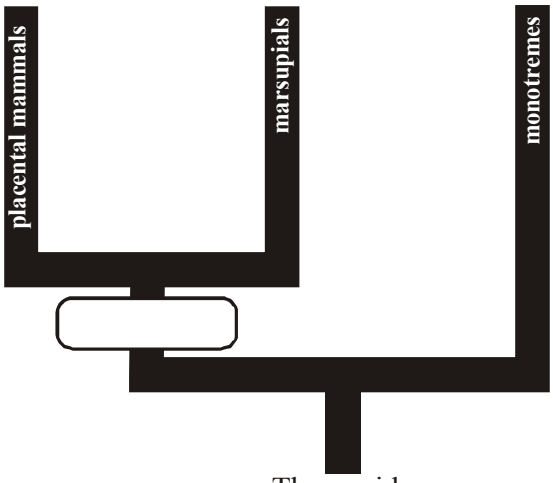
(4) 

52. High milk yielding varieties of cows are obtained by

(1) Super ovulation (2) Artificial insemination

(3) Use of surrogate mothers (4) All of the above

53. Which statement best supplies information to complete the diagram below?



(1) Adults give birth to live offspring.

(2) Adults lay eggs.

(3) Offspring live in the mother's pouch after birth.

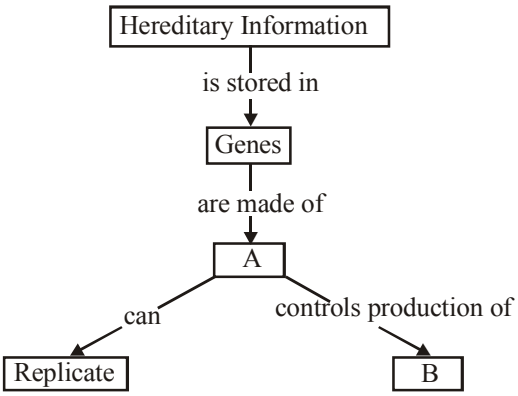
(4) Offspring receive milk from the father.

54. Which organizes groups of organisms in order of increasing complexity?

(1) Eukaryotes, prokaryotes, viruses (2) Viruses, prokaryotes, eukaryotes

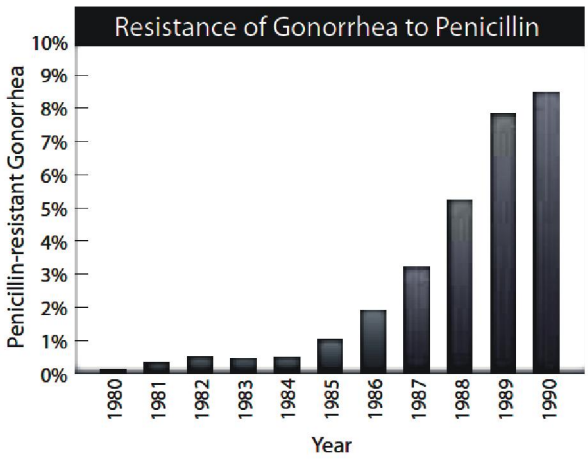
(3) Viruses, eukaryotes, prokaryotes (4) Prokaryotes, viruses, eukaryotes

55. In the diagram below, which molecules are represented by box B?



(1) Bases (2) Proteins (3) Amino acids (4) Simple sugars

56. What conclusion can be reached based on the graph below about treatment of a disease with antibiotics?



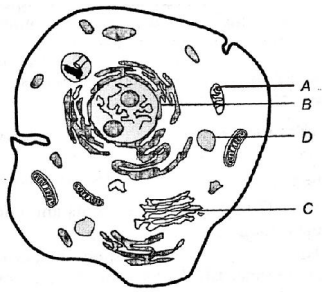
(1) The success rate increased.

(2) The number of antibiotics increased.

(3) The number of cases of the disease decreased.

(4) The failure of penicillin to treat the disease increased.

57. The Rough Endoplasmic Reticulum in the cell synthesizes proteins which would be later used in building the plasma membrane. But it is observed that the protein in the membrane is slightly different from the protein made in the Rough Endoplasmic Reticulum. The protein was probably modified in another cell organelle. Identify that organelle in the given diagram.



(1) D (2) A (3) B (4) C

58. In meiosis

(1) Division of nucleus occurs twice and replication of DNA only once

(2) Both division of nucleus and replication of DNA occurs twice

(3) Both division of nucleus and replication of DNA occurs once

(4) Division of nucleus occurs once and replication of DNA is twice

59. Which statement is not true about ribosomes?

(1) Ribosomes build proteins by following the directions of the DNA.

(2) Ribosomes are made in the cytoplasm of the cell.

(3) Ribosomes can occur attached to the endoplasmic reticulum as well as free in the cytoplasm.

(4) Ribosomes are not bound by a membrane.

60. In the diagram given below showing Agaricus, what is the structure labelled as A ?

(1) Bud (2) Gametangium (3) Mycelium (4) Fruiting body

SECTION-D : MATHEMATICS

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

61. Mr. and Mrs. Gupta need to rent a truck to move their furniture and other belongings to their new house. The table shows the price for renting a truck of the size they need for various amounts of time.

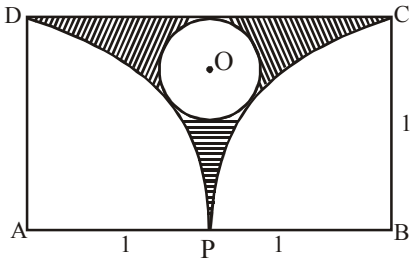
Time (t), in hours	Rental Charge (C)
4	Rs.90
6	Rs.120
12	Rs.210
24	Rs.390

Which equation expresses the rental charge as a function of the time?

(1) C= 10t + 50 (2) C= 15t + 30

(3) C = 20t+ 10 (4) C = 30t+ 15

62. In the following figure, ABCD is a rectangle with AD and DC equal to 1 and 2 units, respectively. Two quarter circle are drawn with centers at B and A, respectively. Now a circle is drawn touching both the quarter circles and one of the sides of rectangle. Find the area of shaded region.
(Use $\pi = 22/7$)



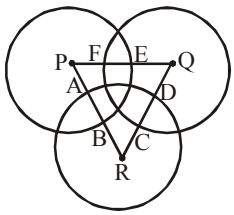
(1) $\frac{32}{115}$ square units (2) $\frac{13}{56}$ square units

(3) $\frac{16}{83}$ square units (4) $\frac{7}{20}$ square units

63. The value of $\frac{\left(x^{2^{n-1}}+y^{2^{n-1}}\right)\left(x^{2^{n-1}}-y^{2^{n-1}}\right)}{x^{2^n}-y^{2^n}}$ is

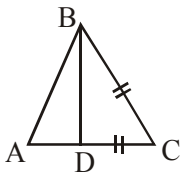
(1) 1 (2) 8 (3) 0 (4) None

64. Below shown are three circles, each of radius 20 and centres at P, Q and R; further AB=5, CD=10 and EF=12. What is the perimeter of the triangle PQR?



(1) 120 (2) 66 (3) 93 (4) 87

65. In the triangle ABC, BC = CD and ($\angle$ABC – $\angle$BAC) = 30°. The measure of $\angle$ABD is (figure not upto the scale)



(1) 30° (2) 45° (3) 15° (4) can't be determined

66. Assume that a mango and its seed, both are spherical, now if the radius of seed is 2/5 of the thickness of the pulp. The seed lies exactly at the centre of the fruit. What percent of the total volume of the mango is its pulp.

(1) $63\frac{3}{5}\%$ (2) 97.67 % (3) $68\frac{2}{3}\%$ (4) None of these

67. If $\frac{a^2+b^2}{c^2+d^2}=\frac{ab}{cd}$, then find the value of $\frac{a+b}{a-b}$ in terms of c and d only.

(1) $\frac{c+d}{cd}$ (2) $\frac{cd}{c+d}$ (3) $\frac{c-d}{c+d}$ (4) $\frac{c+d}{c-d}$

68. Which of the following statement is/are necessary to answer the given question ?
What is the difference between the ages of Y and X ?
I. The ratio between the ages of X and Y is 2:3.
II. Y's age is 50% more than X's age.
III. One fourth of X's age is equal to one-sixth of Y's age.
(1) All I, II & III
(2) Any two of the three
(3) III & either I or II
(4) None of the three is sufficient to give the answer

69. If $A^{B^C} = 729$, then the minimum possible value of A+B+C (where A, B & C are positive integers) is :

(1) 29 (2) 13 (3) 12 (4) 10

70. A three digit number 4a3 is added to another three-digit number 984 to give the four-digit number 13b7, which is divisible by 11. Then, (a + b) is

(1) 10 (2) 11 (3) 12 (4) 15

71. A cat takes 7 steps for every 5 steps of a dog, but 5 steps of a dog are equal to 6 steps of cat. What is the ratio of speed of cat to that of dog?

(1) 24 : 25 (2) 42 : 25 (3) 24 : 19 (4) none of these

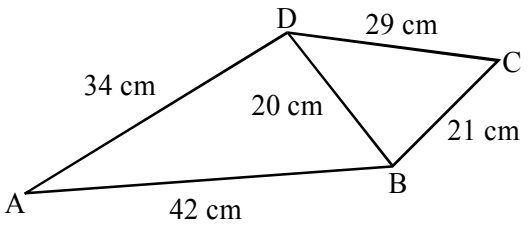
72. A naughty student breaks the pencil in such a way that the ratio of two broken parts is same as that of the original length of the pencil to one of the larger part of the pencil. The ratio of the other part to the original length of pencil is

(1) $1:2\sqrt{5}$ (2) $2:(3+\sqrt{5})$ (3) $2:\sqrt{5}$ (4) can't be determined

73. The water in a rectangular reservoir having a base 80 metres by 60 metres is 6.5 metres deep. In what time can the water be emptied by a pipe of which the cross section is a square of side 20 cm, if the water runs through the pipe at the rate of 15 km per hour ?

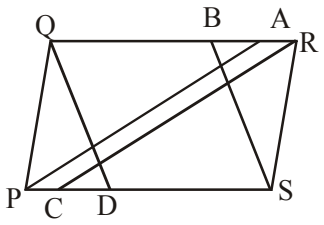
(1) 26 hrs (2) 52 hrs (3) 65 hrs (4) 42 hrs

74. Find the area of the quadrilateral ABCD in which AB = 42 cm, BC = 21 cm, CD = 29 cm, DA = 34 cm and diagonal BD = 20 cm.



(1) 546 cm^2 (2) 540 cm^2
(3) 640 cm^2 (4) None of these

75. PQRS is a parallelogram and PA, SB, RC, QD are angle bisectors. If PQ = QD = 6 units, find m∠PQR.

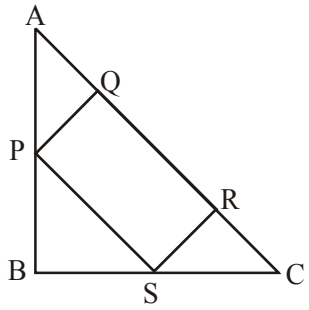


(1) 30° (2) 60° (3) 120° (4) Indeterminate

76. The remainder when 8^{1785} is divided by 7 is :

(1) 5 (2) 1 (3) 6 (4) can't be determined

77. In the given diagram ΔABC is an isosceles right angled triangle, in which a rectangle is inscribed in such a way that the length of the rectangle is twice of breadth. Q and R lie on the hypotenuse and P, S lie on the two different smaller sides of the triangle. What is the ratio of the areas of the rectangle and that of triangle ?

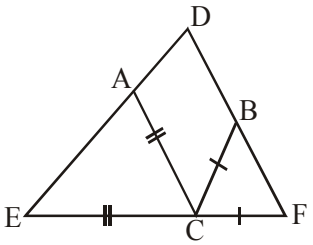


(1) $\sqrt{2}:1$ (2) $1:\sqrt{2}$ (3) 1 : 2 (4) $\sqrt{3}:2$

78. From a container, 6 litres milk was drawn out and was replaced by water. Again 6 litres of mixture was drawn out and was replaced by the water. Thus the quantity of milk and water in the container after these two operations is 9 : 16. The quantity of mixture is :

(1) 15 (2) 16 (3) 25 (4) 31

79. In ΔDEF, points A, B and C are taken on DE, DF and EF respectively such that $EC = AC$ and $CF = BC$. If $\angle D = 50°$, then $\angle ACB$ is :



(1) 120° (2) 80° (3) 90° (4) 50°

80. A number 'A' is formed when we write from 1 to 150 i.e. 12345678910111213141516....
Find 58^{th} digit from left side :

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

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK

TALLENTEX 2015
ALLEN'S Talent Encouragement Exam

REVISED ANSWER KEY : CLASS - 9th (IX)

(Held on : 16-11-2014)

Q. No.	Ans.
1	4
2	4
3	1
4	1
5	1
6	4
7	4
8	4
9	1
10	4
11	1
12	4
13	2
14	2
15	1
16	2
17	2
18	3
19	2
20	1

Q. No.	Ans.
21	4
22	Bonus
23	3
24	1
25	2
26	3
27	3
28	1
29	3
30	3
31	3
32	3
33	3
34	3
35	1
36	1
37	2
38	4
39	2
40	3

Q. No.	Ans.
41	4
42	1
43	2
44	4
45	1
46	1
47	4
48	4
49	3
50	1
51	2
52	4
53	1
54	2
55	2
56	4
57	4
58	1
59	2
60	4

Q. No.	Ans.
61	2
62	2
63	1
64	3
65	3
66	2
67	4
68	4
69	4
70	1
71	4
72	2
73	2
74	1
75	3
76	2
77	3
78	1
79	2
80	1