KALOL INSTITUTE OF TECHNOLOGY AND RESEACH CENTER

[Gujarat Technological University]

SEMESTER:-2ND (C.E., I.T,)

SESSIONAL EXAMINATION MARCH-2009

SUB:-Elements of Mechanical Engineering **TIME: 10: 30 to 12: 00**
TOTAL MARKS: 40

Q-1 Attempt Any FIVE: [15]

(1) Give the definition and types of system. Explain any Two.
(2) Write a short note on Internal Energy.
(3) Explain LPG and CNG.
(4) Give the Difference between S.I. Engine and C.I. Engine.
(5) What is the Basic difference between Cast Iron and Steel? Give the types Of steel and Explain any one.
(6) Write a short note on Calorific Value.
(7) Derive the Mayer's Equation.
(8) Give the Difference and Similarities between Heat and Work.

Q-2 (A) Explain the Working Of Four Stroke I.C. Engine. (The compression ratio of I.C. Engine is below 10) [5]
(B) Derive the Equation of Poisson's law. [4]

OR

(B) One Kg of Ideal Gas is heated from 18˚C to 98˚C.Assuming R=0.264kj/kg K and γ = 1.2 for the gas and work done 200 kj, Find (1) Specific heat (2)the change in Internal Energy (3) the change in Enthalpy (4)The heat supplied

Q-3 (A) An automobile vehicle of 1500 kg mass is running at a speed of 60 km/hr. The brakes are applied and the vehicle is brought to rest. Calculate the rise in the temperature of the brakes if there mass is 15 kg. Take specific heat of the material of brakes = 0.46 kj/kg k. [3]
(B) Give the definition and classification of Prime mover. How they are Classified according to conventional and non-conventional types of sources. [5]

Q-4 Attempt Any TWO: [8]

(1) A four cylinder four stroke cycle S.I. Engine has 110 mm bore and stroke is 1.3 times bore. It consumes 4 Kg of fuel per hour having a calorific value of 41100 kj/kg. If the engine speed is 800 rpm, Find its indicated thermal efficiency. The mean effective pressure is 0.7 N/mm^2.

(2) A 6 cylinder four stroke I.C. engine is to develop 89.5 kW ip at 800rpm. The stroke to bore ratio is 1.25:1.Assuming mechanical efficiency of 80% and brake mean effective pressure of 5 bar, determine the diameter and stroke of the engine.

(3) Give the definition of Strength, Ductility, Creep and Fatigue.

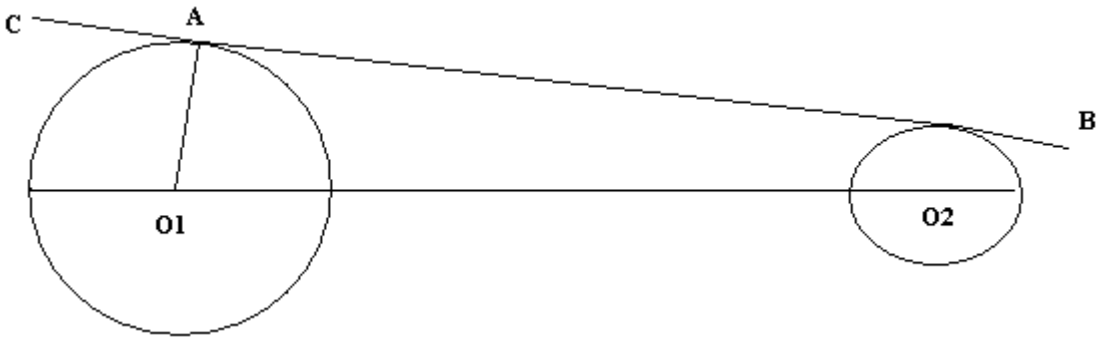
KALOL INSTITUTE OF TECHNOLOGY AND RESEARCH CENTRE, KALOL
Sessional Examination for B.E. Sem-II (Mech/ EE /EC)
Subject:- Engineering Graphics **Total Marks:- 40**
Date : 26/03/2009 **Time:- 1.5 hours**

Q-1 (A) A pendulum OC pivoted at O is 120 mm long. Its swings 30° to the right of vertical and also 30° to the left of vertical. Insect, initially at O reaches the point C, when the pendulum completes two oscillations. Draw the path of the insect, assuming motion of insect and of pendulum as uniform. **08**

OR

The front view of a line AB 90 mm long measures 65 mm. Front view is inclined to XY line by 45˚. Point A is on V.P. and 20 mm below H.P. Point B is in third quadrant. Draw the projections and find inclination of line with V.P. and H.P.

(B) The crank O_1A is 35mm long and rotates about the point O_1 in the clock wise direction. The link AB is connected to the crank by turning pair at the point A. The link AB glides/ slides over a fixed cylinder of 25mm radius as shown in figure. O_1O_2= 100mm, AB= 140mm, AC=15mm, BC=155mm.Draw the loci of the points B and C for one revolution of crank. **08**



OR

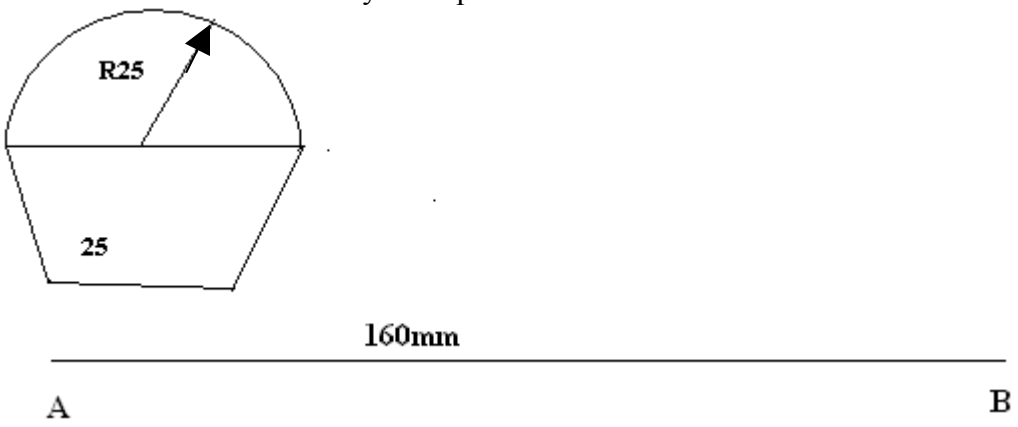
The top view and the front view, of the line CD measure 65mm and 53 mm respectively. The line is inclined to H.P and to V.P by 300 and 450 respectively. The end C is on the H.P. and 12mm in front of V.P. Other end D is in the 1st Quadrant. Draw the projections of the line CD and fine its true length

Q-2 Attempt ant two : **18**

1) Two straight lines OA and OB make an angle of 75˚ between them. 'P' is a point 40 mm from OA and 50 mm from OB. Draw a hyperbola passing through 'P' with OA and OB as asymptotes, mark at least 10 points.
2) Construct an Archimedean spiral of one convolution given the maximum and minimum radius as 55 mm and 31 mm respectively. Draw tangent and normal to the curve at 60° to the horizontal axes.
3) The major and minor axis of an ellipse is 125mm and 75mm respectively. Construct half ellipse by concentric circle method and half by oblong method.

Also draw normal and tangent at any point

4) A disc in the form of a semicircle and a semi- regular hexagon of thickness as shown in figure below. The distance between disc and string is 20mm.A disc is firmly fixed at point O. an inelastic string of length 160mm is fixed at point A and the free end B of a string is turned round the disc in anticlockwise direction. Draw the locus of B. Draw the tangent and normal to the curve at a distance of 110mm away from pole O. Name the curve.



Q-3 Attempt any three **06**

I) Explain the system of dimension.

II) Define the following terms. 1) Focus 2) Directrix 3) Eccentricity 4) vertex

III) Define ellipse and give its application.

IV) Define conics.

KALOL INSTITUTE OF TECHNOLOGY AND RESEACH CENTER

Gujarat Technological University
SEMESTER:-2ND (E.E., M.E., E.E.,)
SESSIONAL EXAMINATION MARCH-2009
Computer Programming and Utilization

TIME: 10: 30 to 12: 00
TOTAL: 40 MARKS

Q-1 State whether true or false. [6]

(1) All variable must be given a type when they are declared.

(2) The underscore can be used any where in an identifier.

(3) All arithmetic operators have same level of precedence.

(4) Declaration can appear any where in a program..

(5) Parentheses can be uses to change the order of evolution expressions.

(6) The modulo operator operator can use only integer value.

Q-2 Differentiate between. [5]

(1) Relational operator and logical operator.

(2) ++x and x++.

(3) (a && b) and (a & b).

(4) Logical AND and logical OR operator.

(5) >> and << operator.

Q-3 Explain conditional control statement with example. [7]

Q-4 Explain decision making and looping with example [7]

[OR]

Q-4 Explain different data type in "c". [7]

Q-5 Do as directed. [5]

(1)Find out put of following C code.

```
void main()
{
int a;
printf("%d %u", a ,a);
}
```

(2) Find out put of following C code.

```
Void main()
{
Int y;
printf("%d %d %d", y , y++, y--);
}
```

Q-6 Do as directed [10]

(1) Write a C program to display following pattern

1
12
123
1234

(2) Write a C program to find maximum number in given one dimensional array

----------Best of luck----------

GUJARAT TECHNOLOGICAL UNIVERSITY

SEMESTER: 2ND

SESSIONAL EXAMINATION MARCH-APRIL -2009

SUB: PHYSICS **MAX. MARKS: 40**

Q.1 Answer the following in short. **10**

i. Define Weber-Fechner Law and sensitivity of ear.
ii. Define magnetostriction effect.
iii. Define reverberation time.
iv. What is a Photoconductive cell?
v. Define Hall effect.
vi. Define meissner effect.
vii. What is population inversion and pumping?
viii. What is a holography and hologram?
ix. Write down the three important factors for a superconducting state.
x. Describe the Principle of Light Emitting Diode (LED).

Q.2 Answer the following in detail. **10**

i. Write down the properties of ultrasonic sound waves.
ii. Give the comparison between p-n junction diode and LED.
iii. Draw the V-I characteristics of a p-n junction diode and zener diode.
iv. Write down the applications of laser and holography.
v. Compare Type-I and Type-II superconductors.

Q.3 Answer the following in detail. **10**

i. Explain any one method of producing ultrasonic waves with construction and working.
ii. Explain the basic three processes based on Einstein's theory.

OR

Q.3 Answer the following in detail. **10**

i. Explain the properties of the superconductors.
ii. Describe the construction and working of Nd: YAG Laser.

Q.4 Answer the following in detail. **10**

i. Derive an expression connecting Hall voltage and Hall coefficient.
ii. Describe construction and working of a Solar cell.
iii. The volume of a room is 1500 m^3. The wall area of the room is 260 m^2, the floor area is 140 m^2 and ceiling area is 140 m^2. The average sound absorption coefficient for wall is 0.03, for the ceiling is 0.8 and for the floor is 0.06. Calculate the average absorption coefficient and reverberation time.

OR

Q.4 Answer the following in detail. **10**

i. Give the classification of solids on the basis of band theory.
ii. Write down expression for thermal conductivity and electrical conductivity. and prove Wiedemann- Franz Law.
iii. Calculate the electrical conductivity of copper. Given atomic weight, density and relaxation time as 63.5, $8.9 * 10^3$ kg m^{-3} and $2.48 *10^{-14}$ s respectively.

Kalol Institute of Technology and Research Centre

Sessional Exam – 2nd Semester
Sub: Communication Skills in English

Date: 28/03/2009
Time: 10:30 to 12:00 **Total Marks: 40**

Q1.Draw a neat figure of the 'the communication cycle' and explain various 'Levels of Communication'. (5)

OR

Q1. Which are the "Barriers to Effective Communication" and explain the Intrapersonal Barriers?

Q2. What is the difference between 'Listening' and 'Hearing'? Write types of Listening? And explain in brief. (5)

OR

Q2. Discuss various barriers to Effective listening. And give tips for effective listening?

Q.3 Draft an application Letter and give a copy of your Resume for the post of a Software Engineer in response to the following advertisement: (5)

Wanted a Software Engineer at our new factory in Ahmedabad, Gujarat. Engineering graduates with

Five years of experience with Software Company. Apply with particulars Box 650, The Hindu, Ahmedabad Gujarat-380 012.

OR

Q3.Define Technical Report and state its, types in brief.

Q4. Show the various components of the Paragraph and explain in brief. (5)

Q4. Explain what is reading comprehension? And explain the terms 'skimming' and 'scanning'

Objective type questions:

Q1. A Technical Report is usually a piece of factual writing based on evidence containing organized information on a particular _____.

1. Topic 2.Case
3. Matter 4.Problem.

Q2. Planning for a report is as important as the process of _____.

1. Speaking 2.writing
3. Asking 4.Listening.

Q3. _____ is a name given to the body's physical movement.

1. Chronemics 2. Syncronics
3. Kinematics 4. Kinesics

Q4. Listening is a _____Process.

1. Attentive, conscious, Physical 2.Receving, interpreting, reacting.
3. Reflective, Sympathetic Physical . 4. None of the Above

Q5. The students' act of listening is _____.

1. Appreciative Listening 2.Empathitic Listening
3. Comprehensive Listening 4.Critical Listening

Q6. Improper Language Encoding and Decoding is a _____Barriers to Communication.

1. Linguistic Language 2.Phychological
3. Cultural Barriers 4.All of the above.

Q7. "Limited Vocabulary" is a _____Barrier to communication.

1. Intrapersonal 2.Organisational
3. Interpersonal 4.None of them.

Q8.To Give the receiver's response to the sender is called_____.

1. Communication 2.Feedback
3. Language 4.Selection.

Q9.It is true that face is the Index of _____.

1. Body 2.Mind.
3. Eye 4.Character.

Q10. “Varied Perceptions” is a _____ type of Barrier to effective communication.

1. Intrapersonal
2. Interpersonal
3. Organizational
4. Personal

Q11.Reading comprehension refers to the ability to understand information in_____.

1. Oral form
2. Liquid form
3. Written form
4. Index form

Q12.The meaning of a Text is conveyed by the means of----------.

1. Words
2. Illustrations
3. Implications
4. All of the Above

Q13. Preview the Text, Read quickly, Study the detail all of these are involved in_____.

1. Inference
2. Scanning
3. Recalling
4. Skimming

Q14. Reading Comprehension Is _____.

1. Decoding, Comprehending, Text Analysis
2. Skimming, Scanning, Illustrating
3. Deciphering, Ideating, Re-structuring
4. None of the Above

Q15. To communicate effectively one has to_____.

1. Find background, be empathetic Listen carefully
2. Be positive, be clear, invite thoughtful contribution
3. be non-evaluative, interact cautiously
4. All of the Above

Q16. “Standing erect” is a_____type of Body Language.

1. Eye Movement
2. Facial Expression
3. Gesture
4. Posture

Q17. While listening to a comedian, musician, or an entertainer we do _____ type of listening.

1. Critical
2. Comprehensive
3. Appreciative
4. Empathetic

Q18. There are mainly _____ types of barriers to effective communication.

1. Three
2. Four
3. Five
4. Two

Q19. Communication is the exchange of ideas, thoughts and emotions between the listener and the speaker by the means of mutually accepted_____.

1. Signs and symbols
2. Interaction
3. Attention
4. Formats

Q20. Communication is a _____process.

1. Re-structuring
2. Active
3. Passive
4. Recalling

KALOL INSTITUTE OF TECHNOLOGY AND REASERCH CENTRE

Gujarat Technological University

SEMESTER-2ND (C.E/I.T)

Sessional Examination March-2009

Subject: Environmental Study

Time: 10:30 am to 12:00 pm

Total: 40 marks

Q-1 (a) Define Following Terms: [6]

1) Environment
2) Ecology
3) Ecosystem
4) Zero population growth
5) Life expectancy
6) Renewable and non renewable resources

(b) Explain: Solar Cooker [4]

OR

(b) Explain: Solar Cell [4]

Q-2 Write a short note on any three. [12]

1) Composition of Atmosphere.
2) Impact of Technology on Environment
3) Biogas
4) Wind energy
5) Structure and function of Ecosystem

Q-3 (a) Classify Ecosystem. [4]

(b) Describe: World Food Problems. [4]

OR

Q-3 (a) Write down Principles of ES. [4]

(b)Which are the types of mineral resources and use of it? [4]

Q-4 (a) Describe: Hydrological Cycle. [6]

(b)Explain biotic and abiotic components. [4]

----Best of Luck----

KALOL INSTITUTE OF TECHNOLOGY & RESEARCH CENTER
GUJARAT TECHNOLOGICAL UNIVERSITY
IInd SEM. SESSIONAL EXAM MARCH-2009

SUBJECT: ELEMENTS OF CIVIL ENGINEERING **DATE: 24/3/09**

MAX. MARKS:40 **TIME:10:30 TO 12**

SUBJECT CODE: 110004

Q.1 (A) Discuss the importance of scheduling. (4)

(B) Differentiate between the following. (4)

1. Tie line and base line
2. 2. Direct ranging and Indirect ranging.

OR

(B) Following observations were recorded in running a closed compass traverse. Mention the station affected by local attraction. Workout the corrected bearings of all lines and tabulated your results. (4)

Line	F.B.	B.B.
PQ	53°	230°
QR	135°	315°
RS	240°	58°
SP	298°	123°

Q.2 (A) The following consecutive readings were taken with a dumpy level. (5)
3.875,3.630,2.865,1.945,0.920,3.165,2.860,1.895,2.125,0.965,0.785.
The level was shifted after the fifth and eighth readings. The first reading was taken on the bench mark of R.L. 260.865. Calculate the reduced levels of all points and apply usual check.

(B) Define the following term: (4)
Change point, Foresight, Bench Mark, Reduced Level.

(C) Write characteristic of contour with neat sketch. (3)

Q.3 (A) What is cement? Discuss various types of cements with their uses? (4)

(B) Enlist various ceramics products. Write importance of ceramics as building construction materials. (4)

(c) Write short note on orientation of building. (4)

OR

(c) Enlist the types of stair. (4)

Q.4 (A) Discuss classification of building based upon structure. (3)

(B) What are the various principles of planning? Briefly discuss them with Neat sketches. (5)

OR

Q.4 (A)	Enlist various types of foundations. Draw neat sketch for 20 cm. and 30 cm. thick wall foundations.	(4)
(B)	Define: 1. Spread footing 2. Sill 3. Composite structure	(2)
(c)	Draw symbols for concrete, 2-way switch, Brick, ceiling fan	(2)

KALOL INSTITUTE OF TECHNOLOGY & RESEARCH CENTER

GUJARAT TECHNOLOGICAL UNIVERSITY

IInd Sem. SESSIONAL EXAM MARCH-2009

SUBJECT: MECHANICS OF SOLIDS **DATE: 25/3/09**
MAX. MARKS:40 **TIME:10:30 TO 12**
SUBJECT CODE: 110010

Q.1 (A) Find the value of P to keep the bar in equilibrium. Find also elongation of the bar. Take E=200GPa. (5)

(B) A steel rod of 20 mm diameter passes centrally through a copper tube of 50 mm external diameter and 40 mm internal diameter. The tube is closed at each end by rigid plates of negligible thickness. The nuts are tightened home on projecting parts of the rod. If the temperature of the assembly is raised by 50°C, calculate the stresses developed in copper and steel. Take $E_s=2E_c=200$ GPa, $\alpha_s=12 \times 10^{-6}$ per °C and $\alpha_c=18 \times 10^{-6}$ per °C. (6)

Q.2 (A) Find the centroid of the given lamina shown in figure. (6)

(B) Find the Moment of Inertia about centroidal horizontal axis shown in figure. (7)

OR

(B) 1. State and prove parallel axis theorem. (3)
2.Using first principal obtain the Moment of Inertia of rectangular area of width b and depth d about its centroidal axis. (4)

Q.3 Answer the following (Any Three)
1. Define resultant force and equilibrium force. (6)
2. State and explain Lami's Theorem.
3. Differentiate between moment and couple.
4. Define limiting friction.

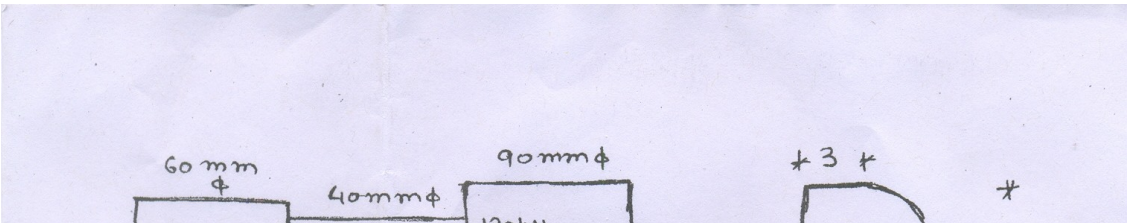
Q.4 (A) Determine the resultant force for force system shown in figure. (4)

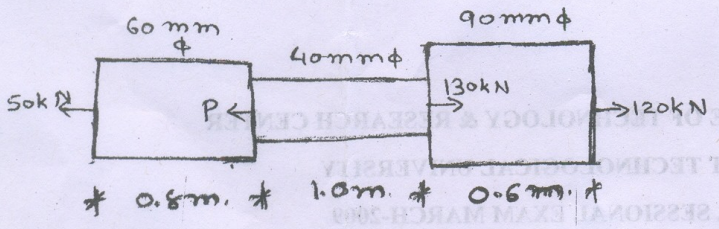
(B) A coplanar non-concurrent system of forces shown in figure. Determine the magnitude, direction & position of resultant of the system. (4)

OR

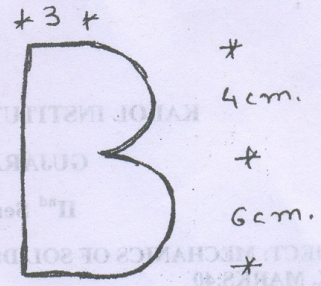
(B) A cord supported at A and B carries a load of 10 kN at D and a load of W (unknown) at C as shown in figure. Find the value of W so that CD remains horizontal. (4)

(C) Draw free body diagram of the figure. (2)

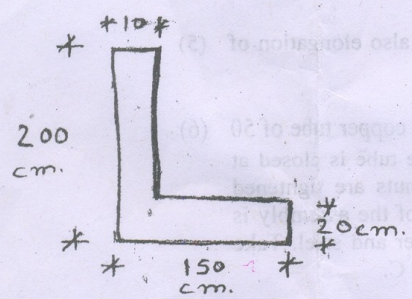




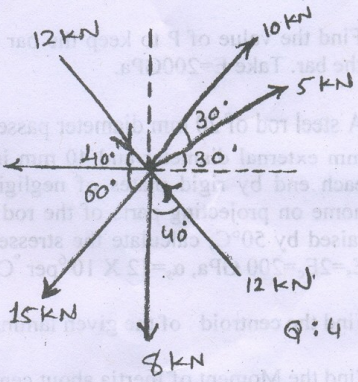
Q.1 (A)



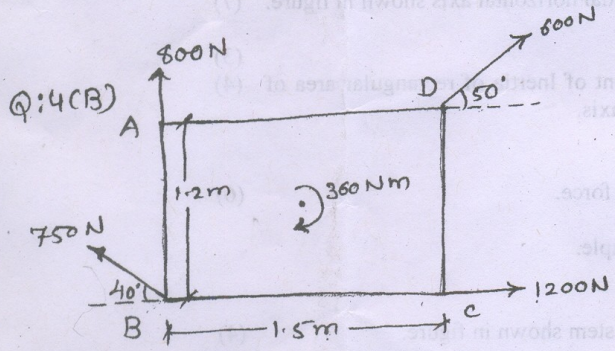
Q.2 (A)



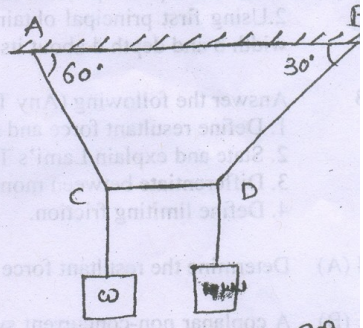
Q.2 (B)



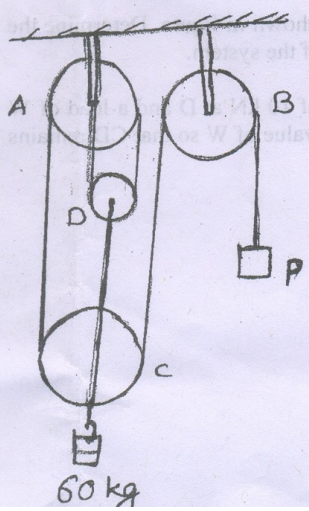
Q:4 (A)



Q:4(B)



Q:4 (B) OR



Q:4 (C) (FBD).

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Kalol Institute of Technology and Reserch Centre, Kalol

MID SEMESTER EXAM
(IInd Sem. CE, IT)

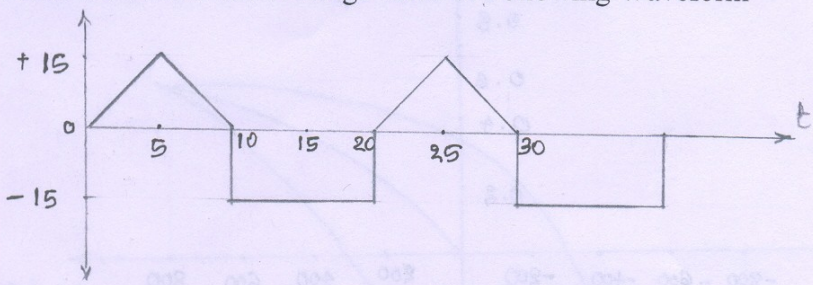
Sub: - Elements of Electrical Engineering **TOTAL MARK [40]**
TIME: - $1\frac{1}{2}$ Hours **DATE: - 24/3/09**

Instruction:
1. **Attempt the entire question.**
2. **Figure to the right indicates the full marks.**
3. **Make Suitable assumption and Draw necessary figure and Waveform to support your answer when ever required.**

Q-1.

A). Prove that when the frequency is less than resonance frequency power factor of Circuit is leading . **(4)**

B). Calculate the R.M.S and Average value of Following Waveform **(8)**

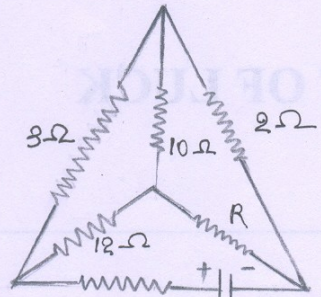


Q-2.

A). Find the Resultant Current of Following All Currents Which flowing in circuit **(5)**

$I_1 = 3\sqrt{2} \sin (315t-70)$
$I_2 = 10\sqrt{2} \cos (315t-10)$
$I_3 = 5.7 \cos (315t+780)$
$I_4 = 3 \sin (315t)$
$I_5 = 10 \sin (315t+1000)$

B). Find the value of resistance R and current through the resistance R when Current through 10Ω resistance is zero. **(8)**



Q-3.

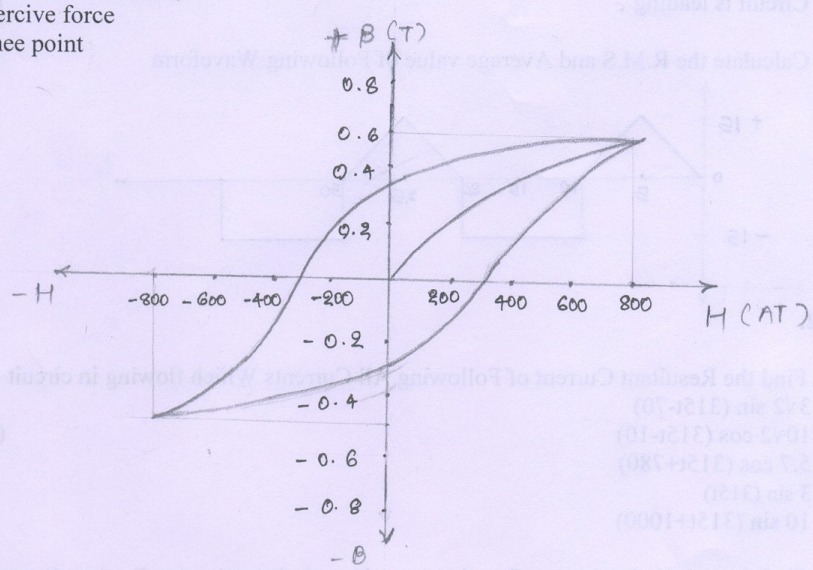
A). Define following Term **(7)**

a) Fringing Effect
b) Reluctance
c) Leakage Co-efficient
d) Knee point
e) Self inductance
f) Q-factor
g) Residual flux

B). Compare Electric and Magnetic circuit **(5)**

C). From below graph find **(3)**

a) Relative Premiability
b) Residual flux density
c) coercive force
d) Knee point



BEST OF LUCK

KALOL INSTITUTE OF TECHNOLOGY AND RESEARCH CENTRE
GUJARAT TECHNOLOGICAL UNIVERSITY

DATE: 23-03-09 **SUB: MATHEMATICS-II** **MAX.MARKS-40**

TIME: 10:30 to 12:30 **SESSIONAL EXAMINATION (2nd SEM)**

Q. 1 .Attempt the following:

(a) Define the rank of matrix. Reduce into normal form the following matrix and find the rank. [4]

$$A = \begin{bmatrix} 3 & 4 & -2 & 1 \\ 5 & 8 & 4 & 2 \\ 8 & 12 & 2 & 3 \\ 12 & 20 & 6 & 5 \end{bmatrix}$$

(b) Solve the system by using Gauss-Jordan elimination method, [4]

$$x - y + 2z - w = -1\,,\ 2x + y - 2z - 2w = -2,\ -x + 2y - 4z + w = 1, 3x - 3w = -3$$

OR

(b) Solve by Cramer's rule. [4]

$$4x + y + z + w = 6\,,\ 3x + 7y - z + w = 1,\ 7x + 3y - 5z + 8w = -3,\ x + y + z + 2w = 3$$

(c) Find inverse of following matrix by using Gauss-Jordan raw reduction method. [4]

$$A = \begin{bmatrix} -1 & 3 & -4 \\ 2 & 4 & -1 \\ -4 & 2 & -9 \end{bmatrix}$$

Q. 2 Attempt the following:

(a) Determine the values of λ. [4]

$if\ x + 2y + z = 3\,,\ \ x + y + z = \lambda,\ \ 3x + y + 3z = \lambda^2$ are consistent and solve them for these values of λ.

(P.T.O)

(b) State Caley- Hemilton theorem and if $A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 3 & 5 \\ 0 & -1 & 1 \end{bmatrix}$, then

express $A^5 - A^4 + 3A^3 - 5A^2 + 2A - 3I$ in terms of A^2, A and I. [4]

OR

(b) If $A = \begin{bmatrix} i & 1+i \\ -1+i & 2i \end{bmatrix}$ then prove that $(I - A)\,(I + A)^{-1}$ is unitary. [4]

(c) Find eigenvalue and eigenvector of matrix $A = \begin{bmatrix} -2 & 2 & 3 \\ -2 & 3 & 2 \\ -4 & 2 & 5 \end{bmatrix}$ [4]

Q. 3 Attempt the following:

(a) Define Basis and Dimension. [2]

(b) Attempt followings: [3]

(1)Determine the set of all 2×2 matrices A such that detA=0 is subspace of M_{22} or not, explain it.

(2) Determine the set of all polynomials of the form $a_0+a_1x+a_2x^2+a_3x^3$ for which

$a_0+a_1+a_2+a_3 = 0$ is subspace of P_3 or not, explain it.

(c) Show that the set S= {(1, 0, 0), (1, 1, 0), (1, 1, 1)} is a basis of vector space $V_3(C)$.Hence find the Co-ordinates of the vector $(3 + 4i, 6i, 3 + 7i)$ in $V_3(C)$ with respect to S. [3]

OR

(c) By definition show that S= {(-3, 0, 4), (5, -1, 2), (1, 1, 3)} is a basis of R^3. [3]

(d) Let the set V be the points on a line through origin in R^2 with the slandered addition and scalar multiplication. Show that V is a vector space over R. [4]

(e) Reduce the following set of vectors to obtain a basis for the vector space R^3,

S= {(1, 0, 0), (0, 1, -1), (0, 4, -3), (0, 2, 0)}. [4]

OR

(e) Find a slandered basis vector that can be added to the set S= {(-1, 2, 3), (1, -2, -2)} to produce a basis of R^3. [4]