Talent & Olympiad

Congruence of Triangles

Multiple Choice Questions

- 1. In $\triangle ABC$, AB = AC and AD is perpendicular to BC. State the property by which $\triangle ADB = \triangle ADC$. (a) S.A.S. property (b) S.S.S. property (c) R.H.S. property (d) A.S.A, property
- 2. 2Two students drew a line segment each.What is the condition for them to be congruent?(a) They should be drawn with a scale.
 - (b) They should be drawn on the same sheet of paper.
 - (c) They should have different lengths.
 - (d) They should have the same length.
- **3.** In the given figure, if AD = BC and AD || BC, which of the following is true?



4. In $\triangle PQR$ and $\triangle XYZ$, $\angle P = 50^{\circ}$, XY = PQ, and XZ = PR. By which property are $\triangle XYZ$ and $\triangle PQR$ congruent?

(a) S.S.S. property	(b) S.A.S. property
(c) A.S.A. property	(d) R.H.S. property

5. A: Two triangles are said to be congruent if two sides and an angle of one triangle are respectively equal to the two sides and an angle of the other.

R : Two triangles are congruent if two sides and the included angle of one are equal to the corresponding two sides and included angle of the other.

Given A & R, which of the following statements is correct?

- (a) A is false and R is the correct explanation of A.
- (b) A is true and R is the correct explanation of A.
- (c) A is true and R is false.
- (d) A is false and R is true.
- **6.** Two triangles, A PQR and ADEF are of the same size and shape. What can we conclude about them?
 - (a) ΔPQR is smaller than ΔDFE .
 - (b) ΔPQR is larger than ΔDFE .
 - (c) ΔPQR is congruent to ΔDFE .
 - (d) ΔPQR is not congruent to ΔDFE .
- **7.** Which of the following examines the congruence of plane figures?
 - (a) Trial and error method
 - (b) Superposition method
 - (c) Substitution method
 - (d) Transposition method
- **8.** Which of the following is a pair of congruent figures?

(a) A regular pentagon and a regular hexagon.

(b) A rhombus and a square.

(c) Two equilateral triangles of the same length of their sides.

(d) A quadrilateral and a rectangle.

9. A In $\triangle ABC$ and $\triangle PQR$, $AB = x \ cm$, $BC = y \ cm$ and $CA = z \ cm$. What are the measures of sides PQ, QR and RP of $\triangle PQR$ if $\triangle ABC \cong \triangle ABC \cong \triangle PQR$?

	PQ	QR	RP
(A)	x cm	y cm	z cm
(B)	y cm	x cm	z cm
(C)	x cm	z cm	y cm
(D)	z cm	x cm	y cm

(10-11): In the given figure, AD = CD and AB = CB.



- **10.** What are the three pairs of equal parts? (a) $\angle ADB = \angle CDB, \angle ABD = \angle CBD; BD = BD$
 - (b) AD = AB, DC = CB, BD = BD
 - (c) AB = CD, AD = BC, BD = BD
 - $(d) \angle ADB = \angle CDB, \angle ABD = \angle CBD; \angle DAB = \angle DBC$
- **11.** Which of the following is the correct conclusion?
 - (a) $\triangle ABC$ and $\triangle CBD$ are isosceles triangles.
 - (b) BD bisects $\angle ADC$.
 - (c) BD bisects $\angle BAD$
 - (d) $\Delta\!A\!B\!C$ and $\Delta\!C\!B\!D$ are equilateral triangles.
- **12.** In the given figure, AB = AC and AD is the bisector of $\angle BAC$.



Which among the following statements is true?

(a) $\Delta ADB \cong \Delta ABC$	(b) $\triangle ADC \cong \triangle ABC$
(c) $\angle B = \angle C$	(d) $\angle ABC = \angle CAB$

- In ΔABC and ΔDEF, AC = DF, AB = DE and BC = EF. By which property are ΔABC and ΔDEF congruent?
 (a) R.H.S. property
 (b) S.S.S. property
 (c) S.A.S. property
 (d) A.S.A. property
- **14.** For the triangles $\triangle ART$ and $\triangle PEN$ given, if S.A.S. criterion should be used given $\angle T = \angle N$ what are the respective measures of PN and RT?



- **15.** Which of the following is an example of A.S.A. criterion of congruency for two triangles $\angle ADB$ and $\angle DEF$?
 - (a) AB = EF, $\angle B = \angle E$ and $\angle C = \angle F$
 - (b) BC = EF, $\angle B = \angle E$ and $\angle C = \angle F$
 - (c) AC = EF, $\angle B = \angle D$ and $\angle C = \angle F$
 - (d) AC = DE, $\angle B = \angle D$ and $\angle C = \angle F$
- **16.** In the figure given, AC = BD and $\angle BAC = \angle CDB = 90^{\circ}$



If $\triangle ABC = \triangle DCB$ by R.H.S. property which of the following is required?

(a) The measure of AB. (b) The measure of CD.

(c) The measure of BC. (d) AC = BD

- Which of the following criterion does not exist?
 (a) A.S.A. criterion
 (b) R.H.S. criterion
 (c) A.A.A. criterion
 (d) S.S.S. criterion
- 18. In two triangles, the three angles of one triangle are correspondingly equal to three angles of another triangle. Which of the following is a correct statement?
 - (a) One triangle is an enlarged copy of other.
 - (b) The two triangles are necessarily congruent.
 - (c) The two triangles are congruent by A.A.A. congruency criterion.
 - (d) All of the above.

(19-20): $\triangle ABC$ is congruent to $\triangle PQR$ under the correspondence $ABC \longleftrightarrow RQP$,

19. Which part corresponds to PQ?

(a) \overline{CB}	(b) <u>AC</u>
(c) \overline{QR}	(d) \overline{AB}

20. Which part of corresponds to RP?

(a) \overline{AB}	(b) \overline{AC}
(c) \overline{CA}	(d) \overline{BC}

- **21.** $\triangle ABC$ is congruent to $\triangle XYZ$. Find the measures
 - of $\angle x$ and $\angle y$ respectively.



- **22.** $\triangle ABC \cong \triangle FDE$ and $AB = 3 \ cm$, $EF = 8 \ cm$ and $DF = 10 \ cm$. What are the respective lengths of AC and DE in cm?
 - (a) 10,3 (b) 10,8
 - (c) 8,3 (d) 3,10

23. $\triangle ABC \cong \triangle FDE$ What is the measure of $\angle F$?



24. In the figure, PQ = PS and QR = SR. If ΔPQR is congruent to ΔPSR , which of the following is correct?



25. AB and AC are two chords of a circle with centre O as shown.



If $\triangle AOB$ is congruent to $\triangle AOC$, which of the following is correct?

- (a) $\angle OBA = \angle OCA$
- (b) $\angle AOC = \angle OCA$
- (c) AO = AC
- (d) AB = OC

26. A regular hexagon is divided into four triangles.



Which of the following is correct?

- (a) $\triangle ABF \cong \triangle EDF$ (b) $\triangle FDC \cong \triangle FCB$
- (c) $\triangle ABF \cong \triangle FBC$ (d) $\triangle FDC \cong \triangle BCF$

27. $\triangle ABC$ and $\triangle DEF$ are as shown.



By which condition of congruence is $\triangle ABC \cong \triangle DEF$? (a) S.S.S. condition (b) S.A.S. condition (c) R.H.S. condition (d) A.S.A. condition.

28. Given *AB* || CD and *AB* = CD, which of the following is correct?



29. $\triangle ABC$ is isosceles, AB = AC and $AD \perp BC$,



Which of the following is correct?

(a) $\triangle ADC \cong \triangle ADB$	(b) ∆ADBŹ∆ADB
(c) $\triangle ADB \cong \triangle ABC$	(d) $\triangle ABC \cong \triangle ADC$

30. Observe the triangles given in the figure.



State the condition under which $\triangle ABC \cong \triangle PQR$

(a) A.S.A.	(b) S.S.S.
(c) S.A.S.	(d) R.H.S.

31. In the given figure, AB = AC and AD = AE.



Which of the following statements is not true?

- (a) $\angle CAE = \angle BAD$ (b) $\triangle ACE = \triangle ABD$
- (c) $\triangle AEC = \triangle ABD$ (d) BE = DC
- **32.** ABCD is a parallelogram in which AB = DC and AD = BC.



By which condition of congruence of triangles is $\triangle ABD \cong \triangle CDB$?

(a) R.H.S.	(b) S.A.S.
(c) S.S.S.	(d) A.S.A.

33. Given ΔXYZ and ΔLMN .



Choose the correct statement.

- (a) $\Delta XYZ \cong \Delta LMN$ (b) YZ = LM
- (c) XY = MN (d) XZ = LM

34. Identify the incorrect statement.

(a) The corresponding sides of congruent triangles are equal.

(b) The corresponding angles of congruent triangles are equal.

(c) Two triangles cannot be congruent.

(d) There are four congruency conditions for congruence of triangles.

35. A By which congruency property are the two triangles PQS and PRS given in the following figure congruent?



(a) S.S.S. property(b) S.A.S. property(c) A.S.A. property(d) R.H.S. property

- **36.** In the following figure, two triangles ABC and EDC are such that AC = EC, BC = DC, $\angle E = 60^{\circ}$, $\angle DCE = 30^{\circ}$, and $\angle B = 90^{\circ}$, . By which property is $\triangle ABC \cong \triangle EDC$? (a) S.S.S. property (b) S.A.S. property (c) A.S.A. property (d) R.H.S. property
- **37.** For the congruence of $\triangle ABC$ and $\triangle PQR$, which one of the following sets of conditions is not sufficient?



- (a) $\angle ABC = \angle PQR$, a = p, c = r
- (b) $\angle CAB = \angle RPQ, \angle ABC = \angle PQR, c = r$
- (c) b = q, $\angle CAB = \angle RPQ$, a = p
- (d) $a = p, c = r, \angle ABC = \angle PQR$

- 38. Which of the following are congruent?(a) Two Rs. 1 coins
 - (b) A Rs. 1 coin and a Rs. 2 coin
 - (c) A Rs. 2 coin and a Rs. 5 coin
 - (d) A Rs. 5 coin and a Rs. 10 coin
- **39.** Which of the following is important in congruence of triangles?

(a) Naming the angles of the triangles using capital letters.

- (b) Measures of angles in degrees.
- (c) The order of letters of the triangles.
- (d) Exact length of the sides of the triangles.
- **40.** In the figure given, which of the following statements is true?



(c) $\Delta PRS \cong \Delta QPR$	(d) $\triangle QRP \cong \triangle PSR$

- **41.** In two triangles, pairs of corresponding sides and the corres-ponding angles are equal. What can be concluded from this?
 - (a) The triangles are small.
 - (b) The triangles are congruent.
 - (c) The triangles are equilateral.
 - (d) The triangles are equiangular.
- **42.** Which of the following are measurements of two triangles by which they are congruent under S.A.S condition?

(a)
$$\triangle ABC : \angle B = 50^{\circ}, BC = 5cm$$
, and
 $AB = 7cm$.
(b) $\triangle ABC : BC = 6cm$, $AC = 4 cm$ and
 $\angle B = 35^{\circ} \quad \triangle DEF : DF = 4 cm$, $EF = 6 cm$ and
 $\angle D = 55^{\circ}$
(d) Either (B) or (C)

43. $\triangle ABC$ is isosceles with AB = AC, $AD \perp BC$; which of the following is a correct statement?



- (a) $\triangle ABC \cong \triangle ADC$ (b) $\triangle ABD \cong \triangle ACD$
- (c) $\triangle ADB \cong \triangle ACD$ (d) $\triangle ADC \cong \triangle ABD$
- **44.** Are triangles in the given figure congruent by R.H.S. condition?



- (a) Yes
- (b) Insufficient data
- (c) No
- (d) Either (B) or (C)

Solution

 (C) According to the question, the triangles formed are right angled triangles, as shown in the figure.



- So, $\triangle ADB \cong \triangle ADC$ (R.H.S. property)
- **2.** (D) Line segments of equal length are congruent.
- **3.** (B) In the given figure,

AD = BC, AC = AC, and $\angle DAC = \angle BCA$

(:: AD || BC alternate angles)

By S.A.S. theorem $\triangle ABC \cong \triangle CDA$

So, AB = DC. (Corresponding parts of congruent

triangles.)

4. (B)



In $\triangle PQR$ and $\triangle XYZ$.

 $\angle P = \angle X = 50^{\circ}$

- PQ = XY and PR = XZ.
- $\therefore \Delta PQR \cong \Delta XYZ$ (S.A.S. property)
- **5.** (A) Not available
- **6.** (C) Not available
- **7.** (B) Not available

- 8. (C) Not available
- 9. (A) Corresponding parts of congruent triangles are equal. So, $PQ = AB = x \ cm$, $QR = BC = y \ cm$ and $RP = CA = z \ cm$.
- **10.** (A) Corresponding sides in $\triangle ABD$ and $\triangle CBD$.
- **11.** (B) Since $\triangle ABD$ and $\triangle CBD$ are congruent, $\angle ADB = \angle CDB$ (Corresponding parts of congruent triangles).

 \Rightarrow BD bisects $\angle ADC$

- **12.** (C) Not available
- **13.** (B) Not available
- **14.** (C) Not available
- **15.** (B) Not available
- 16. (C) BC is the hypotenuse of the given triangles.Whose measure must be known.
- **17.** (C) A.A.A. criterion does not exist.
- (A) If the three angles of a triangle are congruent to corresponding angles of the other, it is an enlarged copy of the triangle.
- **19.** (A)



 \overline{CB} corresponds to \overline{PQ}

20. (B) \overline{AC} corresponds to \overline{RP}

[Note that \overline{CA} corresponds to PR.]

21. (A) $\triangle ABC \cong \triangle XYZ$

Similarly, $\angle y = \angle B = 60^\circ$

- 22. (A) The sides corresponding to AC and DE respectively are DF and AB.
 - \therefore AC = 10 cm, and DE = 3 cm.
- **23.** (A) $\angle F$ corresponds to $\angle A$ in $\triangle ABC$ Hence, $\angle F = 180^\circ - 110^\circ = 70^\circ$
- 24. (C) Corresponding parts of congruent triangles are equal.
- 25. (A) Corresponding angles of congruent figures are equal (proportional).
 - $\therefore \angle OBA = \angle OCA$
- **26.** (A) Not available
- **27.** (C) Not available
- **28.** (A) Not available
- **29.** (A) Not available
- **30.** (B) $\triangle ABC \cong \triangle PQR$ by S.S.S. condition as three sides of $\triangle ABC$ are correspondingly equal to three sides of $\triangle PQR$.
- **31.** (C) $\triangle AEC \cong \triangle ADB$. So, option (C) is the required answer.
- **32.** (C) In $\triangle ABD$ and $\triangle CDB$, BD is the common side. So, $\triangle ABD = \triangle CDB$ by S.S.S. condition.
- **33.** (A) $\triangle XYZ \cong \triangle LMN$ by R.H.S.

condition as YZ = MIN, $\angle Y = \angle M$ and XZ = LIN.

34. (C) All statements are correct except that in (C).Two triangles can be congruent according to any of the 4 properties of congrudence.

35. (B) In
$$\triangle PQS \triangleq \triangle PRS$$
, we observe that,
 $PQ = PR, PS = PS, \quad \angle QPS = \angle RPS$ So,
 $\triangle PQS \cong \triangle PRS$ (By SAS property.)

- 36. (D) Right angle, hypotenuse and side of the triangles are congruent.
- **37.** (C) Not available
- **38.** (A) Not available
- **39.** (C) Not available
- 40. (A) Order of letters of congruent triangles must be maintained.
- **41.** (B) By definition of congruence of triangles.
- **42.** (A) The measurements in option (A) are the measurements of two triangles under S.A.S condition.
- **43.** (B) Not available
- **44.** (A) Not available