



PCB

**SAMPLE PAPER
ADMISSION TEST**



DURATION: 3 Hours

M.MARKS: 400

General Instructions:

1. Immediately fill in the particulars on this page of the test booklet.
2. The test is of 3 Hours duration.
3. The test booklet consists of 100 questions. The maximum marks are 400.
4. All questions are compulsory.
5. There is only one correct response for each question.
6. Each correct answer will give **4 marks** and -1 for any wrong answer.
7. No student is allowed to carry any textual material, printed, or written, bits of paper, pager, mobile phone, any electronic device, etc. inside the examination room/hall.
8. The keyboard will be disabled during the exam.
9. Candidate will have to answer using "mouse".
10. An automatic clock has been generated in the device. A designated time will be given to the candidates, where the time will be allotted for the login and log-out. When the clock reaches zero, the exams will stop automatically.

Name of the Student (In CAPITALS): _____

Date of exam - _____ Father name - _____

Class - _____ School Name - _____

_____ D.O.B. _____

9th class(%) / School topper _____

Present Address - _____

Centre name - _____

Contact number - _____ E-Mail ID - _____

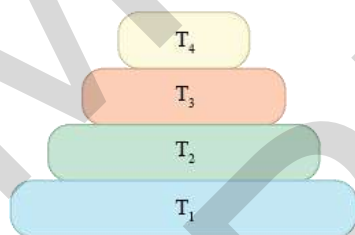
PART : I (BIOLOGY)

SECTION – 1 : (Maximum Marks : 150)

- This section contains **FIFTY** questions
 - Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four option is correct
1. A zygote which has an X-chromosome inherited from the father will develop into a
(a) boy (b) girl (c) X- chromosome does not determine the sex of a child (d) either boy or girl
 2. Select the incorrect statement
(a) Frequency of certain genes in a population change over several generations resulting in evolution
(b) Reduction in weight of the organism due to starvation is genetically controlled
(c) Low weight parents can have heavy weight progeny
(d) Traits which are not inherited over generations do not cause evolution
 3. New species may be formed if
(i) DNA undergoes significant changes in germ cells (ii) chromosome number changes in the gamete
(iii) there is no change in the genetic material (iv) mating does not take place
(a) (i) and (ii) (b) (i) and (iii) (c) (ii), (iii) and (iv) (d) (i), (ii) and (iii)
 4. Two pea plants one with round green seeds (RRyy) and another with wrinkled yellow (rrYY) seeds produce F1 progeny that have round, yellow (RrYy) seeds. When F1 plants are selfed, the F2 progeny will have new combination of characters. Choose the new combination from the following
(i) Round, yellow (ii) Round, green (iii) Wrinkled, yellow (iv) Wrinkled, green
(a) (i) and (ii) (b) (i) and (iv) (c) (ii) and (iii) (d) (i) and (iii)
 5. A basket of vegetables contains carrot, potato, radish and tomato. Which of them represent the correct homologous structures?
(a) Carrot and potato (b) Carrot and tomato (c) Radish and carrot (d) Radish and potato
 6. Select the correct statement.
(a) Tendril of a pea plant and phylloclade of Opuntia are homologous.
(b) Tendril of a pea plant and phylloclade of Opuntia are analogous.
(c) Wings of birds and limbs of lizards are analogous. (d) Wings of birds and wings of bat are homologous.
 7. If the fossil of an organism is found in the deeper layers of earth, then we can predict that
(a) the extinction of organism has occurred recently
(b) the extinction of organism has occurred thousands of years ago
(c) the fossil position in the layers of earth is not related to its time of extinction
(d) time of extinction cannot be determined
 8. Which of the following statements is not true with respect to variation?
(a) All variations in a species have equal chance of survival
(b) Change in genetic composition results in variation
(c) Selection of variants by environmental factors forms the basis of evolutionary processes.
(d) Variation is minimum in asexual reproduction
 9. A trait in an organism is influenced by
(a) paternal DNA only (b) maternal DNA only
(c) both maternal and paternal DNA (d) neither by paternal nor by maternal DNA
 10. Select the group which shares maximum number of common characters
(a) two individuals of a species (b) two species of a genus
(c) two genera of a family (d) two genera of two families
 11. According to the evolutionary theory, formation of a new species is generally due to
(a) sudden creation by nature (b) accumulation of variations over several generations
(c) clones formed during asexual reproduction (d) movement of individuals from one habitat to another
 12. From the list given below, select the character which can be acquired but not inherited

- (a) colour of eye (b) colour of skin (c) size of body (d) nature of hair
13. The two versions of a trait (character) which are brought in by the male and female gametes are situated on
(a) copies of the same chromosome (b) two different chromosomes
(c) sex chromosomes (d) any chromosome
14. Select the statements that describe characteristics of genes
(i) genes are specific sequence of bases in a DNA molecule (ii) a gene does not code for proteins
(iii) in individuals of a given species, a specific gene is located on a particular chromosome
(iv) each chromosome has only one gene
(a) (i) and (ii) (b) (i) and (iii) (c) (i) and (iv) (d) (ii) and (iv)
15. In peas, a pure tall plant (TT) is crossed with a short plant (tt). The ratio of pure tall plants to short plants in F₂ is
(a) 1 : 3 (b) 3 : 1 (c) 1 : 1 (d) 2 : 1
16. The number of pair (s) of sex chromosomes in the zygote of humans is
(a) one (b) two (c) three (d) four
17. The theory of evolution of species by natural selection was given by
(a) Mendel (b) Darwin (c) Morgan (d) Lamarck
18. Some dinosaurs had feathers although they could not fly but birds have feathers that help them to fly. In the context of evolution this means that
(a) reptiles have evolved from birds (b) there is no evolutionary connection between reptiles and birds
(c) feathers are homologous structures in both the organisms (d) birds have evolved from reptiles
19. Which one of the following is an artificial ecosystem?
(a) Pond (b) Crop field (c) Lake (d) Forest
20. In a food chain, the third trophic level is always occupied by
(a) carnivores (b) herbivores (c) decomposers (d) producers
21. An ecosystem includes
(a) all living organisms (b) non-living objects
(c) both living organisms and non-living objects
(d) sometimes living organisms and sometimes non-living objects
22. In the given food chain, suppose the amount of energy at the fourth trophic level is 5 kJ, what will be the energy available at the producer level?
Grass → Grasshopper → Frog → Snake → Hawk
(a) 5 kJ (b) 50 kJ (c) 500 kJ (d) 5000 kJ
23. Accumulation of non-biodegradable pesticides in the food chain in increasing amount at each higher trophic level is known as
(a) eutrophication (b) pollution (c) biomagnification (d) accumulation
24. Depletion of ozone is mainly due to
(a) chlorofluorocarbon compounds (b) carbon monoxide (c) methane (d) pesticides
25. Organisms which synthesise carbohydrates from inorganic compounds using radiant energy are called
(a) decomposers (b) producers (c) herbivores (d) carnivores
26. In an ecosystem, the 10% of energy available for transfer from one trophic level to the next is in the form of
(a) heat energy (b) light energy (c) chemical energy (d) mechanical energy
27. Organisms of a higher trophic level which feed on several types of organisms belonging to a lower trophic level constitute the
(a) food web (b) ecological pyramid (c) ecosystem (d) food chain
28. Flow of energy in an ecosystem is always
(a) unidirectional (b) bidirectional (c) multi directional (d) no specific direction
29. Excessive exposure of humans to UV-rays results in

- (i) damage to immune system (ii) damage to lungs (iii) skin cancer (iv) peptic ulcers
(a) (i) and (ii) (b) (ii) and (iv) (c) (i) and (iii) (d) (iii) and (iv)
30. In the following groups of materials, which group(s) contains only non-biodegradable items?
(i) Wood, paper, leather (ii) Polythene, detergent, PVC
(iii) Plastic, detergent, grass (iv) Plastic, bakelite, DDT
(a) (iii) (b) (iv) (c) (i) and (iii) (d) (ii) and (iv)
31. Which of the following limits the number of trophic levels in a food chain?
(a) Decrease in energy at higher trophic levels (b) Sufficient food supply
(c) Polluted air (d) Water
32. Which of the statement is incorrect?
(a) All green plants and blue green algae are producers.
(b) Green plants get their food from organic compounds.
(c) Producers prepare their own food from inorganic compounds.
(d) Plants convert solar energy into chemical energy.
33. Which group of organisms are not constituents of a food chain?
(i) Grass, lion, rabbit, wolf (ii) Plankton, man, fish, grasshopper
(iii) Wolf, grass, snake, tiger (iv) Frog, snake, eagle, grass, grasshopper
(a) (i) and (iii) (b) (iii) and (iv) (c) (ii) and (iii) (d) (i) and (iv)
34. The percentage of solar radiation absorbed by all the green plants for the process of photosynthesis is about
(a) 1 % (b) 5 % (c) 8 % (d) 10 %
35. In the given figure the various trophic levels are shown in a pyramid. At which trophic level is maximum energy available?



- (a) T4 (b) T2 (c) T1 (d) T3
36. What will happen if deer is missing in the food chain given below?
Grass → Deer → Tiger
(a) The population of tiger increases (b) The population of grass decreases
(c) Tiger will start eating grass (d) The population of tiger decreases and the population of grass increases
37. The decomposers in an ecosystem
(a) convert inorganic material, to simpler forms (b) convert organic material to inorganic forms
(c) convert inorganic materials into organic compounds (d) do not breakdown organic compounds
38. If a grasshopper is eaten by a frog, then the energy transfer will be from
(a) producer to decomposer (b) producer to primary consumer
(c) primary consumer to secondary consumer (d) secondary consumer to primary consumer
39. Disposable plastic plates should not be used because
(a) they are made of materials with light weight (b) they are made of toxic materials
(c) they are made of biodegradable materials (d) they are made of non-biodegradable materials
40. From the list given below pick the item that is not a natural resource
(a) Soil (b) Water (c) Electricity (d) Air
41. The most rapidly dwindling natural resource in the world is
(a) water (b) forests (c) wind (d) sunlight
42. The most appropriate definition of a natural resource is that it is a substance/commodity that is
(a) present only on land (b) a gift of nature which is very useful to mankind

- (c) a man-made substance placed in nature (d) available only in the forest
43. The main cause for abundant coliform bacteria in the river Ganga is
(a) disposal of unburnt corpses into water (b) discharge of effluents from electroplating industries
(c) washing of clothes (d) immersion of ashes
44. The pH of water sample collected from a river was found to be acidic in the range of 3.5 – 4.5, on the banks of the river were several factories that were discharging effluents into the river. The effluents of which one of the following factories is the most likely cause for lowering the pH of river water?
(a) Soap and detergent factory (b) Lead battery manufacturing factory
(c) Plastic cup manufacturing factory (d) Alcohol distillery
45. The pH range most conducive for life of fresh water plants and animals is
(a) 6.5 – 7.5 (b) 2.0 – 3.5 (c) 3.5 – 5.0 (d) 9.0 – 10.5
46. The three R's that will help us to conserve natural resources for long term use are
(a) recycle, regenerate, reuse (b) reduce, regenerate, reuse
(c) reduce, reuse, redistribute (d) reduce, recycle, reuse
47. Given below are a few statements related to biodiversity. Pick those that correctly describe the concept of biodiversity
(i) Biodiversity refers to the different species of flora and fauna present in an area
(ii) Biodiversity refers to only the flora of a given area
(iii) Biodiversity is greater in a forest
(iv) Biodiversity refers to the total number of individuals of a particular species living in an area
(a) (i) and (ii) (b) (ii) and (iv) (c) (i) and (iii) (d) (ii) and (iii)
48. Among the statements given below select the ones that correctly describe the concept of sustainable development
(i) Planned growth with minimum damage to the environment
(ii) Growth irrespective of the extent of damage caused to the environment
(iii) Stopping all developmental work to conserve the environment
(iv) Growth that is acceptable to all the stakeholders
(a) (i) and (iv) (b) (ii) and (iii) (c) (ii) and (iv) (d) (iii) only
49. In our country, vast tracts of forests are cleared and a single species of plant is cultivated. This practice promotes
(a) biodiversity in the area (b) monoculture in the area
(c) growth of natural forest (d) preserves the natural ecosystem in the area
50. A successful forest conservation strategy should involve
(a) protection of animals at the highest trophic level
(b) protection of only consumers
(c) protection of only herbivores
(d) comprehensive program to protect all the physical and biological components

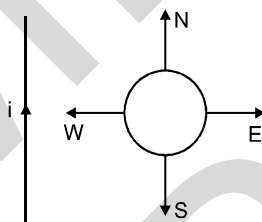
2. PHYSICS

PART - II

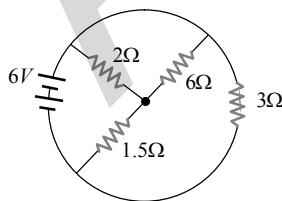
SECTION – 1 : (Maximum Marks : 45)

- This section contains **FIFTEEN** questions
- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four option is correct

51. Two particles having charges q_1 and q_2 when kept at a certain distance, exert force F on each other. If distance is reduced to half, force between them becomes :
- (A) $F/2$ (B) $2F$ (C) $4F$ (D) $F/4$
52. A cylindrical bar magnet is kept along the axis of a circular coil. If the magnet is rotated about its axis, then
- (A) A current will be induced in a coil (B) No current will be induced in a coil
(C) Only an e.m.f. will be induced in the coil (D) An e.m.f. and a current both will be induced in the coil
53. An object A is placed at a distance d in front of a plane mirror. If one stands directly behind the object at distance S from the mirror, then the distance of the image of A from the individual is :
- (A) $2S$ (B) $2d$ (C) $S + d$ (D) $S + 2d$
54. If a wire of resistance 1Ω is stretched to double its length, then the resistance will become :
- (A) 3Ω (B) 2Ω (C) 5Ω (D) 4Ω
55. A circular loop of wire is in the same plane as an infinitely long wire carrying a constant current i . Four possible motions of the loop are marked by N,E,W and S as shown :

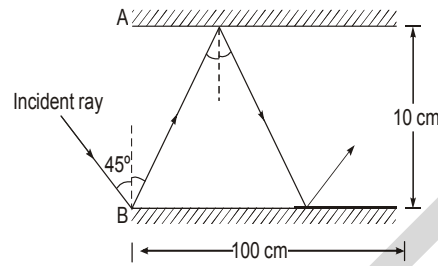


- (A) N (B) E (C) W (D) S
56. Which of the following would you prefer to read very small letters printed on a page of dictionary?
- (A) A convex lens of focal length 100 cm
(B) A concave lens of focal length 10 cm
(C) A concave lens of focal length 5 cm
(D) A convex lens of focal length 5 cm.
57. The total current supplied to the circuit by the battery is



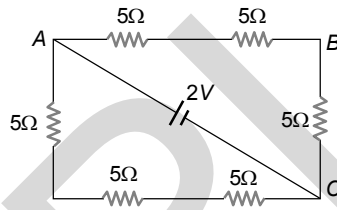
- (A) 1 A (B) 2 A (C) 4 A (D) 6 A
58. The direction of the force on a current-carrying wire placed in a magnetic field depends on :
- (A) the direction of the current but not on the direction of the field
(B) the direction of the field but not on the direction of the current
(C) the direction of the current as well as the direction of field
(D) neither the direction of the current nor the direction of the field.

59. Two parallel plane mirrors A and B are placed at a separation 10 cm as shown in figure. A ray incident on the corner of mirror B at an angle of incidence 45° . Find the number of times this rays is reflected from mirror A :



- (A) 4 (B) 5 (C) 6 (D) 7

60. The potential difference between points A and B of adjoining figure is



- (A) $\frac{2}{3}V$ (B) $\frac{8}{9}V$ (C) $\frac{4}{3}V$ (D) $2V$

61. According to Faraday's law, the total charge induced in a conductor that is moved in a magnetic field depends upon :

- (A) initial magnetic flux (B) final magnetic flux
(C) rate of change of magnetic flux (D) change in magnetic flux

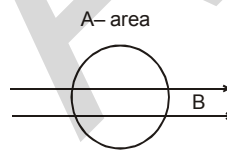
62. When viewed vertically a fish appears to be 4 metre below the surface of the lake. If the index of refraction of water is 1.33, then the true depth of the fish is :

- (A) 5.32 metres (B) 3.32 metres (C) 4.32 metres (D) 6.32 metres

63. If $Q = 2$ coulomb and force on it is $F = 100$ newton, then the value of electric field intensity will be:

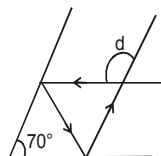
- (A) 100 N/C (B) 50 N/C (C) 200 N/C (D) 10 N/C

64. A coil is placed in a constant magnetic field. The plane of the coil is parallel to magnetic field as shown in figure then the flux passing through coil will be :



- (A) BA (B) $\frac{BA}{2}$ (C) zero (D) infinity

65. A ray of light is incident on system of mirror as shown in the adjacent figure. What is the total deflection (d) of the ray when it emerges out after two reflections ?



- (A) 220° (B) 180° (C) 120° (D) 140°

CHEMISTRY
PART - III

SECTION – 1 : (Maximum Marks : 45)

- This section contains **FIFTEEN** questions
- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four option is correct

66. A method of obtaining oxygen, which illustrates a physical change and does not involve a chemical change, is :

- (A) electrolysis of water (B) decomposition of H_2O_2
(C) heating of potassium chlorate (D) distilling liquid air

67. Which of the following is not an open chain compound ?

- (A) Methane (B) Ethene (C) Toluene (D) Butyne

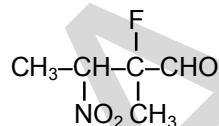
68. IUPAC name of the compound $CH_3-\underset{\text{OH}}{\text{CH}}-\text{CH}_2-\overset{\text{CH}_3}{\underset{\text{OH}}{\text{C}}}-CH_3$ is

- (A) 1,1-dimethylbutane-1,3-diol (B) 2-methylpentane-2,4-diol
(C) 1,3,3-trimethylpropane-1,3-diol (D) 1,3,3-trimethylpentane-2,4-diol

69. Alnico is a mixture of :

- (A) Fe, Al, Ni, Co (B) Fe, Cr, Ni, Co (C) Al, Ni, Co, Mn (D) Al, Cu, Mn, Mg

70. IUPAC name of the following compound is :



- (A) 1-Fluoro-1-methyl-2-nitrobutanal (B) 3-Nitro-2-fluoro-2-methylbutanal
(C) 2-Fluoro-2-methyl-3-nitrobutanal (D) None of these

71. Which of the following is combination reaction ?

- (A) $Fe + S \longrightarrow FeS$ (B) $2HgO \longrightarrow 2Hg + O_2$
(C) $Zn + \text{dil. } H_2SO_4 \longrightarrow ZnSO_4(\text{aq.}) + H_2$ (D) None of these

72. Which of the following pairs of elements does not belong to same group ?

- (A) Cl, Br (B) N, P (C) Mg, Ca (D) Al, Si

73. Which of the following aqueous solutions has highest pH value ?

- (A) Sodium chloride (B) Potassium carbonate
(C) Copper sulphate (D) Ammonium chloride

74. 1 carat is the amount equal to –

- (A) 200 kg (B) 200 gm (C) 200 mg (D) 20 mg

75. The IUPAC name of compound $CH_3-\text{CH}_2-\underset{\text{CH}_3}{\text{CH}}-\text{COOH}$ is :

- (A) Butan-3-oic acid (B) Butan-2-oic acid
(C) 3-Methylbutanoic acid (D) 2-Methylbutanoic acid

76. In the reaction $\text{Fe}_2\text{O}_3(\text{s}) + 3\text{CO}(\text{g}) \longrightarrow 3\text{CO}_2(\text{g}) + 2\text{Fe}(\text{s})$ reducing agent is :
(A) Fe_2O_3 (B) CO (C) Fe (D) CO_2
77. Which of the following is a correct pair according to increasing atomic number ?
(A) Na, Ne (B) Ca, Cl (C) Be, B (D) He, H
78. When a base is diluted with water :
(A) concentration of OH^- ions per unit volume increase.
(B) concentration of OH^- ions per unit volume decrease.
(C) concentration of OH^- ions per unit volume may increase or decrease depending upon the nature of the base.
(D) no change in concentration of OH^- ions per unit volume occurs.
79. Which of the following is a sulphide ore ?
(A) Bauxite (B) Haematite (C) Cuprite (D) Iron pyrites
80. In bio lab chemical used to preserve specimens is :
(A) formaldehyde (B) ether (C) formic acid (D) none

PART - IV (MENTAL ABILITY)

SECTION – 1 : (Maximum Marks : 60)

- This section contains **TWENTY** questions
- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four option is correct

Direction : Find the wrong term ?

81. 9, 54, 44, 264, 254, 1520, 1514

- (A) 1514 (B) 1520 (C) 264 (D) 44

Direction (82) : Find the missing term ?

82. CK 16 9 JR
OS 24 19 TX
KM ? ? PV

- (A) 56, 84 (B) 84, 56 (C) 21, 14 (D) 14, 21

83.

7	8	9
7	15	24
7	?	46

- (A) 33 (B) 23 (C) 22 (D) 14

84. If **MOON** is coded as **19** and **RED** is coded as **9**, how would you code **SISA** in the same code language?

- (A) 15 (B) 16 (C) 13 (D) 18

Directions : (85) Read the following information carefully and answer the questions :

- (i) Six flats on a floor in two rows, facing east and west are allotted to Q, R, S, T, U and V.
- (ii) R gets east side facing and not next to T.
- (iii) T and V get diagonally opposite flats.
- (iv) S next to V gets a west facing flat.
- (v) U gets a east facing flat.

85. Which of the following combination gets west facing flats ?

- (A) SQR (B) RTS (C) STU (D) QSV

Directions (86) : In each of the following questions, two statements are given followed by three or four conclusions numbered I, II, III and IV. You have to take the given statements to be true even if they seem to be at variance from the commonly known facts and then decide which of the given conclusions logically follows from the given statements disregarding commonly known facts.

86. Statements : All politicians are honest. All honest are fair.
Conclusions : I. Some honest are politician. II. No honest is politician.
III. Some fair are politician. IV. All fair are politician.
- (A) None follows (B) Only I follows
(C) Only I and II follow (D) Only I and III follow

Directions : (87) Read the following information and answer the question based on it :

In a school, there were five teachers. A and B were teaching Hindi and English C and B were teaching English and Geography. D and A were teaching Mathematics and Hindi. E and B were teaching History and French.

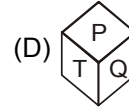
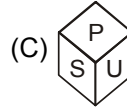
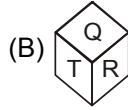
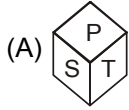
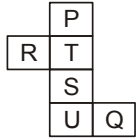
87. Who among the teachers was teaching maximum number of subjects ?

- (A) A (B) B (C) C (D) D

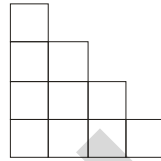
88. If Sripal's birthday falls on Thursday 20th March, 2000, then on which day of the week his birthday falls in the year 2001 ?

- (A) Wednesday (B) Friday (C) Saturday (D) Sunday

89. Which of the following dices is identical to the unfolded figure as shown here ?



90. How many squares are there in given figure :



(A) 12

(B) 14

(C) 13

(D) 11

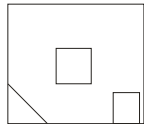
Directions : (91) Find the water-Image of the given term :

91. VAYU8436

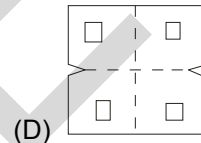
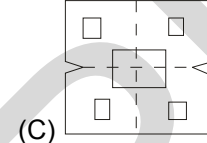
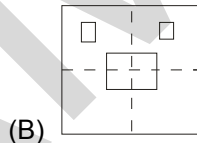
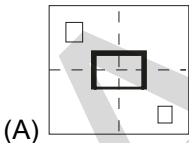


(D) None of these

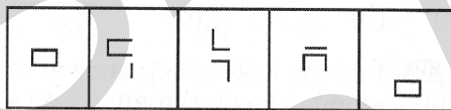
Directions : (92) A square transparent sheet with a pattern is given in figure X. Find out from amongst the alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



92.



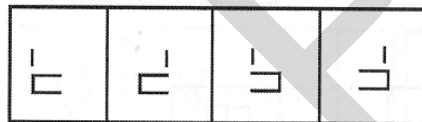
Directions : (93) There are two sets of figures namely problem figures containing five figures 1, 2, 3, 4, 5 and answer figures A, B, C, D. You have to select one figure from the answer set which will continue the same series as given in problem figures.



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

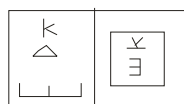
93.

Answer Figure

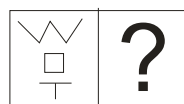


(A) (B) (C) (D)

Directions : (94) Figures 1 and 2 are related in a particular manner. Establish the same relationship between figures 3 and 4 by choosing a figure from amongst the four alternatives, which would replace the question mark in figure (4).

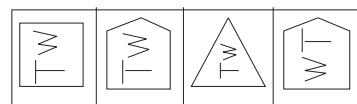


(1)



(3)

(4)



(A)

(B)

(C)

(D)

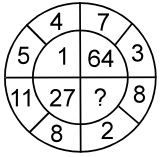
94.

Problem Figures

Answer Figures

Direction (95) Find the missing term.

95. 7, 19, 55, 163, _
 (A) 387 (B) 329 (C) 527 (D) 487
96. KTE, SBM, AJU, IRC, ?
 (A) KZQ (B) ZRL (C) QZK (D) LYJ

97. 
 (A) 125 (B) 216 (C) 121 (D) 225

98. If **SPECIAL** is coded as **KZHBODR** then **ORDINARY** would be ?
 (A) ZQBMHCSX (B) XQZOHCQN (C) XQZMHCQN (D) ZQBHOBQZ

Directions : (99) 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 the fat person.

99. Tall person is at which place counting from right ?
 (A) First (B) Second (C) Third (D) Fourth

Directions (100) : In the question below are given two statements followed by two conclusions numbered I and II. You have to take the given two statements to be true even if they seem to be at variance from commonly known facts. Read the conclusion and then decide which of the given conclusions logically follows from the two given statements, disregarding commonly known facts.

100. Statements : Some doctors are fools. Some fools are rich.
 Conclusions : I. Some doctors are rich. II. Some rich are doctors.
 (A) if only conclusion I follows (B) if only conclusion II follows
 (C) if neither conclusion I nor II follows (D) if both conclusions I and II follow.