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(E)

MARKING SCHEME
PRE-BOARD EXAMINATION-2019-20
CLASS : X
SUBJECT: MATHEMATICS (BASIC) (241)

Time Allowed : 3 hours **Maximum Marks : 80**

General Instructions:

1. The marking scheme provides general guidelines to reduce subjectivity and maintain uniformity. The answers given in the marking scheme are the best suggested answers. The content is thus indicative.

2. Alternate methods are accepted. Proportional marks to be awarded.

3. In case where no answers are given or answers are found wrong in this Marking Scheme due to misprinting, correct answers may be found and used for valuation purpose.

SECTION-A

1.	(a)	$a \times b$	1
2.	(c)	(0, b)	1
3.	(d)	55°	1
4.	(b)	± 4	1
5.	(a)	1	1
6.	(b)	20 – 30	1
7.	(b)	$\frac{4}{7}$	1
8.	(b)	6	1
9.	(b)	$x^2 - 3x + 2$	1
10.	(d)	more than 3	1

11. 1 — 1

12. $\frac{15}{4}$ — 1

OR

$\frac{1}{2}$ — 1

13. Rhombus — 1

14. $\frac{1}{\sqrt{3}}$ — 1

15. Parallel — 1

16 No, because difference between consecutive terms are not same. — 1

17. Correct statement — 1

18. 0 — ½

19. $\cot B = \cot (90° - A)$ — ½

$= \tan A = \frac{3}{4}$

OR

0 — ½

20. Radius of semicircle = 7 cm — ½

Perimeter $= \frac{22}{7} \times 7 + 14 = 36\text{cm}$

SECTION-B

½

21. $A - B = 30°$ ...(i) — ½

$A + B = 60°$ ...(ii) — 1

From (i) and (ii), $A = 45°$ and $B = 15°$

OR

$\text{cosec}\,(90° - A) = \text{cosec}\,(A - 20°)$ 1

$A = 55°$ 1

22. $r + h = 37$ ½

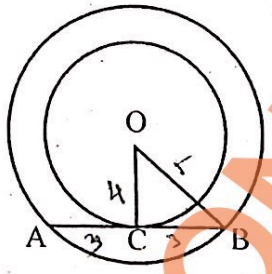
$\Rightarrow h = (37 - r)$ cm

$1628 = 2 \times \frac{22}{7} \times r \times 37$ ½

$\Rightarrow r = 7$ cm ½

$h = 30$ cm ½

23. Figure ½



$BC = \sqrt{(5)^2 - (4)^2} = 3\text{cm}$ 1

$AB = 2 \times 3 = 6$ cm ½

OR

Correct proof

24. 52 complete weeks in a leap years and possibility of remaining 2 days be (Sunday, Monday), (Monday, Tuesday), (Tuesday, Wednesday), (Wednesday, Thursday), (Thursday, Friday), (Friday, Saturday), (Saturday, Sunday) 1

P (53 Sundays) $= \frac{2}{7}$ 1

25. Quotient $= (2x - 1)$ 1

Remainder $= 3$ 1

26. Possible outcomes = HH, HT, TH, TT 1

P (exactly one head) $\frac{1}{2}$ 1

SECTION-C

27. $6 = 2 \times 3$

$72 = 2^3 \times 3^2$

$120 = 2^3 \times 3 \times 5$ 1

HCF $= 2 \times 3 = 6$ 1

LCM $= 2^3 \times 3^2 \times 5 = 360$ 1

OR

Correct proof

28. Let $\frac{1}{x} = a$ and $\frac{1}{y} = b$ ½

$2a + 3b = 13$ ...(i) ½

$5a - 4b = -2$ ...(ii) ½

Solving (i) and (ii), $a = 2$ and $b = 3$ 1

Therefore, $x = \frac{1}{2}$ and $y = \frac{1}{3}$ ½

29. Coordinates of D is (3, 5) ½

Coordinates of E = (6, 4) ½

Area of $\Delta ADE = \frac{1}{2}$ sq.units 2

30. Correct proof 3

OR

Correct proof

et $p(x) = 2x^4 - 3x^3 - 3x^2 + 6x - 2$

$(x - \sqrt{2})$ and $(x + \sqrt{2})$ are the factors of p(x)

So, $(x^2 - 2)$ is also factor of p(x)

$p(x) = (x^2 - 2)(2x^2 - 3x + 1)$

$= (x - \sqrt{2})(x + \sqrt{2})(2x - 1)(x - 1)$

So, zeros of given polynomial are $\sqrt{2}, -\sqrt{2}$, ½ and 1 1½

32. Correct proof. 3

33. Correct construction of ΔABC. 1½

Correct construction of similar triangle. 1½

OR

Correct construction of circle. 1

Correct construction of tangents. 2

34. Area of shaded region = area of quadrant OACB – area of ΔODB. 1

$= \frac{22 \times 3.5 \times 3.5 \times 90°}{7 \times 360°} - \frac{1}{2} \times 3.5 \times 2$ 1½

$= 6\frac{1}{8} cm^2$ ½

SECTION-D

35. $D = (-2)^2 - 4 \times 3 \times (-8) = 100 > 0$ 1

Roots are real. 1

$x = \frac{-(-2) \pm \sqrt{100}}{2 \times 3}$ 1

$x = 2$ or $\frac{-4}{3}$ 1

36. $S_7 = 700$, $n = 7$ and $d = -20$ ½

$700 = \frac{7}{2}[2a + (7-1)(-20)]$ 1

$a = 160$ 1

So, value of each prize is ₹160, ₹140, ₹120, ₹100, ₹80, ₹60 and ₹40. 1½

OR

$a = 121$ and $d = 117 - 121 = -4$ ½

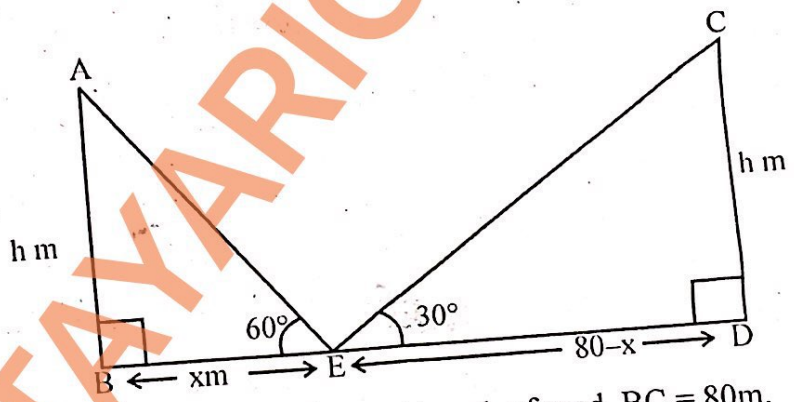
$a_n < 0$ ½

$121 + (n-1)(-4) < 0$ 1

$n > \frac{125}{4}$ 1

So, 32th term of given A.P. is its first negative term. 1

37. Figure



Let height of each pole be h m and length of road, BC = 80m.

Let BE = x m and ED = (80–x) m

In ΔABE, $\tan 60° = \frac{h}{x}$

$\sqrt{3}x = h$ ...(i) 1

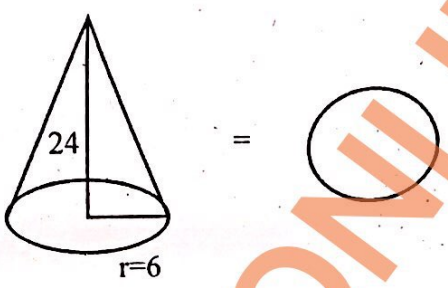
In ΔCDE, $\tan 30° = \frac{h}{80 - x}$

$\frac{80 - x}{\sqrt{3}} = h$ ...(ii) 1

From (i) and (ii), x = 20 therefore $h = 20\sqrt{3}$ m 1

38. Let the radius of sphere be r cm.

Volume of sphere = volume of cone 1



$\frac{4}{3}\pi r^3 = \frac{1}{3}\pi(6)^2 \times 24$ 1

r = 6 cm

OR

r = 3 cm, h = 4 cm

l = 5 cm 1

C.S.A. of cone = $\pi rl = 15\ \pi cm^2$ 1

C.S.A. of hemi = $18\pi cm^2$ 1

T.S.A. = $15\pi + 18\pi = 33\pi cm^2$ 1

Profit (in lakh ₹)	Number of shops
Less than 10	2
Less than 15	14
Less than 20	16
Less than 25	20
Less than 30	23
Less than 35	27
Less than 40	30

Draw points (10, 2), (15, 14), (20, 16), (25, 20), (30, 23), (35, 27) and (40, 30). 1

Join them. 1

40. Correct figure, given, to prove, construction 2

Correct proof 2

OR

Correct proof 4