

ENGINEERING DRAWING - II

(03 groups of CTS Engineering trades during 2nd year)

(Not applicable for Draughtsman trade Group)

2nd Year – (Group - I)- Mechanical trade group – Fitter, Turner, Machinist, Machinist Grinder, Mechanic Machine Tool Maintenance, Operator Advance Machine Tool, Mechanic Motor Vehicle, Mechanic Agriculture Machinery, Ref. & A/C Mechanic, Central Air Conditioning Plant, Mechanic Mining Machinery, TDM (D&M), TDM (J&F), Marine Fitter, Aeronautical Structure, Spinning Technician, Textile Wet Processing Technician, Weaving Technician, Textile Mechatronics, Painter General, Mechanic Maint. (Chemical Plant), Refractory Technician, - **22 trades.**

Sl. No.	Topic	Time in hrs.
1.	Construction of scales and diagonal scales	4
2.	Conic sections (Ellipse and Parabola)	3
3.	Sketches of nuts, bolt, screw thread, different types of locking devices e.g. Double nut, Castle nut, Pin, etc.	6
4.	Sketches of foundation	08
5.	Rivets and rivetted joints, welded joints	10
6.	Sketches of pipes and pipe joints	10
7.	Assembly view of Vee blocks, Bush & Bearing, Different types of Coupling viz., Muff coupling, Half Lap Coupling, Flange coupling, etc. Simple work holding device e.g. vice Drawing details of two mating blocks and assembled view	25
8.	Sketch of shaft and pulley, belt, gear, gear drives	14
Total		80

2nd Year – (Group - II)- Electrical, Electronics & IT trade Group – (Electroplater, Lift & Escalator Mechanic, Electrician, Tech. Medical Electronics, Technician Mechatronics, Wireman, Electrician Power Distribution, Instrument Mechanic, Technician Power Electronics System, Electronics Mechanic, Mechanic Consumer Electronics Appliances, Instrument Mechanic (Chemical Plant), Attendant Operator (Chemical Plant), Laboratory Attendant (Chemical Plant), Information & Communication Technology System Maintenance, Information Technology, Tech. Electronic System Design & Repair) – 17 trades.

Sl. No.	Topic	Time in hrs.
1.	Sign and Symbols of Electrical, Electronics and related trades	4
2.	Sketch of Electrical and Electronics/ trade related components	6
3.	Electrical and Electronics wiring diagram/ trade related Layout diagram	14
4.	Electrical earthing diagram - Drawing the schematic diagram of plate and pipe earthing.	8
5.	Electrical, Electronics/ trade related circuit diagram	30
6.	Block diagram of Instruments/ equipment of related trades	18
Total		80

2nd Year – (Group - III) – Vessel Navigator - 01 Trade

Sl. No.	Topic	Time in hrs.
1.	Construction of scales and diagonal scales	4
2.	Basic Navigational Chart Work Practice Introduction of a navigational chart. Various type of navigational chart. Parallel Ruler and instruments used. Measurement of distance, sea miles, International nautical mile, geographical mile.	6
3.	Great circle, parallels of latitude and Longitudes. Important features of Mercator chart. Simple plotting of position and measurement of distance. Variation, Deviation, Conversion of compass course to true course.	6
4.	Conversion of true course to compass course. Calculation involving deviation, variation, and compass error. A few terms associated with chart work, symbols and Abbreviations	4
5.	True bearing, compass bearing, abeam bearing. Current, wind and its effects. Allowing current and leeway.	5
6.	To counter act current and wind. Find actual current experienced.	4
7.	Method of fixing the ship position by bearing and depth, bearing and distance by vertical sextant angle, horizontal angle or Radar Given:	5

	course steered engines speed direction and rate of current wind and leeway to find course and speed made good. Give: Initial position / final position to find set and rate of drift Transfer position line and simple running fix.	
8.	ADVANCED NAVIGATIONAL CHART WORK PRACTICE Transfer of position line and running fix with current. Running fix with current and leeway.	4
9.	Transfer to position line while makes more than one course to given running fix. To find course to steer to counteract the current and leeway.	4
10.	To find course to steer and speed to steer in order to maintain the required ETA in prevailing current. Three bearing method to find course made good	4
11.	To find CMG direction by three bearing of same object from different position.[only set is given rate is not known]	6
12.	To find CMG direction by three bearing of same object from different position[both set and rate is given]	6
13.	Dipping and rising bearing of lights[dipping range or rising range]	5
14.	To find true set and drift [actual set and rate of current experienced]	4
15.	Tide problems	4
16.	To arrive with a given point right ahead at extreme range.	4
17.	Nautical publications.	5
TOTAL		80

TOOLS & EQUIPMENTS

LIST OF TOOLS AND EQUIPMENT FOR ENGINEERING DRAWING			
S No.	Name of the items	Specification	Quantity
1.	Drawing instrument box	Containing - Compass with pencil point, divider, protractor, scale, etc.	01 set per trainee
2.	Set square celluloid 45°	250 X 1.5 mm	01 no. per trainee
3.	Set square celluloid 30°-60°	250 X 1.5 mm	01 no. per trainee
4.	French-curves (set of 12 celluloid)		4sets.
5.	T-Square or Mini drafter	750mm	01 no. per trainee
6.	Drawing board IS: 1444	700mm x 500 mm	01 no. per trainee
7.	Almirah steel	As required	As required