



Class – IX

School Integrated Program

ENTRANCE TEST CUM SCHOLARSHIP TEST

[Time: 2 Hours]

[Max Marks: 400]

A. General:

1. *This booklet is a Question Paper containing 100 questions.*
2. *Blank Papers, Clipboards, Log Tables, slide rules, calculators, cellular phones, pagers and electronic gadgets in any form are not allowed to be carried inside the examination hall.*
3. *The answer sheet, a machine-readable optical mark recognition sheet (OMR Sheet), is provided separately.*
4. *DO NOT TAMPER WITH THE OMR OR THE BOOKLET.*
5. *Please fill your roll number correctly in the OMR sheet (answer sheet).*
6. *Both Question Paper and OMR Answer Sheet will be submitted after completion of this examination.*

B. Question Paper Format and marking scheme:

1. *The Question Paper consists of five parts (Part I: MAT, Part II: Physics, Part III: Chemistry, Part IV: Biology, Part V: Mathematics).*
2. *Each Question carries +4 marks for correct answer and -1 mark for incorrect answer.*

MAT

1. Pointing out to a photograph, a man tells his friend, " she is the daughter of the only son of my father's wife". How is the girl related to the man in the photograph?

(a) Daughter (b) Cousin (c) Mother (d) Sister

Direction (Q. 2-3) : Study the following information and answer the question given below. *S* and *R* are brothers. *T* is daughter of *S*. *U* is the spouse of *R* and mother of *Q*. *P* is the daughter of *V*, who is the spouse of *T*.

2. Who is the grand father of *P* ?

(a) *U* (b) *S* (c) *R* (d) *V*

3. Who is the cousin of ?

(a) *T* (b) *V* (c) *R* (d) *P*

Direction (Q. 4-6) : Complete the following series

4. 16, 33, 67, 135,

(a) 251 (b) 259 (c) 271 (d) 289

5. 5, 9, 16, 29, 54,

(a) 103 (b) 105 (c) 109 (d) None of these

6. $ab - -da - bcda - cd - bcd$

(a) bcbbaab (b) bcabbab (c) babbbab (d) bcbbbab

7. In a certain code language, the word 'RECTANGLE' is coded as TGEVCPING, then how is the word 'RHOMBUS' coded ?

(a) TJOQDWV (b) UVWTJQN (c) TJQODWU (d) JTQOEWN

8. In a certain code, RADIO is XZOPL and SHEET is NBGGI, then HEATER is coded as ?

(a) BNGZIX (b) BGZGIX (c) BGZIGX (d) GZBIXZ

9. If $\times$ means $\div$, $-$ means $\times$, $\div$ means $+$ and $+$ means $-$ then $(3 - 15 \div 19) \times 8 + 6 = ?$

(a) -1 (b) 2 (c) 4 (d) 8

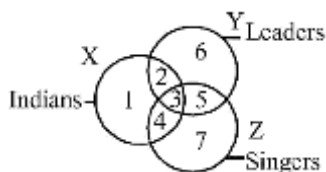
10. A man leaves for his office from his house. He walks towards East. After moving a distance of 20 m, he turns south and walks 10 m. Then he walks 35 m towards the west and further 5 m towards the North. He then turns towards east and walks 15 m. What is the straight distance (in metres) between his initial and final positions?

(a) 0 (b) 5
(c) 10 (d) Cannot be determined

11. Choose the correct alternative that represents the relationship among illiterates, poor people and unemployed.

(a)  (b)  (c)  (d) 

Direction (Q. 12-13) : Study the following figure carefully and answer the given questions:



12. Which region denotes Indian leaders who are not singers?

(a) 2 (b) 3 (c) 4 (d) 5

13. Which region represents Indian leaders who are singers?

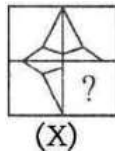
(a) 2 (b) 3 (c) 4 (d) 5

14. What is the angle between the 2 hands of the clock at 8:24pm ?
 (a) 100° (b) 107° (c) 106° (d) 108°
15. The year next to 1991 having the same calendar as that of 1990 is -
 (a) 1998 (b) 2001 (c) 2002 (d) 2003
16. Select a figure from the four alternatives, which when placed in the blank space of figure (X) would complete the pattern.



- (a) (b) (c) (d)

17. In the following question, select a figure from amongst the four alternatives, which when placed in the blank space of fig. (X) would complete the pattern.



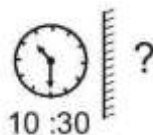
- (a) (b) (c) (d)

18. Find the correct option for the mirror image for the following question.



- (a) MAERD (b) DREAM (c) MAERD (d) MAERD

19. Rotate the mirror image of the given clock 90° clockwise and the time will be.



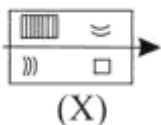
- (a) 4:45 (b) 5:45 (c) 2:30 (d) 1:45

20. Find the correct option for the water image for the following question.



- (a) PLEDGE (b) PLEDGE
 (c) PLEDGE (d) PLEDGE

21. Find the correct option for the water image for the following question.



- (a) (b) (c) (d)

Direction (Q. 22-23) : Consider the three figures, marked A, B, and C showing one fold in A , another in B and the cut in C . From amongst the four alternative figures a, b, c and d , select the one showing the unfolded position of C .

22.

(A)

(B)

(C)

(a)

(b)

(c)

(d)

23.

(A)

(B)

(C)

(a)

(b)

(c)

(d)

Direction (Q. 24-25) : In each of the following questions, you are given a figure (X) followed by four alternative figures (a), (b), (c) and (d) such that fig. (X) is embedded in one of them. Trace out the alternative figure which contains fig. (X) as its part.

24.

(X)

(a)

(b)

(c)

(d)

25.

(X)

(a)

(b)

(c)

(d)

26. In the following question, from amongst the figures marked (a), (b), (c) and (d), select the one which satisfies the same conditions of placement of the dot as in fig. (X).

(X)

(a)

(b)

(c)

(d)

27. In the question below are given two statements followed by 2 conclusions numbered I & 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.

Statements: Some hens are cows. All cows are horse.

Conclusion:

- | | |
|--|--|
| I. Some horses are hens. | II. Some hens are horses. |
| (a) If only conclusion I follows | (b) If only conclusion II follows |
| (c) If both conclusion I & II follows. | (d) If neither conclusion I nor II follows |

Direction (Q. 28-30) : A number arrangement machine, when given a particular input, rearranges it following a particular rule. The following is the illustration of the input and the steps of arrangement:

Input: 245, 316, 436, 519, 868, 710, 689

Step I: 710, 316, 436, 519, 868, 245, 689

Step II: 710, 316, 245, 519, 868, 436, 689

Step III: 710, 316, 245, 436, 868, 519, 689

Step IV: 710, 316, 245, 436, 519, 868, 689

Step IV is the last step for the given input.

28. If ' 655,436,764,799,977,572,333 ' is the input, which of the following steps will be ' 333,436,572,655,977,764, 799 ' ?

- | | | | |
|------------|-----------|------------|-----------|
| (a) Second | (b) Third | (c) Fourth | (d) First |
|------------|-----------|------------|-----------|

29. How many steps will be required to get the final output from the following input?

Input: 544, 653, 325, 688, 461, 231, 857

- | | | | |
|-------|-------|-------|-------|
| (a) 5 | (b) 4 | (c) 3 | (d) 6 |
|-------|-------|-------|-------|

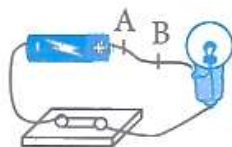
30. For the given input, which of the following will be the third step?

Input: 236, 522, 824, 765, 622, 463, 358

- | | |
|---------------------------------|---------------------------------|
| (a) 522,236,765,824,622,463,358 | (b) 522,622,236,824,765,463,358 |
| (c) 522,622,236,765,824,463,358 | (d) 522,622,236,463,824,765,358 |

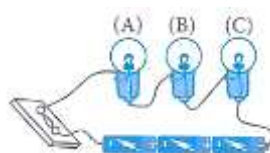
PHYSICS

31. When current flows through the copper wire *AB* (see figure), how does the wire behave?



- | | |
|--|--------------------------|
| (a) Deflects a magnetic needle placed near it. | (b) Becomes red hot. |
| (c) Gives electric shock. | (d) Behaves like a fuse. |

32. Then the switch is turned ON in the circuit with bulbs A, B, and C (as shown), which of the following statements is true?



- | |
|--|
| (a) Bulb C glows before the others. |
| (b) Bulbs B and C glow together, and bulb A glows after a delay. |

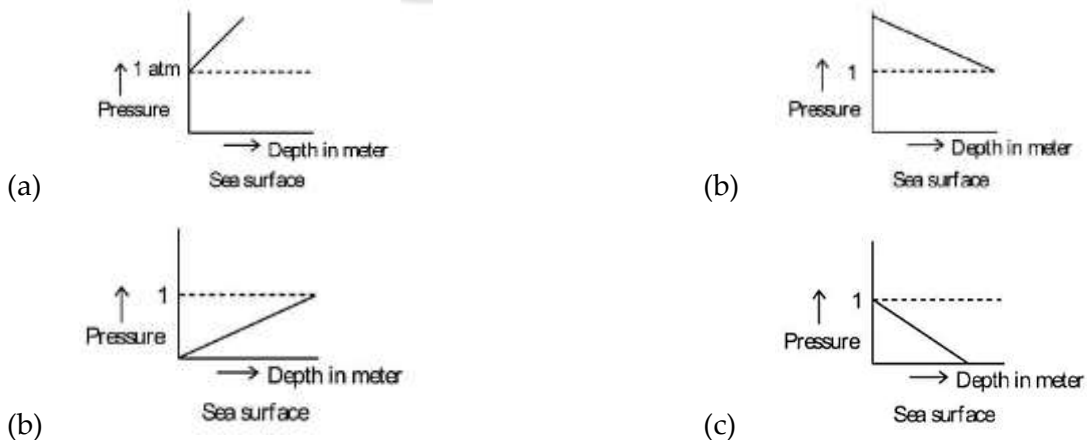
- (c) All bulbs A, B, and C light up at the same moment.
 (d) The bulbs light up one after another in the order A, then B, then C.

33. Match the column

Column - A		Column - B	
A.	A cell	a.	Study of electric charges at rest
B.	Bulb	b.	Close or open an electric circuit
C.	Static electricity	c.	Substitute for fuse
D.	Switch	d.	
E.	MCBs	e.	Avoid unauthorized use of current
F.	Main fuse at kWh meter	f.	Converts chemical energy into electrical energy

- (a) $A \rightarrow f; B \rightarrow d; C \rightarrow a; D \rightarrow b; E \rightarrow c; F \rightarrow e$
 (b) $A \rightarrow b; B \rightarrow e; C \rightarrow a; D \rightarrow f; E \rightarrow c; F \rightarrow d$
 (c) $A \rightarrow f; B \rightarrow d; C \rightarrow e; D \rightarrow b; E \rightarrow f; F \rightarrow a$
 (d) $A \rightarrow d; B \rightarrow f; C \rightarrow c; D \rightarrow b; E \rightarrow a; F \rightarrow e$

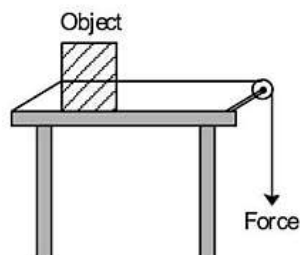
34. A body submerged in the sea is brought up to its surface. Which of the following graphs represents correctly the variation of the pressure on the body with increase in the depth.



35. Four forces are acting on a body. If the body doesn't change its position or shape, the forces:

- (a) Must be of equal magnitude (b) Must be parallel & opposite
 (c) Must add up to zero when taken as vectors (d) Must be in a single line

36. A force of 5 N is required to move an object from rest. The maximum value of static friction (f) acting on the body will be:



- (a) 5 N (b) $f > 5 \text{ N}$ (c) $f < 5 \text{ N}$ (d) 10 N

37. When a ball is left rolling on ground it stops after some time. What bring the rolling ball to rest?
- (a) Force of friction (b) Gravitational force
(c) Air drag (d) Buoyant force

38. Match the column

Column - A		Column - B	
A.	A battery	a.	Good conductor
B.	Metal	b.	Mechanical energy is converted into electric energy
C.	A generator	c.	
D.	Filament bulb	d.	Heating effect of electricity
E.	Ammeter	e.	

- (a) A → e; B → a; C → b; D → d; E → c (b) A → d; B → a; C → b; D → e; E → c
(c) A → a; B → e; C → b; D → d; E → c (d) A → e; B → a; C → c; D → d; E → b
39. Which one of the following is not used to reduce friction.
- (a) Oil (b) Ball bearings (c) Sand (d) Graphite
40. Which of the following is not an example of force acting at a distance ?
- (a) Force of gravity (b) Magnetic force
(c) Electric force (d) Frictional force
41. Frictional force between two surface in contact is due the
- (a) Adhesive force between the molecules
(b) Cohesive force between the molecules
(c) Repulsive forces between the molecules
(d) Both 2 and 3
42. A perpendicular force is applied to a certain area and produces a pressure P . If the same force is applied to a twice bigger area, the new pressure on the surface is:
- (a) $\frac{P}{2}$ (b) $\frac{P}{3}$ (c) $\frac{P}{4}$ (d) None
43. The force between two charge bodies is called
- (a) Muscular force (b) Gravitational force
(c) Magnetic force (d) Electrostatic force
44. It is recommended that the air pressure in motor car tyres be reduced for a motion of the motor cars on sand because inflated tyres cause
- (a) High pressure on the sand deflated tyres cause
(b) High pressure on the sand
(c) Inflated tyres cause low pressure on the sand
(d) Deflated tyres cause low pressure on the sand
45. Tick the most appropriate answer:
A car skids on a wet or muddy road due to
- (a) Increased friction between the road and the tyres
(b) Lubrication of brakes on a wet road
(c) Reduced friction between the road and the tyres
(d) Streamlined shape of the car

CHEMISTRY

46. How can the volume of an irregular solid be measured?
- (a) Using a balance
 - (b) Using a measuring cylinder and water displacement method
 - (c) Using a thermometer
 - (d) Using a ruler only
47. The component present in larger quantity in a solution is called
- (a) Solute
 - (b) Solvent
 - (c) Mixture
 - (d) Compound.
48. A solution that can dissolve more solute at a given temperature is called:
- (a) Concentrated solution
 - (b) Saturated solution
 - (c) Dilute solution
 - (d) Unsaturated solution.
49. Which technique would best separate a mixture of gases present in air based on the lowest boiling point?
- (a) Diffusion
 - (b) Fractional liquefaction
 - (c) Filtration
 - (d) Solvent extraction
50. A mixture of ink and alcohol is given to a student for separation. Which technique would fail?
- (a) Chromatography
 - (b) Evaporation
 - (c) Fractional distillation
 - (d) Filtration
51. Which statement about element is correct?
- (a) They can be broken into simpler substance by physical methods.
 - (b) They are made of identical atoms.
 - (c) They are always compounds.
 - (d) They exist only in liquid state.
52. A student states: "All minerals are elements because they occur naturally." Identify the error.
- (a) Minerals cannot occur naturally.
 - (b) Minerals are always metals.
 - (c) Most minerals are compounds, not elements.
 - (d) Minerals have no fixed composition.
53. Which two elements are liquids at room temperature?
- (a) Mercury and bromine
 - (b) Helium and oxygen
 - (c) Nitrogen and hydrogen
 - (d) Sodium and chlorine
54. Which of the following best describes the arrangement and attractive forces between particles in a gas jar filled with oxygen?
- (a) Particles are closely packed and orderly; attractive forces are weak.
 - (b) Particles are not arranged in any order; attractive forces are weak.
 - (c) Particles are not arranged in any order; attractive forces are strong.
 - (d) Particles are closely packed and orderly; attractive forces are strong.
55. What happens to the volume of an aqueous solution when a small amount of sugar is dissolved in it?
- (a) Volume increase
 - (b) No change
 - (c) Volume decrease
 - (d) Volume first decreases then increases
56. The process of converting liquid into solid is called
- (a) Boiling
 - (b) Melting
 - (c) Condensation
 - (d) Freezing.
57. Which of the following has the strongest interparticle force of attraction at room temperature?
- (a) Nitrogen
 - (b) Water
 - (c) Iron
 - (d) Chalk

58. In liquids, there is ___ and ___ between particles than in solids.
- (a) Strong force of attraction, more spacing
 - (b) Weaker force of attraction, less spacing
 - (c) Weaker force of attraction, more spacing
 - (d) Strong force of attraction, less spacing.
59. ORS solution tastes the same in every sip because it is a
- (a) Non-uniform mixture
 - (b) Heterogeneous mixture
 - (c) Uniform mixture
 - (d) Pure substance
60. When chalk powder is mixed with water, the mixture formed is
- (a) Solution
 - (b) Uniform mixture
 - (c) Non-uniform mixture
 - (d) Compound.

BIOLOGY

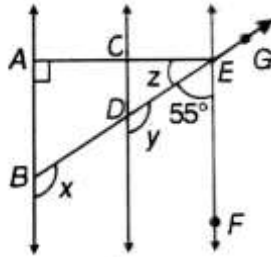
61. Which cell organelle is known as the "Brain of the cell"?
- (a) Mitochondria
 - (b) Nucleus
 - (c) Vacuole
 - (d) Cell wall
62. Which of the following is found only in plant cells and NOT in animal cells?
- (a) Cell membrane
 - (b) Cytoplasm
 - (c) Chloroplast
 - (d) Nucleus
63. What is the jelly-like substance present inside the cell membrane called?
- (a) Cytoplasm
 - (b) Cell wall
 - (c) Nucleolus
 - (d) Chromosome
64. Which microorganism is used to turn milk into curd?
- (a) Amoeba
 - (b) Lactobacillus bacteria
 - (c) Yeast
 - (d) Penicillium
65. Mushrooms and molds belong to which group of microorganisms?
- (a) Bacteria
 - (b) Viruses
 - (c) Fungi
 - (d) Algae
66. Diseases that can spread from an infected person to a healthy person through air, water, or food are called:
- (a) Chronic diseases
 - (b) Communicable diseases
 - (c) Non-communicable diseases
 - (d) Genetic diseases
67. Which insect acts as the carrier (vector) for the malaria-causing parasite?
- (a) Housefly
 - (b) Female Anopheles mosquito
 - (c) Aedes mosquito
 - (d) Butterfly
68. Which of the following is a non-communicable disease (cannot spread from person to person)?
- (a) Common Cold
 - (b) Tuberculosis
 - (c) Diabetes
 - (d) Chickenpox
69. Deficiency of Iron in our daily diet causes which of the following diseases?
- (a) Scurvy
 - (b) Anemia
 - (c) Rickets
 - (d) Goitre
70. Green plants are called "Producers" because they can make their own food by which process?
- (a) Respiration
 - (b) Transpiration
 - (c) Photosynthesis
 - (d) Evaporation

71. In a food chain, what role do organisms like bacteria and fungi play?
 (a) Producers (b) Herbivores
 (c) Carnivores (d) Decomposers
72. Animals that eat only plants are classified as:
 (a) Carnivores (b) Herbivores
 (c) Omnivores (d) Predators
73. Which gas is most abundant in Earth's atmosphere?
 (a) Oxygen (b) Carbon dioxide
 (c) Nitrogen (d) Hydrogen
74. The layer of air that surrounds the Earth like a blanket is called the:
 (a) Hydrosphere (b) Atmosphere
 (c) Lithosphere (d) Biosphere
75. Large-scale cutting down of trees is known as:
 (a) Afforestation (b) Deforestation
 (c) Reforestation (d) Agriculture

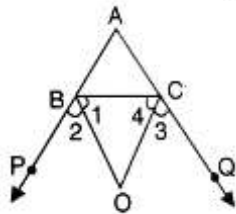
MATHEMATICS

76. Convert the decimal $0.\overline{148576}$ into $\frac{p}{q}$ form.
 (a) $\frac{1}{999999}$ (b) $\frac{14857}{999}$ (c) $\frac{148576}{9999}$ (d) $\frac{148576}{999999}$
77. $\sqrt{3 + \sqrt{5}} =$
 (a) $\sqrt{\frac{5}{2} + \frac{1}{2}}$ (b) $\frac{\sqrt{5}}{2} + 1$ (c) $\sqrt{\frac{5}{2}} + \sqrt{\frac{1}{2}}$ (d) $\sqrt{5} + \frac{1}{\sqrt{2}}$
78. If $9^{x+2} = 240 + 9^x$, find x .
 (a) 0.5 (b) 0.2 (c) 0.4 (d) 0.1
79. Find the value of $\frac{(0.6)^0 - (0.1)^{-1}}{\left(\frac{3}{8}\right)^{-1} \left(\frac{3}{2}\right)^3 + \left(\frac{-1}{3}\right)^{-1}}$.
 (a) $-\frac{2}{3}$ (b) $\frac{3}{2}$ (c) $-\frac{3}{2}$ (d) $\frac{2}{3}$
80. If 12 pens cost ₹180, what is the cost of 7 such pens?
 (a) ₹105 (b) ₹120 (c) ₹95 (d) ₹110
81. If $p = x + y$ and $q = x - y$, then find the value of expression $\frac{p+q}{p-q} - \frac{p-q}{p+q}$
 (a) $\frac{x-y}{xy}$ (b) $\frac{x^2-y^2}{xy}$ (c) $\frac{x^2+y^2}{xy}$ (d) $\frac{x+y}{xy}$
82. In a birthday party, on average 5 bottles of Coke are served for a group of 6 children. How many friends were present at Mohit's party if 15 bottles of Coke were used ?
 (a) 18 (b) 24 (c) 30 (d) 12
83. If p, q, r and s are proportional, then $\frac{p+q}{p-q}$ is equal to
 (a) $\frac{q}{p}$ (b) $\frac{r-s}{r+s}$ (c) $\frac{s}{r}$ (d) $\frac{r+s}{r-s}$
84. Find the value of $\sqrt{1053 - \sqrt{860 - \sqrt{378 - \sqrt{289}}}}$
 (a) 36 (b) 38 (c) 34 (d) 32
85. If $(1^2 + 2^2 + 3^2 + 4^2 + 5^2)^2 = \frac{1}{P}$, then P is
 (a) $\frac{1}{3125}$ (b) 3125 (c) $\frac{1}{3025}$ (d) 3025

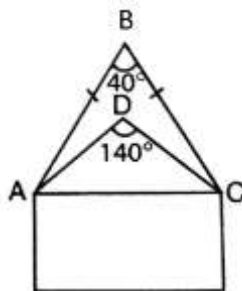
86. If A and B are real numbers and $A^2 + B^2 = 0$, then
 (a) $A > 0, B < 0$ (b) $A < 0, B > 0$ (c) $A = 0 = B$ (d) $A = -B$
87. The value of $(7^{-1} - 8^{-1})^{-1} - (3^{-1} - 4^{-1})^{-1}$ is
 (a) 56 (b) 12 (c) 68 (d) 44
88. When $5 \times 10^{-3} - 2000 \times 10^{-6}$ is expressed in standard form, we will get
 (a) 3×10^{-2} (b) 3×10^{-3} (c) 3×10^3 (d) 3×10^2
89. Five times a number is equal to twice the number increased by 18, then the number is
 (a) 20 (b) 12 (c) 6 (d) 50
90. In the given figure, $AB \parallel CD$ and $CD \parallel EF$. Also $EA \perp AB$. If $\angle BEF = 55^\circ$, find the value of $x - z$.



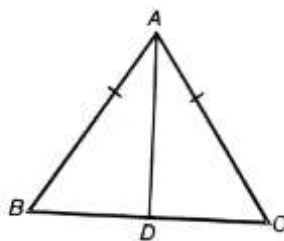
- (a) 0° (b) 50° (c) 80° (d) 90°
91. In the given figure, BO and CO are angle bisectors of external angles of $\triangle ABC$. Find $\angle BOC$.



- (a) $90^\circ - \frac{1}{2}\angle A$ (b) $90^\circ + \frac{1}{2}\angle A$ (c) $180^\circ - \frac{1}{2}\angle A$ (d) $180^\circ + \frac{1}{2}\angle A$
92. Triangle ABC and ADC are isosceles with $AB = BC$ and $AD = DC$. Point D is inside $\triangle ABC$, $\angle ABC = 40^\circ$ and $\angle ADC = 140^\circ$. The degree measure of $\angle BAD$, is

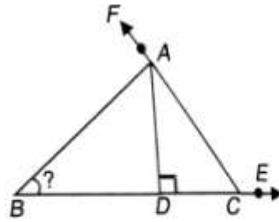


- (a) 20° (b) 30° (c) 40° (d) 50°
93. In the figure given $AB = AC$ and $\overline{AD}$ bisects $\angle A$. Which of the following is true?
 (a) $\angle ADB = 90^\circ$ (b) $BD = CD$ (c) $AB = BC$

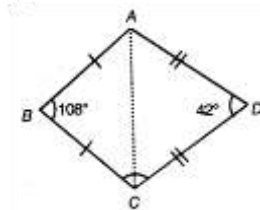


- (a) Only (a) (b) Only (b)
 (c) Both (a) and (b) (d) All (a), (b) and (c)

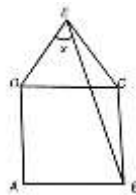
94. In $\triangle ABC$, AD is the altitude from A to the side BC . $\overline{BC}$ is produced to E , and $\overline{CA}$ is produced to F . $\angle ACE = \frac{5}{2}\angle DAC$ and $\angle BAF = \frac{5}{3}\angle DAC$, then find $\angle ABC$.



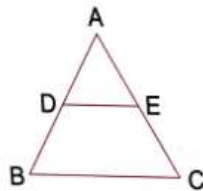
- (a) 35° (b) 45° (c) 70° (d) 90°
95. In the given figure, $ABCD$ is a quadrilateral in which $AB = BC$ and $AD = DC$. Find the measure of $\angle BCD$.



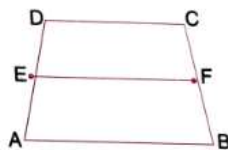
- (a) 150° (b) 30° (c) 105° (d) 72°
96. In the figure given below, equilateral triangle EDC surmounts square $ABCD$. Find the angle DEB represented by x .



- (a) 60° (b) 15° (c) 30° (d) 45°
97. From the diagram below, if D and E are midpoints of the lines AB and AC , respectively and if $DE \parallel BC$, then what is the relation between DE and BC ?



- (a) $DE = BC$
 (b) $3DE = BC$
 (c) $2DE = BC$
 (d) There is no definite relation between DE and BC
98. In the given figure, $ABCD$ is a trapezium in which side AB is parallel to side DC and E is the midpoint of side AD . If F is a point on the side BC such that the segment EF is parallel to side DC then



- (a) $EF = \frac{1}{2}(AB + DC)$ (b) $EF = \frac{1}{2}(AB - DC)$
 (c) $EF = 2(AB - DC)$ (d) $EF = 2(AB + DC)$

99. In a quadrilateral $ABCD$, bisectors of $\angle B$ and $\angle D$ meet CD and AB produced at P and Q respectively then

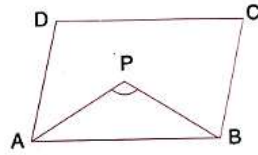
(a) $\angle P + \angle Q = \frac{1}{2}(\angle ABC + \angle ADC)$

(b) $\angle P + \angle Q = \frac{1}{2}(\angle ABC - \angle ADC)$

(c) $\angle P + \angle Q = 2(\angle ABC + \angle ADC)$

(d) None of these

100. If AP and BP are the bisectors of the angle A and angle B of a parallelogram $ABCD$, then value of the angle APB is:



(a) 30°

(b) 45°

(c) 60°

(d) 90°