



Curriculum of Engineering Materials, Surveying, Mechonics Vocational Course

Introduction

It is very important to study about the type of materials either naturally occurred or Artificially manufactured. The Service Condition of a building depends upon wide range of materials and their various properties such as apperance, colours, strength deuability, water resistance, wakability etc. It is also important to study about the area of a given plot when the building is to be constructed and which instrument is to be used for levelling the place so that the construction can be done early. Engg Mechanics is also important to know the centre of Gravty of different strutures and to know the laws which are used for safety.

Objectives

To increase the skill in selecting the good building material

To get a Quality material

To find a good procedure for survey in assesting the supervisors, Engg's and to become self employed.

Skill's Required

To prepare building drawing skills to operate the instruments.

Skills in testing good building materials. The skills required in survey field.

Job opportunities

Wage Employment

To Work as a helper in construction industry like field man

To Work as a assistant engg

Self Employment

1. To become a supplier for good building material
2. Can execute small works under contractors
3. Become a surveyour for finding small areas

Entry Level Qualification

For Inter & Tenth in SSC (or) equivalent as per APOSS

Must be above 14 years

Scheam of Instruction

Item	Days	Hours	Marks Allotted
Theory	60	300	60
Particles	60	300	40
Total	120	600	100

*** Scheme of examination**

Item	Marks
Theory (Public exam)	60
Procedure	15
Record	03
Viva	02
VTC assessment (IA) as Per VTC from V	05
TMA's of theory particle (IA) as per VTC from VI	05
training Diary (IA) as per WSTP from F	05
WST Assessment (IA) as per WSTP from E	05
Total	100

Evaluation of report

S.No	Work skills	Module-1	M2	M3	M4	M5
1.	2	(a)Max marks	b) Marks avoided			
	Adapting correct Postures and observation of safety measures	10	4			
2.	Methods and techniques used	10				
3.	Enthusiasm far learning	10				
4.	Organizing work practice	10				
5.	observation of time schedule	10				
6.	Cooperation with fellow works	10				
7.	Know have of tools and raw materials	10				
8.	Handing of tools and equipment	10				
9.	Presentation of work	10				
10.	Proficiency in terms of productivity	10				
	Total	100				

Internal evaluation report far VTC, TMA

Adduced final marks avoided to the student reducing the weitage for 10 marks

S.No	Assignments	TMA/VTC		TMA/VTC		TMA-3		TMA-4		TMA-5		TMASTotal	
	student Regd Al WST name no. Code	I		II									
		a) Maximum marks	b) Marks avoided	a) Maximum marks	b) Marks avoided	a) Maximum marks	b) Marks avoided	a) Maximum marks	b) Marks avoided	a) Maximum marks	b) Marks avoided	a) Total max marks	b) Total Marks avoided
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1)	Tution marked Assignment (TMA's)	10		10		10		10		10		50	
	Total	10		10		10		10		10		50	

TMA/VTC Form

Cumulative student Assessment Sheet

Student Name

Id No.

Clam

Subject Code

Name & place of AI in which admitted AI code

Name of VTC and place enrolled VTC code

VTC faculty Signature

VTC principals Signature

Module No.	Module Heading	Theory& subtitles	VSPs	Particles	VTPS	Assignments Group disamion	Leaving outcome
------------	----------------	-------------------	------	-----------	------	----------------------------	-----------------

Part A - Construction Materials

1.	Introduction	General Scope & importance of subject	04	Introduction of different materials	03		Under standing of Subject in detail
2.	Stones	a.Rock and stone b.Classification of rocks Geological, physical Chemical classification c.Quarrying of stones d.methods of quarrying e.Dremining of stone f.characterisation of good building stones g.use of stones h. Testing of stones	02	Naturally available stones are to be shown and explained	03	Different samples are to be collected	Student should get the concept about stones.
3.	Bricks	Definition & comparison chemical composition classification of bricks	02	Brick should bosom and its domains	03	should give Assignment work an	Complete knowledge about bricks

		manufacture of brick Stufter for determining of suitability of brick tertinty of bricks		all to be used Tulted for its	brick drawing 03	
4.	Lime	Introduction Manufacture of lime 04 properties of lime use of lime		Lime Naturally 03 available should show	Tents an lime	They should the usage of lime
5.	Cement	Introduction History & develop- ment of cement, 04 chemical compention of cement, properties of cement use of cement		cement is to be stone 03 the different Brands available in market 03	Tent an cement	Complete knowledge about cement should obtained.
6.	Concrete	Classification of concrete properties 04 of cement concrete water cement ratio 04 Reutaced cement concrete preparation 04 concrete conveyance and playing of concrete workability, Dualibility 04 curing of concrete Ready mix concrete		preparation of concrete 03 Tentity of 03 concrete wavlea 03 tent compremon steps of 03 concrete	students should bring Different types Aggregates, to prepare different mixes	what is the
7.	Timber	Introduction use of Timber 04 Sames of Timber Quality of good Timber, classification of Timber, Seasainy of Timber 04 Artificial seasany		wood to be introduced 03 Importance of Timber in 03 building completion Quality terts 03 conducted	They should draw neat diagram of Timber, should dry the samples of wood.	
8.	Introduction	Basic Principles Classification of 02 suryas Importance of suryas				

9.	Measurements	Types of measurements Direct & Indirect measurements	04				
10.	Claim Surey	Types of erram Claim, steeltapes raying rods Arnes peys cress staff Raiyry, obstades convy in claim survy Recording field notes	04	Claim sury linear Eupts	03	Drawing of claim plotting is to be done	They should know the use of claim
11.	Levelling	Basic terms in levelling, level, Levelling staff types of levels Temporary Adjust- ments of Dupy level, methods of leavilly, fly levelly	04	use of Dupy level and autolevel	06	Draw the Elevation diagram	use of land should be
	Theodolite	Introduction use of Theodolite	04	Eepments to be conduct- ed for leveling	09	Draw the eutone levely Diagram	They should be the use of cuul

Part C-Mechanics

Farce and Mamts	Definition of force ment, rantant parallologram law of forces, Triangle law	04	-	-	Should draw the dimetion of forces	
Centoid and tant of Interia	Centoid, Raditon of cryrature, centroid for different shapes Determination of Tant of Interia	04	-	-	Should draw the centroid of different shapes	Students know the use of subject

i) Accommodation & Infrastructures

a) Accommodation & infrastructure required for a batch of 20 students at vocation training centre (VTC)

1. suitable class room for conduct of VSPs for a batch of 20 students with a minimum area of 400 sq ft with good ventilation.
2. suitable accommodation for administration i.e., to principal, office staff, library, store etc.
3. 2 to 3 Toilets and 4 urinals separately for boys and girls with good sanitation and water facility.
4. Two Black boards one each in class room & workshop

5. Furniture

- i) staff chairs - 15
- ii) student chairs fixed with writing flanks - 30
- iii) Tables - 6
 Demo Tables - 4
- iv) stools for students - 30
- v) Armchairs - 6
- vi) Racks - 4
- vii) safety apparatus

7. provision of first Aid materials kit

8. Provision of Good Quality, Drinking water

9. Maintenance of aesthetics & good sanitation in premises

10. Machinery and equipments as prescribed to the course

11. Qualified & skilled staff as per needs of work local

b) Accommodation & infrastructure required at WST / Working skills training area :

1. Accommodation suitable to allotted number of trainee Associates.
2. Good Hygiene, sanitation & Drinking water in the place
3. Provision of toilets and urinals in the working location
4. First Aid provision / Arrangements
5. safety Tools / Apparatus
6. Equipment / Apparatus / Machinery as per course curriculum to be provided for practice to allotted number of Trainee Associates.

- ii) List of Machinery, Equipment, and consumable Required to
a) Vocational Training center (VTC) for a batch of 30 Nos students.

S.No.	Item	Quantity
1.	Consistency, vicat apparatus	3
2.	Initial, final setting time	
3.	Fines/sieve analysis	3
4.	Compressive testing / cul mould	3
5.	soundness, leach test	2
6.	chain survey equipment	4 sets
7.	compass survey	4 sets
8.	Auto level, dumpy level	4 sets
9.	Theodolites	4 sets

Short Answer Questions

1. What is brick and its composition.
2. State the ingredients in brick earth with proportions.
3. State the functions of various ingredients in bricks earth.
4. State the defects in bricks with reasons and remedies.
5. State the various stages involved in manufacture of bricks.
6. State the General qualities of bricks as ISI.
7. State the advantages of clamp firing.
8. State and explain the various types of moulding of bricks.
9. Mention the advantages of kiln firing.
10. State and explain the Artificial drying .
11. What is the weathered brick ? Explain briefly.
12. Define tile and state its classifications.
13. State the characteristics of roof tiles.
14. State four advantages of vitrified tiles.
15. State briefly the stages of manufacture of flooring tiles and wall tiles.

Short Answer Questions

16. State the 5 important uses of O.P.C in construction field.

17. State & explain the chemical composition of OPC.
18. State & explain the setting action of cement.
19. Explain manufacture of cement by dry process through flow diagram.
20. Enumerates Various types of cement.
21. Write on the following (a) Vicat apparatus (b) LC chelier apparatus (c) flaw diag of manufacture of cement by wet process.
22. State the need of soundness test of cement.
23. Bogue's Compauncls of cement clinker.
24. What is lime and have it is attained.
25. State 6 properties of lime.
26. State 6 uses of lime.
27. What are the sauries of lime.
28. What is ment by slaking of lime and state its adjects.
29. Define Concrete : state its classifications.
30. State the ingredients in the plain cement concrete.
31. State the advantages of RCC over PCC.
32. State the types of mechanical mixers used in the preparation of concrete.
33. What is the compaction and state its purposes in compaction.
34. State the importance of curing far cement concrete.
35. What are the normal proportions of cement concrete far the following items.
36. (a) RCC far building works (b) RCC far writer tanks (c) Mass concrete four foundations (d) Ram retaining walls.
37. What is the need far water aheorption of sand and coarse aggregates in concrete.
38. Define the following in the cement concrete
 - (i) Hydration of cement (2) water cement ratio (3) Consistency (4) workability (5) Batching of materials (6) Revlurations
39. State factors effecting the work ability of cement concrete.
40. State factors affecting the duralulity of concrete.
41. State the uses of ready mixed Concrete.
42. State the uses of precast concrete and to colared concretes.
43. State the types of expansion and construction joints in concrete.

44. State the importance of timber in engineering aspects.
45. State 5 important uses timber in construction works.
46. State the classification of timber with examples.
47. State the factors affecting the quality of timber.
48. State the defects in timber.
49. State the requirements of preservation timber.
50. What is meant by chain surveying.
51. What are the compensative errors in chain survey.
52. What is meant by well conditioned triangle.
53. Define large line, check line, tie line, offset line.
54. Define the terms a) level surface b) horizontal surface c) line of collimation & axis of bubble level.
55. Distinguish b/w Back sight and fore sight.
56. What are the temporary adjustments of dumpy level.
57. What are the face left and face right observations in theodolite.
58. What are the temporary adjustments of transit theodolite.
59. What are the uses of theodolite.
60. State the important '10' characteristics of good bricks used for construction of heavy load bearing walls of a building.
61. What are the various stages involved in preparation of bricks. Explain briefly the preparation of brick earth.
62. What is moulding of bricks. Explain the types of moulding of bricks with uses etc.
63. a) What is the process of burning of bricks in intermediate kiln.
b) Give in detail and neat sketch of Hoffman's kiln.
64. a) What are the factors affecting the strength of bricks.
b) Write briefly about different tests for bricks.
65. What are the refractory bricks. Explain the various classifications with uses.
66. State and explain the various ingredients in OPC and their functions.
67. Describe the method of manufacture of cement by dry process through flow diagram.
68. Describe the stages of (i) mixing (2) burning in manufacture of cement in wet process.
69. What are the various tests conducted in laboratory for the cement.

70. Write short note 1) soundness test of cement 2) Tensile strength test of cement.
71. a) what is pozzolanic material b) Write properties advantages and disadvantages of pozzolanic cement.
72. State the various types of cements available in the market and with their uses in construction.
73. State and explain briefly the various classification of lime through flow diagram.
74. a) What is lime in nature and cell it is destined
b) state and explain briefly the process of manufacture of lime.
75. Define slaking of lime : state and explain the various methods of slaking of lime.
76. What is RCC & explain its importance in construction of structures.
77. State the requirements steel in RCC works.
78. Explain the procedure of preparation of concrete by machine mix?
79. Explain the stage of conveyance, placing, compaction and curing of cement concrete in construction of structures.
80. What is the ready mixed concrete and how it is manufactured.
81. State 10 Nos important precautions that are to be taken in cement concrete constructions.
82. a) What is meant by M20 grade concrete
b) Describe compaction factor.
c) What is concrete explain its importance in construction works.
83. a) Explain the qualities of good timber
b) Explain defects due to seasoning.
84. Trees are the source of timber. Explain with classification and examples.
85. What is seasoning of timber. State the methods of seasoning.
86. State and explain the methods of seasoning of timber.
87. State and explain the decay of timber and its precautions.
88. State the properties and uses of 10 Nos. varieties timber available in AP.
89. Describe the process of conversion timber.
90. Draw a neat cross section of an exogenous tree and show various components of it and explain.
91. Differentiate between exogenous trees and endogenous trees.
92. Explain in brief about the alternative materials for wood.
93. a) What is meant by chain surveying ? Explain the principle on which it is based?

- b) Describe a field book and show how field measurements are entered in it. How is a chain survey planned?
94. Describe briefly the process of chaining, clearly mentioning the duties of the leader and the follower.
95. a) What is meant by a well conditioned triangle? Why is it necessary to use it?
 b) In chaining a line, a surveyor comes across a ground with a tall building, a hill explain with sketches how the line is continued with chain only.
96. A survey line PQ intersects a pond at M and N on opposite sides. A line MC, 1000m long, is run on the left of MH, and a second line MD, 1200 m long is laid on the right of MH, the points C, H and D being in the same line, CH and HD were then measured and found to be 600 m and 650 m respectively calculate the length of MH.
97. Define the terms : level surface, horizontal surface, line of collimation, and axis of bubble tube.
98. Draw a neat sketch of a dumpy level and name the parts.
99. Write the characteristics of level marks, profile levelling and the sensitivity of a bubble tube.
100. Complete the following level - book and find the RL of BM A also apply the arithmetical check.

B.S	IS	FS	Ht of coll	RL	Remarks
3.415					BM-A
	2.725				
0.975		1.855			
1.365		2.450			
	0.475				
2.805		2.405			
3.065		1.685			
1.500		1.400			
		2.750			S12.00BM-B

101. The staff readings attained with a leveling instrument are as follows.

Instrument station	Staff reading at	
	A	B
A	2.650	1.905
B	2.805	2.125

102.

Module	Topic	Wt of marks
No		
1		
2		
3		
4		
5		
6		
7		

Weightage by (b) objectives

Question paper (Q.P) setters are requested to ensure that the theory QP contains Marks for

Knowledge % 11

Understanding % 11

Application % 16

In the total paper

Weightage by (c) Difficulty level :

The difficulty level of the Question shall be as follows

Below average 50%

Average : 25%

Level Average 25%

SNo	objective	Knowledge	understanding	Application	Total
	Type of questions	LAQ	SAQ	LAQ	SAQ
	content unit				