

For GCT Timergara, Kohat, Nowsehra and Abbottabad

Physics for B-Tech

| S.No. | Description of Items with Specification | Qty. |
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| | Resonance tube apparatus ,length 1 meter: With Plastic tube 840×25mm mounted on record with 500ml Plastic tube bulb. | 06 |
| 1. | Sonometer with slotted weights and two wedges: Wooden resonance box with two rules 1m long. one each brass and steel wires. two moveable bridges pulley and fixed screws, slotted weights $\frac{1}{2}$ kg×4, 1 kg×4, 2 kg×4 | 06 No |
| 2. | Linear Expansion apparatus with metal rod and Accessories: Apparatus added with spherometer, glass jacket enclose Brass, Iron, Aluminum and a Copper rod within Error scale having differently colored pointers. Accessories: Brass, Iron, Aluminum, Copper rods | 06 sets (12 each) |
| 3. | Steam generator: Aluminum vessel with cork lid and retainer on an adjustable hot plate with thermal circuit breaker, volume 250ml | 12 No |
| 4. | Sextant: Student model, Comprising 220mm radius, with sighter adjustable half mirror and scale 0 to 130 with Vernier reading to five minimum in wooden case. | 06 No |
| 5. | Set of weights: 13 pieces set of Brass weights in storage block. 1×1g, 2×2g, 1×5g, 1×10g, 2×20g, 1×50g, 1×100g, 2×200g, 1×500g, 1×1000g. | 06 sets |
| 6. | Kundt's tube with scale and Accessories: Transparent acrylic tube with scale and end plates with tubing nozzles for filling with various gases, built-in speaker at one end, a bore and guide for accommodating moving piston or probe microphone at the other end. Includes retaining clips for mounting on stands and a connector lead for the speaker, length 1000mm, dia 70mm, tube nozzle 7mm dia. Accessories for each set: 1 Probe micro phone with frequency range 20hz-20000hz with DIN plug for battery box, barrel foot, 1 function generator (230V, 50hz), 1 whistle, a 1700hz tuning fork, 1 bottle of cork powder. | 06 sets 06 sets |
| 7. | Hook's law apparatus with helical spring: Pointer and scale graduated in cm and mm hanging weights 6×50gm, 5 helical springs of lengths 120mm, 145mm, 150mm, 147mm, 142mm. | 06 sets |
| 8. | Convex lenses: Of different focal lengths from 10cm to 50 cm | 60 No (12 each type) |
| 9. | Concave lenses: Of different focal lengths from 10cm to 50cm | 60 No (12 each type) |
| 10. | Concave mirrors: Of different focal lengths from 10cm to 50cm | 60 No (12 each type) |

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| 11. | Convex mirrors: Of different focal lengths from 10cm to 50cm | 60 No (12 each type) |
| 12. | Fletcher trolley complete: Light metal track 1720×150 mm wide with leveling feet covered with stops at either end, aluminum pulley 50mm dia., clamp for vibrator and automatic Pen release. Metal trolley with three wheels mounted on ball bearings. Five hooks to accommodate cylindrical masses approximate 350gm. Vibrator 60mm long with clamping works at 5 and 8Hz and Pen holder to take fibertip type of pen. | 03 No |
| 13. | Single ray projector with accessories: Light source for experiments on optics, connecting line 1.5m long with 4mm plug dimension $120\text{mm} \times 70\text{mm}$ dia., magnetic holder for single ray projector 12V, 60VA (230V, 50Hz), Halogen lamp 12V, 35W | 02 sets |
| 14. | Multiple ray projectors, magnetic with accessories: Light source for optics. Lamp 12V, 55W connecting line 1.5 meter long with 4mm Plug. Dimension $150 \times 200 \times 50\text{mm}^3$ Transformer 12V, 60 VA (230V, 50Hz) Halogen Lamp 12V, 55W. | 02 sets |
| 15. | Optics kit for white board: Plan mirror (plastic) $200 \times 35 \times 35\text{mm}^3$. Convex, concave mirror $f = \pm 100\text{mm}$ $200 \times 35 \times 35\text{mm}^3$. Plano Concave lens (Acrylic glass), $f = 400\text{mm}$, $200 \times 40 \times 35\text{mm}^3$. Plan parallel Plate (Acrylic glass) $200 \times 100 \times 35\text{mm}^3$. Semicircular body, $f = 200\text{mm}$ dia. $200 \times 35\text{mm}^2$ (Acrylic glass) Right angled prism $200 \times 200 \times 35\text{mm}^2$ (acrylic glass) Cubide (Plastic) $100 \times 20 \times 35\text{mm}^3$ Cylinder (plastic), dia. $5 \times 35\text{mm}^2$ Cylinder(plastic) dia. $6 \times 35\text{mm}^2$ | 06 No |
| 16. | Heat equivalent apparatus: Consist of a shaft with ball bearing at both ends, an integrated counter for measuring the number of revolutions and an attached table clamp. 1 basic unit, 1 Aluminum calorimeter, 1 temperature sensor, 1 pair of adopter cables with 4mm safety plugs / 2mm plugs, 1 fraction belt, 1 bucket of 5 liter, 1 counter weight, cord of length 1.80m and temperature calibration table. | 06 sets |
| 17. | Optical bench complete with all standard accessories: Optical bench: Optics Track (1.2 m) rugged aluminum track. The metric tape makes position measurements easy. Accessories: Light Source has a lighted crossed arrow target with metric scale for focusing images through lenses or using with the concave mirror. Acts as a point light source, 1, 3, or 5parallel rays, or red-green-blue rays. Lenses: 4 - 50 mm diameter. Lens's focal lengths +100, +200, +250, -150 mm mounted in protective holders. Concave/Convex Mirror: 50 mm diameter plastic mirror with reflective surface on both sides. Includes "half-screen" upon which the image is focused. Adjustable Lens Holder: from 19 mm to 75 mm in diameter. Storage Box: Everything fits neatly into the protective storage box, with the exception of the 1.2 meter Optics Track. 1 transparent screen, 1 white screen. 1 pin hole aperture $d=1\text{mm}$ 1 pin hole aperture $d=6\text{mm}$ | 06No 06 sets |
| 18. | Electrical calorimeter (1200ml) with accessories: | 06 no |

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| | <p>Consist of a double walled, heat insulating plastic container with insulating vessel inside made of reflecting glass with heating coil and stirrer</p> <p>Accessories: Aluminum shot 100g, copper shot 200g, glass shot 100g, granules for filling calorimeter.</p> | 03 bottles of each type |
| 19. | <p>Precision hair Hygrometer: Consist of a round plastic housing with a human hair Measuring range: 0%----100% relative humidity Temperature range: 35c-+65% °C Reading accuracy: ±5% Diameter: 100mm</p> | 06 No |
| 20. | <p>Torsion apparatus: Searle horizontal pattern. Two cast iron feet and grub securing screws separated by two support rods approx. 700mm long, wheel 165mm dia. moving in ball bearings, mounted on front foot, other end supported with clamping block through rear foot with two aluminum scales graduated with 30-0-30 in single degree mounted on pillar support, two pointers with clamp for attaching to specimen, one each Brass and Steel rods 5mm diameter, chord and hook for carrying masses and two spanners for clamping block nuts.</p> | 06 No |
| 21. | <p>Differential pulley: One piece aluminum with diameter of 38.5 mm & 63.5mm mounted in a metal frame with hook.</p> | 12 No |
| 22. | <p>Differential wheel and axle; compound wheel and axle with cast aluminum alloy block Comprising wheel 100mm diameter and axle 50mm & 25mm diameter mounted on adjustable steel cones and steel frame, wood back board with four holes for wall mounting, complete 5m nylon cord and steel hook.</p> | 12 No |
| | <p>Maxwell's needle with accessories: Hollow metal cylinder 200mm long pointer and chuck to accommodate wires up to 20swg with each hollow and solid cylinders 50mm long tripod, stand with rod 1.2m long, base with leveling screws, clamp with arms 180mm long with chuck complete with three wires 1.5m long one Brass 26swg and one each steel 26 and 20swg.</p> | 06 No |
| 23. | <p>Friction measuring apparatus with Accessories: Demonstration apparatus with moveable friction surface for measuring static and dynamic friction. The track can be made inclined. Dynamometer, 3 rails for holding static bodies, three 100gm weight. Accessories: Precision dynamometer (1N range),(2N range),(10N range)</p> | 06 No. |
| 24. | <p>Experiment set pulleys, block and tackle: Complete set of equipment consisting of a stable base plate, retort stand rods, pulley blocks, block and tackle, a set of pulleys of various diameters on an axle, weight holders, slotted weights with base plate 810×200mm , pulleys 50mm diameter, standrods 810mm×12.5mm, slotted weights 2×10g, 2×20g, 2×50, 4×100g, 4×200g, 1×500g, holders, 1×10g, 1×20g, 5×50g.</p> | 06 sets |
| 25. | <p>Reciprocating motion motor: A field coil motor connected to a rotatory to linear converter mechanism showing cross sectional view. Both motor and gearbox are fully sectioned to show the method of operation. Lead from motor and gear box together taken to three 4mm sockets for connection to a 12 volts DC or AC supply mounted on plastic base complete with instructional booklet.</p> | 06 sets |
| 26. | <p>Compound lever (Brace version): Wooden structure consisting of Front and rear legs, leaver arm, base beam, handle, arms, lever arm, beam sides, brace, feet, hex bolt, washer, fasteners.</p> | 06 No |
| | <p>Forces in a Jib crane apparatus with complete accessories:</p> | 06 No |

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| | Bench mounted. The unit consists of a metallic rod which provides the support locations for jib and tie. Load is applied via a hanger on the junction of jib and tie. To measure the deformation in jib and tie, dial gauges are connected to both elements. | |
| 27. | Simple screw jack for demonstration to students: 220 mm diameter turntable fitted with a 30 mm x 6 mm pitch screw is supported in a heavy cast iron base. Stand on a firm bench and a cord and weight hanger are wound round the rim of the turntable and hung over the pulley. The pulley runs on ball bearings to reduce friction to a minimum. To be provided with instructional manual | 04 No |
| 28. | Inclined plane: Metal base and inclined surface plane hinged with scales for angles, length and height. angle of inclination between 0-45, adjustable pulley, roller weight pan and cord | 06 No |
| 29. | Simple harmonic module/apparatus: Consist of a black metal disc, 200mm dia supported vertically on a clear plastic base fitted with feet. A white marker 13mm dia may be made to follow a circular orbit about the central of the disc. A similar marker move in a slot along the diameter of the disc in phase with the peripheral marker performing SHM when the peripheral marker caused to rotate at uniform speed .The disc is marked with cords and radial lines to assist in locating the relative marker positions. | 06 sets |
| 30. | Worm and wheel apparatus: Wall-mounted, to study a way of connecting 2 shafts at right angles. Gear sets for 1, 2, 3 and 4 start worm and wheel units; interchangeable to fit on a rigid steel back plate. Two load hangers and weights set. | 06 sets |
| 31. | Derrick Crane: Bench-top, for analysis of internal forces in a pin-jointed framework. Deflection measured by individually calibrated leaf-spring balances. Movement measured by digital Vernier. Load hanger, loading weights, link and digital caliper. | 06 sets |
| | Gearing elements to illustrate simple mechanical belt and gear wheel drives: Gearing elements consisting of base plate, belt pulley(35mm diameter), belt pulley (70mm dia.) gear wheel (20 teeth), gear wheel (40 teeth), crank handle, drive belt sets. | 02 sets |
| | Reaction of beam apparatus: .Bench mounted. This apparatus is designed for simple experiments and demonstrations on simply supported beams. Two spring balances act as supports and enable reactions to be read directly. Three movable load hangers allow loads to be put in a number of positions. Levers can be investigated by suspending the beam from the free standing frame, and holding down the end with a spring balance. | 04 No |
| | Bell crank lever:- (1) Strong table unit for demonstrating the application of moment to a crank lever. (2) Pressure gauge 50N. (3) Metal crank mounted in ball bearings. (4) Mechanical advantage min. 1:1 max. 2:1 (5) Fine compensation device for adjusting the crank so that the forces always act vertically. (6) Crank length vertical: 200mm, horizontal: 400mm. Set of weights: up to 20N along with 6 weights with carrier. | 04 No |

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| 32. | Fractional horse power motor and Accessories: max 746 watts(single phase induction)with prony brake and revolution counter. With related accessories required for operational characteristics. | 03 No |
| 33. | Fly wheel with slotted weight: Cast metal made, approx. 200mm dia×40mm thick mounted on a balanced horizontal shaft in metal bracket 280×180mm ² drilled forwall mounting. | 03 No |
| 34. | Specific gravity bottle,25cc: | 24 No |
| 35. | Specific gravity bottle,50cc: | 24 No |
| 36. | Viscometer (Standard Size)with Accessories: Falling sphere viscometer with 6 spheres and 1 ball gauge measuring range 0.5mPaS To 7×10 ⁴ mPaS. Accessories: 2 sphere of Borosilicate glass,2 spheres of Ni-iron and 2 spheres of steel, thermometer 0-100C,test certificate with accurate values for spheres constant K and density ,silicon tubing(2x) immersion/circulation thermostat | 06 06 sets |
| 37. | Photo Electric cell for determining planks constant with Accessories: Basic apparatus with photo cell, volt meter, Nano ammeter and power supply, 5 LEDs in casing with connector leads one plug in supply 12V AC, wave length 472 nm, 505 nm, 525nm, 588 nm, 611nm, Accessoriesfor photo electric cell: Set of 15 experimental leads,75cm | 06 No 06 sets |
| 38. | Galvanometer DC: Range ± 35 Micro Amp, scale division 1 Micro Amp, Internal resistance 1000 ohm | 06 No |
| 39. | Laser beam apparatus : ➤ 0.5mw He-Ne Laser ➤ optical bench ➤ screen Metal bench ,guide rail with leveling plate form 500mm,laser diode driver and temperature controller, laser safety goggles.1000mw and 100mw diode laser with built in cooler, thermistor and photo diode, lens, collimator, optical rider, mounting plate, Nd:YAG crystal. Laser mirror 1 and 2.frequency module, passive Q switch. PIN photo diode on optical rider, cylindrical lens of f = +15mm, +25mm, +45mm, collimator lens of f= +75mm,focusing lens f= +75mm, filter holder with filters, polarization filter and transport case. Or Equivalent Specification. | 06 sets |
| 40. | Magnets Horseshoe: Horseshoe magnet Alnico magnet with screw, Poles marked red and green pole Area approx. 20x10mm ² . Distance between poles approx. 50mm length of shank approx. 70mm. | 06 No |
| 41. | Parallel plate capacitor with Accessories: A fixed and a moveable plate on a guide rail having centimeter scale, plate separation can be finally adjusted and read off from display to an accuracy of 1/10mm plate spacing: 0-160mm,plate area 500cm ² plates solid casting. Plates can be adjusted between 0 and 20mm via a sindle. Accessories: Plastic dielectric plate 300x300x2mm ³ approx Plexiglass dielectric plate 300x300x2mm ³ approx | 03 No 12 (2 each) |
| 42. | Electric field meter (230V,50Hz.) with Accessories: Maximum output voltage: 10 VIV output can correspond to 100V/c,300V/cm,1000V/cm,10V,30V, 100V(with Ix voltage measurement plate), | 02 No |

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| | 100V,300V,1000V(with 10 x voltage measurement plate), I capacitor measurement plate 250cm ² set Plexiglas spacers, Drip cup basin. | |
| 43. | <p>Center of gravity apparatus: Comprises a rod mounted on a base with a suspension screw at the top and four laminas of clear acrylic - 1 each of circular, triangular, square and trapezoidal. Each lamina has suspension holes along their periphery.</p> | 06 No |