WBCS (Main) Exam Paper – VI Practice Set

Answers with Explanation

(c) Let the total no. of candidates = x1. 50x - 100(80 - 50) = 40দিন গুৰায়ে 50x - 3000 = 40x10x = 3000x = 300(b) Suppose the average expenditure was \mathbf{z} x. 2. The total expenditure = 40x, when 5 more students join the mess, total expenditure = 40x + 45.Now, the average expenditure $=\frac{40x+45}{40+5}=\frac{40x+45}{45}$ Now, we have $\frac{40x+45}{45} = x - 1$ or 40x + 45 = 45 (x - 1)or 45x - 40x = 45 + 45or 5x = 90গ্যাচিডাৰ্ম ∴ x = 18 The original expenditure of the mess = $40 \times$ 18 = ₹ 720 (b) A can write $\left(\frac{60}{20}\right)$ i.e. 3 pages in 1 hr 3. A + B can write $\left(\frac{125}{25}\right)$ i.e. 5 pages in 1 hr B can write (5 - 3) i.e. 2 pages in 1 hr B can write 46 pages in $=\frac{46}{2} = 23$ hrs. (c) 25 men do the rest of the job in 12 days (12 4. = 33 - 20 - 1) 20 men can do the rest of the job in $\frac{12 \times 25}{20} = 15 \text{ days}$ Thus the work would have been finished in 20 + 15 = 35 days, that in (35 - 33) = 2 days after the scheduled time. 5. (a) $3 - \frac{4}{1 + \frac{2}{16}} \Rightarrow 3 - \frac{4}{1 + \frac{10}{16}} \Rightarrow 3 - \frac{64}{26}$ र्फाएरगाएर $\Rightarrow \frac{14}{26} = \frac{7}{13}$

(a) Divisor = $(54 \times 5) = 270 = 9 \times \text{quotient}$ 6. Quotient = 30 $Divident = (divisor \times quotient) + Remainder$ $= (270 \times 30) + 54$ = 8100 + 54ন্দাগুৰায়ে = 81547. (c) 1 man can complete the work = $6 \times 14 = 84$ days 1 woman can complete the work = 14×12 = 168 days1 child can complete the work in = 28×9 = 252 days (8 men + 2 women + 5 children)'s 1 day's work $=\left(\frac{8}{84}+\frac{2}{168}+\frac{5}{252}\right)$ $=\frac{1}{84}\left(8+1+\frac{5}{3}\right)=\frac{32}{84\times 3}=\frac{8}{63}$ They will do the work in = $\frac{63}{8}$ days গ্যাচিভার্ম (b) The number of stoppages $=\frac{180}{12}-1=14$ 8. \therefore Total time = $\left(\frac{180}{45}\right)$ hours + 12 ×14 min = 4 hours + 168 min = 6 hours 48 min (b) ₹ 375 = (100% - 25%) of lost of chair = 75% 9. of cost of chair The cost of chair $=\frac{375 \times 100}{75} = ₹500$ So, the required price to gain 40% profit = (100 + 40)% of ₹ 500 $=\frac{140}{100}$ ×500 = ₹ 700 10. (c) Net change in entry fee $=-35+40-\frac{35\times40}{100}$ দ্যান্তৰায়ে = -35 + 40 - 14= -9%i.e. 9% decrease.

11. (b) After 1 year, Amount will be
= 3000 + 10% of 3000 = ₹ 3300 he pays
1,000, after completion of a year. After 2 year,
Amount will be = 2300 + 10% of 2300
= ₹ 2530
After 3 year, Amount will be = 1530 + 10% of
1530 = ₹ 1683
12. (a)
$$x = 4 + \sqrt{15}$$
, $y = 4 - \sqrt{15}$
 $x + y = 8$ and $xy = 1$
 $\frac{x^2 + y^2}{x^3 + y^3} = \frac{(x + y)^2 - 2xy}{(x + y)^3 - 3xy(x + y)}$
 $= \frac{(8)^2 - 2}{(8)^3 - 3(1)(8)} = \frac{62}{488} = \frac{31}{244}$
 $\frac{x^2 + y^2}{x^3 + y^3} = \frac{31}{244}$
13. (a) $\frac{|15| = 15 \times 14 \times |13|}{|13| = |13|}$
 $\frac{|14| = 14 \times |13|}{|15| = |14| - |13| = 15 \times 14 \times |13| - 14 \times |13| - |13|}$
 $= \frac{|13| \times |210| - 14| - 1|}{|13| = 15 \times 14 \times |13| - 14 \times |13| - |13|}$
 $= 15 \times 13 \times |13|$
14. (c) Final = Initial (1 - Initial part drawn)ⁿ
 $8 = x \left(1 - \frac{1}{5}\right)^3$
 $8 = x \times \frac{64}{125}$

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$$\frac{1000}{64} = x \Rightarrow x = \frac{125}{8} \text{ litres}$$
The capacity of vessel $=\frac{125}{8} \text{ litres}$
15. (c) If average cost of 1 pen $= ₹ x$
Then, $27x + 68 \times 3 = 501$
 $x = \frac{297}{27}$
 $x = ₹ 11$

16. (c) Total present age = $26 \times 7 = 182$ years and 5 years before total age = $152 - 5 \times 7 = 147$ years The number of persons = 6

So, average age $=\frac{147}{6} = 24.5$ years

17. (c) We know that $a^3 + b^3 + c^3 - 3abc$ $\frac{1}{2} \times (a + b + c) \times [(a - b)^2 + (b - c)^2 + (b - c)^2] + (b - c)^2 + (b$ $(c - a)^2$] দ্যাগ্রবায়ে $=\frac{1}{2}(213 + 214 + 216) [(-1)^{2} + (-2)^{2} + (3)^{2}]$ $=\frac{1}{2}(643 \times 14) = 4501$ 18. (b) B's marks = C's marks + 10% of 300 = 200 + 30 = 230A's marks = B's marks + 20% of 300= 230 + 60 = 29019. (c) C.P. of goods = ₹ 450 overall profit = 20%দি গুৰাদেওঁ Total S.P. = 450 + 450 × $\frac{20}{100}$ = ₹ 540 S.P. of $\frac{1}{3}$ rd goods = 150 - 150 × $\frac{10}{100}$ = ₹ 135 So, S.P. of rest goods = ₹ (540 - 135) = ₹ 405 Profit = $Profit = \frac{405 - 300}{300} \times 100 = 35\%$ 20. (b) Discount percent $=\frac{1200-1100}{1200} \times 100$ $=8\frac{1}{2}\%$ দ্যান্দ্র প্রায়িষ্ঠ 21. (c) A's speed : B's speed = $\sqrt{\frac{b}{c}}$ B's speed = 48 km/hrb = 25 hr, a = 16 hr A's speed = $48 \times \sqrt{\frac{25}{16}} = 48 \times \frac{5}{4} = 60 \text{ km / hr}$ 22. (b) The circumference of roller = 132 cm $2\pi r = 132 \text{ cm}$ $r = 132 \times \frac{7}{22 \times 2} = 21 \text{ cm}$ Outer radius = 21 cmInner radius = (21 - 3) cm = 18 cm the length of roller = 42 cm the volume of iron roller = $ph(R^2 - r^2)$ গ্যাচিডাৰ্ম $=\frac{22}{7}\times 42 [21^2-18^2]$ $=\frac{22}{7} \times 42 \times 39 \times 3$

=15444 cm³

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the capacity of frustum $=\frac{1}{3}\pi h(r^2 + R^2 + \pi r)$

$$= \frac{1}{3} \times \frac{22}{7} \times 6[4 + 16 + 8]$$
$$= \frac{1}{3} \times \frac{22}{7} \times 6 \times 28$$
$$= 176 \text{ m}^{3}$$

24. (c)
$$A \propto \frac{1}{B \times C}$$

 $A = \frac{K}{B \times C}$
(c) $K = A \times B \times C$

: When B = 7, C = 13, then A = 65 Now, When B = 5 & C = 13, then K = A × B × C In this condition, K = 7 × 13 × 65

$$A = \frac{K}{B \times C}$$
$$A = \frac{7 \times 13 \times 65}{5 \times 13}$$

25.

The sum of ratios = 9 + 6 + 8 = 23
Total profit earned =
$$\frac{23}{8} \times 56000 = ₹161000$$

26. (b) Required angle
$$=\frac{360}{100} \times 35^\circ = 126^\circ$$

27. (c) Income from 'Income tax and Excise duty'

=
$$\frac{733 \times 45}{100}$$
 = ₹ 329.85 cr

28. (d) Income from other sources other than

market tax
$$=\frac{165}{33} \times 67 = ₹ 335$$
 cr

29. (a) Total time taken by boat to row a place and come back is

$$=\frac{22.5}{6+1.5}+\frac{22.5}{6-1.5}=3+5=8$$
 hours

30. (d)
A 5 N B
MN = 17 cm
AN = 5 cm
CM = 12 cm
In ΔAON
S² + ON² = r² ...(i)
In ΔCMO
12² + OM² = r² ...(ii)
From (i) and (ii) adding
If we go through the triplet (5, 12, 13)
In ΔANO ON = 12, then r = 13
In ΔCMO OM = 5, then r = 13
31. (a) Total consumption in 2012 = 2200 units
Total consumption in 2013 = 2300 units
Increased percentage
=
$$\frac{2300 - 2200}{2200} \times 100 = 4.54\% = 4.54\%$$

32. (c) Let the total lead are = 8000 kg.
So, the weight of metal = $8000 \times \frac{60}{100}$
= 4800 kg
The weight of silver = $4800 \times \frac{3}{4 \times 100} = 6$ kg
So, the mass of lead = ($4800 - 36$) kg
= 4764 kg
33. (a) $\sqrt{\frac{0.324 \times 0.081 \times 4.624}{1.5625 \times 2.89 \times 72.9 \times 64}} = \frac{3}{125} = 0.024$
34. (d) Let the average cost of the books be = ₹ x
 $64(x - 1) - 50x = 76$
 $44x = 140$
x = 10
35. (d) ATQ
The weight of (A + B + C) = 252 kg
The weight of D = 68 kg
The weight of E = 71 kg

The weight of (B + C + D + E) = 316 kg

The weight of (B + C + D) = 316 - 71 = 24541. (c) Let M.P.= ₹ 100 kg ...(ii) discounts is The weight of A = 320 - 245 = 75 kg 36. (a) Ratio of efficiency of A, B and C = 6 : 3 : 2Time taken by all together to complete the work = 6 daysLet total units of work = $(6 + 3 + 2) \times 6$ units = 66 units So, time taken by C to complete the work 66/2 = 33 days ম্পাগুৰীয়ি^ট 37. (b) The ratio of two numbers В Α $\begin{bmatrix} 2 & : & 3 \\ 3 & : & 4 \end{bmatrix}$ after adding 8 only 1 unit increases that means = 1 unit = 8Sum of ratio = 2 + 3 = 5 units The value of 5 units = $5 \times 8 = 40$ 38. (a) Let the distance b/w A and B = 280 kmThe speed of A = 70 km/hগ্যান্থি The speed of B = 80 km/hrminutes 140 km 43. (b) If $x + \frac{1}{x} = 1$ $x^{2} + 1 - x = 0$ $x^{2} - x + 1 = 0$ $A \longrightarrow A \qquad B$ $5^{2 \text{ hour}} \leftarrow 7AM$ $t = \frac{140}{150}$ গ্যাচিডাম $t = 56 \min$ The two trains meet at 7 : 56 AM. 39. (d) 1st Alloy Tin : Iron = $(1 : 2)_{\times 5 \times 3} \Rightarrow 15 : 30$ 2nd Alloy Tin : Iron = $(2:3)_{\times 3 \times 4} \Rightarrow 24:36$ 45. (d) A + B 30 Required ratio = 39 : 66 = 13 : 2240. (a) Let the CP of Radio = ₹ 100 B + C 20--20% gain = ₹ 120 Marked price $=\frac{120}{90} \times 100 = ₹ \frac{400}{3}$ দিন গুৰায়ে Discount = 20%S.P. $=\frac{400}{3} \times \frac{80}{100} = ₹ \frac{320}{3}$ Profit percent $=\frac{\frac{320}{3}-100}{100}\times100$ $=\frac{20}{3}\%=6\frac{2}{3}\%$

CP for the dealer of ten two successive থ্যাচিডাৰ্ম $100 \times \frac{90}{100} \times \frac{80}{100} = ₹ 72$ 10% of CP on transportation = ₹ 7.2 Total CP = 72 + 7.2 = ₹ 79.2 The price to gain 15% should be = $\frac{79.2}{100}$ × 115 = ₹ 91.08 42. (b) A (**†**) 30 $\begin{array}{c} B(\uparrow) 45 \\ \hline \\ C(\downarrow) 36 \end{array} \begin{array}{c} +4 \\ \hline \\ -5 \\ \hline \\ \pm \overline{c} \end{array}$ দিনি জ্বার্মির Let total units of work = 180 units Units of work done by (A + B) in first 12 minutes = $(6 + 4) \times 12 = 120$ units Remaining units = 180 - 120 = 60 units Time taken to fill remaining tank = 60/5 = 12 days Total time taken = (12 + 12) minutes = 24 দিন জবায়ি $\frac{2}{x^2 - x + 1 + 1} = \frac{2}{0 + 1} = 2$ 44. (c) The cost price of camera = ₹ 600 Profit percent = 20% $SP = \frac{600}{100} \times 120 = ₹ 700$ Discount percent = 10% $MP = \frac{100}{90} \times 720 = ₹ 800$ গ্যাচিডাৰ্ম 60 Let total units of work = 60 units If A work for 5 days + B work for 15 days + C work for 18 days= 5 days work of (A + B) + 10 days work of (B + C) + 8 days work of C So, unit of work done by (A + B) in 5 days = $2 \times 5 = 10$ units So, units of work done by (B + C) in 10 days $= 3 \times 10 = 30$ units Remaining units = 60 - 100(10 + 30) = 20 units Time taken by C to complete 20 units = 8 days So, time taken by C to complete the work

$$=\frac{8}{20}\times 60 = 24$$
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46. (d) ATQ Total interest for 4 year = $4 \times 12 = 48\%$ Total interest for 5 years at 15% p.a. = 75% Let the sum on each investment = $\mathbf{R} \mathbf{x}$ $\frac{x \times 75}{100} - \frac{x \times 48}{100} = 1350$ ক্ষাভবায়ে $\frac{25 \times x}{100} = 1350$ $x = \frac{1350 \times 100}{27}$ x = ₹ 25000 So, sum deposited in each case = ₹ 25000 47. (a) Let the C.P. of bicycle be = $\mathbf{R} \mathbf{x}$ $\frac{125}{100} \times \frac{90x}{100} = \frac{110x}{100} + 60$ দি গুৰাটে $\frac{45x}{40} - \frac{110x}{100} = 60$ 450x - 440x = 60400 $10x = 60 \times 400$ x = ₹ 2400 48. (d) 30 দিন গুৰাজি The volume of cone = volume of cylinders $\frac{1}{3} \times \pi (14)^2 \times 30 = \pi r^2 \times 6.4$ $\frac{14^2 \times 10 \times 10}{64} = r^2$ $r = \frac{14 \times 10}{8} = \frac{35}{2}$ cm

So, diameter = 35 cm 49. (b) $A \xrightarrow{30^{\circ} \times 10^{\circ} \times 30^{\circ}}$ $P \xrightarrow{C}$ Given $\angle CBD = 30^{\circ}$ $\angle CAD = 30^{\circ}$

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Angle subtends by a single chord at the circumference are equal $\angle APD = 180^{\circ} - 110^{\circ} = 70^{\circ}$ $\therefore \ \angle ADB = 180^{\circ} - 100^{\circ} = 80^{\circ}$ 50. (d) $x^3 + y^3 + z^3 - 3xyz$ $= \frac{1}{2} (x + y + z) \Big[(x - y)^2 + (y - z)^2 + (z - x)^2 \Big]$ ক্ষান্তৰাজ $=\frac{1}{2}(676)\left[0^2+1^2+1^2\right]$ $=\frac{1}{2} \times 676 \times 2 = 676$ 51. (c) Botany is related to plants. Similarly microbiology is related to Germs. 52. (d) The unit of energy is joule. Similarly, the unit of resistance is ohm. 53. (c) E = 5 (place value) PEN = 16 + 05 + 14 = 35 (place value) Similarly, PAGE = 16 + 1 + 7 + 5 = 2954. (a) 55. (b) Equality, Liberty and Justic e is the fundamentals of **Democracy**. 56. (a) (a) $90 \div 14 = 6.42$ ন্দাগুৰাটে (b) $156 \div 12 = 13$ (c) $160 \div 10 = 16$ (d) $132 \div 22 = 6$ 57. (a) 58. (a) 59. (b) Except option (b) all are perfect squares. Village District State Country Continent 60. (c) 5 4 3 1 2 61. (a) $(7-2)^2 - 2 = 23$ $(9-5)^2 - 5 = 11$ $(11-4)^2 - 4 = 45$ Similarly, $(10 - 3)^2 - 3 = 46$ 62. (a) $7 \times 3 = 21$, $9 \times 3 = 27$ $4 \times 9 = 36,$ $2 \times 9 = 18$ Similarly, $9 \times 6 = 54, \quad 4 \times 6 = 24$ দ্যাগুৰায়ে 63. (a) 64. (c) 65. (c) 66. (d) The number of people who knows all the languages The number of people who do not know French $=\frac{100}{540}=\frac{5}{27}$ দি গুৰাটে 67. (a)

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