DIPLOMA-2ND SEMESTER (ALL STREAM)

SUB: BUSINESS ECONOMICS AND ACCOUNTANCY
PAPER CODE: - BEA

1. Discuss Cobb-Douglas Production Function.

2. Differentiate Journal and Ledger. Explain the accounting process in detail.

3. Explain Law of Variable proportion in details.

4. Journalise the below transactions for the month of April 2017 in the books of Mr. Subhramanyam.

Date	Transactions	Amount (Rs.)
1	Subhramanyam started his business with cash	5,00,000
2	Borrowed from Mahesh	5,00,000
2	Purchased furniture	1,00,000
4	Purchased furniture from Mohan on credit	1,50,000
5	Purchased goods for cash	50,000
6	Purchased goods from Ram on credit	2,50,000
8	Sold goods for cash	1,25,000
9	Sold goods from Shyam on credit	25,000
10	Paid cash to Ram	90,000
11	Deposited into bank	5,00,000
11	Withdrew cash for personal use	10,000
14	Withdrew cash for office use	50,000
19	Paid Ram by cheque	1,50,000
20	Paid salary	30,000
25	Paid instalment of loan	25,000
28	Interest allowed by bank	8,000
30	Paid LIC premium	12,000

5. The following details on the cash flows of two projects X and Y.

Year	Project X cash flows (Rs.)	Project Y cash flows (Rs.)
0	4,00,000	5,00,000
1	2,00,000	1,00,000
2	1,75,000	2,00,000
3	3 25,000	3,00,000
4	2,00,000	4,00,000
5	1,50,000	2,00,000

Compute PBP, NPV and PI for X and Y and suggest which project should be accepted and why.

6.Define Price elasticity of Demand. What are factors affecting Price Elasticity of Demand? Define Cross Elasticity of Demand.

SUB-APPLIED PHYSICS
PAPER CODE: AP

1. Define centripetal and centrifugal force.
2. Define moment of inertia and give its physical significance.
3. Write down Newton's second law of motion and give the measurement of force from it.
4. State with example – (i) positive work done   (ii) negative work done.
5. Write down kinematical equations for motion under gravity and mention the different terms.
6. Show the relation between linear and angular acceleration.
7. Draw the time-displacement graph for a particle moving with uniform velocity.
8. If the earth contracts to half of its radius, what would be the length of the day?
9. Which has greater resistance- 1kw electric heater or a 100 w filament bulb marked both for 220V.
10. Write down Kirchhoff's law?

SUB-APPLIED CHEMISTRY

PAPER CODE: AC

1. Define lubricant, classify lubricant with example. What are the functions of a lubricant?
2. Write a brief account on Calorific Value of fuel.
3. Write down the reactions that take place during setting and hardening of cement.
4. Mention four characteristics of a good paint. Mention the constituents of paint.
5. How paint differ from Varnish?
6. Write down the reactions at anode and cathode for rusting of iron.
7. What is destructive distillation of coal? What is pulverized coal?
8. Write down the functions and give one example of each of thinner and drier used in making of paint.

ENGINEERING MATHEMATICS

PAPER CODE: EM

1. If $A = \frac{1}{3}\begin{bmatrix} -1 & 2 & -2 \\ -2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$, show that $AA^T = I_3$.

[Hint: Find transpose of a matrix and solve.]

2. Solve the differential equation $sin^{-1}\left(\frac{dy}{dx}\right) = x + y$.

3. Express $A = \begin{bmatrix} a & b & c \\ l & m & n \\ x & y & z \end{bmatrix}$ as the sum of symmetric matrix and a skew-symmetric matrix.

[Hint: Use properties of matrices.]

4. If $u = tan^{-1}\frac{x^3+y^3}{x-y}$, show that $x\frac{\delta u}{\delta x} + y\frac{\delta u}{\delta y} = sin2u$.

5. Obtain an approximate value of $\int_0^1 \frac{dx}{1+x^2}$ by Simpson's One third rule taking four equal intervals.

6. There are 3 children in a family. Find the probability that all the children are boys, i) if no prior information is available about the children, ii) if it is known that the two eldest are boys, iii) if it is known that at least two of them are boys.

[Use Binomial distribution of probability]

7. Solve: $\frac{dy}{dx} + \frac{sin\,2y}{x} = x^3(cos\,y)^2$

8. The arithmetic mean calculated from the following frequency distribution is known to be 67.45. Find the value of missing frequency.

Height (inches)	60-62	63-65	66-68	69-71	72-74
Frequency	16	54	?	81	24

ELECTRICAL TECHNOLOGY

PAPER CODE :ET

1. State and explain Kirchoffs Current & Voltage law.
2. What is the difference between a voltmeter and an ammeter?
3. An alternating voltage is given by the equation e= 339 sin 314t. Determine-
   a) R.M.S value
   b) Frequency
   c) Time period and
   d) The value of the voltage after 0.005 sec.
4. Explain the basic principle of a transformer.
5. State the difference between transmission and distribution of electric power.
6. Explain back emf of DC Motor
7. Sketch a scheme to measure the insulation resistance of a underground cable with the help of a megger the insulation resistance tester.
8. State the explain the Faradays laws of electromagnetic induction.
9. Difference between Squirrel cage motor and slip ring induction motor.

SUB-STRENGTH OF MATERIALS

PAPER CODE:SOM

1. A simply supported beam 8m span carries a uniformly distributed load of 3 KN/m over a length of 3m, at a distance 2m from the left hand support& also point loads 2,3 KN at distances 3m & 5m from the left hand support respectively. Draw the SF &BM diagram of the beam.
2. A hollow alloy tube 4m long with external & internal diameters of 40mm & 25mm Respectively was found to extend 4.8m under a tensile load of 60KN. Find the buckling Load for the tube with both ends pinned. Also find the safe load on the tube, taking a Factor of safety as 5.
3 efine bending moment & shear force at any section of the beam. Explain the term point of contraflexure. Calculate the shear force & bending moment diagram of a simply supported beam carried an udl of w kg/m run for a length of L meter.
1. Draw the shear force & bending moment diagram of a simply supported beam carrying point loads of 10 KN &15 KN at a distance of 2m & 3.5m from the left & right support for a length of 8m of the beam.
2. A steel girder of I-shape cross section has equal flanges each 12 cmx 2cm connected by a web 20cm x 2cm. Determine the moment of inertia of the section about its centroidal axis which is parrel to the web.
3. A load of 20 KN is to be raised with the help of a stel wire. Find the minimum diameter of the wire if the stress is not to exceed 20000 KN/m^2.
4. A boiler is 1.5m in diameter having thickness of plate as 20mm. The efficiencies of the longitudinal joint & circumferential joint are respectively 60% & 80%. If the maximum allowable tensile stress in plate be 70 N/mm^2, calculate the safe steam pressure in the boiler.
5. A solid rod 300 cm long & 5m in diameter is used as a column whose one end is fixed & other end is hinged. If E = 2x104 KN/cm2 & factor of safety = 4, determine the safe compressive load for this column.
6. Define these mechanical properties such as Elasticity, Ductility, Malleability, Hardness, Brittleness, Strength, Creep etc.
7. Classify the different types of beam with proper sketch. classify the different types of loading with proper sketch.

8. For a simply supported steel beam, 6m long & 150mm diameter, what point load should be placed at the mid span to restrict the deflection 10.35mm.Take $E = 2 \times 10^5$ N/mm^2 What will be the slope at the ends.
9. What is the difference between strut & column? What are the classification of columns. What are the assumptions made in the Euler's theory.

SUB-DEVELOPMENT OF LIFE SKILL
PAPER CODE:DLS

1. What is the importance of development of life skills in the present scenario of life?
2. Write a short note on SWOT.
3. What do you mean by information search? What are the sources of getting information?
4. What do you mean by "self esteem"?
5. What is "Personality "? Mention five integral parts of the human personality?
6. What is time management?
7. Write a short note on "setting smart goal".
8. What are the ways to enhance memory and concentration?
9. What are the major causes of stress? What to do to cope up with stress?
10. Mention process of effective time management.

DIPLOMA-4TH SEMESTER (EE)
SUBJECT: ELECTRICAL MACHINE-II
PAPER CODE: EM II

1. Define distribution factor and coil span factor?
2. Explain the starting method of Direct-On-Line (DOL) starter of 3-phase induction motor with proper diagram.
3. Explain the operation of the different types of stepper motors.
4. Explain the regenerative Braking of 3-phase induction motor.
5. Describe any two methods of determining the voltage regulation of 3-phase Alternator.
6. Write short notes on Reluctance motor.
7. Explain the advantage of parallel operation of alternator.
8. Write the Application of Synchronous motor.
9. What is Cogging & Crawling?
10. Write short notes on Capacitor run motor.

ELECTRICAL MEASUREMENT AND CONTROL
PAPER CODE- EMC

1. Draw the block Diagram and explain the operation and application of CRO.

2. What is RVDT? Give construction & working principle.
3. What is potentiometer? Explain the working with diagram.
4. Explain the phenomenon, how changes develop on two plates placed across a piezoelectric crystal with force applied on it.
5. What is see-beck effect? How does it develop and how has it been commercially exploited.
6. a) Describe the working principle of digital frequency meter.
   b) Describe the working principle of successive approximation type digital voltmeter.
7. Write short note:
   (a) Push switch (b) Limit switch (c) Float switch (d) Pressure Switch
8. (a) What is open loop and close loop control system?
   (b) Determine the transfer function of closed loop transfer function with a simple example

TRANSMISSION & DISTRIBUTION OF ELECTIC POWER
PAPER CODE: TDEP

(1) What is sag? What is the effect of wind and ice on sag?
(2) State Kelvin's laws and limitation of this law for the economic choice of conductor size.
(3) What is string efficiency?
(4) Give the advantages, drawbacks and limitations of EHV ac transmission.
(5) What do you understand by hollow, ACSR and bundled conductors?
(6) What are the I.E rule related to spacing of conductors and length of span of overhead transmission lines?
(7) Explain end condenser method and Nominal T-Method with appropriate pharos diagram.
(8) Discuss the advantages and disadvantages of (i) pin type insulators (ii) Suspension type insulators

PAPER NAME: APPLIED & DIGITAL ELECTRONICS
PAPER CODE: ADE

1. State De-Morgan's theorem.
        Prove that, A+BC = (A+B) (A+C)
2. Why FETs are called unipolar? Write down the differences between MOSFET and JFET.
3. Write short notes on the following:
        a. CMOS
        b. Even parity generator and checker.
        c. Pinch-off voltage
4. Design EX-OR gate using NAND gates.
5. Simplify the following Boolean function using K-Map
 $Y = \Sigma_m(0,2,3,6,7) + \Sigma_d(8,10,11,15)$
6. Define amplification factor, transconductance, drain resistance related to JFET and establish the relationship between them.
7. Design NOR gate using NAND gates.
8. Short Notes: a) OP AMP – 'Inverting & Non Inverting' b) MOSFET C) EPROM
9. Obtain the canonical product of sum form of the function: Y = A+ BC
10.   Design 16:1 mux using 4:1 mux & OR gate.
11. Give the logic diagram and logic symbol of 4-to-16 Decoder & briefly explain its function.

1. What are the different working fluids in binary cycle geothermal power plants?
2. Layout and working principle of a Gas turbine power plant.
3. Describe the Nuclear power plant with layout diagram.
4. Layout and working of a Thermal power plant.
5. Explain the construction and working of Solar power plant.
6. What are the different types of tidal power plants?
7. Layout and working principle of a Diesel turbine power plant.
8. Layout of Hydro & Thermal Power Plant.

PAPER NAME: DEVELOPMENT OF LIFE SKILL-II

PAPER CODE: DLS-II

1. What do you mean by problem solving?
2. Discuss the technique of "Trial and Error" and " Brain Storming".
3. Write down the steps of problem solving?
4. What is interpersonal relation? Discuss about the types of interpersonal relationship?
5. Identify different sources of job vacancies.
6. An MNC requires a supervisor for their new project. Write an application applying for that post and attached your C.V.
7. What are the advantages of memos?
8. What is graphic communication in engineering? Define the term 'Kinesics'.
9. Suppose you have purchased 30 numbers of ceiling fans from a reputed company. In time of installation it is found that some are not functioning properly. Now write a complaint letter to the company asking for immediate replacement or repairing of those faults.
10. How can you develop effective interpersonal skills?

DIPLOMA-4TH SEMESTER (CE)

SUB: ADVANCED SURVEYING

PAPER CODE: SURV

1. How to measure the horizontal angle using theodolite? Write down step by step.
2. (i) What is Ranging? Draw rough sketch.
 (ii) What is levelling? Draw a rough sketch and explain its importance.
3. What is the principle of compass surveying?
4. What do you mean by foresight, backsight and intermediate sight reading?
5. What is the purpose of levelling?
6. Write down the properties of a simple circular curve.
7. What is radius and degree of curve?
8. What is Trapezoidal rule and what is Prismoidal Rule?
9. What is super elevation? Derive the expression of super elevation.

10. (i) Write down five purposes for which theodolite can be used?

    (ii) What is line of collimation?

(iii) What is the minimum angle for a well defined triangle?

SUB: GEOTECHNICAL ENGINEERING-I

PAPER CODE: GE-I

1. What is sieve analysis? Explain. What is hydrometer test? What is the difference between sieve analysis and hydrometer test?
2. What is compaction? How this process occurs? Why is water added in the process of compaction?
3. What is Mohr Coulomb Failure? Explain with neat diagram.
4. What is uniformity coefficient and coefficient of curvature? What is shrinkage, plastic and liquid limit? Define the different index related to this concept. What is sensitivity and activity of soil?
5. Define-void ratio, porosity, degree of saturation, water content. Write down the mathematical expression.
6. The undisturbed sample of soil has a volume of 100 cc and mass of 190 gm. On oven drying for 24 hour, the mass is reduced to 160 gm. If the specific gravity of soil is 2068, determine the water content, void ratio and degree of saturation.
7. What is permeability? State Darcy's law. Write down briefly about the falling head method and constant head method.
8. What is active earth pressure and passive earth pressure? Write the expression of coefficients related to it. What is pressure bulb?
9. What is the difference between compaction and consolidation? How many types of consolidation? Define and write down the mathematical expression
10. Write down the methods of site exploration. What is area ratio, inside clearance and outside clearance?

SUB: TRANSPORTATION ENGG I

PAPER CODE: TE-I

1. Discuss the component parts of a permanent way with sketch.
2. Discuss the rail joints with sketch.
3. What are the functions of railway sleepers?
4. State briefly the procedure of carrying out a preliminary survey for the alignment of a railway track in plain of west Bengal.
5. Draw the plan and elevation of a bridge showing its component parts clearly.
6. Define ruling gradient, momentum gradient and cant deficiency
7. Write short notes on loading gauge and adzing of sleeper.
8. Define a bridge. Explain the difference between a bridge and culvert.

SUB: ESTIMATING & COSTING

PAPER CODE :EAC

1. In a Block Development meeting you are required to draw up a preliminary estimate of a School Building for 500 students in order to assess the amount of fund. The following particulars are colleted by you:-

Carpet area for per student = 1.20 sq. m with an area of corridor, varandah, lavatories etc be 20% and for walls 15% to that of plinth area of the building.

Consider, Plinth area rate = Rs. 1100/sq m, cost of water supply = 5% , sanitation= 6% , electrification=10% , cost of approach road and boundary wall=3% of the building cost.

2. What is the difference between centre line method and long & short wall method?
3. What do you mean by estimation? What is the objective of estimation? Discuss about different types of estimation.
4. Calculate the volume and price of cement, coarse aggregates and fine aggregates in a concrete mix volume (1:2:4) of 49 cubic meter. Rate of materials: Cement= Rs. 180/bag, Coarse Aggregate= Rs. 900/cu.m, Fine Aggregate= Rs. 220/ cu.m.
5. Write down the rate and unit of rate of 10 items including materials and labours.
6. Write short notes on administrative approval, key plan and sub work.
7. What are Lump Sum Item, Supplementary Item and Substituted item? Briefly explain with example.
8. What do you mean by quantity survey and abstract estimate?
9. What is mass diagram? Explain different terms related to it.
10. Differentiate between Revised & Supplementary Estimate and briefly discuss it.

SUB: IRRIGATION ENGINEERING
PAPER CODE: IE

1. What is hydrograph? Explain with sketch.
2. What is meant by hydrologic cycle? Explain with neat figure.
3. What is duty, delta and base period of a crop?
4. Explain the relation between duty, delta and base period with proper units.
5. Explain clearly how the dam is recognized as low dam and high dam
6. What are the different types of dams? State example of each.
7. What is the difference between dam and barrage?
8. What are the different methods of determining yield of open well? Describe then with sketch.
9. What should be the standard of the irrigation water?
10. What are the different pool levels in a reservoir?
11. Design an irrigation channel by Lacey,s theory having the following data-
    a) F.S.D = 5 cumec
    b) silt factor= 1
    c) side slope = ½ :1
12. Difference between Kennedy,s theory and Lacey,s theory.

DIPLOMA-4TH SEMESTER (CST)
SUB:MICROPROCESSOR & PROGRAMMING
PAPER CODE:MP

i.   Draw and explain the minimum and maximum mode operation of 8086 microprocessor.
ii. What purpose does the "READY" signal serve in an 8085 microprocessor?
iii. Explain the flag register of 8085 & control word register of 8255.
iv. Write a program that adds 16bit data .Store the result and carry in two different register pair.
v.   Draw the architecture of 8085 microprocessor
vi. Write about the interrupt of 8086 microprocessor.

SUB: COMPUTER NETWORK
PAPER CODE: CN

1. What is SMTP .
2. What is ARP.
3. Discuss about ftp,rarp.
4. Give one example of public key & private key cryptography.
5. Write down the different layers in TCP/IP model and their works
6. Explain different types of topology.
7. What are Baud Rate and Bit Rate? Explain guided media and unguided media.
8. Discuss about OSI model (briefly).
9. What is cryptography? What is the difference between public key and private key cryptography? What is firewall?
10. Discuss about IPv4

SUB: RELATIONAL DATA BASE MANAGEMENT SYSTEMS
PAPER CODE: RDBMS

1. List the advantages of DBMS.
2. Draw and explain with diagram the DBMS architecture.
3. Difference between candidate key and alternate key.
4. Draw an ER diagram for a library management system.
5. Difference between primary key and secondary key.
6. What is DBA? How it is work?
7. With proper example explain – i) Generalization & ii) Aggregation.
8. Discuss the usefulness of ACID properties to ensure integrity during transaction process.
9. Briefly describe the 3-layer architecture of DBMS.
10. Consider a BANK database having customer, loan, account, employee and branch as entity types. Each banks of branch allows customers to open accounts and borrow loans. A customer can open more than one account and one account may also belong to one or more customers (joint account). Design an E-R diagram for the BANK database.

SUB: OBJECT ORIENTED PROGRAMMING
PAPER CODE: OOP

1. Write a C++ program to check any character is vowel or consonant.
2. Write a C++ program to print the greater number among three numbers.
3. Write a C++ program to check any number is Palindrome number or not.
4. Write a C++ program to print the reverse number of any number. (e.g. reverse no. of 123 = 321).
5. Write a C++ program to print the pattern bellow

```
      *
    * * *
  * * * * *
* * * * * * *
```

6. Write a C++ program to add two-dimensional matrix.
7. Write a C++ program to multiply two-dimensional matrix.
8. Write a C++ program to check any number is palindrome or not.
9. Write a C++ program to sort array in ascending order.
10. Write a C++ program to print the Fibonacci series.

SUB :COMPUTER GRAPHICS

PAPER CODE: CG

1. Write two techniques for producing color displays with a CRT.
2. Explain Mid-point circle drawing algorithm.
3. Draw a circle with radius=10 cm. using Mid-point circle drawing algorithm.
4. Briefly explain the raster scan display with a neat diagram.
5. Distinguish between Raster Scan and Random Scan Display
6. Discuss DDA line drawing algorithm with the help of an example.
7. Difference between DDA and Breshenham's line drawing algorithm
8. What is polygon?
9. What are the types of polygon?
10. Explain boundary fill and flood fill algorithm.

SUB: DEVELOPMENT OF LIFE SKILL-II

PAPER CODE: DLS-II

1. What do you mean by problem solving?
2. Discuss the technique of "Trial and Error" and " Brain Storming".
3. Write down the steps of problem solving?
4. What is interpersonal relation? Discuss about the types of interpersonal relationship?
5. Identify different sources of job vacancies.
6. An MNC requires a supervisor for their new project. Write an application applying for that post and attached your C.V.
7. What are the advantages of memos?
8. What is graphic communication in engineering? Define the term 'Kinesics'.
9. Suppose you have purchased 30 numbers of ceiling fans from a reputed company. In time of installation it is found that some are not functioning properly. Now write a complaint letter to the company asking for immediate replacement or repairing of those faults.
10. How can you develop effective interpersonal skills?

DIPLOMA-4TH SEMESTER (ME)

SUB: DEVELOPMENT OF LIFE SKILL-II

PAPER CODE: DLS-II

1. What do you mean by problem solving?
2. Discuss the technique of "Trial and Error" and " Brain Storming".
3. Write down the steps of problem solving?
4. What is interpersonal relation? Discuss about the types of interpersonal relationship?
5. Identify different sources of job vacancies.
6. An MNC requires a supervisor for their new project. Write an application applying for that post and attached your C.V.
7. What are the advantages of memos?

8. What is graphic communication in engineering? Define the term 'Kinesics'.

9. Suppose you have purchased 30 numbers of ceiling fans from a reputed company. In time of installation it is found that some are not functioning properly. Now write a complaint letter to the company asking for immediate replacement or repairing of those faults.

10. How can you develop effective interpersonal skills?

SUB- THERMAL ENGINEERING-II

PAPER CODE - TE-II

1. What is a steam boiler? What are the differentiating features between a water tube and a fire tube boiler?
2. Explain the working principle of Carnot cycle with vapour representing on P-V and T-s diagram. Why Carnot cycle cannot be used in practical engines?
3. What are the different between surface condenser and jet condenser?
4. A single stage reciprocating air compressor is required to compress 1kg of air from 1 bar to 4 bar. The initial temperature is 27^0 C. compare the work requirement in the following cases: a) Isothermal compression, b) Isentropic compression.
5. With a neat sketch explain the working principle of Bell-Coleman cycle for air refrigeration. Draw P-V and T-s diagram.
6. Describe briefly any two of the following processes a) sensible heating b) sensible Cooling   c) Heating & humidification
7. Describe briefly VCR Cycle with T-s and p-h diagram.
8. Explain the terms forced draught,induceddraurght .
9. Prove that for natural draught h=353H[(1/Ta) –{ (m+1)/m}1/Tg]
10. What are the desirable properties of refrigerants? Explain name at least five commercial refrigerants.
11. Explain the construction and working of a La Mount boiler with the help of a neat sketch.
12. Compare reciprocating compressor with a rotary compressor.
13. Describe the construction and working principle of a vane-type compressor.
14. A boiler generates 500kg/hr of steam at 16 bar and 300^0 C from feed water at 30^0C coal used is 60kg/hr of C.V. 30000kj/kg, find a) equivalent evaporation and b) boiler efficiency.
15. Consider a steam plant operating on a simple Rankine cycle. Steam enters the turbine at 3Mpa and 350^0C and is condensed in the condenser at a pressure of 75 kPa. Determine the thermal efficiency of the cycle.
16. Define the Psychometric? Explain the Dalton's law of Partial Pressures

SUB- MANUFACTURING PROCESSES-II

PAER CODE: MP-II

1. What is taper? What is taper turning? Describe various taper turning methods.
2. What factors should be selected during selection of a grinding wheel.
3. Describe various material used in a grinding wheel.
4. Find the time required on a shaping machine for completing one cut on a plate 400mmx600mm if the cutting speed is 20mm/ unit. The return to cutting time ratio is 2:3. Assume approach =40mm, over travel =35mm, allowance on either side of the plate width =6mm and feed/ cycle = 1mm.
5. Sketch and describe the tool head of a shaper machine.
6. Write down the various milling operation with figures.
7. What are the different between up milling and down milling, shaper and planer & thermo plastic and thermosetting plastic.

8. Explain the process of extrusion, compression moulding , transfer moulding and clandering due to produce of plastic.
9. Sketch and pointing the drilling cutter.
10. What is super finishing process? What are the purpose of super finishing process?
11. Index for 87 divisions in milling machine.
12. Calculation cutting time for cutting 150mm long key way using end mill of 20mm diameter having 4 cutting teeth. The depth of key way is 4.2 mm, feed/ tooth is 0.1 and cutting speed is 38mm /min. Assume approach and over travel distance as half of the diameter of the cutter and a depth of cut 4.2mm/pass.
13. Draw and explain various types of lathe chuck.

SUB- PRINCIPLES OF ELECTRICAL ENGINEERING
PAER CODE: PEE

1. Explain different types of Transducer.
2. Describe about Distribution of Electrical Power.
3. What is a transformer and how does it work?
4. Explain the application of autotransformer.
5. Explain the concept of VFD control.
6. What are the advantages and disadvantages of PMMC Instruments?
7. Describe the torque equation of moving iron instruments.
8. What is Piezoelectric Sensor?
9. Short note on Strain Gauges?
10. Explain the methods for Power Factor Improvement.

SUB: ENGINEERING METROLOGY
PAPER CODE: EM

1. State and explain the Taylor's Principle of Gauge Design.
2. Differentiate between between Tolerance and Allowance.
3. Differentiate between Hole Basis system and Shaft Base System of fits.
4. What are essential consideration for selection of material for gauges ? List some of materials commonly and explain the manufacture of gauges.
5. Why it is necessary to give tolerance on engineering dimensions? Explain Both Bilateral and unilateral tolerance with suitable example. Which system is preferred in interchangeable manufacture ? Why?
6. Explain why a Go gauge should be full form and a No –Go gauges should check any one dimension of element or feature of work.
7. Design a suitable "Go" and "No-Go" plug gauge for a bored hole (25.1/25.0) mm diameter.
8. Discuss the indian standard system of limits and fits.
9. What do you mean by the term 'Metrology' as applied to engineering industry ? What do you mean by 'Line standard' and 'End standard'.
10. State the principle of Vernierinstrument . Explain briefly the construction and use of Vernier caliper with a neat sketch.
11. Enumerate the desirable characteristics of precision measuring instrument.

12. Explain the construction and use of following (1) Vernier height gauge (2) Vernier depth gauge (3) inside and outside micrometer. Also state the least count of each measuring instrument.
13. Describe surface Plate with reference to its instruction , use and material.
14. What are the various instrument used for measuring the flatness of a surface plate.? Describe the test procedure by using one such instrument.
15. Explain the principle of spirit level.
16. Explain with construction (1) combination square (2) Universal surface gauge.
17. Sketch and explain the working principle of dial indicator.
18. Explain why it is not preferred to use sine bar for measuring angles more than 90^0 ?
19. Explain the sine bar and also its application with neat sketch.
20. Explain the construction and working principle of (1) Vernier Bevel Protector (2) optical bevel protector (3) combination set.
21. What are angle Gauge Blocks and how are they used ?
22. What is Comparator ? How they classified ? Describe the essential characteristics of comparator.
23. Explain the principle of working and construction of (1) Mechanical Comparator (2) Optical Comparator (3) Sigma Comparator. (4) Electrical Comparator (5) Pneumatic Comparator.
24. Name the important elements of threads which are required to be measured in order to determine the accuracy of screw threads . Describe in brief how the errors in these elements affect the working of threaded elements.
25. Name the various types of pitch error found in screw . State their causes ? Describe the effects of pitch errors on effective diameter of screw thread.
26. What is (1) best size wire (2) two wire method (3) Periodic error (4) Drunken error
27. Enumerate the effect of flank error on effective diameter of screw thread.
28. Explain the working with neat sketch of instruments which are used for gear tooth thickness measurement . Explain all four method used gear tooth thickness measurement.
29. State the various types of errors in gear . Why need for inspecting gear tooth element ?
30. Describe in brief the various methods for inspecting the involute profile of a spur gear wheel.

SUB: THEORY OF MACHINES & MECHANISM
PAPER CODE:TMM

1. Explain with a neat sketch compound gear train &epicyclic gear train.
2. Discuss the construction & working of a rope brake absorption type dynamometer.
3. what is machine? Give Classification of link. What is significance of degrees of freedom of a kinematic chain when it functions as a mechanism? Give Examples.
4. Explain the slotted and lever quick return motion mechanisms with neat sketches.
5. Define Cam and Follower. A cam drives a flat reciprocates follower is the following manner: During the first 120^0 rotation   of the cam, follower moves outwards through a diameter of 20 mm with simple harmonic motion. The follower dwells during next 30^0 of cam rotation .During next 120^0 of cam rotation, the follower moves inward with simple harmonic motion. The follower dwells for the next 90^0 of cam rotation. The minimum radius of the cam is 25mm.Draw the profile of cam.
6. Derive the equation for Velocity Ratio of belt drive. Also explain the slip of belt with derivation.
7. An engine running at 150 rpm. , drives a line shaft of a belt. The engine pulley is 750 mm diameter and the pulley on the shaft being 450 mm . A 900 mm diameter pulley on the line shaft drives a 150 mm

diameter pulley keyed to a dynamo shaft. Find the speed of the dynamo shaft. When 1). There is no slip , and 2) there is a slip of 2% at each drive.

8. Two pulleys , one 450 mm diameter and the other 200 mm diameter are on parallel shafts 2.95 m apart and are connected by a crossed belt. Find the length of the belt required and the angle of contact between the belt and pulley. What power can be transmitted by the belt when the larger pulley rotates at 200 rev/min , if the maximum permissible tension in the belt drive is 1 KN , and the coefficient of friction between the belt and pulley is 0.25?.

9. What is the difference between brake & clutch? Explain rope drive , its types and advantages and disadvantages in detail.

10. A pulley used to transmit power by means of ropes has a diameter of 3.6 m and has 15 grooves of $45°$ angle.. The angle of contact is $170°$ and the coefficient of friction between the ropes and grooves sides is 0.29 . The maximum possible tension in the ropes is 960 N and mass of the ropes is 1.5 Kg permetre length. What is the speed of pulley in rpm and the power transmitted if the condition of maximum power prevail ?

11. Explain the Shoe Brake with its derivations and explain the conditions.

12. In a laboratory experiments, the following data were recorded with rope brake: Diameter of the flywheel 1.2 m , diameter of the rope 12.5 mm , speed of the engine 200 rpm , dead load on the brake 600 N , spring balance reading 150 N .Calculate the brake power of the engine.

13. Explain the Belt transmission Dynamometer and its derivation with neat skeych.

14. Define Governors. Explain Centrifugal governors with neat sketch and derivations

15. In an engine governor of the Porter type , the upper and lower arms are 200 mm and 250 mm respectively and pivoted on the axis of rotation . The mass of the central load is 25 Kg , the mass of each ball is 5 Kg and friction of the sleeve together with the resistance of the operating gear is equal to a load of 30 N at the sleeve. If the limiting inclinations of the upper arms to the vertical are $30°$ and $50°$, find , taking friction into account , range of speed of the governor.

16. A single plate clutch , effective on both sides , is required to transmit 25 KW at 4500 rpm . Determine the outer and inner diameters of frictional surface if the coefficient of friction is 0.355 , ratio of diameters is 2.25 and maximum pressure is not to exceed 0.3 N/mm^2 . Also determine the axial thrust to be provided by springs . Assume the theory uniform theory.

17. `Write short notes on i) inversion of mechanism ii) steam engine mechanism.

18. Define balancing. What is different between Vibrations and Balancing. What are steps to taken to avoid problem of balancing .

DIPLOMA-4TH SEMESTER (ETCE)
SUBJECT: ELEMENTARY COMMUNICATION ENGINEERING
PAPER CODE: ECE

1. Discuss the principle of linear and non-linear quantization. What do you mean by commanding inter symbol interference.
2. Discuss the derivation of sidebands in AM systems. Draw necessary waveforms of Amplitude modulation.
3. Compare AM,FM and PM.
4. Discuss the principle of operation of frequency modulation using Varactor diode and VCO.
5. Discuss with the principle of generation and reception of PAM,PWM and PPM with block diagram and discuss their applications.

6. Explain with block diagram PCM communication system .
7. What should be the minimum bandwidth required to transmit a PCM   channel?

SUBJECT: ANALOG ELECTRONICS II
PAPER CODE: AE II

1. Discuss with fig. the operation of Wien bridge oscillator.
2. Discuss the fabrication of Diode and BJT.
3. Draw and discuss the operation of stagger tuned amplifiers. Also draw frequency response.
4. What do you mean by Schmitt Trigger circuit. Discuss with fig and waveforms.
5. Discuss the log amplifier and clipper circuit using OPAMP IC.

SUBJECT: CONSUMER ELECTRONICS
PAPER CODE: CNE

1. Briefly Describe the Construction, Working Principle and Frequency Response of Carbon Microphone.
2. Discuss the construction and working principles of moving Coil Loudspeaker.
3. What are the Frequency characteristics of
   i) Woofer
   ii) Tweeter
   iii) Squaker
4)Describe the basics shortly of stereo:- Tone, Bass, Trebel, Balance and Control.
     4)   Make a Block diagram and describe the black and white TV Transmitter and Receiver.
     5)   a. What is Vidicon camera? Describe shortly with its working principle.
     6) What are the principles of VCD and DVD player?
     7) Briefly describe the CD recording and CD playing.

SUBJECT: MICROPROCESSOR
PAPER CODE: MP

1. What is control word register? Explain briefly.
2. Write the differences between 8 bit & 16 bit microprocessor.
3. Explain the different type of modes & block diagram of 8253.
4. Draw & explain bus structure of 8085 microprocessor.
5. What is 8255? Explain its modes.
6. Define the flag register of 16 bit microprocessor.
7. Short note on Control unit.
8. Short note on Data bus.

DIPLOMA-6TH SEMESTER (EE)

SUB: ELECTRICAL DESIGN, ESTIMATION & COSTING
PAPER CODE: EDEC

1. What are the functions of conservator and breather in transformer?
2. State the factors, governing the amount of illumination at a particular place and the necessary point to be kept in view for executing schemes.
3. State the factors, governing the amount of illumination at a particular place and the necessary point to be kept in view for executing schemes.
4. Explain utilization factor and depreciation factor used in connection with lighting scheme.
5. Write short notes on (i) transformer bushings (ii) transformer tapping.
6. Write short notes on any one (i) transformer bushings (ii) transformer tapping.

SUB: ELECTRICAL INSTALLATION, MAINTENANCE, TESTING
PAPER CODE: EIMT

(1) a) What is maintenance? What are the different types of maintenance?

    b) Discuss any one of the above maintenance.

(2) Discuss various factors affecting line of insulating materials.

(3) What is planning and design of installation work-explain. Also explain inspection before arrival of machine.

(4) a) What is a MCB?

    b) Why MCB's are used instead of HRC fuses in LV circuits?

(5) State of operational steps involved in installation of electric machines in a workshop.

(6) On arrival of electrical machines what steps you should follow for their acceptance?

(7) Write short notes on following:i) Various types of faultsii) Common troubles in HV and LV switchgear

(8) Discuss in details installation of alternator, induction motor and transformer.

SUB: INDUSTRIAL MANAGEMENT
PAPER CODE:IM

1. State Fayol's 14 principles of management.

2. What is Human Resource Planning? Describe the different stages in Human Resource Planning process.

3. What is Recruitment? State the various methods of recruitment.

4. Give a short note on:

HRP

ABC analysis

Induction Training Program

On the job training

5. Maslow and Herzberg had approached the study of motivation somewhat differently but there are also similarities in their ideas. Compare and contrast their views of motivation.

6. Define financial ratio. What are the objectives of ratio analysis?

7. State the functions of a 'Human Resource Manager'.

8. Discuss the various methods of recruitment.

SUB: CONTROL OF ELECTRICAL MACHINE
PAPER CODE: CEM

1. Explain with a neat sketch, the control of a conveyor system by sequential starting of conveyor motors.

2. Write down some basic elements of servo mechanism.

3. Write down the principle of design of motor control circuit.

4. Develop a ladder logic diagram for star Delta starter and explain.

5. Draw a neat sketch of Pneumatic timer and explain principle of operation.

6. Draw the close loop control using by PLC programming.

7. Write down the function of each part of PLC.

DIPLOMA-6TH SEMESTER (CST)
SUB: INDUSTRIAL MANAGEMENT
PAPER CODE: IM

1. State Fayol's 14 principles of management.

2. What is Human Resource Planning? Describe the different stages in Human Resource Planning process.
3. What is Recruitment? State the various methods of recruitment.
4. Give a short note on:
   a. HRP
   b. ABC analysis
   c. Induction Training Program
   d. On the job training

5. Maslow and Herzberg had approached the study of motivation somewhat differently but there are also similarities in their ideas. Compare and contrast their views of motivation.
6. Define financial ratio. What are the objectives of ratio analysis?
7. State the functions of a 'Human Resource Manager'.
8. Discuss the various methods of recruitment.

SUB: ADVANCED JAVA PROGRAMMING
PAPER CODE: AJP

1. What is class? Define a class with example.
2. What is constructor? Define with example.
3. What is method overloading? Describe with example.
4. What is single inheritance? Define with example.
5. What is Thread Priority? Define with example.
6. Define various types of exceptions.
7. Define Applet life cycle.
8. How do applets differ from application programs?
9. Discuss the steps involved in developing and running a local applet.
10. Discuss the steps involved in loading and running a remote applet.

SUB: SYSTEM PROGRAMMING& COMPILER DESIGN
PAPER CODE: SPCD

1. What is SDT? What is parsing?
2. What are the number of passes and explain them.
3. Write down the process for identifying the basic blocks.
4. Describe Peephole optimization.
5. Describe YACC
6. Describe Lexical Analyzer
7. Describe Thompson Construction
8. Describe Assembler
9. What is the difference between linker and loader?
10. Explain about dynamic linking

SUB: NUMERICAL METHODS
PAPER CODE: NM

1. Prove that $\Delta . \nabla = \Delta - \nabla$.
2. Write down the Newton's backward Interpolation Formula.
3. Discuss the Bisection method for finding a root.
4. Find the Lagrange's formula the interpolating polynomial which corresponds to the following data

X	-1	0	2	5
f(x)	9	5	3	15

5. Solve the system of equations, by Gauss–elimination method

$$3x_1 + 9x_2 - 2x_3 = 11$$
$$4x_1 + 2x_2 + 13x_3 = 24$$
$$4x_1 - 2x_2 + x_3 = -8$$

Correct up to two decimal places.

6. Given $\frac{dy}{dx} = x^3 + y$, $y(0) = 1$, compute $y(0.02)$, by Euler's method correct up to four decimal places, taking step length h = 0.01.

7. Using Trapezoidal rule with h = 2, evaluate the integral $\int_0^{12} \frac{dx}{1+x}$ correct to four decimal places.

8. Construct the diagonal difference table of given data.

X	0	1	2	3	4	5
f (x)	12	15	20	27	39	52

Hence write down the values of $\Delta f(1), \Delta^2 f(3), \Delta^3 f(2), \Delta^4 f(0)$

9. If $y = 4x^6 - 5x$, find the relative percentage error in y at x = 1, if the error in x = 0.04

10. Construct the formula for Confluent Divided Differences.

DIPLOMA-6TH SEMESTER (CE)

SUB: DESIGN OF STEEL STRUCTURE
PAPER CODE: DSS

1. Design a built up column 10m long to carry factored axial load of 1180KN.the column is restrained in position but not in direction at both the ends. Provide single lacing system with bolted connections. Assume steel of grade fe410 and bolts of grade4.6.design the column with two channels placed back to back.

2. Design a single angle discontinuous strut to carry a factored axial compressive load of 65KN.the length of strut is 3m between intersections. It is connected to 12mm thick gusset plate by 20mm diameter 4.6 grade bolts. Use steel of grade Fe410.

3. How shear value, bearing value and tearing value related to riveted connection is calculated?

4. Define slenderness ratio. State its values as per is 800.

5. What is batten and lacing? Draw a figure for each.

6. Define ductility factor and shear lag factor of tension members.

7. Design a lap joint to connect two plates 300mm wide and 16mm thick using 20mm diameter bolts of grade4.6the applied service load is 475KN.

8. Write the design procedure of Tension member

9. What are the assumptions in the riveted joint theory?

10. Determine the design tensile strength of plate (160x8mm) connected to 10mm thick gusset using 16mm bolts, as shown fig, if the yield and the ultimate stress of steel used are 250 Mpa and 410 Mpa respectively.
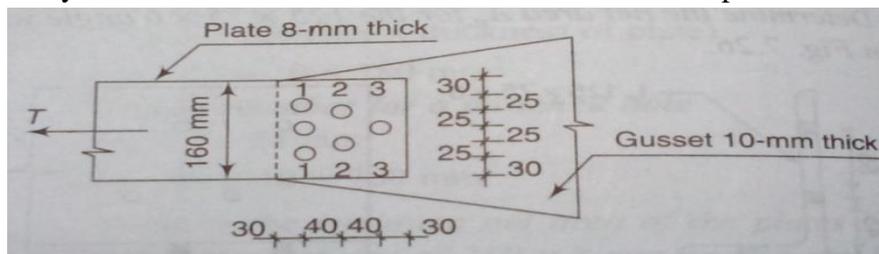
11. Write design procedure of truss member.

SUB: CONSTRUCTION & DISASTER MANAGEMENT
PAPER CODE: CDM

1. How many types of network diagrams are there? Explain them.
2. Explain cost analysis Withequation.What do you mean by crash cost.
3. What are charts? Enumerate the various types of chart with graphical representation.
4. Write about the contracting of network.
5. Write a short note-
   a. Slackb.Forward plans
6. Distinguish between Amount put to tender and tender amount.
7. What are the factors to be considered while planning the rebuilding works after a major disaster due to flood /cyclone/earthquake
8. Differentiate natural disaster and manmade disasters with examples.
9. What is plinth area and cubic rate estimate?
10. Explain' Work Break Down' structure.

SUB: ENVIRONMENTAL ENGINEERING
PAPER CODE: EE

1. What is activated sludge? Describe activated sludge process with line diagram.
2. Draw the flowchart of purification of water supplies and describe the each method in brief.
3. What is BOD? What is dissolved oxygen? How is these two related?
4. What is Turbidity, Hardness, pH, Eutrophication?
5. What is mass curve method? Where is it used? Draw the neat sketch of a stop cock.
6. Write short notes on acid rain and greenhouse gases and its effects.
7. Give the comparative detail between slow sand filter rapid sand filter.
8. What is aquifer? What are the types and define every type. What is conjunctive use of water?
9. What are the various types of sewers and various systems of sewerage?
10. What are DPR and EIA? Write down some points regarding the EIA of mining project.

SUB: WATER RESOURCE MANAGEMENT
PAPER CODE: WRM

1. Discuss about types of precipitation.
2. Define about terms Aquifer,Unconfined Aquifer, Aquicludes, Aquifuges.
3. Define terms berm, canal bank,hydraulic gradient, free board.
4. Describe with aneat sketch the working of a float type rain gauge.
5. What are the open wells? Explain with a sketch constant level pumping test
6. explain mass curve analysis, explain with sketches.
7. Enumerate the systems of flood forecasting.
8. Write a short note on decry's law of measuring velocity of ground water.
9. What is the necessity of temperature control is gravity dam?
10. Describe the method of watershed management.

DIPLOMA-6TH SEMESTER (ME)

SUB: DESIGN OF MACHINE ELEMENTS
PAPER CODE: DME

1. Explain General considerations while doing the Machine Design.
2. Explain the Classifications of Machine Design. Explain the term Stress Concentration.
3. Define Cotter Joint. Explain The complete design procedure of Socket and Spigot Cotter joint.
4. Design and Draw a cotter joint to support a load varying from 60 KN in compression to 60 KN in tension . The material used is carbon steel for which the following allowable stresses may be used. The load is applied statically. Tensile stress = Compressive stress = 80 Mpa ,Shear stress = 40 MPa , and crushing stress = 120MPa.
5. Design a knuckle joint to transmit 350 KN. The design stresses may be taken as 95 MPa in tension , 85 MPa in shear and 180 MPa in compression.
6. Explain the term Effect of keyways. A 15 KW, 960 rpm motor has mild steel shaft of 60 mm diameter and the extension being 80 mm. The permissible shear and crushing stresses for mild steel key are 60 MPa, and 120 MPa. Design the keyway in motor shaft extension. Check the shear strength of the key against the normal strength of the shaft.
7. Explain term Protected type flange coupling with neat sketch. Explain Design Procedure of Flange Coupling in detail.
8. Design and draw a protective type of cast iron flange coupling for steel shaft transmitting 15 KW , 250 rpm , and having an allowable shear stress of 50 KPa. The working stress in bolts should not exceed 40 MPa . Assume that the same material is used for shaft and key and that the crushing stress is twice the value of its shear stress . The maximum torque is 25% greater than the full load torque . The shear stress for cast iron is 14 MPa.
9. Explain the design of shaft on the basis, 1). Strength, 2). Rigidity and stiffness in detil.
10. Find the diameter of solid steel shaft to transmit 30 KW , at 250 rpm . The ultimate shear stress for steel may be taken as 400 MPa and factor of safety is 10. If a hollow shaft shaft is to be used in place of solid shaft, find the inside and outside diameter when ratio of inside to outside as 0.89.
11. A foot lever is 2 m from the centre of shaft to the point of application of 1000 N load find : a) Diameter of shaft ,b) Dimensions of the key , c) Dimensions of Rectangular arm if the foot lever at 75 mm from shaft assuming width of the arm as 3 times thickness. The allowable tensie stress may be taken as 95 MPa and allowable shear stress as 90 MPa. Draw the figure also.
12. Explain the term Torque required to Raise load bt square threaded screws with derivation and neat sketch.
13. Define Ergonomics, also state its advantage. State the Objectives of Ergonomics. Explain the man-machine relationship.
14. Define Costing and Estimating. State the functions Estimating Department. Explain the process of general costing method any components.
15. Explain the term 'life of bearing'. State the materials used for Bearings. State the Advantage and Disadvantage of Rolling contact bearing over sliding contact bearing.
16. Explain in brief the classification of spur gear in brief.
17. State the Design Consideration of a Gear Drive. Explain Merits and Demerit of Gear Drive.

SUB: INDUSTRIAL MANAGEMENT
PAPER CODE: IM

1. State Fayol's 14 principles of management.
2. What is Human Resource Planning? Describe the different stages in Human Resource Planning process.

3. What is Recruitment? State the various methods of recruitment.
4. Give a short note on:
HRP
ABC analysis
Induction Training Program
On the job training
5. Maslow and Herzberg had approached the study of motivation somewhat differently but there are also similarities in their ideas. Compare and contrast their views of motivation.
6. Define financial ratio. What are the objectives of ratio analysis?
7. State the functions of a 'Human Resource Manager'.
8. Discuss the various methods of recruitment.

SUB: FLUID POWER
PAPER CODE: FP

1. a. Explain the merits & demerits of the three types of hydrostatic type of hydraulic circuits In use.
   b. Why is a relief valve used in a hydraulic circuit? Explain its working with the help of a diagram.
2. a. What is the difference between the terms fluid power & hydraulics & pneumatics?
   b. Compare the use of fluid power to a mechanical system by listing the advantages & disadvantages each.
3.
   a. What is a positive displacement pump? In what ways does it differ from a centrifugal pump.
   b. A gear pump has a 75mm outside diameter ,50mm inside diameter & 25mm width. If the volumetric efficiency is 90 % at rated pressure, what is the corresponding actual flow rate? Take pump speed as 1000 r.p.m.
4. a. What is a 3-way & 4-way direction control valve. Explain with a neat sketch.
   c. What is a pressure reducing valve? What is its purpose?
5. a. Explain the principle of a balanced design of vane pump.
   b. What type of pumps are available in variable displacement design.
6. a. How does a pilot check valve differ from a simple check valve.
   b. A hydraulic motor has a 82 cm^3 volumetric displacement. If it has a pressure rating of 70 bars & it receives oil of 0.0006 m^3/s from a theoretical flow rate pump find the speed , theoretical torque,theoretical power of motor.
7. a. Differentiate between compensated& non compensated flow control valve.
   b. State the construction & working function of meter in & meter out circuit in fluid flow.
8. a. Draw the flow diagram circuit of pressure intensifier and explain it.
   b. Explain the function of - linear actuator,hydraulicmotor,direction control valve.
9. a. What is a hydraulic filter? What function does it serve in a hydraulic circuit? What are The common materials us*ed for hydraulic filter?*
   b. *Write a brief note on hydraulic piping used in a hydraulic circuit .*
10. *a. List out the characteristic* properties of hydraulic fluids. What are the common hydraulic fluids used in practice.
    Give the schematic diagram of a direction control valve. Explain how it works.
11. a. Explain the merits & demerits of the three types of hydrostatic type of hydraulic circuits in use.
    b. Why is a relief valve used in a hydraulic circuit? Explain its working with the help of a

Diagram.
    c.
Diagram.

SUB: REFRIGERATION & AIR CONDITIONING
PAPER CODE: RAC

1. Describe the C.O.P of refrigerator and heat pump. Obtain the relation between them.
2. Discuss the deviation of actual vapour compression cycle from simple theoretical cycle .
3. Differentiate between Air Cooled Condenser and Water cooled Condenser.
4. 28 tonnes of ice from at 0° C is produced per day is an refrigerator. The temperature range in the compressor is from 25 $^{\circ}$ C to -15 $^{\circ}$ C. The vapour is dry and saturated at the end of compression and an expansion valve is used . Assuming a coefficient of performance of 62% of the theoretical , Calculate the power required to drive the compressor. use R-12 as refrigerant.
5. Explain with neat sketch the 'Electrolux refrigerator with working and principle. '
6. Define the Psychometric? Explain the Dalton's law of Partial Pressures
7. Ennumerate and explain in short the points should be considered while making the heat load calculation .
8. Classify the Air Conditioning system . Explains any one.
9. Explain the method of installation of refrigeration system in car.
10. Write short note on various types of compressors. Explain any one with neat sketch.
11. Define Refrigerant. State desirable properties of an Idle refrigerant.
12. Explain heat rejection factor for the case of a condenser. State the basic function of a Expansion device.
13. With a neat sketch explain the working principle of Bell-Coleman cycle for air refrigeration. Draw P-V and T-s diagram.
14. Describe briefly any two of the following processes a) sensible heating b) sensible Cooling   c) Heating & humidification
15. A refrigeration system operates on the reversed Carnot cycle. The higher temperature of the refrigerant in the system is 25° C and lower temperature is -5° C. The capacity is to be 6tonnes. neglect all losses. Determine, a)Coefficient of performance. b) Heat rejected from the system per hour, c)power required.
16. What are the desirable properties of refrigerants? Explain name at least five commercial refrigerants.
17. Compare reciprocating compressor with a rotary compressor.
18. Describe the construction and working principle of a vane-type compressor.

SUB: PRODUCTION MANAGEMENT
PAPER CODE: PM

1. What are roles of suppliers and customer in JIT system
2. What are steps for ISO 9000 registration .
3. Describe the five step road map for implementing six-sigma.
4. What are requirement for planning preventive maintenance?
5. Write short note on (a) Total Productive maintenance (b) breakdown maintenance.
6. How the standard time of maintenance is calculated.Define motion study .state the different charts which are used for motion study.
7. 7How work measurement is done?.
8. Write a short note on Gantt chart and Line balancing.What do you mean by dispatching ? Describe the importance of follow up section .

9. Define production control. What are different techniques of production technique..State the functions Estimating Department .Explain inventory managnment.
10. Write a short note on Automated guided vehicles systems.
11. Write a short notes on (a) Margin of safety , (b) Angle of incidence
12. Explain the different material handling equipments.