the Muhammadans of Pabna will not take food from the hands of
a Hindu ; but it is said that those who are of inferior social rank,
and are under obligations to Hindus, will take food from them
privately, though they abstain from doing so in public. The
Collector reported in 1873 that class rules are daily becoming
more rigid, and the separation between Hindus and Musalmans
more marked. The last generation of Musalmans were allowed
to eat food touched by a Hindu, but those who now do so are
looked upon as having lost caste. The Muhammadan ministers
of religion, or *mullas*, are said to be less avaricious than Hindu
priests; but they gladly accept any present offered them by the
cultivators. In most of the villages there are houses for praying,
in which a *mulla* or priest is employed on a salary of one or two
rupees per month, with an additional allowance for diet. The pay
of the *Mulla*, and the cost of building and repairing the house of
prayer, are generally met by local subscriptions; but in some villages
the houses are built by individual wealthy residents. The wives of
the Muhammadan peasantry do not work in the fields, but they make
themselves generally useful in the performance of domestic duties.

LAW.

First Paper—Regulations, &c.

(1)   Explain the following terms :—

   (a)   Lakhiraj tenure.   (c)   Istimrari tenure.
   (b)   Shikami taluk.   (d)   Khas mahal.
               (e)   Jalkar.

(2)   With what object was Regulation VII of 1822 passed ?
What provision was there in it for the disposal of waste
lands ?

(3)   When issuing the proclamation about the permanent settle-
ment, what powers did the Government reserve for safeguarding
the welfare of dependent talukdars and cultivators ?

(4)   State the effects attaching to a Collector's certificate recor-
ded under the Public Demands Recovery Act.

(5)   What is a separate account for the payment of revenue ?
If an estate with one or more separate accounts be liable to sale
for arears of revenue, how is the Collector to proceed ?

(6)   State exactly what the Collector's award should embrace
under the land Acquisition Act.

If a claimant objects to the award, what procedure should he
adopt ?

Has Government any remedy if dissatisfied with the award
either of the Court or of the Collector ?

(7)   In awarding compensation under the Land Acquisition
Act, what is the point of time to which the market value of the

land is referable ? What kind of subsequent damage may be taken into consideration ?

(8) What are the cases in which the Local Government may without the previous sanction of higher authority direct the preparation of a record-of-rights by a Revenue Officer in respect of the lands of a local area ?

(9) What are the provisions in the Tenancy Act governing *khamar* lands ?

LAW.

SECOND PAPER—CODES.

1. Define " dishonestly, " " voluntarily, " " good-faith, " " wrongful loss. "

2. Define " mischief " and state the aggravated forms of mischief for which distinct penalties are prescribed in the Code.

Give an instance showing how mischief may be committed by a person in respect of property belonging to himself and in his own possession.

3. In each of the following instances has Z committed any, and if so, what offence ? Name or describe the offence ? or give the section of the Code or the penalty prescribed :—

(a) Z with six others assembled at midnight with the object of committing house robbery, but being unable to cross a river, the assembly dispersed without accomplishing their object.

(b) Z's father, intending to commit robbery, attacks and murders a traveller. Z arrives on the spot after the murder, and joins his father in stripping the dead body of all valuable articles.

(c) Z, a landholder, is informed that the manager of his estate is assembling armed men to take forcible possession of a disputed chur. Z takes no action, and a riot takes place on the chur.

(d) Z appears in a drunken state in the public street and conducts himself in such a manner as to cause annoyance to passers-by.

4. Note briefly the principal points of difference in procedure in the trial of summons and warrant cases.

5. When a person on whom a conditional order to remove a nuisance has been served does not either comply with the order or appear to show cause or apply for the appointment of a jury,, what successive steps should the Magistrate adopt with a view to enforce his order ?

6. Is a Magistrate authorised under the Code of Criminal Procedure to warn and discharge an offender ? Under what cir-

cumstances may the Court refrain from passing sentence on an offender, and what procedure should he adopt ?

7. State (without explanations) the law of *res judicata* as defined in the Code of Civil Procedure.

8. What procedure should the Court follow if on the first day fixed for the hearing of a suit—(a) the plaintiff appears and the plaintiff does not appear.

9. What goods and chattels belonging to a judgment-debtor are exempt from attachment and sale in execution of a decree ?

10. When is a confession made by an accused person irrelevant in a criminal proceeding ?

11. State succinctly the principal exceptions to the rule that hearsay evidence is inadmissible or that oral evidence must be direct.

12. What do you understand by privileged communications ? Give two instances of such communications.

SURVEYING AND MENSURATION.

1. In using a chain what are the points to be attended to in order to obtain accurate measurements ?

What is a Gunter's chain ? If a Gunter's chain be three inches too long, how would the area of a survey be effected ?

2. In measuring a chain line how would you add the following obstacles and pick up your original chainage and direction correctly after passing them ?:—

      (a) A group of two or three huts over which you cannot see.

      (b) A small tank on an open maidan.

3. What do you understand by a " Cadastral Survey "?

      How are such surveys usually conducted ?

4. Give a specimen page of field-book showing how you would enter two successive lines of a prismatic compass survey along a road with offsets to ditch and fence on either side.

      [Neatness is all-important in answering above question.]

5. In describing a theodolite traverse, it is usual to take the magnetic bearing of the first line. How is this done ?

      How would you determine the true north.

6. What is the acreage of a rectangular field whose sides are $50\frac{1}{4}$ and 123 yards ?

      Express your result also in standard Bengali land measure.

7. A B C is a triangular field ; A C is 738 links long, and perpendicular from B on A C is 583 links. The field is let yearly for £12 an acre ; express the rental in rupees taking £1 = 15 rupees.

      [The above are links of a Gunter's chain.]

8. What is a plane table and how is it used ?

P. W. D.

FOURTH GRADE ACCOUNTANT-SHIP EXAMINATION PAPERS.

JUNE 1888.

I.—Arithmetic.

Time allowed—4 hours.

1. Simplify :— $\dfrac{\frac{7}{17} \times 3\frac{1}{6} \times 2\frac{3}{7}}{7\frac{1}{8} \times \frac{4}{15}}$; and reduce the following fractions to their lowest terms :— $\dfrac{1,155}{168}$, $\dfrac{140,971}{487,621}$.

2. Find the value of ·0426 of Rs. 120-4-9 ; express as fractions in the lowest terms ·19 of $\frac{3}{16}$, and ·37 of $\frac{4}{5}$.

3. A debtor pays 3 annas 4 pies in the Rupee. What percentage of his debt does he pay ? If his total debts amounted to Rs. 16,284-8-0, how much would he still owe ?

4. A certain kind of cloth costs in England $9\frac{1}{2}d$. a yard. If the cost of freight is 3s. for 72 yds. and the rate of exchange 1s. $4\frac{1}{2}d$. per Rupee, at what rate per yard must the cloth be sold in India, so as to yield a profit of 10 per cent ?

5. If the Rupee is worth 1s. $4\frac{1}{2}d$., and 25·62 Francs = 1 English Sovereign, how many Francs will you get for Rs. 1,000 ?

6. If a train 200, yds. long pass a fixed object in 10 seconds, at what rate per hour is the train moving ?

7. A can do a piece of work in 11 days, and B can do it in 17 days. How long would they take to do it together ?

8. The wages of one man, one woman and three children amount to 30 Rupees a week. The man and one child earn together four times as much as the woman. The man and three children earn five times as much as the woman. Find the wages of each.

9. A tea-dealer has teas worth Rs. 2-4-0 and Rs. 1-8-0 a pound respectively, which he mixes, taking two pounds of the former to one pound of the latter, and sells the mixture at Rs. 2-0-0 a pound. What does he gain or lose per cent ?

10. A person sells Rs. 10,000 of $4\frac{1}{2}$ per cent. Govt. Paper at 106, and invests in Shares paying 8 per cent. What must he pay for them so as to be neither a gainer nor loser ?

11. *A* and *B* were partners for 12 months. *A* advanced Rs. 400 for the first three months, and then Rs. 750 more. *B* advanced Rs. 500 for the first five months, and then Rs. 450 more. They gained Rs. 1,020 : What should each receive ?

12. A lawn 400 ft. × 120 ft. has to be raised 2ft. Cost of raising earth is Rs 5 per 1000 cubic feet ; cost of turfing 10 annas a hundred square feet. Calculate expenditure, adding 5 per cent. for supervision.

13. Find by Practice the value of 2 tons 12 cwts. 3 qrs. 7lbs. at £3 17-6½ a ton.

14. *A* and *B* rent a field for £60. *A* puts in 10 Horses for 1½ months, 30 Oxen for 2 months and 100 sheep for 3¼ months. *B* puts in 20 Horses for 1 month, 40 Oxen for 1½ months, and 200 Sheep for 4 months. If the food consumed in the same time by a Horse, an Ox, and a sheep be in the proportion of 3, 2 and 1, find the portion of the rent of the field which each must pay.

II.—Mensuration.

Time allowed—2 hours.

1. The length of the Chord of an Arc is 50⅘ feet, and the Chord of half the Arc is 30⅔ feet ; what is the length of the Arc ?

2. The diameter of a wheel is 28 inches ; find how many revolutions the wheel makes in travelling half a mile.

3. How many Square Yards of canvas will be required to make a conical tent, the radius of its base being 6 Feet, and altitude 10 Feet ?

4. How many Acres are there in a four-sided field, one diagonal measuring 950 yards, and the perpendiculars on it from the other two angles being 135 and 210 yards respectively ?

5. If a pressure of 15lbs. per square inch be applied to a circular plate 3 feet in diameter, what is the total pressure in tons, cwts., qrs., and lbs ?

6. A Prism is 6 inches high, and the sides of its triangular base are 2, 3, and 4 inches ; find its volume in cubic inches.

7. A cubical box, 1 inch in the side, internal measurement, is filled with water, and 8 equal spheres, ½ inch in diameter, are placed in it ; how many cubic inches of water will remain in the box ?

8. The diameter of a sphere is 18 feet ; this sphere is divided into two segments, one of which is twice as high as the other ; find the volume of each.

III.—Book-keeping.

·Time allowed—3 hours.

1. What is book-keeping ? Explain the differences between book-keeping by Single Entry and by Double Entry.

2. Explain the use of the Cash-book. What is the nature of the items that should appear on the Debtor and on the Creditor sides : What should the balance represent ; on which side should it always fall and why ?

3. Name the principal books used by a merchant who keeps his books by Double Entry.

4. Which of the books generally used in Double Entry is not used in Single Entry, and why is it not used ?

5. Explain the use of the Ledger.

6. What is meant by posting the Ledger.

7. What is the first entry a merchant should make in his books on starting business ?

8. Explain the term "Balance." What is meant by balancing the Ledger, and what are the objects with which this is done ?

9. The tolal of the entries on the Debtor side of a Profit and Loss account is greater than the total of those on the Creditor side : What does the difference represent, and what do the entries on each side of the account represent ?

10. A tradesman, A sells goods to B to the value of Rs. 2,000 , B pays A Rs. 1,000 in cash, and also gives him a bill on C for Rs. 1000. What entries would A and B make in their books ? If the bill is dishonoured when due, are any further entries then necessary, if so, name them and state how the accounts of A and C should stand in B's books in respect to these transactions.

1889.

I.—Arithmetic.

Time allowed—4 hours.

1. Simplify :—

$\frac{3}{8}(\frac{1}{3}\frac{2}{1}$ of $6\frac{5}{9} - \frac{3}{8}) \div \frac{2}{3} \times 1\frac{4}{17}$ $(7\frac{4}{5} - 1)$; and reduce the following fractions to their lowest terms :— $\frac{6,068}{13,653}$, $\frac{7,526}{48,913}$.

2. Extract the Square Root of 290,521 ; and the Cube Root of 250,047.

3. Find the values of ·10$\overset{.}{2}$ of £ 2·6·4; and $\frac{2}{3}$ of $\frac{9}{16}$ of $\frac{7}{15}$ of Rs. 100.

4. Find by Practice the value of 4 Tons 3 cwts. 2 qrs. 16 Ibs. at £ 1-6-6½ a ton.

5. If silver, of which 222 parts in 240 are pure silver is worth 42d. an Ounce, what is the value of a Rupee whose fineness is 979 parts in a thousand, and whose weight is 7dwt. 12grs ?

6. If ⅔rd of a Sheep is worth 4 Rupees, and ⅝th of a Sheep is worth ₂₀₀₀ th of a Horse, what will it cost to provide a regiment with 800 Horses ?

7. Find the difference between the Simple and Compound interest of Rs. 256 in 3 years at 4½ per cent.

8. Four merchants, A, B, C and D, trade together. A's stock of Rs. 3,000 was in trade for 12 months ; B's stock of Rs. 3,300 for 10 months ; C's of Rs. 3,750 for 8 months ; and D's of Rs. 3,950 for 6 months. If the whole gain was Rs. 7,230, how much ought each to receive ?

9. A tradesman adds 32 per cent. to the cost price of his goods, and gives his customers a reduction of 10 per cent ; what profit does he make ?

10. If 7 horses and 5 oxen eat up the grass of an enclosure in 74 days, in what time could 5 horses and 7 oxen eat up the grass of the enclosure ?

11. At 6¼ per cent. for what sum should goods be insured which are worth Rs. 3,875 in order that in case of loss the owner may recover their value together with the premium paid ?

12. Explain the distinction between True Discount and Banker's Discount. Does the creditor or the debtor gain by computing interest instead of discount ?

13. A person invests Rs. 22,000 in 4 per cent. Government Paper at 98¼, and sells out at 99. He then buys 4½ per cent. Paper at 103¼. What is the difference in his annual income ?

14. A goods train leaves the Howrah Station 14 hours before the mail train. If the goods train travels at 20 miles an hour, and the mail train at 35, at what distance from Howrah will the mail overtake the goods train ; and how many hours before the mail should the goods train start, so that the one should overtake the other 1,000 miles from Howrah ?

II. – Mensuration.
Time allowed—2 hours.

1 Find the Area in square feet of an equilateral triangle, whose side is 36 feet.

2. How many square yards are there in a trapezium whose diagonal measures 126 feet, 3 inches, and perpendiculars 58·5 feet, and 65·75 feet ?

3. What is the Area of a segment, greater than a semi-circle, whose chord is 30 feet, and height 20 feet ?

4. The inner diameter of a circular building is 73·25 feet, and the thickness of the wall 21 inches ; how many square feet of ground does the wall occupy ?

5. From a timber plank, 16 inches breadth, 6 square feet are to be sawn off ; at what distance from the end must the cut be made ?

6. The annual rent of a triangular field is £43-15 its base measures 25, and perpendicular 14 chains : What is it let for per acre ?   One Chain = 66 feet.

7. The altitude of a cylinder is 20 inches, and its diameter 10 inches : What is the altitude of another cylinder, whose volume is twice as much, its diameter being 30 inches ?

8. How many bricks, each 8 inches by 4 inches, by 3 inches, will build a wall, 200 feet long, 10 feet high, and 1 foot thick ?

9. A leaden pipe 12 feet long weighs 100℔s. ; find the thickness of the lead, the internal diameter being 2 inches. Specific gravity of lead = 11·32.

10. If a balloon is composed of 1,000 yards of silk, ¾th of a yard wide, what is its diameter, supposing it to be a perfect sphere ? Answer in yards.

III.— Book-keeping.

Time allowed—3 hours.

1. Explain the following terms :—Assets, Liabilities, Capital, Dividend.

2. State the heads under which the property of persons in business is composed.

3. What is Book Keeping by Single Entry, and for what descriptions of business is it generally used ?

4. What are the advantages of Double Entry over Single Entry ?

5. Detail the principal books used in Book-Keeping by Double Entry.

6. Explain the use of the Day-book, and the Invoice-Book.

7. What is meant by discounting a bill, retiring a bill and protesting a bill.

8 How should the following accounts be closed :—Trade Expences. Discount. Profit and Loss. Merchandise.

9. Describe the process of balancing and closing a set of books kept by Double Entry.

10. What is the difference between "Personal" and "Impersonal" accounts?

1890.
I.—Arithmetic.

Time allowed—4 hours.

1. (a) Simplify :— $\dfrac{1\frac{17}{25}}{1\frac{11}{45}} \times \dfrac{1\frac{4}{51}}{2\frac{81}{34}}$

(b) What is the highest number that will exactly divide 385 and 495 ?

2. (*a*) Reduce £2·6·4½ to the decimal of £ 9.

(b) Add :— $\dfrac{·63}{5·6}$ to $\dfrac{9·9}{·36}$

3. By practice find the value of 12 Acres, 1 Rood, 17 Poles, at £2·3 the Acre.

4. A man can copy a letter containing 50 lines, 14 times in 3 hours ; how long will he take to make 16 copies of another containing 35 lines ?

5. Divide Rs. 30 among 9 men, 3 women, and 14 children so that each man gets Rs. 1-8 more than a woman, and each woman Re. 1 more than twice as much as a child.

6. 90 per cent. of a school pass in spelling, and 85 per cent. in arithmetic, 174 pass in both subjects, and no child fails in both. How many are there in the school ?

7. Find the difference between the Simple and Compound interest on Rs. 2,000 for 2 years at 6¼ per cent.

8. Find the present worth of the following bill :—For £119 drawn on April 16th at 6 months, discounted May 26th at 5 per cent. per annum.

9. Determine the rate per cent, paid by some stock—

(a) When a holder of £3,720 receives £139-10 income.

(b) When an income of £46-4 is obtained by investing £924 at 105.

10. Find to 3 decimal places the Square Root of ·00099. Find the Cube Root of $\frac{37}{84}$.

11. Selling out Stock from the 5 per cent. at 108 and investing the proceeds in the 4 per cent. at 96, a man obtains an income of £162. What was his income before the transfer ?

12. *A* and *B* can separately finish some work in $4\frac{1}{2}$ hours and $2\frac{2}{3}$ hours. *A*, *B*, and *C*, can together do it in $1\frac{17}{163}$ hours. How long will *C* take to do it alone ?

13. When will the hands of a clock be at right angles to one another ?

    (*a*) Between 4 and 5.

    (*b*) Between 10 and 11.

    (*c*) Between 1 and 2.

14. If 5 ℔s of tea can be exchanged for 8℔s. of coffee, 2℔s. of coffee for 15 ℔s. of sugar, 7 ℔s. of sugar for 12 eggs, how many eggs will be given in exchange for 14 ℔s. of tea ?

15. A man hired himself out on the following conditions: —

For every day he worked he was to receive Re. 1-4, but for each day he remained idle, he was to get no pay, and forfeit 10 annas. After 40 days' service he had to receive Rs. 27-8.; how many days did he work.

16. Find the value in Rupees and decimals of $0\cdot303$ of Rs. 41-6-3 + $0\cdot526$ of £111-7-9. The value of a Rupee being $1s.$ $4\frac{1}{2}d.$

II.—Mensuration.

Time allowed—2 hours.

1. 3 circles are drawn with centres at angular points of an equilateral traingle, so as to touch each other. Find the area included between them, the side of the triangle being 10 feet.

2. A circle is divided into 2 segments by a chord subtending an angle of 90 degrees at the centre : what ratio exists between the areas of the segments ?

3. The Chord of an Arc is 40 feet, and the Chord of half this Arc is 25 feet. Find the side of the greatest square which can be inscribed in this segment.

4. A trapezoid, the parallel sides of which are as 3 : 4, is to be cut from a rectangular board 12 feet long and 2 feet wide. Find the lengths of the parallel sides, in feet and inches, so that the area of the trapezoid may be one-third of the board.

5. How many pounds of water will be contained in a hollow sphere, 12 inches in internal diameter ?

6. Describe the French System of measures called the Metric System.

Define :—Metre, Litre and Gramme.

7. Determine the excess of 15 feet square over 15 square feet.

8. The volume of a Cube is 5 cubic feet, 621 cubic inches. Find the length of the Cube in inches.

III.—Book-keeping.

Time allowed—3 hours.

1. Under what heads the property of persons in business be comprised ?

2. Name the most important books used in Book-keeping.

3. Describe the Day-book and Invoice book, giving brief examples.

4. What advantages has Book-keeping by Double Entry over Book-keeping by Single Entry.

5. A receives from C a bill accepted by B for goods sold and places the bill to C's credit. The bill is dishonoured when due. How would the account appear in A's ledger ?

6. State in the form of an account between X and Y the following transactions :—

X receives from Y a consignment of goods of the value of Rs. 10,000 for sale, on the understanding that he shall be allowed 5 per cent. on the amount of all sales, and also his expenses. X sells goods to the amount of Rs. 9,000, on which his expenses are Rs. 150, and returns Y goods to the value of Rs. 1,000.

1891.

Arithmetic.

Time allowed—4 hours.

1. Simplify the expressions :—

(a) $\dfrac{1-\frac{1}{2}\{\,1-\frac{1}{3}\,(\,1-\frac{1}{4}\,)\,\}}{1-\frac{1}{3}\{\,1-\frac{1}{2}\,(\,1-\frac{1}{4}\,)\,\}}$

(b) $\dfrac{\frac{1}{2}\times\frac{5}{6}+\frac{2}{3}\times\frac{7}{8}-\frac{2}{5}\,(\frac{1}{4}-\frac{5}{7})}{\frac{3}{4}\,(\frac{4}{3}-\frac{1}{2})-\frac{1}{9}\,(\frac{1}{4}-\frac{3}{28})}$

2. The imperial gallon contains 277·274 cubic inches, and one hundred litres contain 6102·379 cubic inches, determine the value of the litre in terms of the quart.

3. A ditch can be filled by one sluice alone in 12 hours and by another in 15 hours ; in what time will it be filled if both are open together ?

4. Divide ·00475 by ·000237 to four places of decimals ; also find the value of ·27 of $\frac{2}{3}$ of a shilling, and ·23 of a £.

5. Extract the square root of 1·3716, and the cube root of 5·000211.

6. A father left ⅖ths of his property to one son and ¼ of ⁸⁄₆₇ of ⅝ of the remainder to a second, and the rest to a third. The difference between the shares of the second and third was £1200. What was the share of each ?

7. Divide £16,815 among three persons *A*, *B* & *C*, so that *A*'s share shall be to *B*'s share as 3:7, and *B*'s to *C*'s as 6:5.

8. A man borrows the money to build a house at 6 per cent. interest and before doing so agrees to let the house when built for Rs. 20 a month ; the owner to pay the taxes, which amounts to Rs. 3 a month. If the house cost Rs. 1,800 to build what is the annual profit percent ?

9. A person possesses Rs. 30,000 worth of Govt. 4½ per cent Paper. He wishes to convert it into sterling, and can do so either by selling in India and remitting to England, or by purchasing enfaced Rupee-paper. If Rs. 100 worth of paper is quoted at Rs. 102·2, and the rate of exchange is 1s.-4½d. ; also if enfaced Rupee-paper is £75¾ for Rs. 1,000 worth of Government Paper, which would be the more profitable transaction ?

10. If the cost of constructing a railway is three million pounds sterling—one-third of which was money borrowed on mortgage at 5 per cent., and the remaining two-thirds held in shares ; what must be the average weekly receipts, so as to pay the share-holders 6 per cent., the working expenses of the railway being 45 per cent. of the gross receipts.

11. A hare starts 40 yards from a grey hound, and is not perceived until she has been going for 40 seconds. If she goes at the rate of 10 miles an hour, and the dog, after viewing her follows at 18 miles an hour, what time will elapse before the dog catches the hare, and what distance will be run by the dog ?

12. Find by practice the value of 1 Ton. 5 Cwt. 1 qr. 12℔s. at £1-6-10 a Ton.

13. What is the Simple Interest on Rs. 18,467-10-6 at 4¼ per cent. for eight years ?

14. Find the Compound Interest on £286-7-6 for 2½ years at 4 per cent.

15. At noon on the 3rd of January, my watch is 10 minutes, 41 seconds too slow ; at the same hour on the 14th February it is found to be 8 minutes, 19 second too fast : what is its daily rate of gaining, and what was the correct time on the 18 th January, when my watch showed 3 Hours 20 Minutes P. M. ?

16. How much must I pay for insuring a vessel for Rs. 38,000, if the insurance rate is 2½ per cent., and brokerage 4 pies in every rupee paid as premium ?

II.—Mensuration.
Time allowed—2 hours.

1. A metre is 39 37 inches ; find the number of cubic feet in a Cube, whose side is one metre.

2. The height of a right circular cylinder is 4 feet; find the height of a similar cylinder of 9 times the volume.

3. A square pole 2 inches wide is cut through a solid cylinder, of which the radius is $\sqrt{2}$ inches, so that the axis of the pole cuts at right angles the axis of the cylinder ; how many cubic inches of the material is cut away ?

4. The weights of two globes are as 9 to 25 ; the weights of a cubic inch of the substances composing them are as 15 to 9 : compare the diameters of the globes.

5. Find the side of an equilateral triangle inscribed in a circle, whose radius is one foot.

6. The bottom of a tank is a square whose area is an acre, it is ten feet deep, and the slope of its sides is 1·5 horizontal to 1 vertical : How many cubic feet of water will it hold ?

7. How much of the earth's surface could be seen by a person raised $\frac{1}{n}$th part of the diameter above it ?

8. The area of the base of a frustum of a regular hexagonal pyramid is double the area of the top, the perimeter of the top is 6 feet, and the slant height 9 feet ; find the area of the whole surface in square feet.

III.—Book-keeping.
Time allowed—4 hours.

1. What is the difference between "Personal" and "Real" accounts ?

2. What is a "Trial balance" ?

3. What is a Stock-book ? Give a description of it and state its uses.

4. On the blank forms given post a Cash-book and ledger, Single Entry, (J. Brown and Goods-General Account,) from the transactions given—

Transactions of T. Smith :—

						Rs.
1st January 1891.	Cash in hand	...	...	...	...	15,000
,,	,,	Goods ...	...	...	...	3,000
2nd	,,	Goods sold for cash to J. Brown	...			55
,,	,,	Goods bought for cash	...		...	100

3rd January 1891. Goods sold for cash 500
,, ,, Paid to J. Brown 50
,, ,, Paid trade expenses—Postage Stamps 3
,, ,, Sold goods to J. Brown 150
,, ,, Paid trade expenses—Salaries ... 200
4th ,, Received from J. Brown 175
5th ,, Bought goods of J. Brown ... 50
7th ,, Bought goods for cash 300
8th ,, Bought goods of J. Brwon ... 200
9th ,, Sold goods to J. Brown for cash ... 1,000
11th ,, Paid into Bank 1,000
13th ,, Paid trade expenses—Salaries ... 100
,, ,, Ditto   —Rent ... 150
,, ,, Ditto   —Taxes ... 25
14th ,, Advanced to clerk for petty expenses 5
15th ,, Drawn from Bank for private expenses 100
16th ,, Paid cash for repairs to business premises 200
17th ,, My acceptance of J. Brown's draft
           due this day, paid by cheque ... 200
18th ,, Sold goods for cash 500
20th ,, Bought goods for cash 1,000
23rd ,, Paid cash for shop furniture ... 100
24th ,, Sold goods to J. Brown 100
25th ,, Received from J. Brown 200
,, ,, Discount allowed 10
28th ,, Draw from bank for private expenses 50
31st ,, Paid into Bank 500
,, ,, Goods in hand at end of January, as
           per stock-book ... ... 2171·4

5. When a merchant meets a draft accepted by him, which of his books are affected ?

6. Explain the meaning of the following terms :—

Discount. Profit. Balance of an Account. Bill of Lading. Account Sale. Letter of Credit.

1892

1.—Arithmetic.

Time allowed—4 hours.

1. Simplify :—

(a) $\dfrac{2\frac{1}{4} \text{ of } (\frac{3}{7} - \frac{2}{5})}{\frac{7}{25} \text{ of } (3 - \frac{2}{3})(\frac{3}{4} - \frac{5}{7})} \text{ of } \left\{ \dfrac{\frac{8}{15} - \frac{6}{13}}{\frac{5}{13} + \frac{3}{4}} - \dfrac{8\frac{1}{5} + 4\frac{4}{5}}{5\frac{1}{14}\text{of } 7\frac{1}{9}} + \dfrac{5\frac{5}{8} - 2\frac{2}{5}}{\frac{2}{23} - \frac{19}{21}} \right\}$

(b) $\dfrac{·0759}{27143 - \frac{23}{24}} \text{ of } \dfrac{14·75}{3·26 - \frac{19}{26}}$

2. Find the value of :—

(a) $\dfrac{1}{2^2} + \dfrac{2}{2^3} + \dfrac{3}{2^4} + \dfrac{4}{2^5} + \dfrac{5}{2^6} + \dfrac{6}{2^7}.$

(b) $\dfrac{25 + \sqrt{10}}{25 - \sqrt{10}} + \dfrac{17 - \sqrt{20}}{15 + \sqrt{20}}.$

3. Substract the least of the following fractions :—
$\frac{8}{15}, \frac{7}{13}, \frac{5}{11}, \frac{9}{19}$, from the greatest, and the sum of the two least from the sum of the two greatest, and find the difference of these two differences.

4. Find the Square root and Cube root of 12 to four places of decimals.

5. Find the L. C. M. and G. C. M. of 98·766 and ·285138.

6. A metre is one-ten millionth part of a quadrant of the earth's surface. Find in miles the length of a meridian drawn from the North to the South Pole. 1 metre = 39·3708 inches.

7. What is the value of ·4 5̇ of ·1̇ 1̇ of 3s.—7½d. ? Reduce it to the decimal of £1.

8. Find by Practice the value of 15 tons 13 cwt. 37℔s. at Rs. 9-9-6 per ton.

9. A contractor agrees to do a piece of work for Rs. 2,000 in 5 days, subject to a fine of Rs. 100 for every day or part of a day after the fifth on which the work is not finished. He engages 30 men and after three days $\frac{2}{5}$ of the work is done. He then engages 10 extra men. When will the work be finished and how much will he receive ?

10. What will be the cost of remitting to England £134-16-5 the rate of exchange being 1s. $3\frac{8}{35}d.$, and the charges $\frac{3}{4}$ per cent ?

11. Find the Compound interest on £525-15-6 @ 4¾ per cent. for 4 years.

12. The Receipts of a Company are divided as follows :—
Guaranteed Dividend on ½ of Capital 5 per cent. Reserve Fund 10 per cent. Working expenses 48 per cent. The remainder £48,000 is divided as a 4 per cent. dividend among the other holders of stock. Find the Receipts and the Capital.

13. A man has Rs. 6,000 ; one-fourth he invests on 4½ per cent. Municipal Debentures at Rs. 107-8 ; one-fourth in a mortgage at 5½ per cent. ; one-fourth in 4 per cent. Government Paper at Rs. 108-14, and one-fourth he leaves at deposit in a Bank at 1½ per cent. What is his income, income-tax being 5 pies in the Rupee ?

14. A workman was engaged for one year at 30s. a week. During 13 weeks he did no work, during 6 weeks he worked half time, and during 3 weeks he worked only 2 days per week. How much did he earn during the whole year ?

II.—Mensuration.

[Time allowed—2 hours.]

1. The section of a canal is 32 feet wide at top, 14 feet wide at bottom, and 8 feet deep. How many cubic yards were excavated in a mile of a canal? Also if the surface of the water be 26 feet wide, what is its depth?

2. A log of oak is 15 feet long, 18 inches broad, and 12 inches thick; at what distance from one end must the log be cut that the smaller portion may weigh 4 cwt., supposing one ton of oak to contain 36.025 cwt.

3. A square pyramid is 12 feet high, and the sides of the base are 3 feet; find its volume. At what distance from the vertex would a horizontal plane bisect the solid?

4. A trough is 18 feet long, 2 feet wide at top, 1 foot wide at bottom, and 1 foot deep. How many gallons will it contain when full, and how many inches will the water sink if 120 gallons be withdrawn?

5. Find the number of cubic feet in a log, the ends of which are rectangles, the sides of the greater being 16 and 12 inches, and the corresponding sides of the other, 10 and 18 inches, the length being 40 feet.

6. Find the area of a regular octagon, whose side is 10 feet.

7. Three men have equal shares in a grind stone, 4 feet in diameter, and they agree not to grind down more than one foot in all. What parts of the diameter may each grind down?

8. A hollow iron sphere, 8 inches external diameter, weighs half as much as a solid sphere of the same diameter: What is the thickness of the metal in inches?

III.—Book-keeping.

[Time allowed—4 hours.]

1. What is an Account-Current? Describe the Day-book and Invoice-book.

2. Distinguish between Debit and Credit.

3. Describe the process of balancing and closing a set of books by Double Entry.

4. Transactions of W. Williams.

Post the following transactions by Single Entry into Day-book, Invoice-book, Cash-book, Bank account and Goods account,

and compare W. William's position at the end of the month
with his position at the beginning of the month :—
W. WILLIAMS.

1st January 1892, Cash in hand	...	... Rs.	200
Cash in Bank	...	... ,,	5,000
Due from J. Brown	...	,,	500
Due to T. Smith ...	...	,,	700
Goods in stock	...	... ,,	2,000

Detail of stock in hand.

500 yards A. cloth at Rs. 2 per yard	...	... Rs.	1,000
10 dozens A. whisky at Rs.50 per doz.....	...	,,	500
10 do. A. Claret at Rs. 25 per doz.	...	,,	250
5 do. Port at Rs. 50 per doz.	...	,,	250
		TOTAL Rs.	2,000

Transactions of month.

1st Jany.,	Bought 50 yards C. Cloth at Rs. 1-8 from E. and Co.	...	... Rs.	75
,,	Bought 5 dozens B. Whisky at Rs. 40, from E. and Co.	...	,,	200
2nd ,,	Sold for Cash, 4 dozs. A. Claret at Rs.27		,,	108
	Sent to Bank ...	...	,,	108
3rd ,,	Paid trade expenses by Cheque—			
	Rent ... Rs. 150			
	Taxes ... ,, 60			
		...	,,	210
4th ,,	Paid trade expenses—Cash—salaries ...		,,	190
5th ,,	Drew from Bank for personal expenses		,,	100
6th ,,	Sold A. & Co. 4 dozs. A. Claret at Rs.27		,,	108
7th ,,	Sold for Cash 5 dozs. Port at Rs. 51 ...		,,	255
8th ,,	Bought 7 dozens B. Claret at Rs. 24, from E. and Co.	...	,,	168
9th ,,	Bought 7 dozens B. Claret at Rs. 24, from E. and Co.	...	,,	168
9th ,,	Bought 5 dozens C. whisky at Rs. 36, from E. and Co.	...	,,	180
10th ,,	Sold for Cash 5 dozs A. whisky at Rs.52		,,	260
11th ,,	Bought 150 yards B. Cloth at Rs. 1-12, from E. and Co.	...	,,	262-8
12th ,,	Paid trade expenses—			
	Stamp ... ... Rs. 10			
	Petty ... ... ,, 5			
		...	,,	15
13th ,,	Paid trade expenses—furniture	...	,,	200
14th ,,	Paid E. and Co. by cheque	...	,,	1,053-8

W. Williams.—(Concluded.)
Transactions of month—(Concluded.)

			Rs.	
15th January,	J. Brown paid me cash ...	... Rs.	500	
16th ,,	Bought 50 yds. A. cloth for cash at Rs.2 ,,		100	
17th ,,	Sent to Bank ... ... ,,		400	
18th ,,	Paid T. Smith on account by cheque ,,		350	
19th ,,	Sold 500 yds. A. cloth for cash at Rs.2-2 ,,		1,062-8	
20th ,,	Paid T. Smith balance of account in cash,,		350	
21st ,,	Sent to Bank ... ... ,,		600	
22nd ,,	Drew from Bank for personal expenses ,,		100	
23rd ,,	Paid trade expenses, petty ... ,,		10	
25th ,,	A. and Co. paid me in cash ... ,,		108	

5. What is meant by discounting a bill, honouring it, taking it up, retiring it, endorsing it, and protesting it ?

6. Define :—

Commission, Dividend, Power-of-attorney, invoice, Capital, Exchange.

1893.

I.—Arithmetic.

[Time allowed—4 hours.]

1. Simplify :—
$$\frac{(\frac{1}{2}+\frac{3}{4})\text{ of }(\frac{2}{3}+\frac{4}{5})+(\frac{1}{2}+\frac{4}{5})\text{ of }(\frac{5}{8}+\frac{3}{4})+(\frac{3}{4}+\frac{4}{5})\text{ of }(\frac{1}{3}+\frac{2}{3})}{\frac{1}{2}\text{ of }(\frac{2}{3}+\frac{3}{4}+\frac{4}{5})+\frac{4}{5}\text{ of }(\frac{1}{2}+\frac{2}{3}+\frac{3}{4})}.$$

2. Find to five places of decimals the value of—
$$1+1+\frac{1}{1\times 2}+\frac{1}{1\times 2\times 3}+\frac{1}{1\times 2\times 3\times 4}+\frac{1}{1\times 2\times 3\times 4\times 5}$$

3. Calculate the value to four decimal places of—
$$\sqrt{\left\{\frac{\sqrt{13}+3}{\sqrt{13}-3}\right\}}$$

4. Find the value of ·345 of 9s. 2d. + $\frac{5}{6}$ of ·075 of £10 + ·05 of 1·125 of £1-13-4, and express the result as a decimal of £50

5. Find by Practice the value of 175 tons 13 cwts. 57lbs. at £13-7·5 per ton.

6. Given that the ratio of the circumference of a circle to its diameter is 3·1416, find the distance moved over in 3 hours by a point on the rim of a fly-wheel, of 6 feet radius, which turns round 35 times a minute. Express your answer in miles

7. A square garden, whose side is 1,824 feet, has a bed all round it, 8 feet 6 inches wide. In the centre there is a square bed containing 1,825 square feet, and 4 circular beds, each of 14 feet diameter. The rest is to be covered with turf. Find the cost of laying down the turf at 10d. per square yard.

8. A bill for £23-13-7 has to be paid in England by a remittance from India, when exchange is at 1s. 2$\frac{25}{33}$d. What sum in Indian money must be remitted, allowing 1 per cent. for commission ?

9. Find the difference between the simple and compound interest on £2,718-15 for 2 years at 3 per cent.

10. The capital of a company consisted of £5,00,000. The working expenses for the first year amounted to £22,916-13-4, and the whole of the net profit was divided in dividends. Next year the working expenses diminished by $\frac{1}{6}$, and the gross receipts increased by $\frac{1}{4}$, and a dividend of 5$\frac{1}{2}$ per cent. was paid. What was the dividend in the first year ?

11. What would be the difference in income obtained by investing Rs. 12,345 in 4 per cent. Government Paper at Rs. 104-2 and in 4$\frac{1}{2}$ per cent. Municipal debentures at Rs. 106-8 ?

12. A merchant mixes two qualities of tea in the proportion of two parts of the cheaper to one part of the dearer, and gains a profit of 25 per cent. by selling the mixture at 2s. 11d. per ℔. By mixing them in the proportion of 3 parts of the cheaper to 2 parts of the dearer, and selling the mixture at 3s. per ℔. he gains the same rate of profit. Find the prices he paid for the two qualities.

13. A. B. C. are three pipes to a tank. A. can fill it in two hours, B. in 4 hours, and C. can empty it in 1$\frac{1}{2}$ hours. A. is opened at mid-day, B. at 1 P.M., and C. at 1-30 P.M. How much water will be in the tank at 2-30 P.M. ?

II.—Mensuration.

[Time allowed—2 hours.]

1. The parallel sides of a trapezoidal field, the area of which is 30 acres, are 12 and 18 chains respectively. Find the perpendicular distance between these sides.

2. The sides of a triangle are 2 + $\sqrt{2}$, 2 − $\sqrt{2}$, and 3, find its area.

3. What must be the diameter of a carriage wheel, in order that it may make 1,000 revolutions in 2 miles ?

4. Find the area in square feet of the segment of a circle, whose height is one-half of the radius, when the radius of the circle is 1 foot.

5.   The paving of a circular court cost £50, at the rate of 3s. 4d. per square yard. What is its circumference in feet ?

6.   Find the number of cubic feet of air in a conical tent 10 feet high, and 14 feet in diameter. What would be the cost of tent at 8 annas a square yard ?

7.   An arch 30 feet radius and 30 feet span is 2 feet thick. If the breadth is 20 feet, find the cost of the Arch at Rs. 30 per hundred cubic feet.

8.   State the prismoidal formula, and apply it to find the volume of a cutting from the following data :—

Depths at three successive pegs 100 feet apart are 3, 4, and 5 feet ; bottom width 40 feet ; side slopes 1 to 1.

III.—Book-keeping.

[Time allowed—4 hours.]

1.   Describe how the Day-book and Invoice-book are posted into the Ledger, giving examples, 6 entries in each case.

2.   Distinguish between Double Entry and Single Entry, and say which system is the better, giving reasons.

3.   Describe very briefly—

| Day-book. | Journal. | Stock-book. |
| Invoice-book. | Ledger. | Warehouse-book. |

4.   On the 1st January 1893, the books of J. Brown opened with the following balances :—

Business premises, valued at	... Rs.	20,000
Office gharry	... ,,	500
Harness ...	... ,,	100
Furniture ...	... ,,	1,000
Goods ...	... ,,	5,000
Cash in hand	... ,,	150
,, at Bank	... ,,	2,000
Due by A. Bayley	... ,,	250
,, R. Robinson	... ,,	300
Due to W. Smith	... ,,	50
,, J. Jones	... ,,	75

Detail of Goods.

300 yards of cloth, A. quality, at Rs. 3 a yard ... Rs.	900
550 ,, ,, B. ,, ,, 2 ,, ... ,,	1,100
Carried over ... ,,	2,000

Detail of Goods.—(Concluded.)

	Brought forward ...	Rs.	2,000
1,000 yards of cloth C. quality at Re. 1 a yard	...	,,	1,000
10 dozens Champagne, at Rs. 80 per dozen	...	,,	800
5 ,, Hock ,, 30 ,,	...	,,	150
30 ,, Whisky ,, 30 ,,	...	,,	900
5,000 Cigars, at Rs. 30 per thousand ...	...	,,	150
	TOTAL	Rs.	5,000

Transactions.

1st January,	Sold to Anderson & Co.—		
	250 yds. A. quality cloth at Rs. 4 per yard	Rs.	1,000
	300 ,, B. ,, ,, ,, 2-8 ,,	,,	750
	5 dozens Champagne, at Rs. 90 per dozen	,,	450
3rd ,,	Bought from Smith & Co.—		
	500 yds. A. quality cloth at Rs. 3 ⅌ yard.	,,	1,500
	1,000 ,, C. ,, ,, ,, 1 ,, ,,	,,	1,000
	1,000 ,, longcloth at 4 annas per yard	,,	250
4th ,,	R. Robinson paid J. Brown, cash ...	,,	300
	Paid trade expenses, cash taxes ...	,,	50
6th ,,	Bought horse for office gharry by cheque	,,	450
7th ,,	Sold 350 yards A. quality cloth for cash		
	at Rs. 3-8 per yard ...	Rs.	1,925
	Sent to Bank	,,	1,500
	Paid trade expenses, cash—		
	Rent ... Rs. 200		
	Stamps ... ,, 20		
	Petty ... ,, 5		
	—————		
	... Rs.		225
8th ,,	Drew from Bank for personal expenses	,,	100
	Sold for cash 10 dozens Whisky at Rs.32		
	per dozen	,,	320
	Bought 20 dozens Hock, at Rs. 30 ⅌ doz.		
	Paid cash ... Rs. 100		
	Cheque ... ,, 500		
	—————		
	... Rs.		600
10th ,,	Sold 1,000 yards C. quality cloth, at Rs.		
	1-4, to Bridges & Co.... ...	,,	1,250
11th ,,	Paid trade expenses, cash—office desk...	,,	50
14th ,,	Sold 2,000 cigars to Mr. Martin, at Rs.		
	35 per thousand	,,	70
18th ,,	Sold 15 dozs. Hock, at Rs.33, to Bridges & Co	,,	495
20th ,,	Bridges & Co. paid J. Brown by cheque		
	and credited in Bank	,,	1,745

Transactions—(Continued.)

21st January,	Drew from Bank, personal expenses...	Rs.		100
25th	,,	Sold 1,000 yards longcloth for cash at		
		5 annas per yard	,,	312-8
		Bought from Atkins & Co., 5 dozens		
		Champagne, at Rs. 80... ...	,,	400
27th	,,	Sold 10 dozens Champagne for cash		
		at Rs. 82	,,	820
29th	,,	Sold 10 dozs. Hock for cash, at Rs. 33	,,	330
30th	,,	Anderson & Co., paid cash to J. Brown	,,	2,200
		Sent to Bank	,,	2,000
31st	,,	Sent to Bank	,,	2,000

Post the above transactions by Single Entry into Day-book,
Invoice-book, Cash-book, Bank account, Goods account, and the
several Ledger accounts, and compare J. Brown's position at the
end of the month with his position at the beginning of the
month.

5. I have an account at the Bank of Bengal, and my tran-
sactions during December, 1892, were as follows :—

1st December,	Balance at credit ...	... Rs.	510
3rd	,,	Cheque given in favor of A. ...	,,	50
5th	,,	Sent to Bank ...	,,	400
7th	,,	Cheque given in favor of B. ...	,,	300
10th	,,	Sent to Bank ...	,,	300
18th	,,	Cheque given in favor of C. ...	,,	500
20th	,,	Sent to Bank ...	,,	600
25th	,,	Cheque given in favor of D. ...	,,	150
31st	,,	Sent to Bank ...	,,	120
		Cheque given in favor of E. ...	,,	75
	,,	,, F. ...	,,	50
	,,	,, G. ...	,,	300
	,,	,, H. ...	,,	506

When my Pass-book comes back from the Bank in January,
I find that my cheques in favor of D. E. and G. have not been
presented.

Give closing balances, 31st December, as per counterfoil of
my Cheque-book and Bank Pass-book respectively.

If all the cheques had been cashed, what would have been
the result ?

6. Describe the following :—

Account-current	Bill-of-exchange	Bill-of-sale
Account-sale	Bill-of-lading	Capital.

1894.

1.—Arithmetic.

[Time allowed—4 hours.]

1. Simplify—

$$\frac{(1\frac{4}{5} + 2\frac{1}{3} \text{ of } \frac{7}{9})(3\frac{2}{3} - 2\frac{6}{7}) + (2\frac{3}{8} - 1\frac{1}{5})(7\frac{1}{4} + \frac{7}{9}) - (\frac{2}{3} + 1\frac{5}{7})(1\frac{1}{3} + \frac{7}{15})}{\frac{1}{3} + \frac{3}{5} + \frac{5}{7} + \frac{7}{9} + \frac{9}{11}}$$

2. Find to five decimal places the value of :—

$$\frac{1}{1 \times 3} + \frac{1}{3 \times 3^2} + \frac{1}{5 \times 3^3} + \frac{1}{7 \times 3^4} + \frac{1}{9 \times 3^5}.$$

3. Find the square root of 1073·2176, and the cube root of 1·860867.

4. What is the value of ·76 of £3-10s-6d + ·21$\dot{5}$ of £1-8s-3d. + $\frac{11}{14}$ of 17s·6d + ·337 of 15s-3d. ? Express your answer as a decimal of £8-7s-6d.

5. Find by Practice the value of 218 ton. 17 cwt. 56lbs. @£11-17s-7d. per ton.

6. The velocity of light is 186000 miles per second, the velocity of sound is 1140 feet per second, and the radius of the earth 3963 miles. Find the distance travelled by sound when light goes 7½ times round the earth.

7. When encharge was at 1s-2$\frac{11}{32}$d. a remitter, who had to send £35-13s. to England, did not remit, hoping that exchange would rise. It fell, however, to 1s-1$\frac{3}{32}$d. when he had to remit. How much did he lose ?

8. Find the compound interest on £2346-16s-7d. @ 3½ per cent. for two years.

9. What sum must be invested in the 3 per cents @ 93 to secure an income of £470 per annum, income tax being 5d. per pound, and brokerage ½ per cent.

10. A. B. C. rise the capital for a business. A contributes 40 per cent., but has to borrow one half of the money @ 8 per cent. interest, B contributes 35 per cent. and C the remainder. C acts as manager and receives 25 per cent of the profits for doing so. After paying C there remains £3627 which enable them to declare a dividend of 10 per cent. What sum does each contribute and what is A's income from the business.

11. A circular wire whose diameter is ·064 inches and length one mile is redrawn into a wire whose diameter is 2·95 millimetres. Find the kilometres its new length. Given 1 millimetre = ·03937 inches.

12. A contractor has to finish a piece of earth work in 13 days, and he finds that 50 coolies can do it in that time working 8 hours a day. The whole 50 work for four days when 12 leave. The remainder work for other four days, doing two hours overtime daily. How many extra coolies must he then employ to finish the work in time, working 8 hours per day ?

13. A watch which goes 3 seconds too fast in 24 hours, is set right at 3 P M. while another which goes two seconds too slow in 24 hours, reads 3-15. When will they indicate the same time, what will that time be ?

II.—Mensuration.

[Time allowed—two hours.]

1. Find the side of a regular hexagon the area of which is half an acre.

2. How much will the turfing of a round plot cost at 2 annas a square yard, if it be 130 feet round ?

3. The sides of a trapezium are 300, 400, 220 and 350 yards and the angle contained by the first two is a right angle ; find the area in acres and decimals.

4. Find the length of the minute hand of a dial, the extremity of which moves over an arc of five inches in $3\frac{1}{4}$ minutes.

5. A ship's hold is 102 ft long, 40 ft. broad and 5 ft. deep ; how many bales of goods each $3\frac{1}{2}$ft. long, $2\frac{1}{4}$ ft. broad, and $2\frac{1}{2}$ft. deep, can be stowed into it, leaving a gangway of 4 ft. broad.

6. Find the whole area, and the volume of a triangular pyramid, each side of the base being $5\frac{1}{2}$ ft. and the perpendicular height 30 ft.

7. If a cubic foot of iron weighs 450 lbs., what is the diameter of an iron ball which weighs 200 lbs. ?

8. A cylindrical pontoon with hemispherical ends is made of $\frac{1}{4}$ inch plate iron. Its internal diameter is 4 ft. and extreme length 14 ft. Find its weight if a cubic foot of iron weighs 480lbs.

III.—Book-keeping.

[Time allowed—three hours.]

1. Name the most important books used in book-keeping.

2. Distinguish between "personal" and "real" accounts.

3. I have account with agents in London and Bombay. My London agent advises me that he has drawn a bill for £ 100 on my Bombay agent on my account. Do I make any entry in my journal? If so, give it.

4. On the 31st December 1893 the condition of my affairs was as follows :—I had goods to the value of £ 250, £ 120 in Bank, £ 10-10 in my office safe. I owed *C* £ 14-19-6, *D* £ 58-10-6, *E* £ 115-10, *F* £ 100, *G* £ 128-0-1. *A* owed me £28-10 ; *B* owed me £28-10. Was I solvent or insolvent and to what extent?

5. Transactions of J. Walter during January 1894.—

Balances on 1st Instant.

Business premises	...	...	...	Rs.	10,000
Goods	...	...	...	,,	5,500
Cash in hand ...	...	...	...	,,	500
,, ,, Bank...	...	...	...	,,	2,000
Due by J. Smith	...	...	...	,,	100
Due by T. Brown	...	...	...	,,	50
Due to R. Roberts	...	...	...	,,	75

Detail of Goods.

Fifty dozens Port wine, at Rs. 50	...	...	Rs.	2,500
Forty dozens Brandy, at Rs. 75	...	...	,,	3,000

Transactions.

1st.	Sold for cash 5 dozens Port, at Rs. 55	...	Rs.	275
3rd.	Bought of B & Co. 4 dozens Sherry at Rs. 30...		,,	120
4th.	Trade expenses—Salaries	...	,,	150
	Paid R. Roberts in cash	...	,,	75
5th.	Sold J. Smith 5 dozens Brandy, at Rs. 80	...	,,	400
6th.	Trade expenses—Rent	...	,,	150
	Do. Taxes ...	...	,,	25
7th.	Drew from bank for private expenses	...	,,	100
8th.	Received from J. Smith cheque which I sent to bank	...	,,	500
10th.	Trade expenses—postage stamps ...	...	,,	20
8th.	Bought 15 dozens Sherry, at Rs. 30, for which I paid by cheque...	...	,,	450
11th.	A & Co. purchased—			
	10 dozens Sherry, at Rs. 35 ...	...	,,	350
	10 ,, Port, at ,, 57 ...	...	,,	570
	10 ,, Brandy, at ,, 78 ...	...	,,	780
13th.	A. & Co. paid into Bank to my credit	...	,,	1,700
14th.	Purchased 30 dozens Port, at Rs. 50 for which paid by cheque...	...	,,	1,500
15th.	Sold for cash 5 dozens Brandy, at Rs. 76	...	,,	380
16th.	Trade expenses—gharry hire ...	...	,,	5

Transactions.—(Continued.)

17th.	T. Brown paid me in cash ... ... Rs.		50
18th.	Sold to B & Co. 20 dozens Port, at Rs. 55 ...	„	1,100
20th.	Bought for cash 10,000 cigars, at Rs. 10 per thousand	„	100
21st.	Sold for cash 10 dozens Port wine, at Rs. 52...	„	520
	Sent to Bank	„	1,000
22nd.	Sold by auction 10,000 cigars bought on 20th, which turned out to be moth-eaten and which realised	„	12
	Auctioneer's commission paid by me ...	„	1
23rd.	Drew from Bank—private expenses ...	„	100
24th.	Trade expenses—gharry hire	„	1
	Ditto Postage stamps... ...	„	20
25th.	Received from B & Co. cheque, which I sent to bank	„	1,100
26th.	Sold for cash 35 dozens Port, at Rs. 52 ...	„	1,820
27th.	Sold for cash 9 dozens Sherry @ Rs. 31 ...	„	279
	Sent to bank	„	2,000
29th.	Sold for cash 20 dozens Brandy @ Rs. 76 ...	„	1,520
30th.	Sent to bank	„	1,000
31st.	Purchased of C. & Co.— 40 dozens Port @ Rs. 50	„	2,000
	20 dozens Brandy @ Rs. 75	„	1,500
	Sent to Bank	„	500

<div align="center">Less 36, Net Capital 17,839.</div>

Post the above transactions by single entry in Day-book, Invoice-book, Cash-book, Bank account, Goods account and several ledger accounts and compare J. Walter's position at the end of the month with his position at the beginning of it.

6. Explain briefly :—
1. Discount.　　　　　　　　4. Invoice.
2. Bill of lading.　　　　　　 5. Account Sale.
3. Personal & impersonal accounts.　6. Bill of exchange.

1895.
I.—Arithmetic.
[Time allowed—4 hours.]

1. Reduce $\frac{1}{7}$ to a circulating decimal, and *hence* show that $\frac{2}{7}, \frac{3}{7}, \frac{4}{7}, \frac{5}{7}, \frac{6}{7}$ are circulating decimals consisting of the same digits in the same cyclical order.

2. Simplify :— $\dfrac{\frac{11}{25} - \frac{7}{17}}{\frac{15}{42} - \frac{16}{45}} \times \dfrac{\frac{5}{8} \times \frac{1}{7} - \frac{1}{10} \times \frac{3}{4}}{\frac{13}{14} - \frac{16}{21}} \div (2\frac{4}{17} \text{ of } 1\frac{7}{25}).$

3. Find the value of :— $\dfrac{1\cdot074}{\cdot0015}$ of $8\frac{1}{2}$ annas.

4. Calculate to five places of decimals the square root of $1 + (\cdot067)^2$.

5. Find the side of a cube which contains 18 cubic feet and 1664 cubic inches.

6. The English sovereign weighs 123·274 grains, of which eleven-twelfths is pure gold and the remainder are alloy, the value of which may be neglected. What is the weight of the French Napoleon, which consists of nine-tenths of pure gold, and which is worth 15s. 10d. ?

7. What was the last year in which there were five Sundays in February ?

8. What principal will amount to Rs. 2,338-2 ans. in 3 years at $2\frac{1}{2}$ per cent. per annum, simple interest ?

9. Interest being payable half-yearly, find the Compound Interest on Rs. 50,000 for two years at 4 per cent. per annum.

10. A father dies leaving £27,600 among 3 sons and 5 daughters. Each son is to receive one-third more than the eldest daughter and she is to receive £200 more than either of her younger sisters. How much did each receive ?

11. A person wishes to paper his room with postage-stamps. The room is 18 feet long, 16 feet broad, 13 feet high and has two doors and two windows, each 9 feet by $4\frac{1}{2}$ feet. Find the number of stamps required, each stamp being $1\frac{5}{8}$ inch by $1\frac{3}{8}$ inch.

12. Reduce $\dfrac{3\cdot345 \times 3\cdot345 - 1\cdot654 \times 1\cdot654}{.41 \times \cdot405}$ to valgar fraction in its lowest terms.

13. A bankrupt whose liabilities amount to Rs. 37,480 pays his creditors Rs. 3,265-8 annas in cash, and makes over for their benefit an undiscounted bill for Rs. 4,784 due three months hence. If the bill be discounted at 4 per cent. per annum (true discount), how much will the creditors receive in the rupee ?

14. A bill for Rs. 1,841 drawn on July 13th at 3 months is discounted on August 15th at 5 per cent. per annum (3 days' grace allowed). How much is got for the bill ?

15. Fifteen Bank of Bengal shares are sold out at Rs. 1,256 each and the proceeds remitted to England at 1s. $1\frac{5}{16}d$. How much stock at $100\frac{3}{16}$ will it buy ?

16. What amount of money must be invested in $3\frac{1}{2}$ per cents. Government paper at Rs. 107-5 annas so as to produce an income of Rs. 200 a month after paying income-tax at 5 pies in the rupee ?

II.—Mensuration.

Time allowed—2 hours.

1. Having a cord 20 yards long, and wishing to know the area of a circular reservoir, of which only a portion was accessible, I found that when the cord was stretched between two points on its margin, the perpendicular distance from the middle of the cord to the nearest point of the circumference was 1·716 yards. Find the area of the reservoir.

2. Find the cost of painting the inside of a hemispherical dome, the internal radius of which is 10 feet, at 4 annas a square yard.

3. A cistern for holding water is in the form of the frustum of a pyramid : the length and breadth of its rectangular bottom are 10 and 6 feet, and it measures 15 feet by 9 feet at the top ; how many gallons of water will it hold, supposing its depth to be 4 feet 6 inches ?

4. A conical tent is 15 feet in diameter and 12 feet high. Find the cost of material in it at $3\frac{1}{2}$ annas a square foot.

5. Divide the volume of a cone into three equal parts by planes drawn parallel to its base.

6. Find the weight of a 14-inch shell made of lead two inches thick ; the weight of a 13-inch iron shell which is 1·8 inches thick being 196lbs., and a cubic foot of lead being to a cubic foot of iron as 100 to 64.

7. Deduce the prismoidal formula.

8. Find the area in square feet of a plot of ground whose sides, taken in order, 80, 75, 64 and 81 feet ; the length of the diagonal opposite the angle contained by the sides 80 and 75 being 95 feet.

III.—Book-keeping.

Time allowed—4 hours.

1. Distinguish between a Balance Sheet and a Trial Balance.

2. A buys goods of B and pays for them by means of a bill accepted by C. When B presents the bill it is dishonoured. What entries are then made in B's books ?

3. How is the profit or loss on a merchant's transactions for a year or any other period ascertained ?

4. What is the difference between a Bill of Exchange and a Promissory note ?

A3

5. Transactions of William Smith during April 1895 :—

Balances on 1st April—

		Rs.
Business premises	... ...	1,00,000
Machinery	... ...	50,000
Furniture ...	... ...	10,000
Goods ...	... ...	10,000
Sundry debts due to W. S.	...	1,000
Ditto by W. S. ...	...	500
Cash in hand	... ...	100
Cash in Bank	...	1,000

Detail of Goods.

50 dozens Brandy at Rs. 50	...	2,500
150 dozens Whiskey at Rs. 50	...	7,500
		10,000

Transactions.

		Rs.	A.	P.
April 1st—Bought 5 dozens Brandy at Rs. 50, for which paid cheque on Bank ...		250	0	0
„ 1st—Bought 1,000 blankets from A. & Co. at Re. 1 each		1,000	0	0
„ 2nd—Sold 20 dozens of Whiskey at Rs. 55 for cash		1,100	0	0
„ 2nd—Sent to Bank		500	0	0
„ 3rd—Paid trade expenses—	Rs.			
Salaries	500			
Postage stamp	20			
		520	0	0
„ 3rd—Paid A & Co. for blankets by cheque on Bank which they allowed me discount Rs. 50		1,000	0	0
„ 4th—Bought 5,000 blankets from A & Co. at Re. 1 each		5,000	0	0
„ 4th—Sold 50 dozens of Whiskey at Rs. 55 for cash		2,750	0	0
„ 4th—Sold 20 dozens of Brandy at Rs. 56 for cash		1,120	0	0
„ 4th—Sent to Bank		3,870	0	0
„ 5th—Sold 2,000 blankets at Re.1-4 for cash		2,500	0	0
„ 5th—Sent to Bank		2,500	0	0

Transactions—(Continued)

April 5th—Paid A & Co. for blankets by cheque
   on Bank on which discount Rs. 250 5,000 0 0
  8th—Paid trade expenses—
    Office furniture 50 0 0
  9th—Bought 20 dozens Brandy at Rs. 50
   from A. & Co. 1,000 0 0
  10th—Paid trade expenses—
    Insurance for the year by cheque ... 3,500 0 0
  10th—Paid sundry debtors outstanding by
   cheque 500 0 0
  11th—Sold 20 dozens of Whiskey at Rs. 55
   for cash 1,100 0 0
  11th—Sent to Bank 900 0 0
  12th—Drew from Bank for private expenses 500 0 0
  13th—Bought 1,000 umbrellas at Re. 1 for
   which paid by cheque... ... 1,000 0 0
  14th—Sold 50 dozens of Whiskey at Rs. 55
   to A & Co.... ... ... 2,750 0 0
  15th—Fire in warehouse which destroyed
   4,000 blankets, loss 4,000 0 0
  16th—Received payment on sundry debts... 500 0 0
  16th—Sent to Bank 500 0 0
  17th—Received cheque from A. & Co. on
   which gave discount Rs. 137-8 ... 2,750 0 0
  20th—Received from Insurance Company
   on account of destruction of pro-
   perty by fire 5,000 0 0
  20th—Sent to Bank 5,000 0 0
  23rd—Bought from A & Co. 10 dozens
   Brandy at Rs. 50 ... ... 500 0 0
  24th—Sold 1,000 umbrellas at Re. 1-2 each
   to A & Co.... ... ... 1,125 0 0
  27th—Paid trade expenses—
   Gharry hire 0 12 0
  30th—Drew from Bank for private expenditure 500 0 0

Post the above transaction by Single-entry in Day-book,
Invoice-book, Cash and bank account (combined if preferred),
Goods account and Ledger accounts, and compare William
Smith's position at end of the month with his position at the
begining of it.

 6. Explain the meaning of—

Account current.	Capital.
Assets.	Real account.
Bill of sale.	Dividend.

1896.
1. – Arithmetic.
Time allowed—4 hours.

1.　Simplify—

(a) $\left\{ \dfrac{1}{1 - \dfrac{1}{2 - \frac{1}{2}}} - \frac{1}{3} + 1\frac{1}{2} \right\} \div \left\{ 3\left(1 + \dfrac{2}{3\frac{1}{2}}\right) - 4 \right\}.$

(b) $\dfrac{\cdot 375 + \cdot 2\dot{7}\dot{0}}{\cdot 125 + \cdot 125675}.$

2.　What is the value of $\sqrt[2]{\left\{ \frac{1}{2} - \frac{1}{22} + \frac{6}{11} - \frac{17}{19} - \frac{18}{361} \right\}}$?

3.　Find the five decimal places the value of $\dfrac{3}{\sqrt{8} - 1}$

4.　Express $\frac{7}{9}$ of £1. 11s. 6d. + ·03 of £2. 5s. + ·57 of 13s. 8d. − $\frac{8}{11}$ of 17s. 8d as a decimal of £1. 12s. 7d.

5.　The cost of preparing a plot of ground at 2 pies per square yard was Rs. 13-8. What was the cost of fencing it at Rs. 2-6 per yard ?

6.　Show that 1 farthing = £·001 + ·01d.

7.　A bankrupt's estate amounts to £910-3-1½ and his debts to £1,875. What can he pay in the £, and what will a creditor lose on £57 ?

8.　Three per cent. stock was bought at 91⅞ and held for 7 months, during which two half-yearly dividends were received, and it was then sold at the same price as it was bought. What was the rate per cent. per annum obtained on the transaction, brokerage being ⅛ on sale and purchase ?

9.　An owner of property receives £110 per week from some tenants, £370-4 per month from others, and £780 per quarter from others. He lays by ¼ of the weekly receipts, $\frac{1}{12}$ of the monthly and $\frac{7}{10}$ of the quarterly. What will he have saved at the end of three years, three months and three weeks ?

10.　An Indian official had to remit England monthly three fourths of his pay, one-half of which pay he was allowed to remit at the rate of 1s. 6d. When the rate of exchange fell from 1s. 2½d. to 1s. 2d., the amount received in England was less by 10s. 5d. What was his pay ?

11.　Find the compound interest on Rs. 14,526-13-6 at 3½ per cent. per annum.

12. What is the yearly income derived from investing a legacy of £ 4,583 10s. in the 3 per cents, at 91⅞, allowing for legacy duty 5 per cent., brokerage ⅛ per cent., and income-tax 5d. in the £ ?

13. The earth moves round the sun in 365¼ days nearly. Assuming that it moves in a circle of 92½ million miles, and that the circumference of a circle is 3·1416 its diameter. What is the rate of motion of the earth in feet per second ?

14. A train made up of 3 first, 4 second, and 5 third-class carriages travelled 191 miles. The rates per mile were—1st class 2¼d., 2nd class 1¾d., 3rd class 1d. The amount paid by all passengers was £465-19-2½. The number of passengers in each second-class carriage was 32, in each third-class 48. Find the number in each first-class carriage.

15. A piece of work can be done in 7 days by 5 boys and 6 men. When they have done ¾ths of it, 2 men leave and 2 more boys come. When will they finish if a man does twice as much as a boy ?

16. A man bought 2,400 articles. He sold ⅜ths. at a profit of 12½ per cent., ¼th at a profit of 15 per cent., and the remainder at cost price. If he had sold at a profit of 10 per cent., he would have gained £47 5s. less. What did the articles cost him ?

II.—Mensuration.

Time allowed—2 hours.

1. A ton of timber being equal to 50 cubic feet, how many pieces of wood 1 foot long by 1 inch square in section would be required to make up an order of two tons ?

2. What is the weight of a cylindrical iron boiler ⅜ths of an inch in thickness, whose mean radius is 4 feet and length 7 feet, the ends being hemispherical, if a cubic foot of iron weighs 480 lbs. ?

3. A cubical iron tank has to hold 27,000 gallons of water. What size should it be ?

4. What will be the cost of 900 feet in length of cast-iron piping, 1½″ mean radius and ½″ thick, at Rs. 10 per cwt, if cast-iron weighs 440 lbs. per cubic foot ?

5. A punkah 12 feet long and 1 foot in depth swings through 15° on either side of the vertical. If the length of the rope is 10 feet, what volume of air, in cubic feet, is displaced during this swing ?

6. What is the radius of the base of a cone, whose altitude is 8 feet, and which holds 450 ℔s. of powder, a pound of powder occupying 30 cubic inches?

7. *A B C* is a cone whose altitude *A D* is 4 inches, the diameter of its base *B C* is 6 inches, and a cylinder E F G H is inscribed in it. The convex surface of the cylinder is one-fourth that of the cone. Find the dimensions of the cylinder.

8. The curved surface of a hemisphere being 157·08 square feet, find the area and the circumference of its base.

III.— Book-keeping.
Time allowed—4 hours.

1. Name the most important books used in Book-keeping.

2. What is a stock book? Give a description of it, and state its uses.

3. Describe the process of balancing and closing a set of books by Double Entry.

4. I have an account in the Bank of Bengal, and my transactions during April 1896 were as follows:—

		Rs.
1st.—Balance at credit	... ...	300
3rd.—Cheque in favour of self	...	100
5th.—Sent to Bank	... ...	1,000
6th.—Cheque in favour of *B* ...	··	200
8th.—Sent to Bank	... ...	300
9th.—Cheque in favour of self	...	500
10th.— Ditto of *C*	... ...	400
15th.—Sent to Bank	... ...	300
20th.—Cheque in favour of *D* ...	...	500
31st.—Sent to Bank	... ...	1,000
Cheque in favour of *E*	... ...	250
,, ,, *F*	... ...	700
,, ,, *G*	... ...	115
,, ,, *H*	... ...	40
,, ,, *K*	... ...	100

When my pass-book came back from the Bank in May, I found that my cheques in favour of *E*, *G*, and *K* were not presented during April. Give closing balance on 30th April as per counterfoil of my cheque-book and Bank pass-book respectively. If all the cheques had been presented, what would have been the result?

5. Define—

Commission.	Account current.
Dividend.	Account sales.
Bill-of-exchange.	Bill-of-sale.
Bill-of-lading.	Real accounts.

6. On 1st January 1896 the books of *W. Thomas* open
with the following balances :—

		Rs.
Cash in hand	... ...	300
„ at Bank	... ...	1,000
Goods ...	... ...	10,000
Business premises...	... ...	40,000
Furniture	... ...	5,000
Due to *W. T.* by *A*	... ...	200
Ditto by *B*	... ...	300
Ditto by *C*	... ...	400
Due by *W. T.* to *D*	... ...	100
Ditto to *E*	... ...	150
Ditto to *F*	... ...	200

Detail of Goods.

Whiskey, 100 dozens, at Rs. 30	...	3,000
Brandy, 140 dozens, at Rs. 50	...	7,000
	Total ...	10,000

Transactions.

1st *January.*—		Sold *A* 10 dozens whiskey at Rs. 32...	320
1st	„	Sold *B* 5 dozens whiskey, at Rs. 32 ...	160
3rd	„	Sold for cash 20 dozs. whiskey, at Rs.32	640
3rd	„	Sent to Bank	640
4th	„	Trade expenses, salaries	200
4th	„	Ditto taxes	65
5th	„	Bought from *G* 20 dozs. whiskey at Rs.30	600
5th	„	*A* paid me his debt in cash ...	200
5th	„	Sent to Bank	200
6th	„	Sold for cash 10 dozs. brandy, at Rs. 55	550
6th	„	*B* paid me his debt by cheque ...	300
6th	„	I paid *D* by cheque my debt to him ...	100
7th	„	Purchased furniture by cheque ...	200
10th	„	Sold for cash 20 dozs. brandy, at Rs. 55	1,100
10th	„	Sent to Bank	1,100
12th	„	Paid *E* my debt to him by cheque ...	150
13th	„	*C* paid his debt to me in cash ...	400
13th	„	Sent to Bank	400
14th	„	Paid *G* by cheque for whiskey bought on 5th	600
14th	„	Sold for cash 60 dozs. brandy, at Rs.55	3,300
14th	„	Sent to Bank	3,300

Transactions (Continued.)

15th January.—		Paid F my debt to him by cheque ...	200
16th	,,	Sold for cash 30 dozs. of whiskey, at Rs.32	960
16th	,,	Sent to Bank ...	960
17th	,,	Sold for cash 20 dozs. of brandy, at Rs.55	1,100
17th	,,	Sent to Bank ...	1,100
18th	,,	Drew from Bank for personal expenses	1,000
20th	,,	Trade expenses, petty ...	15
21st	,,	Sold A 5 dozs. of whiskey, at Rs. 32 ...	160
23rd	,,	Sold B 5 dozs. of whiskey, at Rs. 32 ...	160
23rd	,,	Sold B 5 dozs. of brandy, at Rs. 55 ...	275
24th	,,	Sold for cash 2 dozs. of whiskey, at Rs.32	64
25th	,,	Sold for cash 4 dozs. of whiskey, at Rs.32	128
26th	,,	Sold to C 5 dozs. of whiskey, at Rs. 32	160
26th	,,	Sent to Bank ...	200
27th	,,	Drew from Bank for personal expenses	500
29th	,,	Bought 10 dozens of whiskey, at Rs. 30, and 10 dozens of brandy, at Rs. 50, for which paid by cheque	800
30th	,,	Sold for cash 15 dozs. of whiskey at Rs.32	480
30th	,,	Ditto 15 dozens of brandy, at Rs. 55	825
30th	,,	Sent to Bank ...	825

Depreciation on furniture, 10 per cent. per annum on balance on hand on 1st January.

Post the above transactions in day-book, invoice-book, cash-book, and Bank account, and several ledger accounts ; and compare W. Thomas' position at the end of the month with his position at the beginning of it.

1897.

I.—Arithmetic.

Time allowed—4 hours.

1. Simplify—

$$\frac{\frac{5}{14} - \frac{3}{7} \times \frac{1}{2}}{\frac{15}{16} + \frac{7}{12} \text{ of } 3\frac{1}{4} - (\frac{1}{5} \text{ of } \frac{87}{24} - \frac{1}{3})} \div \frac{\frac{1}{3} \text{ of } \frac{1}{2} + \frac{3}{5} \text{ of } 5}{9\frac{1}{3} - 1\frac{2}{3}}.$$

2. Find to 5 decimal places the square root of the sum of ·742270 and ·741729.

3. What is the sum of $1 + \frac{1}{3} + \frac{1}{3^2} + \frac{1}{3^3} + \frac{1}{3^4}$? Give your answer as a decimal to 6 places.

4. What is the value of $3\dot{\cdot}6$ of $\cdot954$ of $\cdot428571$ of 18s. 6d. ?

5. Find by Practice the cost of 4o cwt. 2 qrs. 24 lbs. at £4 12s. 9d. per cwt.

6. The time of swing of a pendulum varies as the square root of its length, and a pendulum which swings once in a second is 39·1393 inches long. Find the length of one which swings 81 times a minute.

7. How much cloth 4 feet wide at 3s. per sq. foot must be given in exchange for 393·7 metres of French silk, $\frac{3}{4}$ of a yard wide at 4 francs per square metre ; £1 being worth 25·15 francs and 1 metre equals 39·37 inches ?

8. What will be the difference in the incomes obtained by investing Rs. 17,364-12-6 (1) in Government $3\frac{1}{2}$ per cents. at Rs. 103-12, (2) in 5 per cent. Calcutta Municipal Debentures at 110, the usual brokerage being charged ?

9. Find the cost of remitting to England £2,487 6s. 8d. when the rupee is at 1s. $2\frac{13}{16}d$.

10. A merchant buys 440 tons of coal. By selling the whole at 17s. $6\frac{1}{2}d$. per ton he would make $5\frac{1}{4}$ per cent. profit. He sells 300 tons at that rate, and the remainder at a rate which makes his profits on the whole 5 per cent. Find (1) what he paid for the coal, (2) at what rate he sold the second lot.

11. Find the compound interest for 3 years on Rs. 34,265-12 at $3\frac{1}{4}$ per cent.

12. A bill of £1,231 17s. 6d. drawn on the 8th of April at 9 months is discounted on the 4th of June at $3\frac{1}{4}$ per cent. Find the banker's discount.

13 A, B and C rent a farm for £ 54. A puts 200 sheep on it, B 150 and C 100. After 6 months A sells $\frac{3}{4}$ of his flock to C, and 3 months later B sells $\frac{2}{3}$ of his to A. How much rent should each pay at the end of the year ?

14. Two clocks are right at 12 noon on Monday. One gains 2 minutes in 24 hours and the other loses 5 minutes in 48 hours. What is the time by the second clock when the first reads 3 P.M. on Friday ?

15. Find the present value of £3215 16s. 8d. due $4\frac{1}{2}$ years hence, interest being 3 per cent.

16. A person buys £10,000 stock in the $2\frac{1}{2}$ per cents. at 80. How much must he sell in order that after re-investment of the the proceeds in 4 per cents. at 120, his income may be £12 10s. greater ?

II.—Mensuration.

Time allowed—2 hours.

1. What will be the cost of 38 pieces of wood, each 33′ long, and 2″ by 2″ in section, at Rs. 90 per ton of 50 cubic feet ?

2. A cylindrical copper tank is 2′ 6″ in diameter and 1′ 6″ high. How many cubic inches of water will it contain ?

3. Fifty thousand tons of water is contained in a full drain 2′ deed, 2′ wide at the bottom and 3′ wide at the top. Assuming that 1 cubic foot of water weighs 60 ℔s., what is the length of the drain

4. An arch of 20′ radius and 30′ span rests on two walls 20′ high. The archway is closed by a wall 2′ thick. What is the volume of the material in the wall ?

5. A square field has an area of 160 acres, what is the length of its side ?

6. What will be the cost of turfing a plot of ground A B C D E at Re. 1 per 100 square feet, if A B = 90′, B C = 90′, A D = C D = 150′, D E = 90′, and B D = E A = 120′ ?

7. Enunciate Simpson's rule for finding areas, and apply it to find the area enclosed between a straight line and a curve having ordinates 0, 20, 32, 36, 32, 20, 0 feet at a common distance of 2 feet.

8. Find the price of a cylindrical boiler with flat ends, sold as scrap-iron at Rs. 75 per ton. Length 10′ over all, outside diameter 6′, thickness of plate $\frac{1}{4}$″. Assume that 1 cubic foot of iron weighs 480 ℔s.

III.—Book-keeping.

Time allowed—4 hours.

1. Under what heads may the property of persons in business be comprised ?

2. Give the respective advantages of book-keeping by single and double entry.

3. On the 31st December 1896, the condition of my affairs was as follows :—

		Rs.
Goods in hand	...	5,000
Cash at Bank	...	2,000
,, at office	...	500

				Rs.	A.	P.
I owed A	...	...	...	1,500	0	0
,, B	...	...	...	2,000	0	0
,, C	...	...	...	500	0	0
,, D	...	...	...	750	0	0
E owed me	...	...	...	975	10	8
F ,,	...	...	...	2,050	0	0
G ,,	...	...	...	1,025	5	3
H ,,	...	...	...	699	0	2
I owed K	...	...	...	3,000	0	0
,, L	...	...	...	1,598	7	5
,, M	...	...	...	402	8	7
,, N	...	...	...	1,574	6	5
,, P	...	...	...	500	0	0
,, Q	...	...	...	424	9	7

Was I solvent or insolvent, and by how much ?

4. Explain—

Discount.	Bill-of-lading.
Profit.	Account sale.
Balance of an accout.	Letter-of-credit.

Rs.

5. Transactions of E. Howard :—

1st January 1897.—Cash in Bank	...	...	23,000
,, at office	...	...	1,700
Goods—Whiskey 100 dozen Rs. 30	...	3,000

	Rs.		
Premises ...	45,000	Value of premises and furniture	5,0000
Furniture...	5,000		
	50,000		

Debts due by Smith	...	...	500
,, Brown	...	...	600
,, Jones	...	...	700
Debts due to Robinson	...	...	800
,, Taylor	...	...	500
,, Carter	...	...	500

1st January 1897.—Sold 5 dozen of whiskey to Smith at
Rs. 32 160

Rs.

Trade expenses paid by cheque :—		
Salaries	...	1,150
Taxes ½ year	...	250
Gharry hire	...	3
Postage stamps	...	20
		1,423

Transactions—(continued.)

			Rs.
2nd January 1897.—Bought 50 dozen of whiskey at Rs. 30 for which paid cheque		...	1,500
3rd ,, ,, Paid Robinson by cheque		...	800
Smith paid me cash ...		...	500
4th ,, ,, Sold 10 dozen whiskey at Rs. 31, for cash		...	310
5th ,, ,, Sold Smith 10 dozen whiskey at Rs.32			320
6th ,, ,, Sent to Bank ...		...	800
7th ,, ,, Paid trade expenses, postage stamps			20
8th ,, ,, Bought 100 dozen of whiskey at Rs. 30 for which paid by cheque...			3,000
9th ,, ,, Sold Smith 20 dozen of whiskey at Rs. 32		...	640
10th ,, ,, Sold for cash 30 dozen of whiskey at Rs 31		...	930
11th ,, ,, Sent to Bank ...		...	900
12th ,, ,, Jones paid me cash ...		...	700
13th ,, ,, Paid Taylor cash ...		...	500
14th ,, ,, Paid trade expenses, sundries		...	200
15th ,, ,, Bought 50 dozen of whiskey at Rs. 30, for which paid by cheque		...	1,500
16th ,, ,, Brown paid me by cheque which sent to Bank ...		...	600
17th ,, ,, Bought 20 dozen of whiskey at Rs. 30 for cash ...		...	600
18th ,, ,, Sold 100 dozen of whiskey at Rs. 32 to Smith ...		...	3,200
19th ,, ,, Paid trade expenses, petty		...	10
20th ,, ,, Paid Carter by cheque		...	500
21st ,, ,, Bought 200 dozen whiskey at Rs. 30 from Taylor ...		...	6,000
22nd ,, ,, Bought 400 dozen of whiskey at Rs. 30, for which paid by cheque			12,000
22nd ,, ,, Sold 100 dozen whiskey at Rs. 31, for cash ...		...	3,100
22nd ,, ,, Sent to Bank ...		...	3,100
23rd ,, ,, Sold 150 dozen whiskey at Rs. 31 for cash		...	4,650
23rd ,, ,, Sent to Bank ...		...	4,650
24th ,, ,, Bought 400 dozen of whiskey at Rs. 30, for which paid by cheque			12,000

Transactions—(continued.)

25*th*	„	„	Sold 200 dozen of whiskey to Smith at Rs. 32 6,400
26*th*	„	„	Sold 200 dozen of whiskey to Robinson at Rs. 32 6,400

Post the above in Cash-Book, Bank-book, Day-book, Invoice-book, Ledger and Goods account, and compare E. H.'s position at the end of the month with his position at the beginning of it. Depreciation on furniture at the rate of 10 per cent. per annum.

6. Distinguish between a balance sheet and a trial balance.

1898.
I.—Arithmetic.
Time allowed—4 hours.

1. Simplify—

(a) $$\frac{\frac{3}{4 \cdot 5} + 6}{9 - (2\frac{3}{16} \text{ of } 1\frac{3}{7})} \div \frac{2\frac{1}{17} + 1\frac{1}{11}}{4\frac{1}{2} \text{ of } \frac{5}{27}}.$$

(b) $$\frac{\cdot 90 \times \cdot 84663}{\cdot 461538 \times \cdot 83}$$

2. Find the value of $\frac{(\cdot 517)^2 - (\cdot 123)^2}{\cdot 517 - \cdot 123}$ of £9-16s-7d.

3. Multiply correctly to 5 significant figures 571·013 by ·067412 and express $\frac{12285714}{6142857}$ as a decimal to 4 places. These should be worked out by contracted multiplication and division.

4. Find the value of ·375 of a guinea and ·54 of 8s. 3d. + ·027 of £2-15s. – ·775 of ·5s.

5. Find the square root of 10538268·9129 and the cube root of 558254·956904.

5. By practice find the cost of 254 tons 15 cwt. 12 ℔s. of coal at Rs. 9·6 ans. per ton together with delivering charges of 8 annas 6 pies per ton.

6. A train starting at 6·35 P. M. travels 863 kilometres and arrives at 9·15 the next morning. Given that a kilometre is equal to 39371 inches, find the average speed of the train in miles per hour.

7. A train starting at 6·35 P. M. travels 863 kilometres and arrives at 9·15 the next morning. Given that a kilometre is equal 39371 inches, and the average speed of the train in miles per hour.

8. What sum of money must be put out at 3¾ p. c. simple interest to amount to £248-18s.·9d. in 2½ years?

A4