

Educational (1895) Department.

ORDINARY PRINTED.

G.O., No. 882

DATED 16th Nov. 1895

INDEXED.

[Despatch Abstract.]

Agricultural College.

Approving the revised syllabuses prepared by the Committee appointed to revise the syllabuses in Surveying, Levelling and Agricultural Engineering of the ---, and ordering them to be brought into force at the next Examination.

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

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Gt. of {1895} Madras.
EDUCATIONAL.

882
16th Nov. 1895
Issued

Recd.

Encl.

G.O., No. 882, 16th November 1895.

NOVEMBER.

Agricultural College.

Approving the revised syllabuses prepared by the committee appointed to revise the syllabuses in Surveying, Levelling and Agricultural Engineering of the —, and ordering them to be brought into force at the next examination.

GOVERNMENT OF MADRAS.

EDUCATIONAL DEPARTMENT.

Read—the following paper :—

Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), Mis. No. 5349, dated 9th October 1895.

Read—the following letter from the Director of Public Instruction, Madras, dated 20th September 1895, No. 10308, addressed to the Chief Secretary to Government, Madras (through the Board of Revenue) :—

With reference to G.O., No. 464, Educational, dated 5th June last, I have the honour to state that a committee consist-

H. O'C. Cardozo, Esq., Superintendent, Madras Survey.
C. Benson, Esq., M.R.A.C., Deputy Director of Agriculture.
R. E. Ellis, Esq., Acting Sanitary Engineer to Government.
Major H. D. Love, R.E., Principal, College of Engineering.
W. Kees, Esq., M.A., M.R.A.C., Acting Principal, College of Agriculture.

ing of the marginally-named gentlemen was appointed to revise the syllabuses in Surveying and Levelling as well as in Agricultural Engineering.

2. The committee, in its report enclosed, recommends a special syllabus in "Surveying and Levelling" and a few alterations in the syllabus in Agricultural Engineering. Copies of revised syllabuses are submitted for approval.

ENCLOSURES.

MADRAS,
21st August 1895.

The committee appointed by Proceedings of the Director of Public Instruction, No. 7518, dated 15th July 1895, to revise the syllabuses in "Surveying and Levelling" and "Agricultural Engineering" for the use of the College of Agriculture, met on 31st July.

2. The committee recommends that there should be a special syllabus in "Surveying and Levelling" for the diploma in Agriculture and suggests that the syllabus in that subject now submitted—*vide* Enclosure A—be adopted for the purpose. The committee also recommends that the syllabus in "Agricultural Engineering" be altered as shown in Enclosure B.

3. The committee notes that the time occupied in the preparation of the plans prescribed in the syllabus in "Surveying and Levelling" has hitherto been included in the course of instruction. The time thus occupied might, it is thought, be excluded and the students be required to prepare the plans for the most part out of hours. The number of hours shown in the annual report as devoted to practical work in "Surveying and Levelling" would thus be considerably reduced.

4. With reference to the remarks contained in paragraph 3 of the Proceedings of the Board Revenue (Revenue Settlement, Land Records and Agriculture), No. 33, dated 13th February 1895, the committee understands that the Superintendent of Survey did not object to the test in "Surveying and Levelling" as a qualification for employment as Revenue Inspector, but was of opinion that Revenue Inspectors after going through the course should be attached to a Survey party, not to learn surveying but to be trained practically in the method of preparation and use of Revenue Survey records, which he still thinks can best be learnt under officers of the Survey

Department. As all Revenue Inspectors are now working under Survey officers and as there will soon be no Survey parties at work, his letters, No. 62-B, dated 7th July 1888, and No. 458-R., dated 1st December 1892, no longer hold good.

(Signed) H. O'C. CARDOZO—*Chairman*.
(") H. D. LOVE, Major, R.E.
(") R. E. ELLIS.
(") C. BENSON.
(") W. KEES—*Secretary*.

A.

SURVEYING AND LEVELLING.

INTERMEDIATE EXAMINATION (SPECIAL).

(For Diploma in Agriculture.)

1. *Surveying*.—Running a chain line; modes of passing obstacles, measuring offsets, use of cross staff. Survey of areas with the chain only. Well-conditioned triangles, keeping the field book, testing the chain. Survey of areas with the plane table and chain. Survey of areas with the prismatic compass and chain; keeping the field book. Plotting and calculation of areas.

2. *Levelling*.—The French water-level. Use of Dumpy level. Adjustments. Running lines of levels, keeping the field book, bench marks, check levels, longitudinal and cross sections. Plotting.

3. *Setting out and Mensuration*.—Ranging straight lines by eye. Laying out side widths of cuttings and embankments. Gradients. Taking out quantities of earthwork.

The examination shall comprise—

An oral and practical examination on—

(1) *Field Work*.—One or more of the following:—

- Chaining lines between given points and taking offsets.
- Making a site plan of a building.
- Running a portion of a traverse with the plane table.
- Do. a portion of a traverse with the compass.
- Do. a short line of levels.
- Setting out side widths.

(2) *Office Work*.—One or more of the following (Time, three hours):—

- Plotting a chain survey from field book.
- Do. a compass survey from field book.
- Estimation of area of a given plan.

Questions will be put orally to candidates during the progress of the practical work.

Note.—Candidates must, at the time of application for the examination, submit the following finished surveys of moderately open country with a few buildings, with field books, certified to be their own work:—

- Chain survey of not less than 10 acres. Scale = 1 inch to 2 Gunter's chains.
- Plane table survey of not less than 20 acres. } Scale = 1 inch to 5 Gunter's chains.
- Compass survey of not less than 20 acres. }
- Line of levels not less than 1 mile in length with cross sections. Scales: Horizontal, 1 inch to 2 Gunter's chains. Vertical, 1 inch to 20 feet.

The distribution of marks and the minima required for passing shall be as follows:—

							Max.	Min. for passing.	
								1st class.	2nd class.
Oral and practical examination—									
(1) Field work	..	..	..	..	..	..	50	35	25
(2) Office work	..	..	..	..	..	..	50	35	25
Total							100	70	50

B.

AGRICULTURAL ENGINEERING.

INTERMEDIATE EXAMINATION.

I. Plan Drawing and Estimating—

Use of simple drawing instruments. Natural scales. Connection between plan, elevation and sections. Pencil drawings of the works enumerated in II, III and IV. Estimates of quantities and cost of these works.

II. Building Construction—

Materials.—Stone, country bricks and tiles. Lime mortar, mud mortar. Concrete. White-wash. Junglewood, palmyra, bamboo.

Buildings.—Setting out. Excavation. Foundations. Masonry in rubble, stone or country bricks. Door and window openings. Couple roofs for tiles or thatch. Construction of bamboo and leaf sheds.

III. Road-making—

Marking centre line. Setting out cross sections for a third-class road. Allowance for shrinkage of banks. Execution of earthwork. Disposal of cross drainage by road-dams or small culverts. Side drains. Surfacing of sand, gravel, or metal. Line fencing. Repairs.

IV. Irrigation—

Irrigation from wells, tanks and rivers. Laying out land for irrigation. Quantity and application of water. Wells and well-sinking. Water-lifts in common use.

Minor Tanks.—Discharge from catchment areas by Ryves' formula. Construction and repair of tank bunds. Construction of escapes and irrigation sluices. Formulae for the discharge of escapes and sluices, viz., $Q = 3.1 Lh^{\frac{3}{2}}$ and $Q = 5A \sqrt{h}$. Calculation of proper length of escape.

Distribution Channels.—Discharge of a channel $Q = Av$. Practical limits of fall and velocity in minor channels. Laying out channels. Excavation. Regulation of supply from head sluice.

V. Machines—

Parallelogram of forces by graphic method. Moments. The mechanical powers. Work, unit of work. Efficiency of simple agricultural machines such as water-lifts.

The pencil drawings and estimates referred to in paragraph I, authenticated by competent authority, shall be submitted to the Examiners before the date of the examination.

The examination in this subject shall be devised to test the candidates' capacity of understanding the ordinary machines, and of carrying out such constructions and works as might be undertaken by agriculturists (including subordinates in the Land Revenue Department) in Southern India.

It shall comprise—

(1) A written examination—

One paper of three hours' duration.

(2) An oral examination on the matters referred to in the syllabus, with the aid of actual structures, models, materials, &c.

(3) A practical examination including—

(a) One or both of the following:—

(i) Preparation of pencil drawings to scale from notes and specification of such works as are mentioned in the syllabus.

(ii) Preparation of an estimate of quantities from a given plan for similar works.

For this portion of the examination two hours shall be allowed.

(b) Setting out on the ground a small building, or other work mentioned in the syllabus.

The distribution of marks and the minima required for passing shall be as follows:—

	Max.	Min. for passing.	
		1st class.	2nd class.
Written examination	40	..	..
Oral examination	20	..	..
Practical examination { (a) 20 }	40	40	30
{ (b) 20 }			
Total	100	65	45

Resolution—Mis. No. 5349, dated 9th October 1895.

Submitted for the orders of Government with the recommendation that the revised syllabuses recommended by the committee be approved and brought into force for the next examination.

(True Copy and Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

To the Chief Secretary to Government, Educational Department.
Copy to the Director of Public Instruction.

ORDER—No. 882, Educational, dated 16th November 1895.

The revised syllabuses are approved and will be brought into force at the next examination.

(True Extract.)

Chief Secretary.

To the Director of Public Instruction.

- „ Commissioner for Government Examinations.
- „ Board of Revenue (Revenue Settlement).
- „ Revenue Department.

Exd. Shaik Karim.

Board of Revenue

(Revenue Settlement, Land Records
and Agriculture),

MADRAS.

To

The Chief-Secretary to Government
Educational Department



No. of Enclosures. 3

Proceedings, dated 9th October 1895.
No. 5349 Mis

Subject.

Agricultural College

Submitting for the orders of Government with the Board's recommendation letter from the Director of Public Instruction submitting a report of the committee appointed to revise the syllabuses in Surveying and Levelling and Agricultural Engineering, of the —.

(Sett. 20—2,000-22-3-95.)

464 : 5-6-95
759 : 8-10-95
460 : 22-6-95
794 : 3-11-95
741 : 10-10-95
633 : 1-9-95
333 : 16-8-95

Order No. 882 of 16/11/95
P.S.

The revised syllabuses
are approved and will be brought
into force at the next examination.

Minings

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.. Comm. for Govt. Ex. 6

.. Bdy Rev. (R.S.) 11

.. Rev. Dept. 7

16/11/95

INTERMEDIATE EXAMINATION. (SPECIAL)

1. *Surveying*.—Running a chain line; modes of passing obstacles, measuring offsets, use of cross staff. Survey of areas with the chain only. Well-conditioned triangles, keeping the field book, testing the chain. Survey of areas with the plane table and chain. Survey of areas with the prismatic compass and chain; keeping the field book. *Plotting and calculations of areas.*

2. *Levelling*.—The French water level. Use of Dumpy, ~~and reversible~~ levels. Adjustments. Running lines of levels, keeping the field book, bench marks, check levels, longitudinal and cross sections. *Plotting*

3. *Setting out*.—Ranging straight lines by eye. *Laying out* curves by chords and offsets. Laying out side widths of cuttings and embankments. Gradients; use of boning rods. *Taking out quantities of earth work.*

4. *Drawing and mensuration*.—Use of drawing instruments. Construction of scales. *Plotting* surveys made with the chain, or chain and compass. Calculation of areas. *Plotting* lines of levels and cross sections, and taking out quantities of earth work. Copying plans to different scales by squares.

The examination shall comprise—

An oral and practical examination on

(1) *Field work*.—One or more of the following:—

(a) Chaining lines between given points and taking offsets.

(c) *(b) Making a site plan of a building.*
(b) Running a portion of a traverse with the plane table.

(d) *(e)* Running a portion of a traverse with the compass.

(d) Laying out a curve by offsets.

(e) Running a short line of levels.

(f) Setting out side widths.

(2) *Office work*.—One or more of the following.—Time, three hours:—

(g) Copying a plan to a different scale.

(h) *(g)* Plotting a chain survey from field book.

(i) *(h)* Plotting a compass survey from field book.

(j) *(i)* Estimation of area of a given plan.

Questions will be put orally to candidates during the progress of the practical work.

Note.—Candidates must, at the time of application for the examination, submit the following finished surveys, with field-books, certified to be their own work:—

- (1) Chain survey of not less than ¹⁰20 acres. *Scale: 1 inch to 2 20 furlong chains*
- (2) Plane table survey of not less than ¹⁰40 acres. *Scale: 1 inch to 5 quarter's chains*
- (3) Compass survey of not less than ¹⁰40 acres.
- (4) Line of levels not less than ¹2 miles in length with cross sections. *Scales: Horizontal 1 inch to 2 quarter's chains. Vertical 1 inch to 20 feet.*

The distribution of marks and the minima required for passing shall be as follows:—

	Max.	Min. for passing.	
		1st class.	2nd class.
Oral and practical examination—			
(1) Field work	50	35	25
(2) Office work	50	35	25
Total	100	70	50

Encl 3 to Serial C No 1207

Revised up to 31st January 1893.]

Government of Madras Technical Examinations,

AGRICULTURAL ENGINEERING.

INTERMEDIATE EXAMINATION.

I. Plan Drawing and Estimating. -

Use of simple drawing instruments. Natural scales. Connection between plan, elevation, and sections. Pencil drawings of the works enumerated in II, III and IV. Estimates of quantities and cost of these works.

II. Building Construction.

Materials.—Stone, country bricks and tiles. Lime mortar, mud mortar. Concrete. Whitewash. Junglewood, palmyra, bamboo.

Buildings.—Setting out. Excavation. Foundations. Masonry in rubble, stone or country bricks. Door and window openings. Couple roofs for tiles or thatch. Construction of bamboo and leaf sheds.

III. Road-making.

Marking centre line. Setting out cross sections for a third class road. Allowance for shrinkage of banks. Execution of earthwork. Disposal of cross drainage by road-dams or small culverts. Side drains. Surfacing of sand, gravel, or metal. Line fencing. Repairs.

IV. Irrigation.

Irrigation from wells, tanks and rivers. Laying out land for irrigation. Quantity and application of water. Wells and well sinking. Water lifts in common use.

Minor Tanks.—Discharge from catchment areas by Ryves' formula. Estimation of capacity of tanks from contours. Construction and repair of tank bunds. Construction of escapes and irrigation sluices. Formulae for the discharge of escapes and sluices, viz., $Q = 3.1 Lh^{3/2}$ and $Q = 5A \sqrt{h}$. Calculation of proper length of escape.

Distribution Channels.—Discharge of a channel $Q = Av$. Practical limits of fall and velocity in minor channels. Drops. Laying out channels. Excavation. Regulation of supply from head sluice.

V. Machines.

Force as measured by weight. Parallelogram of forces by graphic method. Moments. The mechanical powers. Work, unit of work. Efficiency of simple agricultural machines such as water lifts.

The pencil drawings and estimates referred to in para. I, authenticated by competent authority, shall be submitted to the Examiners before the date of the examination.

The examination in this subject shall be devised to test the candidates' capacity of understanding the ordinary machines, and of carrying out such constructions and works as might be undertaken by agriculturists (including subordinates in the Land Revenue Department) in Southern India.

It shall comprise—

- (1) A written examination.
One paper of three hours' duration.
- (2) An oral examination on the matters referred to in the syllabus, with the aid of actual structures, models, materials, &c.
- (3) A practical examination including—
 - (a) one or more of the following:—
 - i. Preparation of pencil drawings to scale from notes and specification of such works as are mentioned in the syllabus.

- ii. Preparation of an estimate of quantities from a given plan for similar works.
- iii. Calculation of the capacity of a tank from a contoured plan.

For this portion of the examination two hours shall be allowed.

(b) Setting out on the ground a small building, or other work mentioned in the syllabus.

The distribution of marks and the minima required for passing shall be as follows:—

	Max.	Min. for passing.	
		1st class.	2nd class.
Written examination	40	...	...
Oral examination	20	40	30
Practical examination	$\left. \begin{array}{l} (a) 20 \\ (b) 20 \end{array} \right\}$ 40	40	30
Total	100	65	45

that the syllabus "Engineering" be altered as shown in enclosure B

Madras
21st Aug 1895.

The Committee appointed by
Proceedings of the Director of
Public Instruction No 7518 dated
15th July 1895 to revise the
syllabuses in "Surveying and
Levelling" and "Agricultural
Engineering" for the use of the
College of Agriculture, met on
31st July.

2. The Committee recommends
that there should be a special
syllabus in "Surveying and
Levelling" for the Diploma in
Agriculture and suggests that
the syllabus in that subject,
now submitted (vide enclosure A)
be adopted for the ^{purpose} ~~purpose~~.
The Committee also recommends
that the syllabus in "Agricultural
Engineering" be altered as shown
in enclosure B

3. The Committee notes ^{that} the time occupied in the preparation of the plans prescribed in the syllabus in "Surveying and Levelling", has hitherto been included in the course of instruction. The time thus occupied might, it is thought, be excluded and the students be required to prepare the plans for the most part out of hours. The number of hours shown in the annual report as devoted to practical work in "Surveying and Levelling" would thus be considerably reduced.

4. With reference to the remarks contained in para 3 of the Proceedings of the Revenue Board (R.S., L.R. and Agr) N^o ³³ 13 Feb: 1895 the Committee understands that the Superintendent of Survey did not object to the test in "Surveying and Levelling" as a qualification for employment as Revenue Inspector but was

of

of opinion that Revenue Inspectors after going through the course should be attached to a Survey party, not to learn Surveying but to be trained practically in the method of preparation & use of Revenue Survey Records, which he still thinks can best be learnt under officers of the Survey Department. As all Revenue Inspectors are now working under Survey Officers and as there will soon be no Survey Parties at work, his letters $\frac{62B}{7 \text{ July } 88}$ and $\frac{458R}{1 \text{ Dec } 92}$ no longer hold good.

Yardley
(Chairman)

H. D. Lane Esq. R.E.

R. S. M. S.

W. S. M. S.

W. S. M. S.
(Secretary)



Proceedings of the Board of Revenue
(Revenue Settlement, Land Records and Agriculture).

Dated 9th October 1895.

No. 5349 his.

READ

The following letter from the Director of Public Instruction, Madras, dated 20th September 1895, No 10,308, addressed to the Chief Secretary to Government, Madras, through the Board of Revenue:—

With reference to G.O. No. 464 Educational, dated 5th June last, I have the honor to state that a Committee consisting of the marginally named gentlemen was appointed to revise the syllabus in Surveying and Levelling as well as in Agricultural Engineering.

2. The

N. D. C. Cardozo, Esq., Superintendent, Madras Survey
C. Benson, Esq., M.B.A.C., Deputy Director of Agriculture
R. E. Ellis, Esq., Ag. Surveying Engineer to Government
Major H. D. Dow, B.E., Principal, College of Engineering
W. H. Esq., M.B.A.C., Ag. Principal, College of Agriculture

N. 882, Vol. 8 of 16/1/95

of opinion that Revenue Board
after going through the various stages
be attached to a Surveyor General
to learn surveying but to be
trained practically in the use of
of preparation of use of Revenue
Survey Records, which is still
this can best be learnt under
Officers of the Survey Department
as all Revenue Surveyors are
now working under Survey
Officers and as there will soon
be no Survey Parties at all, his
letter of 7 July 88 and 1 Dec 88
is a good

(Chairman)

58/10/95
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15/10/95

2. The Committee, in its report enclosed, recommends a special Syllabus in "Surveying and Levelling" and a few alterations in the syllabus in Agricultural Engineering. Copies of revised syllabuses are submitted for approval.

Resolution

Submitted for the orders of Government with the recommendation that the revised syllabuses recommended by the Committee be approved and brought into force for the next examination.

(One Copy & Abstract)

M. J. S. S.
Secretary

To
The Chief Secretary to Government,
Educational Department
with 3 Encls. in original
Copy to the Director of Public Instruction

First copy sent to Press.

Returned for signature.

Despatched in print.

READ AGAIN G.O. No.
139

DATE

CURRENT No.

ENCLOSURES TO G. No.

ORDER OF GOVERNMENT

LETTER OF GOVERNMENT

STATEMENT WITH DITTO.

PAPERS NOT FILED UP, BEING WANT FOR DESPATCH
IN ORIGINAL.

N.B.—

A = Print in full.
B = Not to be printed.
P = Print abstract only.
Q = Print heading only.

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Letter only.
Order complete with Letter.

Paper taken out of the Records from the charge of the Referencer.

Press
Miscellaneous No. *883*, dated *16-11-95*
Routine 190.

Date taken out.	FOR WHAT PURPOSE.			Initials of clerk taking the paper or of attender.	Date returned.	Initials of attender.
	Department.	C. No.	Year.			
<i>15² 86</i>	<i>for 14</i>	<i>la kho</i>	<i>file</i>	<i>18-6-07</i>	<i>100</i>	
<i>26-6-08</i>	<i>Suburban</i>	<i>19</i>	<i>30-10-08</i>			
<i>4-3-09</i>	<i>for</i>	<i>W. A. G.</i>	<i>86</i>	<i>5/3/09</i>		<i>W</i>
<i>26.12.20</i>	<i>Taken for</i>	<i>57</i>	<i>for Ref</i>	<i>Q</i>		
				<i>Detained</i>		
				<i>BSS 8-2-71</i>		