CHAPTER 06 TRIANGLES

SUBJECT: MATHEMATICS **MAX. MARKS : 40**

CLASS : X **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.

(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.

(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

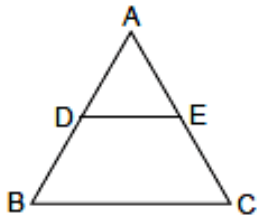
(iv). There is no overall choice.

(v). Use of Calculators is not permitted

SECTION – A

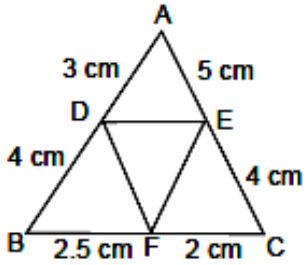
Questions 1 to 10 carry 1 mark each.

1. In the given figure, $\frac{AD}{BD}=\frac{AE}{EC}$ and ∠ADE = 70°, ∠BAC = 50°, then angle ∠BCA =



(a) 70° (b) 50° (c) 80° (d) 60°

2. In given figure, AD = 3 cm, AE = 5 cm, BD = 4 cm, CE = 4 cm, CF = 2 cm, BF = 2.5 cm, then



(a) DE || BC (b) DF || AC (c) EF || AB (d) none of these

3. If ΔABC ~ ΔEDF and ΔABC is not similar to ΔDEF, then which of the following is not true?

(a) BC . EF = AC . FD

(b) AB . EF = AC . DE

(c) BC . DE = AB . EF

(d) BC . DE = AB . FD

4. If in two triangles ABC and PQR, $\frac{AB}{QR}=\frac{BC}{PR}=\frac{CA}{PQ}$, then

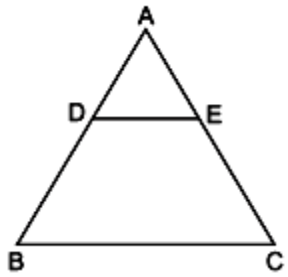
(a) ΔPQR ~ ΔCAB (b) ΔPQR ~ ΔABC (c) ΔCBA ~ ΔPQR (d) ΔBCA ~ ΔPQR

5. If in triangles ABC and DEF, $\frac{AB}{DE}=\frac{BC}{FD}$, then they will be similar, when

(a) ∠B = ∠E (b) ∠A = ∠D (c) ∠B = ∠D (d) ∠A = ∠F

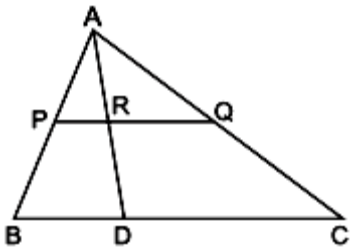
6. The perimeters of two similar triangles are 25 cm and 15 cm respectively. If one side of first triangle is 9 cm., what is the corresponding side of the other triangle?
(a) 5.4 (b) 3.5 (c) 5.5 (d) 4.5

7. In figure DE || BC. If BD = x – 3, AB = 2x. CE = x – 2 and AC = 2x + 3. Find x.



(a) 3 (b) 4 (c) 9 (d) none of these

8. In the figure, AP = 3 cm, AR = 4.5 cm, AQ = 6 cm, AB = 5 cm and AC = 10 cm. Find the length of AD.



(a) 6.5 (b) 7.5 (c) 5.5 (d) 4.5

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

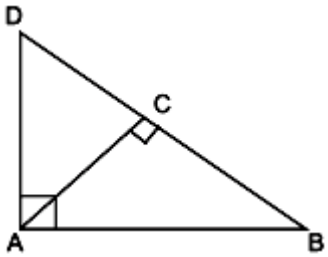
9. **Assertion (A):** D and E are points on the sides AB and AC respectively of a ΔABC such that DE ‖ BC then the value of x is 11, when AD = 4cm, DB = (x – 4) cm, AE = 8cm and EC = (3x – 19) cm.
Reason (R): If a line divides any two sides of a triangle in the same ratio then it is parallel to the third side.

10. **Assertion (A):** D and E are points on the sides AB and AC respectively of a ΔABC such that AD = 5.7cm, DB = 9.5cm, AE = 4.8cm and EC = 8cm then DE is not parallel to BC.
Reason (R): If a line divides any two sides of a triangle in the same ratio then it is parallel to the third side.

SECTION – B

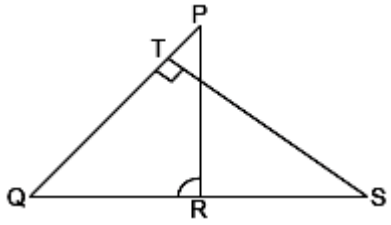
Questions 11 to 14 carry 2 marks each.

11. In figure, ΔABD is a right triangle, right angled at A and AC ⊥ BD. Prove that AB^2 = BC.BD.

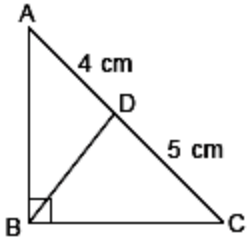


12. In ΔABC, D and E are points on the sides AB and AC respectively, such that DE || BC. If AD = x, DB = $x - 2$, AE = $x + 2$ and EC = $x - 1$, Find the value of x.

13. In the figure, PQR and QST are two right triangles, right angled at R and T respectively. Prove that QR × QS = QP × QT



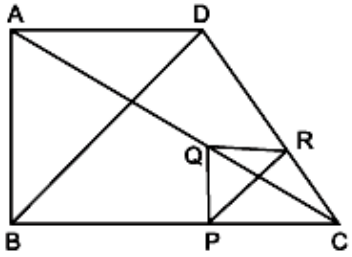
14. In the given figure, ABC is a triangle, right angled at B and BD ⊥ AC. If AD = 4 cm and CD = 5 cm, find BD and AB.



SECTION – C

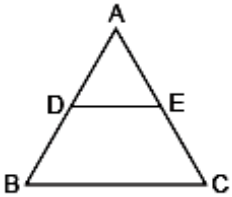
Questions 15 to 17 carry 3 marks each.

15. In figure, two triangles ABC and DBC lie on the same side of base BC. P is a point on BC such that PQ || BA and PR || BD. Prove that QR || AD.



16. P and Q are points on the sides AB and AC respectively of a triangle ABC. If AP = 2 cm, PB = 4 cm, AQ = 3cm, QC = 6 cm, prove that BC = 3PQ.

17. In figure, D and E are points on AB and AC respectively, such that DE || BC. If AD = $\frac{1}{3}$BD, AE = 4.5 cm, find AC.

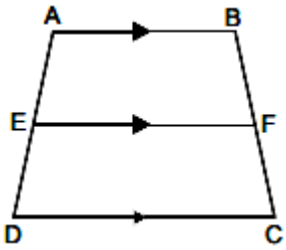


SECTION – D

Questions 18 carry 5 marks.

18. If a line is drawn parallel to one side of a triangle, the other two sides are divided in the same ratio, prove it. Use this result to prove the following :

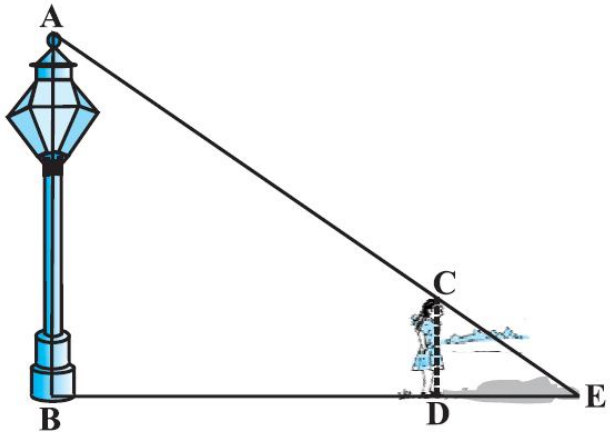
In the given figure, if ABCD is a trapezium in which AB || DC || EF, then $\frac{AE}{ED} = \frac{BF}{FC}$



SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. On one day, a poor girl of height 90 cm is looking for a lamp-post for completing her homework as in her area power is not there and she finds the same at some distance away from her home. After completing the homework, she is walking away from the base of a lamp-post at a speed of 1.2 m/s. The lamp is 3.6 m above the ground (see below figure).

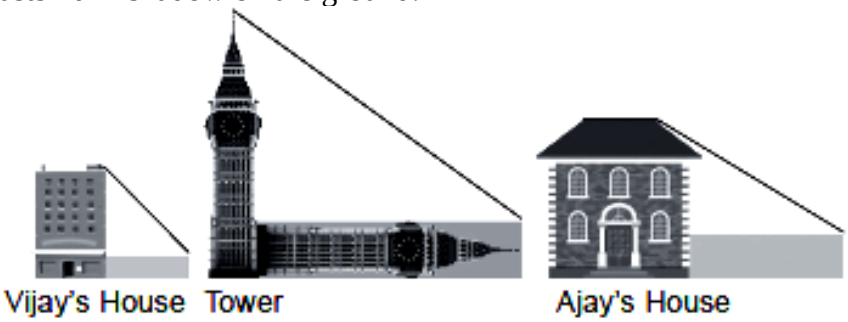


(i) Find her distance from the base of the lamp post. (2)
(ii) Find the length of her shadow after 4 seconds. (2)

OR

(ii) Find the ratio AC:CE. (2)

20. Vijay is trying to find the average height of a tower near his house. He is using the properties of similar triangles. The height of Vijay's house if 20 m when Vijay's house casts a shadow 10 m long on the ground. At the same time, the tower casts a shadow 50 m long on the ground and the house of Ajay casts 20 m shadow on the ground.



(a) What is the height of the tower? (1)
(b) What is the height of Ajay's house? (1)
(c) What will be the length of the shadow of the tower when Vijay's house casts a shadow of 12 m? (2)

OR

(c) When the tower casts a shadow of 40 m, same time what will be the length of the shadow of Ajay's house? (2)