

Govt. of (1886) Madras.
EDUCATIONAL.

Recorded.

7/4/86

7.4.56



Issued

Recd. 3/4/86.

Encl.

G.O., 31st March 1886, No. 198.

MARCH.

Technical Education.

Passing orders on the report of the Committee appointed to fix the details and the exact character of the syllabuses in connection with the scheme of —

25/2/4

Jan 1944

Adams

1871
 1872
 1873
 1874
 1875
 1876
 1877
 1878
 1879
 1880
 1881
 1882
 1883
 1884
 1885
 1886
 1887
 1888
 1889
 1890
 1891
 1892
 1893
 1894
 1895
 1896
 1897
 1898
 1899
 1900
 1901
 1902
 1903
 1904
 1905
 1906
 1907
 1908
 1909
 1910
 1911
 1912
 1913
 1914
 1915
 1916
 1917
 1918
 1919
 1920
 1921
 1922
 1923
 1924
 1925
 1926
 1927
 1928
 1929
 1930
 1931
 1932
 1933
 1934
 1935
 1936
 1937
 1938
 1939
 1940
 1941
 1942
 1943
 1944
 1945
 1946
 1947
 1948
 1949
 1950
 1951
 1952
 1953
 1954
 1955
 1956
 1957
 1958
 1959
 1960
 1961
 1962
 1963
 1964
 1965
 1966
 1967
 1968
 1969
 1970
 1971
 1972
 1973
 1974
 1975
 1976
 1977
 1978
 1979
 1980
 1981
 1982
 1983
 1984
 1985
 1986
 1987
 1988
 1989
 1990
 1991
 1992
 1993
 1994
 1995
 1996
 1997
 1998
 1999
 2000
 2001
 2002
 2003
 2004
 2005
 2006
 2007
 2008
 2009
 2010
 2011
 2012
 2013
 2014
 2015
 2016
 2017
 2018
 2019
 2020
 2021
 2022
 2023
 2024
 2025
 2026
 2027
 2028
 2029
 2030
 2031
 2032
 2033
 2034
 2035
 2036
 2037
 2038
 2039
 2040
 2041
 2042
 2043
 2044
 2045
 2046
 2047
 2048
 2049
 2050
 2051
 2052
 2053
 2054
 2055
 2056
 2057
 2058
 2059
 2060
 2061
 2062
 2063
 2064
 2065
 2066
 2067
 2068
 2069
 2070
 2071
 2072
 2073
 2074
 2075
 2076
 2077
 2078
 2079
 2080
 2081
 2082
 2083
 2084
 2085
 2086
 2087
 2088
 2089
 2090
 2091
 2092
 2093
 2094
 2095
 2096
 2097
 2098
 2099
 2100
 2101
 2102
 2103
 2104
 2105
 2106
 2107
 2108
 2109
 2110
 2111
 2112
 2113
 2114
 2115
 2116
 2117
 2118
 2119
 2120
 2121
 2122
 2123
 2124
 2125
 2126
 2127
 2128
 2129
 2130
 2131
 2132
 2133
 2134
 2135
 2136
 2137
 2138
 2139
 2140
 2141
 2142
 2143
 2144
 2145
 2146
 2147
 2148
 2149
 2150
 2151
 2152
 2153
 2154
 2155
 2156
 2157
 2158
 2159
 2160
 2161
 2162
 2163
 2164
 2165
 2166
 2167
 2168
 2169
 2170
 2171
 2172
 2173
 2174
 2175
 2176
 2177
 2178
 2179
 2180
 2181
 2182
 2183
 2184
 2185
 2186
 2187
 2188
 2189
 2190
 2191
 2192
 2193
 2194
 2195
 2196
 2197
 2198
 2199
 2200
 2201
 2202
 2203
 2204
 2205
 2206
 2207
 2208
 2209
 2210
 2211
 2212
 2213
 2214
 2215
 2216
 2217
 2218
 2219
 2220
 2221
 2222
 2223
 2224
 2225
 2226
 2227
 2228
 2229
 2230
 2231
 2232
 2233
 2234
 2235
 2236
 2237
 2238
 2239
 2240
 2241
 2242
 2243
 2244
 2245
 2246
 2247
 2248
 2249
 2250
 2251
 2252
 2253
 2254
 2255
 2256
 2257
 2258
 2259
 2260
 2261
 2262
 2263
 2264
 2265
 2266
 2267
 2268
 2269
 2270
 2271
 2272
 2273
 2274
 2275
 2276
 2277
 2278
 2279
 2280
 2281
 2282
 2283
 2284
 2285
 2286
 2287
 2288
 2289
 2290
 2291
 2292
 2293
 2294
 2295
 2296
 2297
 2298
 2299
 2300
 2301
 2302
 2303
 2304
 2305
 2306
 2307
 2308
 2309
 2310
 2311
 2312
 2313
 2314
 2315
 2316
 2317
 2318
 2319
 2320
 2321
 2322
 2323
 2324
 2325

GOVERNMENT OF MADRAS.

EDUCATIONAL DEPARTMENT.

READ—the following papers :—

From D^r DUNCAN, Esq., M.A., D.Sc., Acting Director of Public Instruction, to the Acting Chief Secretary to Government, dated Madras, 24th February 1886, No. 1303.

With reference to G.O., dated 11th February 1886, Mis. No. 88, Educational, I have the honor to forward the report of the committee appointed in G.O., dated 11th September 1885, No. 540, Educational, to fix the details and the exact character of the syllabuses in connection with the scheme of technical education approved by Government in their Order, dated 3rd June 1885, No. 377, Educational. The report is followed by an appendix showing the nature of the changes made in the draft syllabuses, and is accompanied by 63 syllabuses approved by the committee. The report, it will be observed, is dated the 27th November 1885. The fact of this delay of from two to three months was referred to in my letter, dated 10th February 1886, No. 916, and recorded in G.O., dated 11th February 1886, No. 88, Educational, and the explanation of it was furnished by Mr. Garthwaite in his letter, dated 20th February 1886, which was forwarded to you on the 22nd instant, under cover of my letter, No. 1253, of the above date.

2. I have also to forward the draft notification, along with a covering letter from Mr. Grigg, dated 28th November 1885. The notification, as now presented, differs in several particulars both from the original draft published in G.O., dated 3rd June 1885, No. 377, and from that, the rough proof of which I received from Mr. Garthwaite when he handed over the papers to me. But, as far as I am able to judge, it expresses the views of the committee. The only changes which it seems necessary to mention specially are the following :—

- (1) In Article 1, I have left the time and place of examination undetermined, instead of fixing it in Madras and on the last Monday in May. One reason for this change is that in many of the subjects the time of the examination must coincide with the closing of the sessions of the institutions which will teach up to these examinations, such as the Agricultural College and the School of Arts. Moreover, I am not sure that it is either practicable or desirable to hold all the examinations in all the subjects at the same time. In any case, it is to be borne in mind that we are making an entirely new departure, and it is better to leave ourselves unfettered by fixed conditions of time and place until some actual experience has been gained of the working of the scheme. If this view meets with the approval of Government, I would propose that, as soon as possible, after the scheme has been sanctioned, a notification be published to the effect that the first examination will take place, say, in the first week of August next.
- (2) Article 18 of the original draft notification has been altogether omitted, as it seems to be out of place in a general notification. Its proper place will be found among the regulations of the Agricultural College and the School of Arts.

- (3) In Article 18 (Article 19 in the original draft), the nature and value of the prizes are left for the present undetermined. The committee seem also to have considered the minute details of the original draft of this article as premature.
- (4) The latter part of Article 20 (21 of the original) has been omitted, partly for the same reason, and partly because it appears to be inconsistent with Article 14, which states that candidates in the third class are not to be arranged in order of merit.
- (5) A few words have been added to Article 21 (formerly 22) in order to define more precisely the class of persons qualified to draw normal scholarships.

3. Before I had time to ascertain whether syllabuses in all the subjects had been prepared, there was some misunderstanding about the Botany syllabus, and to prevent delay, Mr. Lawson kindly undertook to prepare a syllabus in that subject. It turned out, however, that a syllabus had already been adopted by the committee. The syllabus, No. 33, in the bound copy is that of the committee. Mr. Lawson's syllabus is forwarded separately.

4. I have to acknowledge the willing and valuable help rendered me by Mr. Michie Smith in putting these papers into final shape for submission to Government.

From D. DUNCAN, Esq., M.A., D.Sc., Acting Director of Public Instruction, to the Acting Chief Secretary to Government, dated Madras, 8th March 1886, No. 1493.

With reference to my letter, No. 1303, dated 24th February 1886, I have the honor to point out an error in Syllabus No. 59, Tobacco Manufacture. Paragraph 9, "Different kinds of yeasts scientifically described," should be omitted, as it refers to bread-making and not to tobacco-making.

From D. DUNCAN, Esq., M.A., D.Sc., Acting Director of Public Instruction, dated Madras, 9th March 1886, No. 1562.

ABSTRACT.—Submitting further information regarding the report of the Committee on Technical Education.

ENCLOSURES.

Report of the Committee appointed to fix the details and the exact character of the Syllabuses, dated 27th November 1885.

In accordance with G.O., dated 11th September 1885, No. 540, Educational, we have the honor to submit, duly revised, the Syllabuses, the details and character of which we were appointed to consider in relation to the courses of the scheme of Technical Education embodied in the Notification already approved of by Government.

2. *Constitution.*—The first meeting of the General Committee was held on the 30th September 1885. As it was felt desirable to strengthen the Committee by the addition of more members having special knowledge of particular subjects, the following gentlemen were invited to join the Committee:—

P. V. Luke, Esq., C.I.E., Chief Superintendent, Government Telegraph Department.
 J. S. Gamble, Esq., M.A., Conservator of Forests.
 P. Bosworth Smith, Esq., Government Mineralogist.
 F. B. Hanna, Esq., M.A., M.E., Engineer, Madras Railway, Beypore.
 Colonel H. P. Hawkes, Commissary-General.
 R. F. Chisholm, Esq., F.R.I., B.A., Government Architect.

Of these, all consented to join except Mr. Chisholm. All the members (except Mr. Hanna, and also Mr. Bruce Foote and Dr. Bidie, who during part of the time that the Committee sat were absent from Madras on duty) attended most of the meetings. As the work of the Committee was chiefly done by circulation of papers, personal attendance, although desirable, was not essential.

3. *Procedure.*—It was resolved at the first meeting that the Committee should, for the consideration of the draft syllabuses, organise itself into Sub-Committees, as follows:—

- | | |
|---|--|
| I. PURE MATHEMATICS—
Practical Plane and Solid Geometry.
Mensuration.
Statics, Kinetics, Hydrostatics, Hydrokinetics and Pneumatics. | Messrs. G. H. Stuart, C. Michie Smith, Captain H. D. Love, Messrs. H. B. Grigg (President), L. Garthwaite (Secretary). |
| II. (ENGINEERING SUBJECTS)—
Applied Mechanics.
Hydraulics and Hydraulic Engineering.
Building Materials and Construction.
Plan-drawing from Specification, and Estimate-making.
Surveying and Levelling.
Earth-work, Road-making and Railway-making.
Bridge-making.
Principles of Mechanism.
Machine Construction and Drawing.
Steam and the Steam Engine.
Heat. | Captain H. D. Love, Messrs. D. Logan, F. H. Trevithick, F. B. Hanna, G. K. Winter, G. H. Stuart, C. Michie Smith, H. B. Grigg, (President), L. Garthwaite (Secretary). |
| III. LIGHT—
[Sound]. | Messrs. C. Michie Smith, G. K. Winter, G. H. Stuart, H. B. Grigg (President), L. Garthwaite (Secretary). |
| IV. METALLURGY. | Messrs. R. Bruce Foote, F. H. Trevithick, P. Bosworth Smith, H. B. Grigg (President), L. Garthwaite (Secretary). |
| V. ELECTRICITY AND MAGNETISM. | Messrs. G. K. Winter, P. V. Luke, C.I.E., C. Michie Smith, H. B. Grigg (President), L. Garthwaite (Secretary). |
| VI. TELEGRAPHY—
Electrical Engineering.
Electrical Instrument-making.
Electro-metallurgy. | Messrs. P. V. Luke, C.I.E., G. K. Winter, C. Michie Smith, R. G. Orr, H. B. Grigg (President), L. Garthwaite (Secretary). |
| VII. CHEMISTRY—
Inorganic Chemistry.
Organic Chemistry. | Drs. C. J. McNally, G. Bidie, C.I.E., Messrs. C. Michie Smith, W. R. Robertson, J. Mills, H. B. Grigg (President), L. Garthwaite (Secretary). |
| VIII. GEOLOGY—
Mineralogy.
Physiography.
[Principles of Mining.] | Messrs. R. Bruce Foote, P. Bosworth Smith, W. R. Robertson, C. Michie Smith, Dr. G. Bidie, C.I.E., Messrs. H. B. Grigg (President), L. Garthwaite (Secretary). |
| IX. AGRICULTURE. | Mr. W. R. Robertson, Drs. C. J. McNally, G. Bidie, C.I.E., Messrs. J. Mills, J. S. Gamble, H. B. Grigg (President), L. Garthwaite (Secretary). |
| X. ANIMAL PHYSIOLOGY.—
Biology. | Dr. C. J. McNally, Messrs. J. Mills, W. R. Robertson, Dr. G. Bidie, C.I.E., Messrs. H. B. Grigg (President), L. Garthwaite (Secretary). |

XI. VETERINARY SURGERY AND MEDICINE.

Mr. J. Mills, Dr. C. J. McNally, Messrs. W. R. Robertson, H. B. Grigg (President), L. Garthwaite (Secretary).

XII. BOTANY—

Economic Entomology.
Forestry.

Drs. G. Bidie, C.I.E., C. J. McNally, Messrs. J. S. Gamble, W. R. Robertson, H. B. Grigg (President), L. Garthwaite (Secretary).

XIII. HYGIENE (STATE MEDICINE).

Drs. G. Bidie, C.I.E., C. J. McNally, Captain H. D. Love, Messrs. J. Mills, H. B. Grigg (President), L. Garthwaite (Secretary).

XIV. DRAWING AND PAINTING—

Modelling.
Engraving and Etching.
Photography.

Messrs. E. B. Havell, F. B. Hanna, H. B. Grigg (President), L. Garthwaite (Secretary).

XV. INDUSTRIES AND INDUSTRIAL ART—

Printing.
Carpentry and Joinery.
Cabinet-making and Turning.
Carriage-building.
Boot and Shoe making.
Tanning Leather.
Silversmith's and Jeweller's work.
Watch and Clock making.
Pattern-designing.
Textile Fabrics—
A. Cotton.
B. Silk.
Bleaching, Dyeing and Printing—
A. Cotton.
B. Silk-dyeing.
Cotton Spinning.
Carpet Weaving.
Pottery and Porcelain.
Glass-making.
Paper-making.
Philosophical Instrument-making.
Tobacco Manufacture.
Tailoring.
Dress-making.
Lace-making.
Bread-making.
Cookery.
[Tuning and Repairing Musical Instruments.]

Messrs. E. B. Havell, F. H. Trevithick, R. G. Orr, C. Michie Smith, G. K. Winter, Colonel Hawkes, Messrs. H. B. Grigg (President), L. Garthwaite (Secretary).

XVI. MUSIC Mr. L. Garthwaite.

4. *Constitution of the Sub-Committees.*—As the number of subjects before the Industries sub-committee was considerable, that sub-committee was authorised to sub-divide itself, allotting special subjects to one individual member or to, in some cases, two members. A similar step was also found necessary in regard to the sub-committee for the Engineering subjects.

5. *Work of the Sub-Committees.*—The Sub-Committees were authorised—

- To indicate TEXT BOOKS in the syllabuses;
- Also to frame INTRODUCTORY MEMORANDA to the syllabuses;
- Also to provide adequate PRACTICAL TESTS for such subjects as require them;
- Also to transfer from the Preliminary into the Advanced course and *vice versa*, and to substitute or add new matter and to wholly reject existing matter;
- Also to consider in each subject the mark-standard, with a view to suggesting any modifications that may seem required in particular subjects;
- Also to consult (either personally or in writing) gentlemen not on the Committee.

6. *Additions to the list of subjects.*—In anticipation of the sanction of Government, certain subjects were added to those in the Draft Notification of the G.O., viz., the following.

Philosophical Instrument-making, Tobacco manufacture, Bread-making, Lace-making, Dress-making, Tailoring, and Cookery, and in anticipation of the sanction of Government the preparation of syllabuses was directed; also for Hygiene, Light, Mineralogy and Music, for which, though they were in the previous list of subjects, examination had for the present not been contemplated.

In anticipation of sanction, the Tuning and Repairing Musical Instruments was brought in as a subject, but for the present only nominally. No examination being at present contemplated, the preparation of a syllabus was not ordered.

In the other subjects above, it was directed that syllabuses only for the Preliminary Higher Examination should be prepared, except in Hygiene, in which an Advanced Higher Examination is contemplated. As a minor point to which attention has to be called it may be mentioned that in bringing in new subjects it was found desirable to slightly change the order of the syllabuses and to renumber them. The numbers will therefore not in all cases agree with those in the Draft Notification printed in the order above quoted. Of one or two syllabuses, such as "Theoretical Mechanics," it was thought desirable to change the name, either wholly or partly, with a view to the name more exactly following the subjects of the syllabuses.

7. *The Industries Sub-Committee.*—The Industries Sub-Committee met on the 5th of the following month; the work of the revision or preparation of the syllabuses was distributed as follows, it being understood that each member would, where necessary, consult experts—

Printing	...	...	...	...	Mr. GARTHWAITE.
Carpentry and Joining	}	...	...	...	Mr. TREVITHICK.
Cabinet-making and Turning		...	...	...	
Carriage Building		...	...	...	
Boat and Shoe making	...	...	...	...	Mr. GARTHWAITE.
Tanning Leather	...	...	...	...	Colonel HAWKES.
Silversmith's and Jeweller's work	...	...	...	...	Mr. ORR.
Watch and Clock making	...	...	...	...	Mr. WINTER.
Pattern Designing	...	...	...	...	Mr. HAVELL.
Textile Fabrics—	}	...	...	...	Messrs. GARTHWAITE AND HAVELL.
(A) Cotton		...	...	...	
(B) Silk		...	...	...	
Bleaching, Dyeing and Printing—	}	...	...	...	Mr. MICHIE SMITH.
(A) Cotton		...	...	...	
(B) Silk		...	...	...	
Cotton Spinning	...	...	...	...	Mr. HAVELL.
Carpet-weaving	...	...	...	...	Mr. HAVELL.
Pottery and Porcelain	...	...	...	...	Mr. MICHIE SMITH.
Glass-making	...	...	...	...	Mr. GARTHWAITE.
Paper-making	...	...	...	...	Mr. WINTER.
Philosophical Instrument-making	...	...	...	...	Colonel HAWKES.
Tobacco Manufacture	...	...	...	...	Mr. GARTHWAITE.
Tailoring	...	...	...	...	(Mr. GRIGG) transferred to Mr. GARTHWAITE.
Dress-making	...	...	...	...	Messrs. HAVELL AND GARTHWAITE.
Lace-making	...	...	...	...	Colonel HAWKES.
Bread-making	...	...	...	...	Mr. GRIGG.
Cookery	...	...	...	...	

8. *Work of the General Committee.*—Each syllabus already prepared was then put into circulation, and after the suggestions of the individual members of the Sub-Committee had been duly considered by the other members, such alterations, additions or omissions as had been approved of by the majority were embodied in the syllabus and the syllabus thus revised was printed and sent to each of the members of the parent Committee, and at the next meeting of the whole Committee such syllabuses were finally considered and passed with (in general) but slight modifications. It was then once more printed and sent round to each member of the General Committee for final approval and confirmation, and any verbal or other slight alterations having been made where such appeared in harmony with the general sense of the Committee, the syllabus was printed in the form in which it now appears. A similar course was followed in regard to new syllabuses.

As Mr. Grigg is leaving the Presidency, it was resolved to authorise the Sub-Committees in consultation with the Secretary to make the requisite alterations, omissions, and additions in such syllabuses as have not been finally passed on this date.

9. *Changes in the Syllabuses.*—The general character of the courses and syllabuses was on the whole approved of both by the Sub-Committees and the General Committee. Additions and omissions were made, but, except in some of the Engineering subjects and in the subjects connected with Electricity and Magnetism, very material alterations were, in general, not very many; verbal modifications were, as might be expected, more numerous. One material alteration was, however, general, and should be here mentioned, viz., that in the "Practical Side" of each syllabus it was decided to omit the clause calling for competency of apprenticeship certificates from any outside authority, and the "Practical Side" tests were revised so as to enable the Examiners themselves to obtain from their own observation sufficient evidence of the candidate's competency. It was also resolved that certain matter originally appearing in the syllabuses, viz., information regarding the conditions of certain examinations and of the certificates to be given, and regarding any exemptions in the case of particular classes of candidates, would properly appear in the Notification, even although they might in some cases be allowed to stand in the syllabuses.

For convenience of reference, a detailed account of the additions, omissions and other alterations in each individual syllabus is added as a note in the Appendix.

We have the honor to be,

Sir,

Your most obedient Servants,

H. B. GRIGG, *President.*

G. H. STUART,

H. P. HAWKES,

F. H. TREVITHICK,

E. B. HAVELL,

C. MICHIE SMITH,

H. D. LOVE,

C. J. McNALLY,

W. R. ROBERTSON,

J. S. GAMBLE,

R. G. ORR,

J. MILLS,

DAVID LOGAN,

F. B. HANNA,

G. K. WINTER,

P. V. LUKE,

G. BIDIE,

P. BOSWORTH SMITH,

R. BRUCE FOOTE,

L. GARTHWAITE, *Secretary.*

Members.

From H. B. GRIGG, Esq., M.A., Director of Public Instruction, to the Chief Secretary to Government, dated Madras, 28th November 1885.

I have the honor, with reference to G.O., Educational, No. 377, dated 3rd June 1885, to submit, for the final sanction of Government, the draft Notification regarding the Examination in Science, Art, and Industries, and request that it may be published at an early date in three issues of the *Fort St. George Gazette*. The draft has been slightly altered in consideration of the opinions expressed by the Committee for fixing the details of the courses and the exact character of the syllabuses and the suggestions accompanying their report have been embodied in the draft now submitted. I beg here to state my entire concurrence.

NOTIFICATION.

Higher Examination in Science, Art, and Industries.

1. With a view to give effect to the instructions of the Government of India, as contained in their resolution, 10, of the 23rd October 1884, HIGHER EXAMINATIONS in various branches of TECHNICAL SCIENCE and ART and in INDUSTRIES will be held at such times and places as may hereafter be determined, and of which due notice will be given.

2. THE OBJECT of Government in instituting these examinations is to encourage advanced instruction in Science and Art, especially in those kinds of knowledge which bear upon the different branches of Industry now existing in this Presidency or suitable for it, and to furnish a means of testing wholly, or in part, the qualifications of persons desirous of becoming—

I. (a) Science, }
(b) Art, or } Teachers ; or
(c) Technical }

II. Mechanical engineers ; mechanical draughtsmen ; electrical engineers ; telegraphists ; builders ; designers ; engravers ; decorative or art workmen in any branch of artistic industry included in this notification ; or

III. Scientific agriculturists ; foresters ; veterinarians ; or

IV. Managers or foremen of manufacturing, printing and other industrial establishments suitable for this Presidency ; or

V. Employés in posts in the Revenue, Revenue Survey, Public Works, Education, Agriculture, Forest, Sanitation, Cattle Disease, Vaccination, or other departments which require a practical knowledge of any of the branches of science, art or industry in which it is proposed to examine, and for employment in which Government may, from time to time, see fit to recognise these examinations as a test ; or

VI. Employés in similar posts under District Boards and Municipal Councils, or under private employers.

3. THE KIND OF SCIENTIFIC INSTRUCTION that it is proposed to test, differs from that given in connection with the University examinations in this, that what is contemplated is not so much abstract science or science studied merely for the extension of knowledge and the enlargement of the mind, but science viewed in its application to various manufactures and industries. Similar remarks apply to the art examinations.

4. THE EXAMINATIONS shall be conducted by BOARDS OF PROFESSIONAL EXAMINERS appointed by the Commissioner for the Uncovenanted Civil Service Examinations, and shall be under the control and direction of that officer, to whose office all communications regarding the examinations should be addressed. The names of the members of each Board shall be notified beforehand in the *Fort St. George Gazette*.

5. THE EXAMINATIONS may, at the discretion of the Commissioner, be held at PLACES OTHER THAN MADRAS. Of such places, a list will be published in the *Fort St. George Gazette* annually in the month of June, and at such other times as the Commissioner may consider expedient.

6. APPLICATIONS FOR ADMISSION TO THE EXAMINATION must reach the office of the Commissioner not less than two months before the examination, and must be on the printed forms to be obtained as hereinafter prescribed (paragraph 22). Each application must be accompanied by the district treasury officer's receipt for the fee, and by a certificate of the applicant's having passed the Middle School Examination or some examination accepted by the Commissioner as equivalent or higher.

7. THE FEE shall be as follows :—

When only one subject is brought up, the fee (except as hereinafter provided) shall be Rs. 5 for the Preliminary Higher Examination and Rs. 8 for the Advanced Higher Examination ; when two subjects are brought up at any one examination, it shall be Rs. 4 for each subject of the Preliminary Examination, and Rs. 6 for each subject of the Advanced Examination, and similarly the fee shall be Rs. 3 and Rs. 5, respectively, for each subject when three or more subjects are brought up at one examination. No deduction will be made when the additional subject is brought up in a succeeding year.

In those subjects in which the Examination is divided into stages the fees for examination for each stage shall be as follows :—Preliminary Examination, for each stage, Rs. 2. Advanced Examination, for each stage, Rs. 4. In subjects wherein for the present there is notified to be only one examination, the Preliminary Examination fee shall be charged.

8. THOSE WHO PASS the examinations will receive SINGLE SUBJECT CERTIFICATES, GROUP CERTIFICATES, or DIPLOMAS (see paragraphs 15, 16 and 17), and to some there will, under certain

conditions, be given also PRIZES and REWARDS (see paragraphs 18 and 20), and SCHOLARSHIPS (see paragraph 19).

THE TEACHERS of passed candidates will be eligible for GRANTS under the Grant-in-Aid Code (see Grant-in-Aid Code).

9. In connection with these examinations, SCIENCE TEACHERS, LECTURERS AND DEMONSTRATORS will, as opportunity serves and funds allow, be provided in every Government College, which will be provided also with COLLECTIONS OF APPARATUS AND SPECIMENS, and with LABORATORIES. Encouragement will be given to all recognised colleges and high schools to make similar provision, and to District Boards and Municipalities to establish DEMONSTRATION-WORKSHOPS AND FARMS in connection with the above teacherships and lectureships, so that theoretical instruction may be supplemented by practice.

10. Pending further notification there will be no advanced Higher Examination in the following subjects:—MENSURATION; PLAN-DRAWING FROM SPECIFICATION AND ESTIMATE-MAKING; EARTH-WORK, ROAD-WORK AND RAILWAY-WORK; MACHINE CONSTRUCTION; MECHANICAL DRAWING; STEAM AND THE STEAM-ENGINE; HEAT; LIGHT; METALLURGY; ELECTRICAL INSTRUMENT MAKING; ELECTRO-METALLURGY; ORGANIC CHEMISTRY; MINERALOGY; PHYSIOGRAPHY; ANIMAL PHYSIOLOGY; GENERAL BIOLOGY; ECONOMIC ENTOMOLOGY; MODELLING; WOOD AND COPPERPLATE ENGRAVING AND ETCHING; PHOTOGRAPHY; and MUSIC. In each of the Industries, numbered in the list below (paragraph 12), from 41 (PRINTING) to 64 (COOKERY), there will, for the present, be only one Higher Examination. In the other subjects, there will be two examinations, one the Preliminary Higher, and the other the Advanced Higher Examination.

In PURE MATHEMATICS the two Examinations are each divided into two stages, making altogether four examinations in that subject.

In certain other subjects (see Syllabuses) the Preliminary Higher Examination is divided into two STAGES, which may be brought up separately. But no candidate shall be permitted to appear for the second stage until he has passed the first stage, or some examination accepted by the Commissioner as equivalent or higher. In some subjects (see Syllabuses) an option is allowed between two or more sub-divisions of the Syllabus, or of a part thereof.

The Examinations will be so arranged as to allow a diligent candidate of fair capacity to pass the Preliminary Higher Examination in from two to three years after his passing the Middle School Examination, and the Advanced Higher Examination in from two to three years after his passing the Preliminary Examination. Candidates shall not be required to appear in more than a single subject at the same Examination, except in so far as the rules of any institution in which they are studying may provide. Candidates will not, however, be restricted, as yet, to any definite time of preparation; and provided they have passed the Middle School Examination (or some examination accepted by the Commissioner as equivalent or higher), they will be at liberty to come up in any year for the Preliminary Higher Examination, except so far as the rules of the institution in which they are studying preclude. The same restriction applies to students of institutions sending up candidates for the Advanced Higher Examination as the final test of the course in such institutions. But every candidate allowed to present himself for the Advanced Higher Examination in any subject must have passed either the Preliminary Examination in that subject, and in any other subjects declared requisite, or some other examination accepted by the Commissioner as equivalent or higher, or have completed in a technical institution a course of study accepted by the Commissioner as equivalent.

Candidates may, at both the Preliminary and Advanced Higher Examinations, come up in more than one subject, either in the same or in following years, and may, after passing the Advanced Higher Examination, come up for the Preliminary Higher Examination in any subject other than those in which they have passed the advanced Examination.

Candidates who have passed in a lower class in any subject, may come up again to qualify for a higher class, on paying again the full examination fee prescribed in paragraph 7.

11. Students of SCIENCE will find it to their advantage to have, before coming up for the Preliminary Higher Examination, that amount of general education which is implied by passing the MATRICULATION EXAMINATION of the Madras or other Indian University, and similarly candidates for the advanced Higher Examinations in science should possess an amount of general education equal to that implied by passing the FIRST EXAMINATION IN ARTS.

12. The separate SUBJECTS in which Examinations will be held are, for the present, those in the following list, which, however, may be added to. Notice of any addition will be published in the *Fort St. George Gazette*.

NOTE 1.—Till further notice, no examinations will be held in those subjects whose names in the list are enclosed in square brackets [].

NOTE 2.—Advanced examinations will for the present be held in those subjects only whose names in the list are printed in CAPITALS.

NOTE 3.—For each subject, except those whose names in the list are enclosed in square brackets, there is published a syllabus of the knowledge required for the examinations, and such syllabuses are on sale at the Madras School Book Society's Depot, Old College, Nungumbakam, Madras.

N.B.—These syllabuses are subject to Revision. Notice of any revision will be published in the *Fort St. George Gazette*.

Subject:—

1. PURE MATHEMATICS.
2. PRACTICAL PLANE AND SOLID GEOMETRY.
3. MENSURATION.
4. STATICS, KINETICS, HYDROSTATICS, HYDROKINETICS, AND PNEUMATICS.
5. APPLIED MECHANICS.
6. HYDRAULICS AND HYDRAULIC ENGINEERING.
7. BUILDING MATERIALS AND CONSTRUCTION.
8. Plan-drawing from Specification and Estimate-making.
9. SURVEYING, LEVELLING AND SETTING OUT.
10. Earth-work, Road-work, and Railway-work.
11. BRIDGE-MAKING.
12. Machine Construction.
13. Mechanical Drawing.
14. Steam and the Steam Engine.
15. Heat.
16. Light.
17. [Sound.]
18. Metallurgy.
19. ELECTRICITY AND MAGNETISM.
20. PRACTICAL TELEGRAPHY.
21. ELECTRICAL ENGINEERING and Instrument-making.
22. Electro-Metallurgy.
23. INORGANIC CHEMISTRY.
24. Organic Chemistry.
25. GEOLOGY.
26. Mineralogy.
27. Physiography.
28. [Principles of Mining.]
29. AGRICULTURE.
30. Animal Physiology.
31. General Biology.

Subject—continued.

32. VETERINARY SURGERY AND MEDICINE.
33. BOTANY.
34. FORESTRY.
35. Economic Entomology.
36. HYGIENE.
37. DRAWING, PAINTING AND DESIGN.
38. Modelling.
39. Wood and Copperplate Engraving and Etching.
40. Photography.
41. Printing.
- 42 & 43. Carpentry, Joinery, Cabinet Making and Turning.*
44. Carriage Building.*
45. Boot and Shoemaking.
46. Tanning Leather.
47. Silversmith's Work.*
48. Jeweller's Work.
49. Watch Repairing and Clock Repairing.
50. Pattern Designing.*
51. Textile Fabrics, A.—Cotton, B.—Silk.
52. Cotton Spinning.
53. A.—Bleaching, Dyeing, and Printing Cotton. B.—Silk Dyeing.*
54. Carpet Weaving.*
55. Pottery and Porcelain Manufacture.*
56. Glass-making.
57. Paper-making.
58. Philosophical Instrument-making.*
59. Tobacco Manufacture.
60. Tailoring.
61. Dress-making.
62. Lace-making.
63. Bread-making.
64. Cookery.
65. [Tuning and Repairing Musical Instruments.]
66. Music.

13. The QUESTIONS shall not in number or difficulty be more than a candidate of decided ability can answer within the time allowed. Both in the written examination and in the *viva voce* they shall be such as cannot be answered merely from memory, but shall test the candidate's ability to intelligently apply the principles he has learned. No candidate shall receive marks in any science, art, or industry subject who, in the opinion of the examiners, fails to show such an understanding of its principles as is necessary for a useful practical application thereof.

In such sciences as admit of it the examinations shall have a PRACTICAL SIDE, and arrangements shall be made for testing the candidates, *viva voce*, as well as by written papers. In all subjects, the candidates will be liable to be called upon to produce diagrams similar to those given in the ordinary text-books.

No candidate shall pass in a science, who does not satisfy the examiners in the PRACTICAL SIDE of the subject he elects.

NOTE.—The examinations will for the present be held only at places where facility exists for the practical and *viva voce* examinations.

14. LISTS OF THE PASSED CANDIDATES shall be published in the *Fort St. George Gazette*, one list in three classes for each subject; candidates obtaining not less than 60 per cent. being ranked in the first class, those obtaining not less than 45 per cent. in the second class, and those obtaining not less than 35 per cent. in the third class. Candidates in the first and second classes shall be ranked in order of merit, and those in the third class in alphabetical order. In the case of institutions sending up students for examination in one of the hereinafter named groups of subjects as a test in the preliminary or final course of study in such institutions, a separate group

* In connection with the examination in these Industries there must be brought up Drawing, or Modelling, or both (as the case may require), sufficient for the industry.

list will be published. For passing in such group the candidate must obtain at least two-fifths of the marks in the principal subject of the group, one-third marks in each of the allied subjects, and one-half on the aggregate. The names of candidates passing will be included also in the separate subject lists.

15. To each candidate successful in the full Preliminary Higher Examination and to each candidate successful in the full Advanced Higher Examination, except in the subjects named in the margin, there shall be given a SINGLE SUBJECT CERTIFICATE signed by the members of the Board of Examiners in that subject, and by the Commissioner for the

Agriculture. Forestry. Veterinary Surgery and Medicine. Building Construction and Materials.	Geology. Machine Construction. Mechanical Drawing. Metallurgy. Mining.
---	--

Uncovenanted Civil Service Examinations, or an officer deputed by him. In the case of syllabuses in which parts are bracketed, these certificates shall be granted only to candidates who have passed in the whole syllabus. Where the Science or Art is one in which the Preliminary Examination is divided into stages, the certificate shall not be given until the candidate has passed the second stage: but this rule shall not apply to the Examinations in the several industries. Candidates who have passed a first stage and have accordingly had their names published in the *Fort St. George Gazette*, must on applying for admission to the Examination for the second stage, cite the date and page of the *Gazette* in which their names appear, and their number in the list of successful candidates.

16. To each candidate successful in any one of the groups of examinations named below, or in any industry, there shall be given a GROUP CERTIFICATE or an INDUSTRIAL CERTIFICATE, as the case may be; signed as above.

GROUP and INDUSTRIAL certificates shall certify that the holder is qualified to earn his livelihood by the profession or trade in which he has been examined.

PRELIMINARY GROUP TESTS (FOR GROUP CERTIFICATES).

N.B.—For candidates for group certificates certain portions of the 'Allied Subjects' that do not bear on the main subject of the group are omitted in the examination. Such omitted portions are distinguished in the syllabuses by being enclosed in square brackets.

Group A.—AGRICULTURE AND THE ALLIED SUBJECTS.

AGRICULTURE (preliminary); with Botany (preliminary, first stage); Inorganic Chemistry (preliminary); Pure Mathematics (preliminary, first stage); Mensuration; Animal Physiology (first stage); and Physiography.

Group B.—FORESTRY AND THE ALLIED SUBJECTS.

FORESTRY (preliminary); with Botany (preliminary); Surveying, Levelling, and Setting out (preliminary); Physiography; and Pure Mathematics (preliminary, first stage).

Group C.—VETERINARY SURGERY AND MEDICINE AND THE ALLIED SUBJECTS.

VETERINARY SURGERY AND MEDICINE (preliminary); with Inorganic Chemistry (preliminary); Organic Chemistry; Animal Physiology (first stage); and Botany (preliminary).

Group D.—GEOLOGY AND THE ALLIED SUBJECTS.

GEOLOGY (preliminary); with Mineralogy; Physiography; and Surveying, Levelling, and Setting Out (preliminary).

Group E.—BUILDING, CONSTRUCTION, AND THE ALLIED SUBJECTS.

BUILDING MATERIALS AND CONSTRUCTION (preliminary); with Applied Mechanics (preliminary); Plan-drawing from Specifications and Estimate-making; and the Carpentry and Joinery Sections of the Carpentry, Joinery, Cabinet-making, and Turning Syllabuses.

Group F.—MACHINE CONSTRUCTION AND THE ALLIED SUBJECTS.

MACHINE CONSTRUCTION; with Pure Mathematics (preliminary); Steam and the Steam-Engine; Heat; Statics, Kinetics, Hydrostatics, Hydrokinetics, and Pneumatics (preliminary); and Applied Mechanics (preliminary).

Group G.—MECHANICAL DRAWING AND THE ALLIED SUBJECTS.

MECHANICAL DRAWING; with Pure Mathematics (preliminary, first stage); Practical Plane and Solid Geometry; Mensuration; and Drawing and Painting (preliminary, first stage, and the Linear Perspective of the second stage).

Group H.—METALLURGY AND THE ALLIED SUBJECTS.

METALLURGY; with Inorganic Chemistry; and Heat.

[Group I.—MINING AND THE ALLIED SUBJECTS.]

PRINCIPLES OF MINING; with Mineralogy; Geology (preliminary); Physiography; Surveying, Levelling, and Setting Out (preliminary); Plan-drawing from Specifications; and Estimate-making; Machine Construction; Steam and the Steam-Engine; and Heat. *In this group there will, till further notification, be no examination.*

Group J.—ELECTRICITY AND THE ALLIED SUBJECTS.

ELECTRICITY AND MAGNETISM (preliminary); with Pure Mathematics (preliminary, first stage) and with either Electrical Engineering (preliminary, A or B), or Electrical Instrument-making (preliminary), or Electro Metallurgy (preliminary).

Group K.—SANITATION AND THE ALLIED SUBJECTS.

HYGIENE (preliminary); with Veterinary Surgery and Medicine (preliminary, first stage); Biology (preliminary); Physiography; and Inorganic Chemistry (preliminary).

17. A DIPLOMA signed by His Excellency the Governor, or an officer deputed to sign for him, shall be given to each candidate passing in the first or second class in any one of the groups of higher examinations named below.

The holders of Art Diplomas shall be styled Associates of the Madras School of Arts, and the holders of the other diplomas shall be styled Diplomaed Agriculturists, Diplomaed Foresters, Diplomaed Veterinarians, Diplomaed Electrical Engineers, or Diplomaed Chemists, as the case may be.

ADVANCED GROUP TESTS (FOR DIPLOMAS).

(Agriculturist's Diploma).

The subjects of the Preliminary Group Test, and, in addition, the following:—
AGRICULTURE (advanced); with Economic Entomology; Geology (preliminary); Inorganic Chemistry (advanced); Organic Chemistry; Forestry (preliminary); Animal Physiology (second stage); Veterinary Surgery and Medicine (preliminary, first stage); Pure Mathematics (preliminary, second stage); Statics, Kinetics, Hydrostatics, Hydrokinetics, and Pneumatics (preliminary); Building Materials and Construction (preliminary); Surveying, Levelling, and Setting Out (preliminary); and Hydraulic Engineering (preliminary).

(Forester's Diploma).

The subjects of the Preliminary Group Test, and, in addition, the following:—
FORESTRY (advanced); with Botany (preliminary); Economic Entomology; Geology (preliminary); Pure Mathematics (preliminary, second stage); Building Materials and Construction (preliminary); Agriculture (preliminary).

(Veterinarian's Diploma).

The subjects of the Preliminary Group Test, and, in addition, the following:—
VETERINARY SURGERY AND MEDICINE (advanced); with Animal Physiology (second stage); Biology; and Inorganic Chemistry (advanced).

(Electrical Engineer's Diploma).

The subjects of the Preliminary Group Test, and, in addition, the following:—
ELECTRICAL ENGINEERING (advanced); with Electricity and Magnetism (advanced); Practical Telegraphy (advanced); Electro-Metallurgy; Inorganic Chemistry (preliminary); Pure Mathematics (preliminary); Statics, Kinetics, Hydrostatics, Hydrokinetics and Pneumatics (preliminary) and Machine Construction.

(Chemist's Diploma).

INORGANIC CHEMISTRY (advanced); Organic Chemistry; Heat; Light; Electricity and Magnetism (preliminary); and Biology (preliminary); Pure Mathematics (preliminary, first stage); and Botany (preliminary).

(Art Diploma).

DRAWING, PAINTING, AND DESIGN (advanced, both A and B); with Wood and Copperplate Engraving and Etching.

18. In each subject, PRIZES will be given if, in the opinion of the examiners, any candidates shall possess sufficient merit.

To the candidate who, in the Preliminary Examination, passes highest in the Presidency, and is not more than 22 years of age at the date of examination, there shall be given a medal or prize, the nature and value of which will be determined hereafter.

To the candidate who passes highest in the Advanced Examination and is not more than 25 years of age at the date of the examination, there shall also be given a medal or prize, the nature and value of which will be determined hereafter.

[In MATHEMATICS prizes will be given only in the Advanced Higher Examination].

19. If, in the opinion of the examiners, candidates show sufficient merit in any subject, to the first three of those candidates who stand at the head of the list of those who pass in that subject at the Preliminary Examination in any year, SCHOLARSHIPS of Rs. 12, 10, 8, respectively, per mensem, for the next two years will be given, provided they have passed in a subject in which there is an Advanced Examination, and continue to study it in a recognized science, art, or industrial school or class. In each of the subjects in which the Preliminary Examination is divided into stages, and in each of the subjects in which there is only one examination, but that divided into stages, scholarships of half the above amounts, but tenable for one year only, may be given to the three candidates who stand at the head of the list of those who pass in the first stage; provided that in their examination they in the opinion of the examiners show sufficient merit, and that they continue to study the subject in a recognized science, art, or industrial school or class.

No candidate shall be allowed a scholarship in science who has not either at the preliminary examination itself, or at some examination accepted by the Commissioner as equivalent, passed the first stage of pure mathematics and of drawing, respectively, and in one at least of the science subjects of the Middle School Examination.

NOTE.—The object of this restriction is that the student, before commencing an advanced science course, should have acquired such familiarity with the rudiments of mathematics and with practical draughtsmanship as shall enable him to enter with advantage on higher scientific studies.

No student shall be allowed to hold at the same time more than two scholarships. If eligible for more than two at the same time, he shall elect which two he will hold; the scholarship or scholarships rejected passing to the next in order, if, in the opinion of the examiners, he shows sufficient merit.

20. Candidates who pass first or second class in the full preliminary examination in more than one subject, and who, in the opinion of the examiners, show sufficient merit, shall for each additional subject in which they pass, receive REWARDS of Rs. 12 or Rs. 6 according as they pass in the first or second class.

21. Higher or lower grade CERTIFICATES OF CAPACITY AS TEACHERS of Art, Science or Industrial schools or classes will be given to those who pass (a) in the first or second class of the preliminary or advanced examinations, respectively, and also (b) in such examinations as may be prescribed in the principles of teaching, discipline, and class-management, and in teaching a class before a Government Inspector of Schools. Those desirous of obtaining such certificates of capacity as teachers of science, art or industry will find it to their advantage to attend a short course at a Government or other recognised secondary normal school. Such candidates for teacherships of art, science, or industries will receive a monthly stipend of Rs. 15 per mensem while under training at a Government or other recognised Normal school, provided they satisfy the conditions laid down in the Grant-in-aid Code.

NOTE.—Certificated science teachers, art teachers, and teachers of industries in any recognized college or school, Government or aided, will be eligible for grants under the Grant-in-aid Code. Grants to holders of normal certificates are higher than to holders of ordinary certificates.

22. Candidates must send in their applications for examination on printed forms, which may be obtained from all Tahsildars and Treasury Deputy Collectors. Distinct forms, marked A, B, C, D, E, F, G, H, J, and K, respectively, will be supplied to candidates. N.B.—Candidates bringing up a subject only as one of the allied subjects in which a candidate must pass for a group certificate or a diploma, and on that ground claiming exemption from examination in the bracketed portions of the syllabus of that subject, must state accordingly on their applications, and must for this purpose obtain special green forms, and send in their applications on these, otherwise they will be liable to be examined on the full syllabus, the same as ordinary candidates.

- (1) Pupils of a Government or recognized private school or college for general education will be required to make their applications on form A, if males; on form B, if females.
- (2) Pupils in special colleges, schools, or classes, and who are not artisans, on form C, if males; on form D, if females;
- (3) Artizans attending special classes, on form E, if males; on form F, if females;
- (4) Artizans not attending special classes, on form G, if males; on form H, if females;
- (5) All other candidates on form J, if males; on form K, if females.

23. This notification will come into effect from this date.

ORDER—dated 31st March 1886, No. 198, Educational.

In the foregoing letters the Director of Public Instruction submits the results of the labors of the committee appointed by G.O., 11th September 1885, No. 540, Educational, to fix the details of the courses and the exact character of the syllabuses in connexion with the scheme of technical education which was approved by Government in G.O., of the 3rd June 1885, No. 377, Educational. The papers now submitted consist of—

- (1) the Committee's report, dated 27th November 1885;
- (2) sixty-three draft syllabuses; and
- (3) a draft notification regarding the contemplated higher examination in Science, Art and Industries, with covering letter from Mr. Grigg, dated 28th November 1885.

2. His Excellency the Governor in Council approves of and sanctions the draft syllabuses submitted by the Director of Public Instruction, with the exception of syllabus No. 33, that of Botany, which will be issued hereafter. His Excellency in Council further approves of the draft notification with the modifications introduced by Dr. Duncan, and directs its publication in the *Fort St. George Gazette*. With reference to article 18 of the original draft notification which is now omitted, the Director's suggestion that it should be included among the regulations of the Agricultural College and the School of Arts is approved. Dr. Duncan's further proposal to hold the first examination in August next is also approved, and he will submit, as soon as possible, the notification regarding the date of the examination and will make the necessary arrangements for its conduct.

3. In conclusion, His Excellency in Council desires to express the thanks of the Government to the several non-official and official members of the committee for their labors in connection with the scheme of technical education.

(True Extract.)

Shankar

for Chief Secretary.

To the Director of Public Instruction.

- „ Commissioner for the Uncovenanted Civil Service Examinations.
- „ Members of the Committee.
- „ Revenue Department.
- „ Public Works Department.
- „ Financial (Local Fund) Department.
- „ Surgeon-General with the Government of Madras.
- „ Accountant-General.

Exd. A. F. Aaron.

8/c