

DIPLOMA-2ND SEMESTER (ALL STREAM)

SUB: BUSINESS ECONOMICS AND ACCOUNTANCY PAPER CODE: - BEA

Answer the following questions:

- A. Discuss the golden rules of account.
- B. Briefly describe the principles of economics.
- C. Discuss various errors which are not detected by trial balance.
- D. Write a short note on ledger.
- E. From the following transactions you are asked to prepare journal for the month of January '14
January 1. Started business with cash Rs.10, 000 and plant & machinery Rs.20, 000.
January 2. Opened a bank account by Rs2,000..
January 6. Wages paid by Rs.500.
January 25. Purchase goods by Rs.4, 000.
January 31. Sold goods by Rs 9,000.
- F. What do you mean by stability of equilibrium?
- G. What is demand schedule? Represent demand curve graphically.

SUB-APPLIED PHYSICS

PAPER CODE: AP

- A. Explain centripetal and centrifugal force with examples.
- B. Write down kinematical equations for motion under gravity and mention the different terms.
- C. Write down Newton's second law of motion and give the measurement of force from it.
- D. What is apparent weight? Derive the condition for complete weightlessness and super weightlessness of a man in a lift moving with an acceleration a .
- E. Explain Seebeck and Peltier effect. What is the temperature of inversion?
- F. How can we convert a galvanometer to a voltmeter and ammeter?
- G. A particle in its motion has travelled 66cm and 82cm respectively in 12th and 16th sec. What is the distance travelled by the particle in first 10 sec of its motion?
- H. What is momentum? Explain it with an example.

SUB-APPLIED CHEMISTRY

PAPER CODE: AC

- 1. What is Portland cement? State sequentially the chemical reactions that occur during setting and hardening of cement(write the equation).
- 2. Define lubricant. Give the functions of lubricant. Give example of each type of lubricants.

3. Define primary and secondary fuel with example. What do you mean by HCV and LCV? How calorific value of a fuel is calculated by Dulong's formula?
4. What is knocking and anti-knocking compound? Give the by products of coal gas and their uses.
5. Write notes on: (i) LPG (ii) Biogas.
6. Name two common lubricants and mention their uses. What are flash point and fire point?
7. What are cement mortar and cement concrete? Mention their uses. How gypsum is converted into plaster of paris?
8. What is the difference between paint and varnish? Write down the composition and use of one paint.
9. What is galvanization? Give one example of vehicle, thinner and drier used in making of paint.
10. Write down the composition of coal gas. Why it is poisonous? Name two important products obtained from fractional distillation of petroleum.

ENGINEERING MATHEMATICS

Paper Code: EM

Answer the following question:

1. Show that the matrix $A =$
2. Express $A =$ as the sum of symmetric and skew symmetric matrix.
3. Evaluate:
4. Find the value of the integral, by Trapezoidal Rule, with $h = 0.1$.
5. Prove that
6. Prove that $\log f(x) = \log(1 +)$
7. If A and B are independent events, then show that the following pairs are independent a) A and b) and B c) and

ELECTRICAL TECHNOLOGY

ET

1. i) State Ohm's law. ii) State Kirchoff's law.
2. Define:- i) Cycle ii) Phase difference of sinusoidally induced emf iii) Form factor iv) Peak factor v) RMS value
3. A resistance of 10 ohms is connected in series with an inductance of 0.05 H and a capacitance c to a 100 V, 50 Hz, supply. Find at what value of C the series circuit be a purely resistive one.
4. What is power factor? State Faraday's law of electro-magnetic induction.
5. A resistance of 20 ohm is connected in series with a inductance of $50\mu\text{H}$ to a 250 V, 50 hz supply. Find- i) impedance ii) power factor iii) current iv) draw the phasor diagram.
6. State the working principles of operation: 1) D.C. Generator 2) D.C Motor & 3) Transformer.

7. Draw the connection diagram of five light points, two fan point & two Socket outlet through switch board & junction box.
8. Draw the block diagram of different stages of generation, transmission & distribution in power system & explain each stage.

SUB-STRENGTH OF MATERIAL

PAPER CODE : -SOM

1. Define 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.
2. 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.
3. 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 parallel to the web.
4. A load of 20 KN is to be raised with the help of a steel wire. Find the minimum diameter of the wire if the stress is not to exceed 20000 KN/m².
5. 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/mm², calculate the safe steam pressure in the boiler.
6. A solid rod 300 cm long & 5m in diameter is used as a column whose one end is fixed & other end is hinged. If $E = 2 \times 10^4$ KN/cm² & factor of safety = 4, determine the safe compressive load for this column.
7. Define these mechanical properties such as Elasticity, Ductility, Malleability, Hardness, Brittleness, Strength, Creep etc.
8. Classify the different types of beam with proper sketch. classify the different types of loading with proper sketch.
9. 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/mm² What will be the slope at the ends.
10. What is the difference between strut & column? What are the classification of columns. What are the assumptions made in the Eulers theory.

DIPLOMA-4TH SEMESTER (EE)

SUBJECT: ELECTRICAL MACHINE-II

PAPER CODE: EM2

1. Explain with the help of suitable diagrams how rotating magnetic field is produced in a 3-phase induction motor.
2. Explain the Star-Delta starter & Direct -on-Line (DOL) of induction motor with proper diagram.

3. Derive the Torque equation, starting torque, Running torque, Maximum torque & condition for maximum torque with proper equation.
4. A 746KW, 3-phase 50HZ, 16 pole induction motor has a rotor impedance of $(0.02+j0.15)\Omega$ at standstill. Full load torque is obtained at 360 r.p.m. Calculate a) the speed at which maximum torque occurs, (b) the ratio of maximum to full-load torque, (c) the external resistance per phase to be inserted in the rotor circuit to get maximum torque at starting.
5. Explain the Regenerative Braking of 3-phase induction motor

ELECTRICAL MEASUREMENT AND CONTROL

PAPER CODE- EMC

1. Describe the operation of an LVDT for measuring displacement. How is its operation dependent on the position of the core? How is the nonlinearity attempted to be eliminated.
2. a) Describe the working principle of burden tube type pressure instrument.
b) Describe shortly for different type of strain gauges.
3. a) Explain the phenomenon, how changes develop on two plates placed across a piezoelectric crystal with force applied on it.
b) Describe the measurement of speed by using the contact and non-contact type tachometer.
c) How the volumetric flow measurement by electromagnetic flowmeter.
4. a) What is Seebeck effect? How does it develop and how has it been commercially exploited.
b) What different materials pairs are used for making commercial thermo emf generator? How are they designated?
c) What is cold junction compensation technique?
5. a) Draw the block diagram of basic CRO and explain its block. Explain the electrostatic focussing of an electron beam in CRO.
b) How does the voltage, current and phase can be measured by CRO.
6. a) Describe the working principle of digital frequency meter.
b) How does the signal can be amplified by instrumentation amplifier.
c) Describe the working principle of successive approximation type digital voltmeter.

TRANSMISSION & DISTRIBUTION OF POWER

PAPER CODE: TDP

- (1) Describe the general layout of a power system by single line concept. Also discuss the comparison between AC and DC power transmission system.

- (2) What are the different types of insulator are used in power system. Describe with net sketch.
- (3) What is sag? What are the effect of wind and ice on sag?
- (4) (a) State Kelvin's laws and limitation of this law for the economic choice of conductor size.
- (b) A 2-conductor cable 1 km long is required to supply a constant current of 200 A throughout the year. The cost of cable including installation is Rs. $(20a+20)$ per metre. The cost of energy is 5P per kwh and interest and depreciation charges amount to 10%. Calculate the most economical conductor size. Resistivity of conductor is 1.73 u ohm cm.
5. (a) What is string efficiency?
- (b) A string of five insulators is to be fitted with a grading ring. If the pin to earth capacitances is equal to C, find the values of line to pin capacitances that would give a uniform voltage distribution along the ring.

PAPER NAME: APPLIED & DIGITAL ELECTRONICS

PAPER CODE: ADE

1. Describe with Two Inputs Truth Table & Standard Symbol of Three Basic Gates (AND, OR, NOT) & Two Universal Gates (NAND, NOR)
2. Realise the logic expression, $Y = (B+D)$ using gates.
3. State De-Morgan's theorem.
4. Realisation of Basic Operation (AND, OR, NOT) using NAND Gates.
5. Define subtraction using 2's compliment method.
6. Short Notes on op-amp – adder, subtractor,
7. Short Notes on op-amp – inverting and non inverting amplifier. ,

PAPER NAME: POWER PLANT ENGINEERING

PAPER CODE: PPE

- (1) Describe the layout and working of modern thermal power station with block diagram.
- (2) Discuss the site selection of thermal power plant.
- (3) Describe the operation of the followings:
Boiler, Economiser, Super heater, Air pre heater, Condenser.
- (4) What are the merits and demerits of thermal power plant?
- (5) Write short note on FBD, coal handling plant, ash pond.
- (6) State different components used in thermal power plant. Explain the function of each in brief.
- (7) What are the merits and demerits of hydroelectric power plant?
- (8) What is catchment area and what is reservoir?

(9) Write short notes: Coal handling plant, ash storage.

(10) Explain surge tank.

PAPER NAME: DEVELOPMENT OF LIFE SKILL-II

PAPER CODE: DLS-II

1. What are the techniques to be used to develop effective interpersonal skills?
2. Identify different sources of job vacancies.
3. Write your C.V.
4. What is a covering letter? Write a job application letter in response to an advertisement.
5. Give format of a business letter. What is the purpose of an enquiry letter?

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 claim letter to the company asking for immediate replacement or repairing of those faults.

DIPLOMA-4TH SEMESTER (CE)

SUB: ADVANCED SURVEYING

PAPER CODE: SURV

1. What is the principle of chain surveying? Define main stations, subsidiary stations, tie stations, base line, check line, offset?
2. The following are the fore and back bearings of the sides of a closed traverse.

Side	FB	BB
AB	150°15'	330°15'
BC	20°30'	200°30'
CD	295°45'	115°45'
DE	218°0'	38°0'
EA	120°30'	300°30'

Calculate the interior angles of the traverse?

3. What is the principal of plane table Surveying? Briefly explain the advantages and disadvantages of plane tabling?
4. Define leveling, level surface, level line, horizontal plane, horizontal line, vertical line, vertical plane, reduced level, line of collimation, axis of the telescope, axis of the bubble tube, bench marks?
5. Explain the methods of contouring?
6. Briefly explain Simpsons Rule?
7. An embankment of width 10m and side slopes 1.5:1 is required to be made on a ground which is level in a direction tranverse to the centre line. The central heights at 40m intervals are as follows.

.90,1.25,2.15,2.50,1.85,1.35 and .85.

Calculate the volume of earth work according to (a) the trapezoidal formula (b) the prismoidal formula.

8. The following records are obtained in a traverse survey, where the length and bearing of the last line were not recorded.

Line	Length(m)	Bearing
AB	75.50	$30^{\circ}24'$
BC	180.50	$110^{\circ}36'$
CD	60.25	$210^{\circ}30'$
DA	?	?

Compute the length and bearing of line DA.

9. Two tangents AB and BC intersect at a point B at chainage 150.5m. Calculate all the necessary data for setting out a circular curve of radius 100m and deflection angle 30° by the method of offsets from the long chord?
10. Determine the values of stadia constants from the following observations.

Instrument	Staff	Distance (m)	Stadia readings	
Station	reading on		Lower	Upper
O	A	150	1.255	2.750
	B	200	1.000	3.000
	C	250	.750	3.255

SUB: GEOTECHNICAL ENGINEERING-I

PAPER CODE: GE-I

1. What is soil ,describe briefly

(a)Residual soil (b) transported soil(c) glacial soil

What do you understand by soil mechanics? How the knowledge of soil mechanics is useful in design of dams

2. Write down the short note

(a)Black cotton soil

(b) Residual soil

(c) Transported soil

3. Establish the relation between dry density bulk density void ratio of soil. Explain graphically the physical significance of phases of soil.

4. Define the following term. Degree of saturation, flow index, shrinkage limit, percentage air void compression index critical hydraulic gradient.

5. Distinguish between compaction and consolidation .distinguish between coefficient of compressibility and coefficient of consolidation.

6. What do you understand by shear strength of soil. Describe briefly mohr-coulumb failure theory.

7. What is flow net. What are the properties of flownet?

8. Describe briefly the constant head permeability test for determining the coefficient of permeability.

9. What do you understand by shear strength of soil.name the basic component on which the shear strength of soil dependent. State coulomb's equation for strength of soil and explain symbol. What may be the value of cohesion for dry sand?

10. Prepare a table of soil particle sizes (mm) according to MIT classification. Prepare a table of soil particle sizes according to IS classification

11. To draw a particle size distribution curve what is taken as ordinate and what is taken as abscissa.

Calculate the dry density of soil if the bulk density is equal to 1.8gm/cm^3 having moisture content equal to 30%

12. Explain the mechanics of consolidation with the help of spring analogy. what are the factor affecting compaction.

SUB: TRANSPORTATION ENGG.-1

PAPER CODE: TE-I

1. State the function of ballast in a railway track .Name different material used as a ballast.

Hints-ballast chapter

Write short note of any two of the following

- I. Flat footed rail
 - II. Creep of rail
 - III. Suspended rail
2. What is turn out? Draw a neat sketch of right hand turnout showing the component part. what is permanent way.
 3. What are the functions of sleeper in a railway track? what is meant by sleeper density and how is it expressed? state the factors which govern the sleeper density on a railway track
 4. What is creep in a railway track? What are the causes and effect of creep? Suggest some remedial measures against creep.
 5. What is superelevation? What are the objectives of providing superelevation?

Explain the following

- a) Cant deficiency
 - b) Right of way
6. What do you mean by drainage in tunnel? What method will you adopt in draining the water from tunnel? What is the necessity of ventilation of tunnels?
 7. Sketch various types of tunnel cross section state under what condition each is adopted
 8. Draw the plan and elevation of a bridge showing its component parts clearly.
 9. Define a bridge. Explain the difference between a bridge and culvert. Explain the grade separation
 10. List the requirement of an ideal rail joint. Enumerate the different type of rail joint.
 11. What are the different types of station?

What are the functions of yard?

Write about marshalling yard

12. What are the purposes of cheek rail?

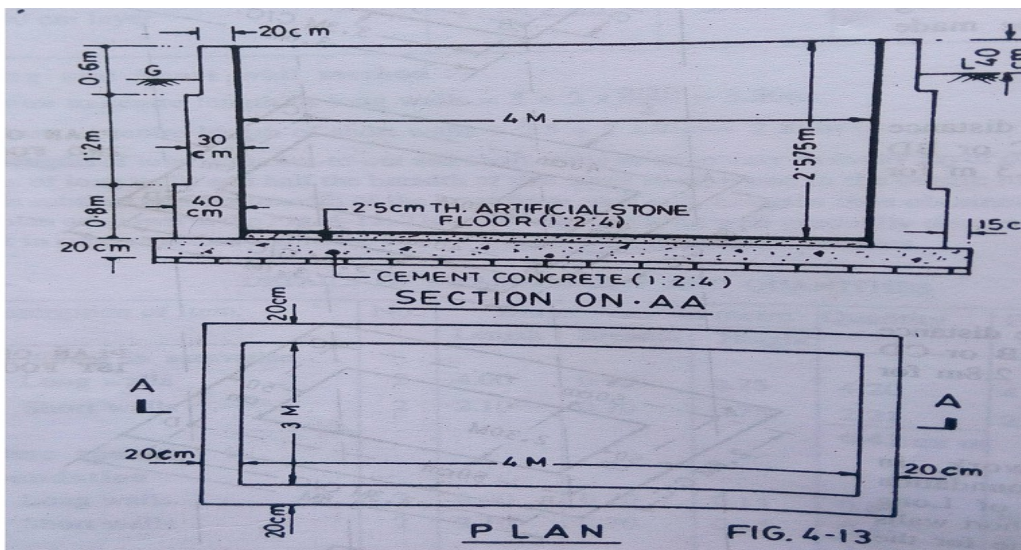
Explain the following with neat sketches (any two)

- a) Diamond crossing
- b) Level crossing
- c) Switch

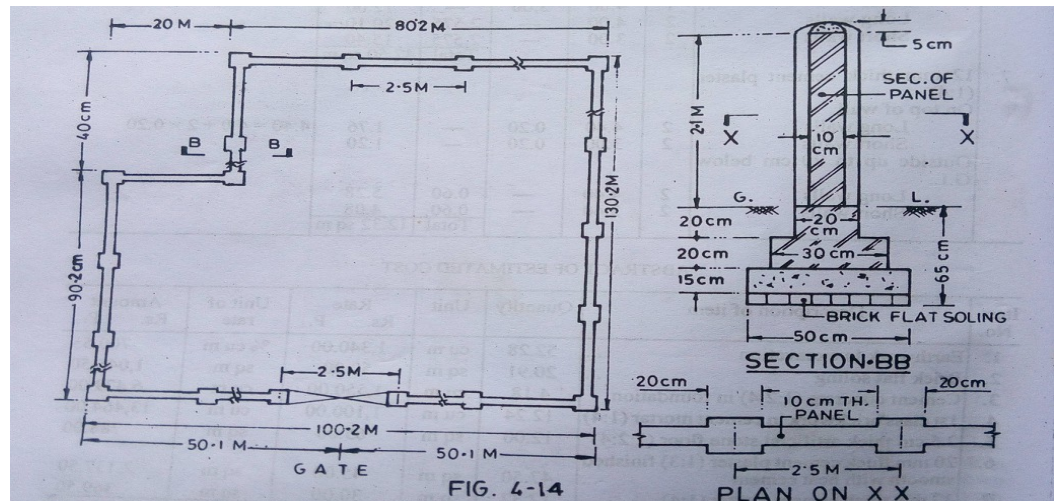
ESTIMATING & COSTING

PAPER CODE : EAC

1. What is an Estimate? Why we prepare Estimate before work done?
2. Purpose of Estimating and Explain it. ?
3. "An Estimate is never the actual cost of the work" Explain it. ?
4. Different type of Estimate and Explain it. ?
5. Different between Revised & Supplementary Estimate with brief discuss.
6. How to prepare a detailed Estimate with brief discuss.
7. The main Function of an Abstract of Estimate with brief discuss.
8. Explain "The data required for preparing Detailed Estimates".
9. Factor to be consider during preparation of a detailed estimate.
10. What is analysis of rate? Purposes of rate analysis with brief discuss.
11. How to fix up rate per unit of an Item ?
12. Prepare Estimate of an Underground Masonry Water Tank. with the below mention figure.



13. Prepare Estimate of Symmetrical Boundary wall with the below mention figure.



Prepare estimate of an unsymmetrical Boundary wall abutting the boundary land

Sub: IRRIGATION ENGINEERING

Paper Code: IE

1. State the advantages and disadvantages of irrigation. Differentiate between the lift irrigation and flow irrigation.
2. What is meant by hydrologic cycle? Explain with neat sketch. What is unit hydrograph? What are the advantages of unit hydrograph?
3. The gross command area of an irrigation project is 1 lakh hectares. The culturable command area is 75% of G.C.A. The intensities of irrigation for Kharif and Rabi are 50% and 55% respectively. If the duties for Kharif and Rabi are 1200 hectare/cumec and 1400 hectare/cumec respectively, determine the discharge at the head of the canal considering 20% provisions for transmission loss, overlap allowance, evaporation loss etc.
4. The command area of a channel is 1400 hectares. The intensity of irrigation a crop is 70%. The crop requires 60cm during that period.

Find,(a) The duty at the head of field.

(b) The duty at the head of channel.

(c) The head discharge at the head of channel.

Assume total losses as 15%.

5. What are the different pool levels in a reservoir? Explain with sketch. How can water be lost from a reservoir? How can the losses be controlled?
6. Describe an ogee spill way with a neat sketch. Describe volute siphon spill way with a neat sketch.
7. How can a gravity dam fail? What precautions should be taken against the factors leading to the failure?

8. Enumerate the points to be considered while selecting the site for diversion head works.

9. Name of the component parts of the diversion head works and state their functions.

10. Describe the method of watershed management.

Answer- preventive measures, curative measures for watershed management.

11. What is meant by waterlogging? State the effects of water logging. Describe the methods of controlling water logging.

12. Describe the methods of flood control or flood mitigation works.

13. Enumerate the systems of flood forecasting. Enumerate the ill-effects of flood.

DIPLOMA-4TH SEMESTER (CST)

SUBJECT NAME – MICROPROCESSOR & PROGRAMMING

SUB CODE: MP

1) What purpose does the “READY” signal serve in an 8085 microprocessor?

2) Distinguish between software interrupt and hardware interrupt in an 8085 microprocessor?

3) Difference between I/O mapped I/O and memory mapped I/O?

4) Draw and describe the internal architecture of 8085 microprocessor.

5) Draw and explain the pin diagram of 8085 microprocessor.

6) Draw the block diagram of 8259 and describe the working principal of it.

7) Draw the block diagram of 8237 and explain the working principal of it .

Sub: COMPUTER NETWORK

Paper Code: CN

1.

Answer the questions.

A. Define analog & digital signal.

B. What is function of HUB?

C. Write the functions of Data link Layer.

D. How TCP/IP model differ from OSI reference model?

E. What is Protocol?

F. What is framing?

G. Explain different types of topology with diagram.

H. Explain the OSI reference model with diagram.

- I. Explain direction of data flow (simplex, half duplex, full duplex) with example.
- J. Explain transmission media (guided & unguided) with diagram.
- K. Explain Circuit switching (time division & space division switch both) in brief.
- L. Explain various type of error detection method in data link layer

PAPER: RELATIONAL DATA BASE MANAGEMENT SYSTEM

PAPER CODE: RDBMS

Answer all the questions:

1. Differentiate the followings:
 - i. Natural join
 - ii. Outer join
 - iii. Equijoin
2. Let R(ABCDE) be a relation schema and consider the following functional dependencies $F = \{AC \rightarrow E, AE \rightarrow B, C \rightarrow E, C \rightarrow D\}$. Find out the candidate key.
3. Define BCNF. Why BCNF is stronger than 3NF?
4. State two phase commit protocol and discuss the shortcomings. What is checkpoint?
5. Discuss ACID property of a transaction.
6. Show that the following is not conflict serializable.

T1	T2	T3
R(X)		
		R(X)
W(X)		
	R(X)	
		W(X)

7. Construct a B+ tree with the following set of values.
(2, 3, 5, 7, 11, 17, 19, 23, 29, 31)
8. Consider the relation $R = (A, B, C, D, E, F, G, H, I, J)$ and the set of functional dependencies:
 $F = (AB \rightarrow C, A \rightarrow DE, B \rightarrow F, F \rightarrow GH, D \rightarrow IJ)$
Decompose in 3NF
9. Consider the following relational scheme:
Hotel(Hotel_No, Hotel_Name, Address)
Room(Room_No, Hotel_No, Type, Charge_pn)
Booking(Hotel_No, Guest_No, Date_Form, Date_To, Room_No)
Guest(Guest_No, Guest_Name, Guest_Address)

Write down the query in *relational algebra* for the followings:

- i. List the hotels which are situated in 'KOLKATA'
 - ii. List all single rooms with charge below Rs. 1000 per night
 - iii. List the names of all guest who are going to stay at ITC hotel from 24th December to 1st January.
 - iv. List the price per night and type of all rooms at Grand Hotel.
10. Write short notes on the followings:
 - i. Hashing
 - ii. Mapping cardinalities
 - iii. Multivalued dependency and 4NF
 - iv. File indexing
 - v. Armstrong's Axioms

SUB: OBJECT ORIENTED PROGRAMMING METHODOLOGY

PAPER CODE: OOP

Define Object Oriented Programming?

What is Object?

What is Class?

What is Encapsulation?

What is Inheritance?

What is Polymorphism?

- G. Explain the difference between a class and an object. What are the differences between a C++ struct and C++ class?
- H. How can you define a class with some private members and some public members?
- I. Write a C++ Program to defining a class and access the class members creating an object.
- J. Define function overloading. [What are the benefits of function overloading?](#) Explain function overloading creating three functions of different number of parameter or different types of parameter or both.
- K. Write a c++ program to calculate sum of two integers and two floats using templates.

PAPER NAME : COMPUTER GRAPHICS

PAPER CODE: CGR

- 1. a) Write down the different application area of computer graphics.
b) Write a short note on flat panel display.
- 2. a) Explain Mid-point circle drawing algorithm.
b) Draw a circle with radius=10 cm. using Mid-point circle drawing algorithm.
- 3. a) Briefly explain the raster scan display with a neat diagram.
a) Distinguish between Raster Scan and Random Scan Display.
- 4. a) Discuss DDA line drawing algorithm with the help of an example.
a) Difference between DDA and Bresenham's line drawing algorithm.
- 5. a) What is polygon?
b) What are the types of polygon?
c) Explain boundary fill and flood fill algorithm.
- 6. a) Briefly discuss Cohen-Sutherland Line Clipping technique.
b) Briefly explain midpoint subdivision algorithm for line clipping.
- 7. a) What are the advantages of using B-spline curve over Bezier curve?
b) Discuss Lagrange Interpolation curves
- 8. a) Prove that two scaling transformations are commute i.e $S_1S_2=S_2S_1$ and two 2D Rotations about origin also commute i.e $R_1R_2=R_2R_1$
b) Explain 3D rotation about arbitrary axis.
- 9. a) Suppose a window has its lower left corner at (-2,-1) and upper right corner at (3, 2). Using the above algorithm find the visible portion of the line joining points (-3,1), (1,3).
b) Discuss window to viewport Coordinate transformation.
- 10. a) Find out an expression for Bezier curve.
b) Find the equation of Bezier curve which pass through points(0,0) and (-2,1) and is Controlled through points (7,5) and (2,0).

PAPER NAME: DEVELOPMENT OF LIFE SKILL-II

PAPER CODE: DLS-II

1. What are the techniques to be used to develop effective interpersonal skills?
2. Identify different sources of job vacancies.
3. Write your C.V.
4. What is a covering letter? Write a job application letter in response to an advertisement.
5. Give format of a business letter. What is the purpose of an enquiry letter?
6. 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 claim letter to the company asking for immediate replacement or repairing of those faults.

DIPLOMA-4TH SEMESTER (ME)

PAPER NAME: DEVELOPMENT OF LIFE SKILL-II

PAPER CODE: DLS-II

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SUB- THERMAL ENGINEERING-II

PAPER CODE - ME/4/T4/MT2

1. Why cannot cycle not used in practical purpose?

2. A Carnot engine works between pressure limits of 35 bar and 0.7 bar. Find the amount of work done per kg of steam and thermal efficiency of the engine.
3. A Carnot engine absorbs 200J of heat from a reservoir at the temperature of normal boiling point of water and rejects heat to a reservoir at the temperature of triple point of water. Find the heat rejected, the work done by the engine and thermal efficiency.
4. Reheat, actual regenerative and actual Reheat regenerative cycle represent on T-S, h-S and P-V Diagrams.
5. Prove that for natural draught $h = 353H \left[\frac{1}{T_a} - \left\{ \frac{m+1}{m} \right\} \frac{1}{T_g} \right]$
6. A boiler uses 2000 kg/h of coal. The temperature of air supplied is 300K and the average temperature of the flue gas leaving the chimney is 650K. The 33m height steel chimney produces a draught of 20mm of column.

Determine the

- a. Quality of air supplied per kg of coal
- b. The draught in terms of column of hot gases
- c. Base diameter of chimney

Assuming that 10% of the theoretical draught is used for creating the flow velocity of gases through the chimney.

7. In a trial on a boiler the observations recorded are feed water temperature 50°C, boiler pressure 10bar, quality of steam 95%, coal consumption 500 kg/hr, calorific value of coal 35,500kJ/kg, Feed water supplied 4000 kg/hr. Determine the evaporation factor and equivalent evaporation from and at 100°C in per kg of coal fired and efficiency. Specific heat of water = 4.1868kJ/kg K.

8. The following observations were taken during a test on a steam boiler

Quantity of coal burnt/hour-720kg

Feed water supplied /hour-7000kg

Calorific value of coal fired- 34000kJ/kg

Feed water temperature entering economizer-25°C

Feed water temperature leaving economizer-80°C

Steam pressure -10 bar

Dryness fractions of steam leaving boiler drum- 0.95

Temperature of steam leaving super heater -250°C

Determine the thermal efficiency of the plant, also calculate the heat absorbed by feed water in various components as a percentage of the total heat absorbed.

9. What are the desirable properties of a refrigerant.
10. Write basic principle and Labeled schematic flow diagram and represented on P-V, P-H & T-S diagrams of vapour compression refrigeration system.
11. Define, relative humidity, specific humidity and degree of saturation, wet bulb temperature and dew point temperature.

12. Prove that volumetric efficiency of compressor $\eta_v = 1 + c - c(p_2/p_1)^{1/n}$
13. Comparison between surface condenser and jet condenser.
14. Steam at 50bar, 400°C expands in a Rankine engine to 0.34 bar for 150 kg/sec of steam; determine
 - (i) Power developed
 - (ii) The thermal efficiency
 - (iii) Specific steam consumption.
15. In a Rankine cycle, the steam at inlet to turbine is saturated at a pressure of 35 bar and the exhaust pressure is 0.2 bar. Determine : (i) The pump work, (ii) The turbine work, (iii) The Rankine efficiency, (iv) The condenser heat flow, (v) The dryness at the end of expansion. Assume flow rate of 9.5 kg/s.
16. In a steam power cycle, the steam supply is at 15 bar and dry and saturated. The condenser pressure is 0.4 bar. Calculate the Carnot and Rankine efficiencies of the cycle. Neglect pump work.
17. An air refrigeration open system operating between 1 MPa and 100 kPa is required to produce a cooling effect of 2000 kJ/min. Temperature of the air leaving the cold chamber is -5°C and at leaving the cooler is 30°C. Neglect losses and clearance in the compressor and expander. Determine : (i) Mass of air circulated per min. ; (ii) Compressor work, expander work, cycle work ; (iii) COP and power in kW required.
18. Write the Construction and Working Principle of Screw compressor.

SUB- MANUFACTURING PROCESS-II

PAER CODE –MP-II

1. A hollow work piece of 60mm outside diameter and 150 mm long is held on a mandrel between cut .
2. What is taper? What is taper turning? Describe various taper turning methods.
3. What factors should be selected during selection of a grinding wheel.
4. Describe various material used in a grinding wheel.
5. Find the time required on a shaping machine for completing one cut on a plate 200mmx300mm if the cutting speed is 10mm/ unit. The return to cutting time ratio is 2:3. Assume approach =50mm, over travel =25mm, allowance on either side of the plate width =5mm and feed/ cycle = 1mm.
6. Sketch and describe the tool head of a shaper machine.
7. Write down the various milling operation with figures.
8. What are the different between up milling and down milling, shaper and planer & thermo plastic and thermosetting plastic.
9. Explain the process of extrusion, compression moulding , transfer moulding and clandering due to produce of plastic.
10. Sketch and pointing the drilling cutter.
11. What is super finishing process? What are the purpose of super finishing process?
12. Index for 87 divisions in milling machine.
13. 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.

ELEMENTS OF ELECTRICAL ENGINEERING

PAPER CODE: EEE

1. What is Back E M F & explain the principle of operation of DC motor with equivalent circuit diagram.

2. Construction of DC machine .Draw the speed-torque characteristics of shunt,series & compound motor.
3. E M F equation of transformer. What is conservator, Breather, Buchholz Relay(with diagram), Bushings.
4. What is Transformer Losses . Describe the voltage regulation in leading, lagging, unity power factor with equation & phasor diagram.
5. Type of DC machine & draw the circuit diagram. What is Cooling process of transformer.
6. An 8-pole lap-connected armature has 40 slots with 12 conductors per slot generates a voltage of 500V . Determine the speed at which it is running if the flux per pole is 50mwb.

A 10 kva, single-phase transformer for 2000/400 V at no load,has $R_1 = 5.5\Omega$, $X_1 = 12\Omega$, $R_2 = 0.2\Omega$, $X_2 = 0.45\Omega$. Determine the approximate value of the secondary voltage at full load,0.8power factor(lagging),when the primary applied voltage is 2000V.

SUB: ENGINEERING METROLOGY

PAPER CODE: EM

1. State the working principal of Sine Bar.
2. Draw and levelling the vernier height gauge.
3. State the working principal of optical encoder.
4. What type of basis size limiting system used in metrology measurement and describe them with example.
5. Write the definition of Allowance, Tolerance, Fit, Zero limit and Nominal size.
6. Describe various limiting system.
7. Describe about two wire method.
8. In a screw thread show major diameter, minor diameter, effective diameter, pitch and thread angle.
9. In the measurement of surface roughness, height of 20 successive peaks and valleys measured from a datum are as follows 45, 25, 40, 25, 35, 16, 40, 22, 25, 34, 25, 40, 20, 36, 28, 18, 20, 25, 30, 38. If these measurements were made over a length of 20mm, determine C.L.A and R.M.S value of these.
10. Show the various symbols for designating surface finish on drawing.
11. Describe how to test flatness by dial gauge.

THEORY OF MACHINES & MECHANISM

PAPER CODE : TMM

List of Question:

1. What do you understand by instantaneous centre of rotation in kinematic of machines?
2. Discuss the three types of instantaneous centers for a mechanism.
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 in the following manner: During the first 120° rotation of the cam, follower moves outwards through a diameter of 20 mm with simple harmonic motion.

The follower dwells during next 30° of cam rotation .During next 120° of cam rotation, the follower moves inward with simple harmonic motion. The follower dwells for the next 90° of cam rotation. The minimum radius of the cam is 25mm.Draw the profile of cam.

6. Why we use Belt drive ? State the types of belt drives and explain the various types belt drive material. Also state the factors for selection of belt drive.
7. Derive the equation for Velocity Ratio of belt drive. Also explain the slip of belt with derivation.
8. 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.
9. 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?.
10. Explain rope drive , its types and advantages and disadvantages in detail.
11. 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 per metre length. What is the speed of pulley in rpm and the power transmitted if the condition of maximum power prevail ?
12. A chain drive is used for reduction of speed from 240 rpm to 120 rpm. The number of teeth on the driving sprocket is 20. Find the number of teeth on the driven sprocket , if the pitch circle diameter of the driven sprocket is 650 mm and centre to centre distance between the two sprocket is 800 mm ,determine the pitch and length of the chain.
13. Explain the Shoe Brake with its derivations and explain the conditions.
14. A bicycle and rider of mass 100kg are travelling at the rate of 25 Km/h on a level road. A brake is applied to the rear wheel which is 0.9 m in diameter and this is the only resistance acting. How far will the bicycle travel and how many turns will it make before it comes to rest? The pressure applied on the brake is 100 N and Coefficient of friction is 0.5.
15. A .band brake acts on the $5/6^{\text{th}}$ of circumference of a drum 450 mm diameter which is keyed to the shaft. The band brake provides a braking torque of 225 N-m. One end of the band is attached to a fulcrum pin of the lever and other end to a pin 100 mm from the fulcrum. If the operating force is applied at 500 mm from the fulcrum and coefficient of friction is 0.25 , Find the operating force when the drum rotates in the (a) anticlockwise , (b) clockwise problem.
16. 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.
17. Explain the Belt transmission Dynamometer and its derivation with neat skeych.
18. Define Governors. Explain Centrifugal governors with neat sketch and derivations

19. 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.
20. Two parallel shafts , about 600 mm apart are to be connected by spur gears. One shafts is to run at 560 rpm and other at 220 rpm . Design the gears if the circular pitch is to be 35 mm.
21. 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.
22. The load on the journal is 150 KN due to turbine shafts of 350 mm diameter running at 2500 rpm determine the Following .(1) Length of the bearing if allowable bearing pressure is 2.9 N/mm^2 . (2) . Amount of heat to be removed by the lubricants per minute if the bearing temperature is 75° C and viscosity of the oil at 75° C is 0.025 kg/m-s and bearing clearance is 0.29 mm.
23. `Explain term Vibrations. State different types of vibrations and explain briefly . Also State the causes and remedies of Vibrations.
24. Define balancing. What is different between Vibrations and Balancing. What are steps to taken to avoid problem of balancing .

DIPLOMA-4TH SEMESTER (ETCE)

ELEMENTARY COMMUNICATION ENGINEERING

PAPER CODE: ECE

1. Discuss the principle of linear and non-linear quantization. What do you mean by companding 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?

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.

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.
- 5) Make a Block diagram and describe the black and white TV Transmitter and Receiver.
 - 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.

MICROPROCESSOR

PAPER CODE: MP

1. Draw the block diagram of 8085 microprocessor.
2. What is 8255? Explain its modes.
3. Define the flag register of 8 bit microprocessor.
4. Describe the function of following pins----
 - (i)HOLD
 - (ii)TRAP
 - (iii)READY
 - (iv)SID
 - (v)INTR
5. Describe the Demultiplexing procedure of 8085.
6. Describe The addressing modes of 8085.

DIPLOMA-6TH SEMESTER (EE)

ELECTRICAL DESIGN, ESTIMATION & COSTING

PAPER CODE: EDEC

1. What are type factors to be considered for selecting the particular type of wiring?

2. What type of wiring would you recommend for mechanical workshop? Give reasons in support of your answer.
3. As per IE rules, what are the provision applicable to medium, high and extra-high voltage installation?
4. State the factors, governing the amount of illumination at a particular place and the necessary point to be kept in view for executing schemes.
5. Explain utilization factor and depreciation factor used in connection with lighting scheme.
6. Write short notes on (i) transformer bushings (ii) transformer tapplings.

What are the functions of conservator and breather in transformer?

ELECTRICAL INSTALLATION, MAINTENANCE & TESTING

PAPER CODE: EIMT

- (1) What is planning and design of installation work-explain. Also explain inspection before arrival of machine.
- (2) What is drying out of rotating electrical machine? What is the necessity of drying out? Discuss different methods of drying out.
- (3) Discuss in details installation of alternator, induction motor and transformer.
- (4) Discuss in details installation of transmission and distribution lines.
- (5) What are the different types of earthing? Explain any one.
- (6) What is fuse? Discuss H.R.C. fuse.
- (7) Write short notes on following:
- (8) Levelling and alignment b) procedure for storing a machine at site.

PAPER NAME: INDUSTRIAL MANAGEMENT

PAPER CODE: IM

Answer the following questions:

- A. Describe Maslow's Hierarchy of Needs.
- B. State the functions of Personal Management.
- C. Write a short note on Induction Training Program.
- D. What is the impact of globalization in India?
- E. Briefly state the types of business.
- F. Briefly discuss balance sheet.

PAPER NAME: CONTROL OF ELECTRICAL MACHINE

PAPER CODE: CEM

1. Explain the difference between Open loop and Closed loop control system.
2. Describe the Pneumatic type of Timer with proper diagram.
3. Describe the Limit switch with its proper diagram.
4. Explain the advantages of solid state control of machines.
5. What is Overload relay? Describe the elements of Servo mechanism.
6. What is Fuse? State the classification of fuse.
7. Describe the principle of operation of single phase induction motor using thyristor.

DIPLOMA-6TH SEMESTER (CST)

PAPER NAME: INDUSTRIAL MANAGEMENT

PAPER CODE: IM

Answer the following questions:

- A. Describe Maslow's Hierarchy of Needs.
- B. State the functions of Personal Management.
- C. Write a short note on Induction Training Program.
- D. What is the impact of globalization in India?
- E. Briefly state the types of business.
- F. Briefly discuss balance sheet.

SUB: ADVANCED JAVA PROGRAMMING

PAPER CODE: AJP

Answer all the questions.

1. List any eight controls from java.awt package.
2. Give the use of URL class and also give the syntax of constructor of URL class.
3. Give sequential steps to use JTree in an applet.
4. Write a program to demonstrate the use of Checkbox and CheckboxGroup class.
5. Explain the use of following methods of List class along with their syntax
GetItem ()
add ()
getItemCount ()
select ()
6. Give the use of ImageIcon class along with syntax of its constructor.
7. What is layout manager? Describe the use of GridLayout manager.
8. Give the use of following methods of Statement interface-
 - i) execute Query
 - ii) execute Update
 - iii) execute
9. Write a program to add cookies using a servlet.

10. Write a program to create an applet that will display the name, family, size and style of currently selected font .
11. Describe the use of Prepared Statement and Callable Statement interface.
12. a) Explain use of command line arguments.
b) Explain about try-catch functionality in Exception Handling
13. Write a program to create a servlet that handles HTTPGET request.
14. Explain how to set font of an applet using Font class. Give suitable code segment to demonstrate.

Sub: SYSTEM PROGRAMMING & COMPILER DESIGN

Paper Code: SPCD

1. What is basic block? List out the basic blocks and draw the flow graph for the following code.

1. location = -1
2. i=0
3. i <100 goto 5
4. goto l3
5. t₁=4i
6. t₂=A[t₁]
7. if t₂= x goto 9
8. goto 10
9. location = i
10. t₃ = i+1
11. i = t₃
12. goto 3
13. ..

2. a) What are three address codes? Construct three address codes for the following code segment.
a= b*-c+b*-c
b) What is SDT? What is parsing?

3. Consider the following grammar :

$S \rightarrow aABb$

$A \rightarrow c|e$

$A \rightarrow d|e$

Prove the grammar is LL(1). Draw the parsing table.

4. What is shift reduce parser? Explain the conflicts that may occur during shift reducing parsing.

Given grammar $A \rightarrow (A)a$, find the LR(0) items.

5. a) Write quadruples, triples and indirect triples for the expression $A=B*-C+B*-C$
b) Compare quadruples, triple and indirect triple.
6. a) Describe the role of Lexical Analyzer. Write the regular expression for the identifiers.
b) Give the Regular expression for the numeric constants. What is Input Buffering?
7. a) What is the difference between compiler and interpreter? What is macro instruction? What are the types of Loader?
b) What is context free grammar? Explain with example. What is token?
8. a) Define Flow graph and explain it with the help of example.
b) Write down the process for identifying the basic blocks.
9. a) What is an operator precedence parser? List the advantages and disadvantages of operator precedence parsing.
b) What do you mean Thompson Construction? Explain with an example.
10. Write short notes of the following.
 - a) Peephole optimization.
 - b) YACC
 - c) Symbol Table
 - d) Thompson Construction
 - e) Cross compiler

Sub : NUMERICAL METHODS

Paper Code: NM

Answer the following question:

1. If the value of $e = 2.71828$ is replaced by 2.71937 . what is the percentage error?
2. Prove that
3. Prove that $\log f(x) = \log(1+)$

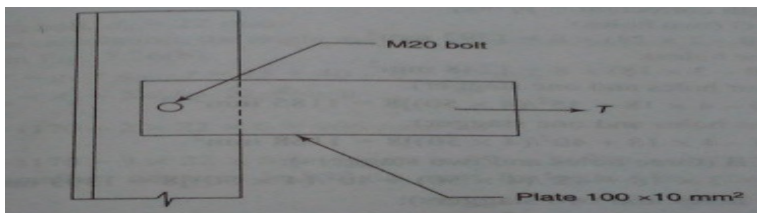
4. Find the polynomial of degree less than 3 passing through the points $(-1,1)$, $(0,1)$, $(1,1)$, $(2,-3)$
5. Solve the following system of linear equations by Gauss- Elimination method :
 $9x + 2y + 3z = -7$, $x - 6y + 2z = -2$, $x + y + 3z = 5$.
6. Find a root of the following non-linear equation by Newtons Raphsons method, $x^3 - 2x - 5 = 0$, Take $x_0 = 1$ and $x_1 = 2$
7. Find the value of the integral, by Trapezoidal Rule, with $h = 0.1$.

DIPLOMA-6TH SEMESTER (CE)

Sub: DESIGN OF STEEL STRUCTURE

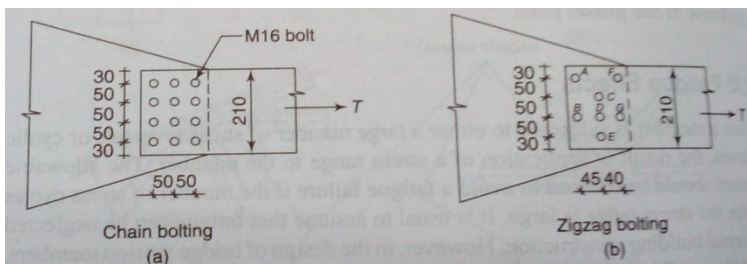
Paper Code: DSS

1. Explain with neat sketches the different types of riveted joints used in steel structures, and name the types of failures in riveted joints.
2. a) Determine rivet value of 18mm dia rivet connecting 12mm plates in single shear. Take permissible stresses in shear and bearing for rivets as 80 Mpa and 250 Mpa and for plate as 250 Mpa.
3. A web of a plate girder consists of 1000x16-mm plate of grade Fe 410 and is to be provided with a splice at a section where the factored shear and bending moment to be resisted by the web are $V=1000$ KN and $M=350$ KNm. The flange plate thickness= 50mm each. Design web splice.
- 4.. What is the net area A_n for the tension member shown in fig. in case of (a) drilled holes and (b) punched holes. Write the design procedure of Tension member.

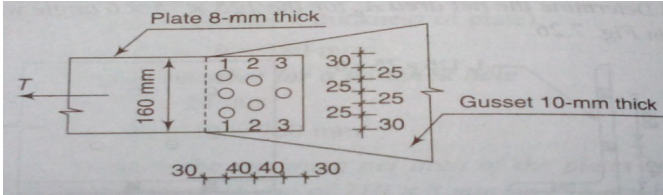


Answer- $A_n = A_g - (\text{hole dia.} \times \text{thickness of plate})$. for design purpose we have to calculate A_n , A_g , no of bolt and check slenderness ratio.

- 5.. Determine the minimum net area of the plates as shown in fig. with a plate size of 210x8mm and 16mm bolts.



6. 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.



7. Determine the design axial load on the column section ISMB 350, given that the height of column is 3m and that is pin ended. Also assume the following: $f_y = 250 \text{ N/mm}^2$, $f_u = 410 \text{ N/mm}^2$; $E = 2 \times 10^5 \text{ N/mm}^2$.

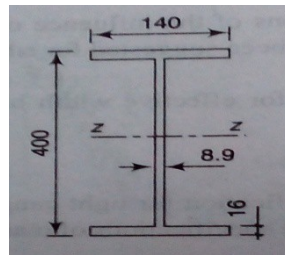
8. Determine the design axial load on the column section ISMB 350. The height of the column is 6m as shown in fig. It is effectively restrained at mid height by a bracing member in the y-y direction, but is free to move in the z-z direction and both the ends of the column are pinned. Also assume $f_y = 250 \text{ N/mm}^2$; $f_u = 410 \text{ N/mm}^2$, and $E = 2 \times 10^5 \text{ N/mm}^2$.

9. Calculate the compressive resistance of a 200x200x20 angle assuming that the angle is loaded through only one leg, when

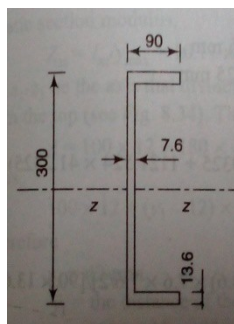
(a) it is connected by two bolts at the ends.

(b) it is connected by one bolt at each end.

10. Determine the plastic moment capacity and shape factor of the I section shown in fig. This section is ISMB 400 with the root radius omitted. Assume $f_y = 250 \text{ Mpa}$



11. Determine the plastic section moduli about the z-z and y-y axis and the plastic moment capacity of the channel section shown fig assume $f_y = 250 \text{ Mpa}$



12. Design the base plate for an ISHB 350 column to carry a factored load of 1200 KN. Assume Fe 410 grade steel and M25 concrete.

13. Design a simply supported beam of span 5m carrying a reinforced concrete floor capable of providing lateral restraint to the top compression flange. The uniformly distributed load is made up of 20 kN/m imposed load and 20kN/m dead load (Section is stiff against bearing). Assume Fe 410 grade steel.

14. What is roof truss? General requirement for selecting of truss?

Sub: CONSTRUCTION & DISASTER MANAGEMENT

Paper Code: CDM

1. What are the contents of a tender document ?
2. Explain the following terms with respect to construction management
 - i) Planning
 - ii) Directing
 - iii) Organizing
 - iv) Controlling
3. What is a chart? Enumerate the various types of chart with graphical representation.
4. What is disaster? what are the different type of disaster?
5. (a) Discuss the “right of contractor”. When a contract can be terminated?
(b) Difference between PERT and CPM network
6. Differentiate natural disaster and manmade disasters with examples. What are the necessary steps to be taken to avoid dangerous epidemics after flood disaster?
7. Define the term
 - (a) direct cost
 - (b) indirect cost
8. What do you understand by cost slope? How do you determine it?
9. What is contract? What is the different type of contracts?
10. Write short note on
 - (a) Earnest money
 - (b) Security deposit
11. Write the different between security deposit and retention money.
12. Explain the following term
 - (a) Slack
 - (b) Critical path method

Sub: ENVIRONMENTAL ENGINEERING

Paper Code: EE

1. Briefly describes the greenhouses gases and its effect on human being?
2. Briefly describe the causes of Air Pollution and sources of Air pollutants?
3. Describes that Global Warming?
4. Briefly describe the analysis of Air Pollutants?
5. What is filtration? Explain it?
6. What is thermal Decomposition? Explain it?
7. Explain briefly Develop Air quality Criteria and Practical emission standards?
8. Explain briefly the sources of Water?
9. Explain briefly the biological Pollution?
10. Explain it the adverse effects on human health and pollution?
11. What is liquid and Solid Wastes and what is domestic and industrial wastes?
12. Briefly explain that advantages and disadvantages of Open Dumping?
13. What is noise pollution? briefly describe the effect of noise pollution?
14. Briefly describes that air and water pollution control acts and rules?

Sub: WATER RESOURCE MANAGEMENT

Paper Code: WRM

1. Describe with a neat sketch the working of a float type rain gauge. What are the advantage and disadvantage of it.
2. a. Define precipitation. What is cyclonic precipitation
b. different between recording and non recording type rain gauge.
3. Explain briefly in infiltration capacity, ω index
4. define the term
 - a. permeability
 - b. transmissibility
5. Enumerate the points to be considered while selecting the site for diversion head works.
6. What is unit hydrograph? What are the advantages of unit hydrograph?
7. Distinguish between hydrograph and hyetograph?
8. What are different types of rain gauge? Describe any one with neat sketch.
9. What are the different methods of computing average depth of precipitation? describe the procedure any one
10. Define and explain of the following term.
 - (a) field capacity, specific yield
11. Write a short note on
 - (a) Aquifer (b) Aquicludes (c) Perched aquifer (d) specific yield.
12. Write a short note on decry's law of measuring velocity of ground water.

PAPER NAME: INDUSTRIAL MANAGEMENT

PAPER CODE: IM

Answer the following questions:

- A. Describe Maslow's Hierarchy of Needs.
- B. State the functions of Personal Management.
- C. Write a short note on Induction Training Program.
- D. What is the impact of globalization in India?
- E. Briefly state the types of business.
- F. Briefly discuss balance sheet.

DIPLOMA-6TH SEMESTER (ME)

Sub: DESIGN OF MACHINE ELEMENTS

Paper Code: DME

1. 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 = 120 MPa.
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 MPa. 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 detail.
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 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 tensile 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 by 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.

PAPER NAME: INDUSTRIAL MANAGEMENT

PAPER CODE: IM

Answer the following questions:

- A. Describe Maslow's Hierarchy of Needs.
- B. State the functions of Personal Management.
- C. Write a short note on Induction Training Program.
- D. What is the impact of globalization in India?
- E. Briefly state the types of business.
- F. Briefly discuss balance sheet.

Sub: FLUID POWER

Paper Code: FP

1. 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 $0.0006 \text{ m}^3/\text{s}$ 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.
- a. Draw the flow diagram circuit of pressure intensifier and explain it.
 - b. Explain the function of - linear actuator, hydraulic motor, direction control valve.
9.
 - a. What is a hydraulic filter? What function does it serve in a hydraulic circuit? What are the common materials used 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.

Sub: REFRIGERATION & AIR CONDITIONING

Paper Code: RAC

List of Question.

1. Derive an expression for C.O.P for an air -refrigeration system working on reversed Brayton cycle.
2. A refrigeration system operates on the reversed Carnot cycle. The higher temperature of the refrigerant in the system is 35°C and lower temperature is -15°C . The capacity is to be 12 tonnes. neglect all losses. Determine, a)Coefficient of performance. b) Heat rejected from the system per hour, c)power required.
3. Write a short note on 'pressure Enthaply' (p-h) chart.
4. Describe the vapour compression refrigeration system with p-h diahram and T-S diagram.
5. 28 tonnes of ice from at 0°C is produced per day is an refrigerator. The temperature range in the compressor is from 25°C to -15°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.
6. Explain with neat sketch the 'Electrolux refrigerator with working and principle. '
7. Define the Psychometric? Explain the Dalton's law of Partial Pressures
8. Explain with the help of psychometric chart , Sensible heating and Sensible cooling process.
9. Classify the Air Conditioning system . Explains any one.
10. Write a short note on the factors affecting comfort air conditioning.
11. Write short note on various types of compressors. Explain any one with neat sketch.
12. Define Refrigerant. State desirable properties of an Idle refrigerant.
13. Explain heat rejection factor for the case of a condenser. State the basic function of a Expansion device

Sub: PRODUCTION MANAGEMENT

Paper Code: PM

Answer the following questions:

- A. Discuss quality circle briefly.
- B. Briefly discuss six sigma.
- C. Discuss control chart.
- D. State the objectives of production and planning control.
- E. Write a short note on Line Balancing.
- F. Briefly discuss the various types of Layout.