Time: 3hrs.   M.M. 80

General Instructions:
1. This Question Paper has 5 Sections A, B, C, D and E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.

Section-A

1. Every rational number is

   a) a natural number   b) an integer   c) a real number   d) a whole number

2. $(9)^{1/3} \times (3)^{1/3}$ is equal to

   a) $\frac{1}{3}$ b) 27   c) 3   d) none of these

3. The value of $\frac{16^{3/4}}{16^{1/4}}$ is

   a) 16   b) 4   c) 0   d) none of these

4. Coefficient of x^2 in $\sqrt{2}\ x - 1$

   a) 1   b) 0   c) -1 d) none of these

5. The value of $p(r) = 6r^2 + 7r - 3$ when $r = -1$

   a) -4 b) 4   c) -13 d) 10

6. A cubic polynomial has

   a) 2 zeros   b) 1 zero   c) 3 zeros   d) 4 zeros

7. Find the value of a, if $x - a$ is a factor of $x^3 - ax^2 + 2x + a - 1$

   a) 3   b) $-\frac{1}{3}$ c) $\frac{1}{3}$ d) 0

8. Any point on the line $y = x$ is of the form

   a) (a, a) b) $(0, a)$ c) $(a, 0)$ d) $(a, -a)$

ny point on the line $y - axis$ is of the form

a) $(x, 0)$ b) (o, y) c) (x, x) d) (x, y)

10. Equation represent X axis is

a) $y = 0$ b) $x = 0$ c) $x = -y$ d) $x = y$

11. Zero of the polynomial $p(x) = x + 2$, is

a) 2   b) -2 c) $\frac{1}{2}$ d) $-\frac{1}{2}$

12. The point $(-3, 5)$ lies in the

a) first quadrant   b) second quadrant   c) third quadrant   d) fourth quadrant

13. If the coorodinates of two points $P(-2, 3)$ and $Q(-3, 5)$ then (abscissa of P) – (abscissa of Q) is
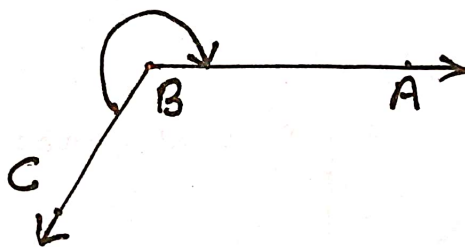
a) -2 b) -5 c) 1   d) -1

14. The value of P (2) of $p(t) = 2 + t + t^2 - t^3$

a) 0   b) -4 c) 2   d) 4

15. Angle ABC marked in figure is a/an

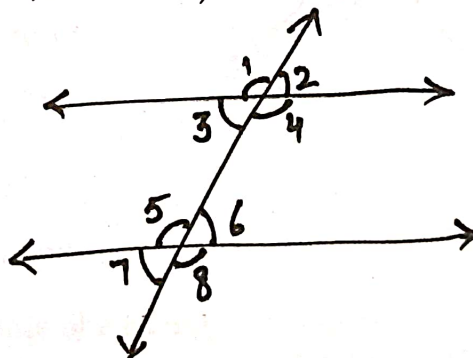a) acute angle

b) obtuse angle

c) reflex angle

d) none of these

16. If the difference between two supplementary angles is 40^0, then the angles are

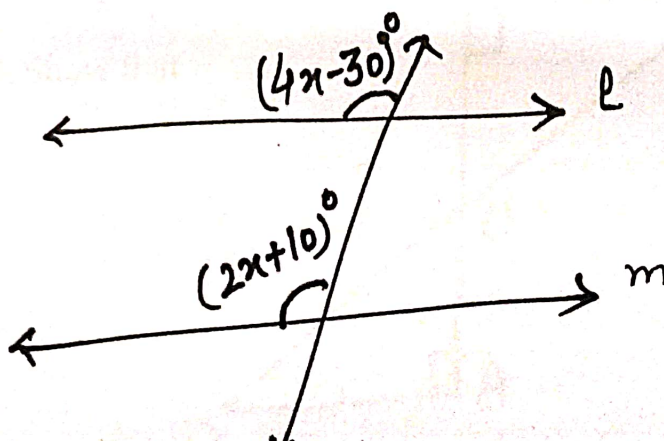a) $65^0, 125^0$ b) $210^0, 150^0$ c) $70^0, 110^0$ d) none of these

17. In figure $\angle 3$ and $\angle 6$ are known as

a) corresponding angles

b) cointerior angles

c) vertically opposite angles

d) alternate interior angles

18. The value of x if $l \parallel m$

a) 30^0

b) 40^0

c) 20^0

d) 50^0

$(4x-30)^0$

$(2x+10)^0$

B -2

the given statement choose the correct option:

Both Assertion and Reason are true and reason is correct explanation of assertion.
Both Assertion and Reason are true but reason is not correct explanation of assertion.
c) Assertion is true but Reason is false.
d) Assertion is false but reason is true.

19. Assertion : $(5 + \sqrt{2})(5 - \sqrt{2})$ is a rational number

Reason : Product of two irrational numbers may be rational or irrational

20. Assertion : If the point $(-2, 2)$ lies on the line $ax + 4y = 2$, then $a = 3$

Reason : The point $(1, 2)$ lies on the line $3x + 2y + 7 = 0$

Section – B

21. Locate $\sqrt{5}$ on the number line.

22. Express $0.2353535 \ldots$ can be expressed in the form of p/q where p/q are integers and $q \neq 0$
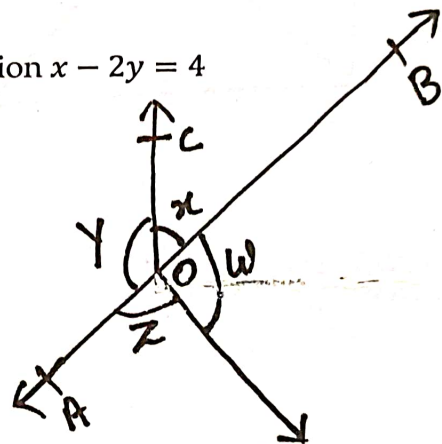
23. Expand $(4a - 2b - 3c)^2$

24. a) Write an equation in two variable, $2x = 3$

  b) Check whether $(4, 0)$ is the solution of the equation $x - 2y = 4$

25. In the given figure if $x + y = w + z$,

  then prove that AOB is a line

Section – C

26. Evaluate $(999)^3$ by using suitable identity

27. Verify $x^3 - y^3 = (x - y)(x^2 + xy + y^2)$
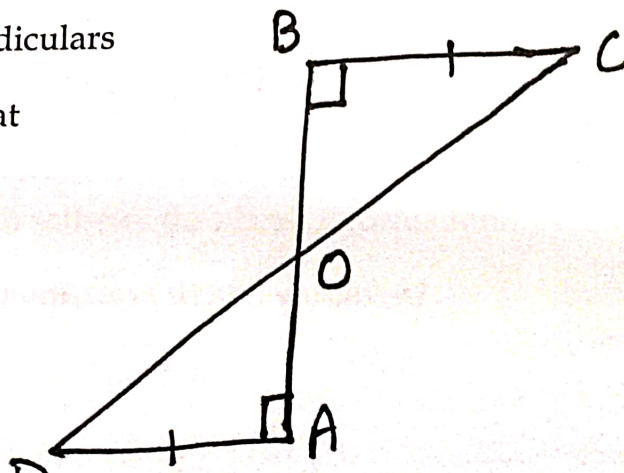
28. Factorise $8x^3 + 27y^3 + 36x^2y + 54xy^2$

29. Evaluate 104×96 by using suitable identity.

30. Prove that angles opposite to equal side of a triangle are equal.

31. AD and BC are equal perpendiculars

  to a line segment AB. Show that

  CD bisects AB

B-3

Section – D

. Find the value of a and b if $\dfrac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}} = a - b\sqrt{6}$

33. Find the value of $\dfrac{4}{(216)^{-2/3}} + \dfrac{1}{(256)^{-3/4}} + \dfrac{2}{(243)^{-1/5}}$

34. By using factor theorem, determine whether $g(x)$ is a factor of $p(x)$

   a) $P(x) = 2x^3 + x^2 - 2x - 1, \quad g(x) = x + 1$

   b) Factorise $6x^2 + 5x - 6$

35. In a right triangle ABC, right angled at C, M is the mid-point of hypotenuse AB. C is joined to M and produced to point D such that DM = CM. Point D is joined to point B
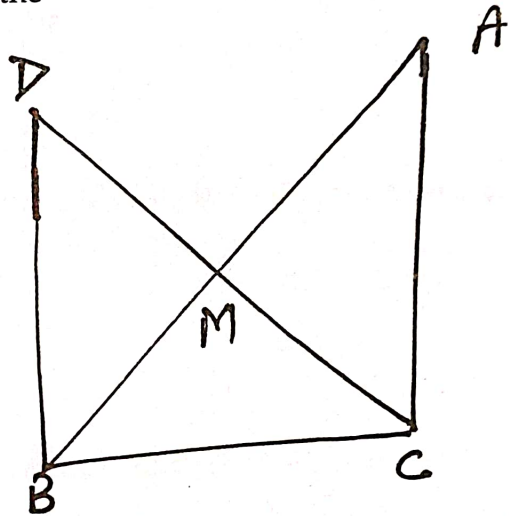
   Show that

   i) $\triangle AMC \cong \triangle BMD$

   ii) $\angle DBC$ is a right angle

   iii) $\triangle DBC \cong \triangle ACB$
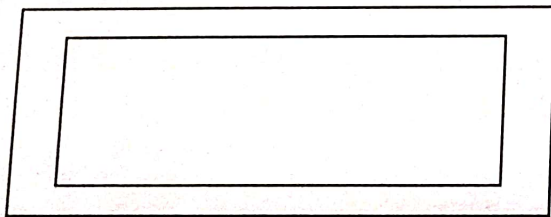
   iv) $CM = \dfrac{1}{2}AB$

Section – E

Case Study :

36. Read and answer the following questions:

   Sunita made a scenery for gift so that she can gift it to her best friend on her birthday. The length of a photoframe is thrice its breadth.

   The length and breadth of the photoframe are y and x respectively.

   a) Write the linear equation which satisfies the above information.

   b) How many solutions of a linear equation in two variables?

   c) If the value of x is 5, then find the value of y.

B-4

ad and answer the following questions:

An aluminium ladder manufacturing company manufactures foldable step ladder shown in figure. The length XY and XZ are each equal to 110 cm and the vertical angle is 36⁰.
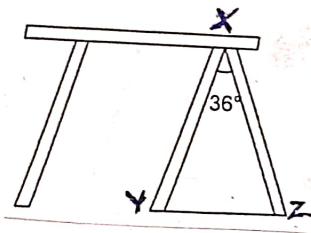
a) Which type of triangle is $\triangle XYZ$?

b) In two triangles ABC and DEF, $\angle A = \angle D$, AB = DE and AC = DF, name the criterion for congruence of triangles?

c) If $\angle YXZ$ is 60⁰ then find the length of YZ.

38. **Read and answer the following questions:**

Sonika loves triangular objects. She wants to decorate the wall of her room with some triangular hangings. When she searched for it she found a number of beautiful options for her room.
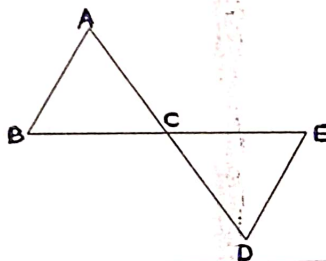
a) The angles of triangle ABC are in the ration 3 : 4 : 5. What is the measure of the largest angle?

b) If $AB \parallel DE$, find the measure of $\angle CED$

c) If $\angle ABC = 50^0$ and $\angle DCE = 55^0$ then find $\angle BAC$