

KGCE (Engineering) Practical Papers (Details)

CIVIL ENGINEERING

Subject 4104 : SURVEY PRACTICAL

TOTAL MARK : 200

COURSE CONTENT

- 1. Chain Survey:** - Raging out survey lines, offsetting, measurements and booking field observation, conventional sines traversing and plotting-computation of areas.
- 2. Compass Survey:** - Taking bearings-correction of bearings and calculation of included angles and checks. Plotting of compass traverse-Adjustment of closing error.
- 3. Plan table Survey:** - Methods of plane tabling-Radiation, intersection, Traversing and resection. Two point problem and three point problem.
- 4. Levelling:** - Temporary adjustments Taking fly levels Recording of field book, reduction, - Height of collimation method and rise and fall method, Arithmetical check
- 5. Theodolite Survey:** - Temporary adjustments, Recording of field book, measurement of horizontal angle by repetition and reiteration method, face left and face right, observation, vertical angle-face left and face right observations, measurement of included angles.

**TOOLS AND EQUIPMETS FOR CIVIL ENGINEERING
(For a batch of 45 students)**

1.	Land measuring Chain 30 Meters with 10 arrows	4 nos
2.	Steel tape 20 meters long	2 nos
3.	Ranging Rods wooden fitted with iron shoes 2 metre long	8nos
4.	Optical Square P.W.D. Pattern	1 no
5.	Optical Square-box type, Circular	1 no
6.	Dumpy Level- 10” focal length with complete accessories	2nos
7.	Levelling Staff –4 meters, reading up to 5 mm, telescope type	4 nos
8.	Plane table with Stand and complete accessories	2 nos
9.	Theodolite	1 no
10.	Surveyor’s compass	1 no
11	Ghat Tracer	1 no
12.	Prismatic Compass	2 no
13.	Cross Staff	2 nos
14.	Drawing Board	30 nos

KGCE (Engineering) Practical Papers (Details)

MECHANICAL ENGINEERING

Subject 4108 : WORKSHOP PRACTICE

TOTAL MARK : 200

COURSE CONTENT

I. Fitting

1. Filing practice
2. Filing and cutting practice
3. Lap joint
4. ' V ' Joint
5. Chipping practice
6. Typical joint comprising of all operations
7. ' T ' Joint
8. Drilling and reaming, use of taps and dies.

2. Smithy

1. Forge round in to square
2. Forge regular octagon
3. Forge regular hexagon
4. Forging hexagonal chisels
5. Forge tongs

3. Sheet Metal

1. Marking and cutting practice
2. Ground joint with single hem
3. Hooked ground joint with double hem
4. Knocked up joint
5. Rounded pipe with flanged edge
6. Prepare funnel

4. Welding

1. Arc maintaining
2. Straight line deposit
3. Single ' V ' Joint

4. Double ' V ' joint
5. Square butt joint
6. ' T ' joint
7. Round fillet joint
8. Shaft butt joint
9. Prepare a taper tray
10. Prepare a chair frame
11. Prepare tea poi frame

5. Turning

1. Plane turning
2. Step turning
3. Step and taper turning
4. Ball cutting
5. Step, taper and thread
6. Ball and curved cutting
7. Step, taper and thread cutting
8. Step, taper, Ball and thread cutting
9. Step curve- taper ball and thread cutting
10. Cutting square thread
11. Start threads

6. Plumbing

1. Pipe cutting practice
2. Thread cutting with die set
3. Nipple thread cutting
4. Water connections - 3 types
5. C.I pipe joint
6. Wash basin fitting
7. Water closet fitting
8. Kitchen sink fitting
9. Fixing wall urinal
10. Repair and maintenance
11. Dismantle and assembling of different types of pumps
12. Rectifications of common defects

13. Replacement of gland packing
14. Checking leakages in section and delivery line

TOOLS AND EQUIPMENTS FOR MECHANICAL ENGINEERING

(For a batch 45 students)

1. Spring Calliper inside 15 cms	3
2. Spring Calliper outside	3
3. Spring Calliper odd leg	3
4. Steel Rule with metric graduations on one side	3
5. Spanner set	2 sets
6. Scriber 15 cms	3
7. Centre punch	3
8. Ball pane Hammer	3
9. Screw driver 20 cms	3
10. Ordinary safety Goggles	3
11. Spring 6 " divider	3
12. Surface plate 30 cms x 30 cms	1
13. Bench vice	10 Nos
14. V Block 75 cms and 15 cms with clamps	3 Nos
15. Hacksaw adjustable 20 cms with & 30 cms	6
16. Files 25 cms smooth	4
17. Files 25 cms bastard	4
18. Half round file second cut 20 cms	4
19. Half round files 25 cms Smooth	1
20. Round files	4
21. Combination set 30 cms	2
22. Micrometer outside C-25 mm	1
23. Micrometer outside 25 mm to 50 mm	1
24. Depth gauge	1
25. Feeler gauge	1
26. Screw pitch gauge	1
27. Try square 15 cms x 10 cms	6
28. Tap and die set wit worth up to 29. 2.5 cms in a box	1 set
30. Sleeves Norse taper	1
31. Reamer straight 6 mm - 25 mm	1

32. Lathe, general purpose SS and SC 41/2-x bed 15 cms with the std accessories and attachments	2
33. Grinder	1
34. Bench Drill	1
35. Drill chuck with key	1
36. Lathe tools	1
37. Welding set 200 A	1 set
38. Anvil	1
39. Sledge hammer	6
40. Tongs assorted sets	1
41. Swage block	1
42. Hand forge	2
43. Chipping screen	6"
44. Welders gloves (LSR)	2"
45. Earth clamp	1 No
46. Chipping hammer	1"
47. Wire brush	6 Nos
48. Spanner set	6"
49. Surface gauge	1 set
50. Hot chisels	6
51. Work benches	4
52. Plumbing vice	6
53. Tap and die set for pipes	2 set
54. Pipe wrenches of different sizes	1
55. Pipe cutters	2 set
56. Screw spanner	1 No
57. Cold chisel- different types	6

KGCE (Engineering) Practical Papers (Details)

ELECTRICAL ENGINEERING

Subject 4112 : ELECTRICAL PRACTICAL

TOTAL MARK : 200

COURSE CONTENT

Wire Joints

- a) Straight joint in 1/18, 3/20 and 7/20 VIR Wires
- b) T Joint -do-
- c) Britannia joints in 8 copper or Aluminium with No. 14 Binding wire.
- d) T joint with No.8 copper wire or Aluminium

These exercise in (C and D) are to be practiced with stranded conductors as well.

Wiring the following exercise are to be taught in the following systems of wiring.

1. CTS Systems.
2. Conduct system (PVC & GI).
3. To wire up single lamp point.
4. To wire up 2 lamps connected in series and controlled by one switch.
5. To wire up 2 lamps in parallel and controlled by a switch.
6. To wire up circuit having 2 light points separately controlled and also a plug point.
7. To wire up a circuit having 2 lamps in such a way that each lamp may be turned "On" and "Off" by operating a single switch.
8. To wire up a circuit having one lamp which may be controlled from two different places (Staircase point wiring)
9. To wire a circuit consisting one lamp which may be controlled from 3 or more places.
10. To wire up a circuit having 2 lamps connected in such a way that a maximum and minimum illumination can be obtained out of their circuit by operating 2 switches (hospital Wiring)
11. To wire a circuit having 3 lamps in go down system or connection.
12. To wire up a circuit with 3 lamps in cinema theatre wiring system.
13. To wire up a typical consumers main board with different circuit fuses main switch etc.
14. To wire up for typical meter board with signal, phase energy meter cut outs etc for giving connection to wiring installation.
15. To wire up 3 pilot lamps for a three phase 3-wire 440 V distribution board.
16. To wire up a typical meter by with three phase energy meter, and other accessories and test the meter by connecting a lamp load consisting of 3 ordinary lamps suitably connected.

17. To wire up 2 lamps to indicate the condition of the circuit fuses (1) Dark method and (2) Bright lamp method (Fuse indicator)
18. Fluorescent tube fitting, identification and replacement of defective parts, vapour lamps.
19. Wiring of 3 phase motors - up to 15 HP (in Conduit & UG system).
20. Panel board wiring for (a) Small workshops (b) Welding shop (c) Laboratories.
21. Study and use of test equipments: Megger, Ohmmeter, Multi- meter, Growler, Phase, sequence indicator, Earth Megger. Conduct the following tests using a Megger in order in order to find the condition of a wiring installation.
 - a) Continuity test (b) Insulation test (c) Earth test.
22. Charging a 6 V Battery from 230 V, AC mains using Battery charger.
23. Study of measuring instruments. Practical application of shunts - Use of ammeters. Voltmeter, Wattmeter and Multi meters - Measurement of a 3-phase power (Motor load) using two wattmeter. Energy meter - Connection of energy meter -Single phase and 3 phase.
24. Re-winding of Motors. Ceiling fans, Table fans and single-phase capacitor motors. Re-winding of 3 Phase motors, - Testing - Winding of DC Armatures - Soldering practice, including soldering of Commutator, study of growler - growler tests.
25. Testing and servicing of transformers, refrigerators, mixies, grinders, electric iron, washing machines, electric bells, buzzers, ammeters, voltmeters, wattmeter's. DOL Starters, Stare -Delta starter. Autotransformer, starter Rotor resistance starter Discharge lamps fans, Heater, Fractional HP motors.
26. Practical on pipe and plate Earthing as per IS.
27. Precautions and method of treatment in case of a person suffering from electric shock.
28. Wiring of cinema halls and knowledge of relevant rules.

TOOLS AND EQUIPMENT - FOR ELECTRICAL ENGINEERING (For a batch of 45 students)

Sly No	Description Quantity	
1.	1/18. 3/20. 7/20 VIR wires	
2.	1/18 CTS wire	
3.	Single way switch (Tumbler / Flush type)	Nos. 25
4.	Two way switch (Flush)	Nos. 25
5.	Intermediate switch	Nos. 10
6.	IC Cut Out	Nos. 5
7.	IC Neutral Link	Nos. 5
8.	Wiring boards	Nos. 15
9.	Combination pliers 205-mm Long with plastic insulated handle	Nos. 10
10.	Long nose pliers 150 mm length with insulated handle	No. 5

11.	Step nose pliers 150mm length	Nos. 2
12.	Ball pane hammer 250 Gms with handle	Nos. 5
13.	Ball pane hammer 500 Gms with handle	Nos. 2
14.	Screw driver 5 mm blade of length 20 mm	Nos. 12
15.	Screw driver 5 mm blade of length 160 mm	Nos. 15
16.	Connector screw driver 3 mm blade	Nos. 10
17.	Adjustable Hack saw frame 250 mm and opening	Nos. 2
18.	Wrench vice with jaw width 100 mm and opening 120 mm depth 75 mm	No.1
19.	SWG (wire gauge)	No. 1
20.	Measuring steel tape 2 m long	No. 1
21.	Stainless Steel Scale	Nos. 5
22.	Wooden mallet with handle 250 gms	Nos. 5
23.	Rubber mallet with handle 500 gms	Nos. 5
24.	Hand saw 250 mm size with handle	Nos. 5
25.	Soldering iron 100 watt, 230 V, 50 HZ	Nos. 5
26.	Soldering iron 60 watt, 230 V, 50 HZ	Nos. 5
27.	Soldering iron 25 watts, 230 V, 50 HZ	Nos. 5
28.	Spanner set 6 mm to 20 mm	No. 1
29.	Screw driver set of 5 blades	No. 1
30.	Growler	No. 1
31.	Condenser different values	No. 1
32.	Standard variable resistance- different values	
33.	Main switch (ICTP) 250V, 16 A	Nos.5
34.	Main switch (ICDP) 440 V, 32 A	Nos. 2
35.	Fuse unit with carrier 16 A, 250 V	Nos. 10
36.	Fluorescent tube, 40 W, 250 V, 50 HZ Complete set with starter, Choke and fitting	No. 1
37.	Mercury vapour lamp 125 W, 250 V, 50 HZ complete with, choke lamp holder power factor capacitor	No. 1
38.	Ceiling fan 1200 mm sweep, 250V, 50 HZ	Nos. 2
39.	Table fan 400 mm sweep, 250 V, 50 HZ	Nos. 2
40.	Incandescent lamps and holders	No. 1
41.	Tong tester	No.1
42.	Workshop scissors for cutting insulation paper length 200 mm	No. 1
43.	Ignition coil	No. 1

44.	Voltmeters (1) 0-600 VAC/DC (2) 0-300 V	Nos. 3
45.	Ammeters (1) 0-15 A	Nos. 3
46.	Wattmeter LPF/UPF, 5/15A, 300/600 V	Nos. 2
47.	Single phase energy meter (induction type) 4 wire, 250V, 10A, 50HZ	No. 1
48.	Battery charger	No. 1
49.	15 Hp, 3 phase squirrel cage induction motor 440 V, 50 HZ with star-delta starter main switch and other fittings	No.1
50.	3 HP, 3 phase squirrel cage induction motor,	No 1
51.	230 V, capacitor start and run Single phase motor	No 1
52.	Coil winding machine (Bench mounting type-hand operated, adjustable for ending 45 SWG to 18 SWG).	No 1
53.	Bench drilling machine. Drilling table size 250mm × 250 mm (approximate) b\Belt driven with 4 speeds ranges from 200 pm to 2000pm. Electric motor power 0.3kw (appx) 230V, 50 HZ single phase	-1
54.	Hand operated portable drilling machine	-1
55.	Megger Insulation tester having hand driven generator to generate 500 VDC range of resistance 0-100 mega ohm.	-1
56	Earth resistance tester 4 terminal type, 5000 ohms range with accessories consists of 4 spikes, 4 spools of wires, 1 hammer, and 1 screw driver and carrying bag	-1

KGCE (Engineering) Practical Papers (Details)

AUTOMOBILE ENGINEERING

Subject 4112 : AUTOMOBILE PRACTICAL

TOTAL MARK : 200

COURSE CONTENT

General workshop:

Fitting

Filing practice, Filing and cutting, making Lap joint, making 'V' joint, making 'T' joint

Smithy

Forge round into square, Forge regular hexagon

AUTO WORKSHOP

Vehicle servicing and maintenance - cleaning, greasing and oiling of vehicles. Inspection and checking of chassis, nuts and bolts - tightening. Removing and refitting wheels - inspecting tyres for wear - testing tubes for leaks. Overhauling of hydraulic, air operator brake system and adjustments of breaks and bleeding procedure. Checking and adjusting castor; camber and kingpin inclination and toe - in of front wheels. Shock absorber testing and fitting back. Dismantling of clutch - relining of clutch facing - refitting of gear box - replacing and repairing of overhauling of universal joint - overhauling of differential - adjusting and eliminating of noise in differential and rear axles. Steering mechanism, dismantling and assembling repairing and replacing worn out components refitting and adjusting of steering.

-Electrical wiring for lights, horn, direction indicator, and windscreen wiper - fuel pump, ignition circuits, charging system, fault finding in electrical system and their rectifications.

Engine overhauling and servicing. Decarbonising of engine - valve clearance adjustment - ignition timing and setting - ignition advance and retard clearing and testing of spark plug, C B points.

Clearing and inspecting engine parts. Taking measurements with precision instruments and reassembling engine parts and checking valve timing.

Checking of crank shaft for wear and tear - fitting crankshaft in main bearing - fitting and setting big end bearings - fitting and setting big end bearings - fitting oversize pistons rings - Re-boring and fitting oversize piston.

Cleaning Lubrication system:- dismantling, cleaning and assembly of carburettors fuel pumps and distributors of petrol engines - adjustment of carburettor.

Timing and phasing of fuel injection pumps - cleaning, adjusting and testing of injectors. Starting and testing of engines.

Different type of measuring instruments - precision instruments - find out the oddity tapes, ovality, wear of automobile components. Using dial gauge and micrometers

Electrical Wiring:- Study of complete wiring of a passengers car and commercial vehicle- study of instrument panel Test of regulator of alternator- checking of electric horn and tune adjustment- adjustment of help lamp-anti dazzling systems- battery testing.

Fitting: - Different types of male and female joint- taping and dieing practice.

Welding: - handling of electrode. Lap joint butt joints-preliminary knowledge of welding tools and equipments.

TOOLS AND EQUIPMENT FOR AUTOMOBILE ENGINEERING (For a batch of 45 students)

1. Hammer ball bane 0.75 Kg	6
2. Chisel cold flat 19 mm	2
3. Centre punch 10 cm	2
4. Calliper outside spring 15 cm	4
5. Screw driver 75 x 19 mm blade	4
6. Pliers combination 15 cm	4
7. Steel rule (inches and mm)	2
8. Scriber 15 mm	4
9. Hacksaw frame adjustable for 20 - 30 cm blade	6
10.Screwdriver, electrician type 15mm size	4
11.File, flat 25 cm bastard	6
12 File, flat 25 cm second cut	6
13.Micrometer, outside 0 - 25 mm	1
14.Micrometer, inside 25 - 50 mm	1
15.Blow lamp 0.5 litre	1
16.Spanner, double ended metric sizes	2 sets
17.Spanners adjustable 20mm	2 Nos.
18.Spanner ring of set of 6 S.A.E 6	2sets
19.Spanner for sparking plug 14 mm	1
20.Magneto spanner set with 8-spanner 10 mm	1 set
21.Spanner socket set of 8 handles T-Bar ratchet	1
22.Gun paraffin pressure	1
23.Grease pressure gun	1
24.Tray cleaning 45 x 30 cm	4
25.Drilling machine (bench) to drill up to 12 mm dia	1
26.Oil can 0.5 litre	2
27.Valve spring lifter	1
28.Valve grinding tool suction type	5 sets
29.Valve seat cutting tools complete with guide and pilot bar (all angles)	1
30.Extractor, stud 'EX' out type 17.6 Kg/sq .cm vacuum	1

31. Compression gauge to read 17.6 Kg/sq. cm vacuum gauge 0 - 75	1
32. Cylinder gauge	1
33. Torque wrench (0 - 7.5 Kg/cm ²)	1
34. Ring expander and remover (piston ring)	1
35. Bench vice 12.5cm jaw	6
36. Fuel pump	1
37. Carburettor (two-different types)	1 each
38. Water pump and oil pump	2 Nos.
39. Feeler gauge	2
40. Tester sparking plug NEON type	1
41. Starter motor	1
42. Voltmeter 24 V	1
43. Ammeter 40 Amp	1
44. Cell tester 1	
45. Hydrometer	1
46. Battery charging set	1
47. Battery, Car 6 and 12 volts	1 each
48. Lathe 1000 mm	1 No
49. Tyre pressure gauge up to 5 kg/sq. cm	1
50. Air compressor 5 kg/sq. cm	1
51. Gauge, wheel alignment universal	1
52. Brake assembly master cylinder wheel cylinder and servo unit	1
53. Vacuum assisted hydraulic assembly with vacuum booster	1
54. Clutches, different types such as disc type diaphragm type	2 Nos.
55. Axle, gearboxes, steering gear boxes, front axle assembly, independent Suspension system. Wheel spring	1
56. Full floating axle and semi floating axle assembly	1
57. Puller set Universal	1
58. Lifting jack, screw type	1
59. Wall charts (driving instruction)	1
60. Motor car in running condition	1
61. Petrol engine	1
62. Diesel engine	1
63. Petrol engine (motor cycle or scooter)	1
64. Spring Callipers (inside) 2 Nos. 65. Spring Callipers (outside)	2 Nos.

66.Odd leg Callipers	2 Nos.
67.Surface Plate	2 Nos.
68.Triangular file, 15 cm	2 Nos.
69.Round File	1 No
70.Half Round File	1 No
71.Combination set	6 Nos.
72.Try square 15 cm	1 set
73.Taps and die set (Metric)	1 set
74.Anvil 1 No	
75.Sledge hammer 1 Kg	1
76.Tong's assorted sizes	3 sets
77.Hand forge	1 No

KGCE (Engineering) Practical Papers (Details)
REFRIGERATION AND AIR CONDITIONING
Subject 4120 : REFRIGERATION AND AIR CONDITIONING LAB.
TOTAL MARK : 200

COURSE CONTENT

PART - A : REFRIGERATION LAB

1. Study of Refrigeration tools.
2. Tube cutting, brazing, flaring, swaging
3. Working principles of pressure and compound gauge.
4. Study the lay out of different parts of open unit
5. Study the lay out and different parts of sealed unit
6. Study the lay out and different parts of a water cooler
7. Study of reciprocating type compressor unit, its parts, dismantling and assembling.
8. Study of the rotary compressor unit, parts, dismantling and assembling
9. Study different types of condenser
10. Study different types of evaporators
11. Study to charge the refrigeration oil to compressor
12. Testing the leaks of refrigerant by using leak detector and soap bubble method
13. Vulcanising and drying system
14. handling of a gas cylinder
15. Removing the door and repairing refitting the door and rubber channel renewal
16. To cut set of gaskets for a reciprocating type compressor
17. Removing and recharging the insulating materials in the cabinet.
18. Refrigerator recharging the materials in the cabinet
19. Study of thermostatic switch
20. Study of relay
21. Study of over load protectors
22. Wiring connections of a refrigerator
23. To start sealed unit without relay
24. Connecting Ammeter in the circuit
25. Connecting voltmeter in the circuit.

PART - B : AIR CONDITIONING LAB

1. Connecting a circuit consisting one lamp and one switch
2. Wiring two lamps controlled by one switch
3. Wiring two lamps controlled by two switches
4. Wiring two lamps in series
5. Testing of the supply finding phase and neutral conductors
6. To find the starting and running winding connections of sealed unit
7. To connect the condenser in a motor
8. Understanding and checking of AR and TE values
9. Electrical wiring of window air conditioning unit
10. Installing a window AC unit
11. Servicing a window AC unit
12. Dismantling a window AC unit
13. Assembling a window AC unit
14. Vocalizing a window AC unit
15. Recharging a window AC unit
16. Practical on Pipe and Plate Earthing as per I.S
17. Precautions and methods of treatment in case of a person suffering from electric shock
18. Wiring of cinema halls and knowledge of relevant rules.

Tools and Equipment for Refrigeration & Air Conditioning
(For a batch of 30 students)

1. Pipe flaring Tool 3/16 " to 1/2 " cap	2 Nos
2. Pipe flaring Tool 5/8" to 3/4"	2 Nos
3. Pipe flaring Tool double flare 3/16 to 1/2" cap	2 each
4. Tube cutters 1/8" to 1" Dia	2
5. Measuring tape steel 6 ft	2
6. Soldering Iron Electric 25 watts with round pencil bit	2
7. Soldering Iron Electric 65 watts with oval bit	2
8. Screw driver 12" Blade	8
9. Instrument screw driver 1/16"tip set of 6	2
10. Philips screw driver 1/8" and 3/16	2
11. Blow lamp 1 pint cap	2
12. Wooden Mallet	2
13. Hammer 6 assorted	4
14. Spanner sockets - size 3/16 to 5/18" 10 to 31 mm with reversible ratchet, short and long extension	1 set

15. Spanner Ring D.E offset multipoint A.E 1/4 " to 1/8 " by 1/3	1 set
16. Spanner Ring D.E offset multipoint with 3/16" to 1/8" by 1/16"	1 set
17. Spanner open jaw double ended with 1/8 " o 5/16" by 1/32	1 set
18. Spanner adjustable 8 "	2
19. Spanner adjustable 6"	2
20. Sockets spanner	2
21. Sockets spanner	1 set
22. Allen keys 1/6 to 1/2 " X 1/16"	1 set
23. Wire gauge	1
24. Hand vice	1
25. D.C. Volt Meter 0-500 v	1
26. D.C. Ammeter 0-25 A	1
27. D.C. Volt meter 0-500 V	1
28. A.C. Ammeter 0-25 A	1
29. Ten on saw	1
30. Boring Scrapers 6"	2
31. Tin man's square 24" x 18 "	1
33. Remote bulb thermometer 4" dial 20 degree to 150 degree	2
34. Compound gauge 2 1/2" dia. with 11b gradation 30 to 150 lbs	2
35. Pressure gauge 2 1/2 dia 0 to 300 lbs with 5 lb graduation	
36. Shut off value socket and tee handled key for 1/4"	1
37. Gland packing socket and tee handled key for 1/4"	1
38. Gland packing socket and tee handled key for 3/16"	1
39. Refrigeration cylinders for F 12 with key 5 lbs cap	1
40. A pocket testing lamp	2
41. 1/4" copper tube 25 inch for charging line and for gauges	1
42. Seal seat puller Universal	1
43. Hallow punches 1/4" to 1" set of eight pieces	2
44. Oil can pressure type 1/8 pint cap	2
45. Swaging tools 1/4" to 3/8" set	1
46. Spring balance dial type 0-20 kg	1
47. Feeler gauges 8" long 1/2" wide tapered to 1/4" 26 blades	1
48. Pipe bender spring types for Round pipe Universal set	1
49. Ratchet Wrench 1/16" and 1/4 " set	1
50. Cleaning trays 2' X 2'	2

51. Portable Forge with blower	1
52. Refrigerator Household assorted types (Reciprocating) and with different capacities	2
53. Compressor, Fractional H.P. for Refrigerator	4
54. Air conditioner wind type 1 Ton	1
55. Refrigerator, Absorption type	1
56. Air compressor with 65-70 gallons cap	1
57. Thermostatic expansion valve	2
58. Automatic expansion valve	1
59. Thermostatic switch	1
60. Low pressure switch(domestic)	1
61. Solenoid Valve	1
62. High pressure (switch domestic)	1
63. Relay for Air conditioner	1
64. Operating switch for Air conditioner	1
65. Check value	1
66. Temperature valve	1
67. Liquid line indicator 3/8" X 3/8"	4
68. Refrigerant Filters	2
69. Two way valve 1/4" X 1/4"	2
70. Three way valves 1/4" X 1/4"	2

KGCE (Engineering) Practical Papers (Details)

RADIO & TV

Subject 4124 : ELECTRONICS PRACTICAL

TOTAL MARK : 200

COURSE CONTENT

ELECTRONICS PRACTICAL

PART - A :

1. Use of Tools and Electronics meters in workshop
2. Identifying testing of electronics components-resistors-capacitors-inductor -LDR-LED - Zener diodes-Tunnel diode Transistors, FET, SCR, UJT etc.
3. Soldering practice.
4. Construction of Half wave, Full wave centre-tapped-bridge Rectifier circuits-voltage stabilizers.
5. Construction of power amplifier using transistor and I.C
6. Assembling of transistorised super heterodyne receiver and alignment, Fault repairing in various stages.
7. Circuit diagram tracing from PCBS.
8. Printed circuit design
9. Construction of power Amplifier using Transistor and I.C

PART - B :

1. Study and use of service Equipments
 - a. frequency Generators
 - b. pattern-Generators
 - c. Cathode Ray oscilloscope
2. Measurements of frequencies with the help of frequency generators and cathode ray oscilloscope
3. A study and use of filter and chokes for TV
4. Power Supplies:
 - a. IC Regulators
 - b. E.H.T.
 - c. SMPS
5. Circuit tracing of monochrome TV Receiver

6. Tracing simple faults
 1. Open circuits affecting power supply
 2. Open circuits not-affecting power supply
 3. Short circuit faults
 4. Fault in video section
 5. faults in Audio section

6. Servicing of TV Receiver

7. TV Alignment a. Tuner b. R F section c. Aerial Erection

8. Study and assembly of different types of TV Antenna.

Practical record should be maintained

TOOLS & EQUIPMENTS FOR RADIO & TELEVISION ENGINEERING

For a batch of 30 students

1.	T.V. Receiver (Monochrome)	-	2nos
2.	T.V. Receiver (Colour)	-	2nos
3.	T.V. Demonstration Board ((Monochrome & Colour)	-	1 each
4.	Pattern Generator	-	2 nos
5.	A.C. Step Voltage Stabiliser	-	1 nos
6.	Signal Tracer	-	2 nos
7.	High Voltage Probe	-	2 nos.

PLUS ALL ITEMS MENTIONED IN ELECTRONICS & COMMUNICATION
TOOLS & EQUIPMENT LIST EXCEPT EQUIPMENT 1 TO 8 (INCLUSIVE BOTH)

KGCE (Engineering) Practical Papers (Details)
ELECTONICS & COMMUNICATIONS ENGINEERING
Subject 4127 : ELECTRONICS PRACTICAL (E&C)
TOTAL MARK : 200

COURSE CONTENT

PART - A :

1. Use of Tools and Electronics meters in workshop
2. Identifying testing of electronics components-resistors-capacitors-inductor -LDR-LED - Zener diodes-Tunnel diode, Transistors, FET, SCR, UJT etc.
3. Soldering practice.
4. Construction of Half wave, Full wave centre-tapped-bridge Rectifier circuits-voltage stabilizers.
5. Construction of power amplifier using transistor and I.C
6. Assembling of transistorised super heterodyne receiver and alignment, Fault repairing in various stages.
7. Circuit diagram tracing from PCBS.
8. Printed circuit design
9. Construction of power Amplifier using Transistor and I.C

Part B:

1. Construction of circuits AND , OR, NAND, NOT NOR using Discrete components and verify truth table
2. Construction of Astable multivibrators
3. Construction of clock generation using 555 IC
4. Construction of Hartley and Colpitt's oscillator
5. Verify decade counter using 1490

**TOOLS & EQUIPMENTS FOR ELECTRONICS & COMMUNICATION
ENGINEERING**

For a batch of 30 students

I Equipments:

1.	Coil winding machine	1 No
2.	PA system 20/40 W	1 No
3.	Radio Demonstration Board	1 No
4.	Commercial Transistorised receiver	4 No
5.	Microphones	2 No
6.	Head Phone	2 No
7.	Cathode Ray oscilloscope	1 No
8.	Insulation tester 2500/500 V	1 No
9.	Service Oscillator	1 No
10.	Record player	1 No
11.	Out put meter	1 No
12.	A.F. Oscillator	1 No
13.	Frequency modulator	1 No
14.	A.M. Modulator	1 No
15.	Loud Speaker Cone type	5 No
16.	Power supply (0-30V)	2 No
17.	Dual Power supply 5V and 12	2 each
18.	Soldering Iron 25 W & 65 W	5 Nos. each

II Meters for measuring Electrical quantities

1.	D.C and A.C ammeter 0-500 ma	2 Nos
2.	D.C and A.C ammeter 0 to 1000 ma	2 No
3.	Multimeters (Capacity for measuring MO, 1000 V, 5A)	15 Nos
4.	D.C and A.C volt meter 0-5 V	4 Nos
5.	D.C and A.C voltmeter 0 to 10 V	4 Nos
6.	D.C and A.C voltmeter 0-500 V	4 Nos
7.	D.C and A.C volt meter 0- 1000 V	2 Nos
8.	Receiving aerial kits	2 Nos
9.	Thermo couple meter (RF) 0-500 MA	1 No

Devices and Components :- Diodes, Zener diode, Tunnel diode, LED, Transistor- DVT ,different types, FET, UJT DVT , different types IC's. Sufficient Nos of the above consumable soldering led, and soldering gum etc. should be provided to assemble various Electronics circuits, PCB's Transformers, Resistors- Capacities-potentiometer different types etc.