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Question Paper Code : A1303



VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

Four Year B. Tech I Semester Supplementary Examinations June - 2014

(Regulations: VCE-R11)

ENGINEERING DRAWING

(Common to Mechanical Engineering, Aeronautical Engineering & Civil Engineering)

Date: 15 June, 2014 AN

Time: 3 hours

Max Marks: 75

Answer ONE question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

Unit - I

1. a) Divide a line of 85mm into 9 equal parts using dividing line by any angle method. 8M
- b) Construct a scale of 1:8 to show decimeter and centimeter and to read up to 1m. Show a length of 7.6 dm on it. 7M
2. a) The major and minor axes of an ellipse are 120mm and 80mm. Draw an ellipse by oblong method 8M
- b) Draw the involute of a regular hexagon of side 20 mm. 7M

Unit - II

3. The front view of a straight line AB is 60 mm long and is inclined at 60° to the reference line xy. The end point A is 15 mm above HP and 20 mm in front of VP. Draw the projections of the line AB if it is inclined at 45° to VP and is situated in the first quadrant. Determine its true length and inclination with HP. 15M
4. A line AB has its end A 20mm above HP and 25mm in front of VP and the other end is 45mm above HP and 55mm in front of VP. The distance between the end projectors is 60mm. Draw its projections and also find its true length and true inclinations of the line with HP and VP. 15M

Unit - III

5. Draw the top, front and left views of a pentagonal prism of sides of base 25 mm and height 60 mm resting on an edge of base on HP such that the axis is inclined at 30° to HP and parallel to VP. 15M
6. A pentagonal prism is resting on one of the corners of its base on HP. The longer edge containing that corner is inclined at 45° to HP. The axis of the prism appears to be inclined at an angle of 30° to VP. Draw the projections of the solid. 15M

Unit - IV

7. A pentagonal prism, side of base 25mm and axis 60mm long, rests with one of the edges of its base on HP. Its axis is inclined at 30° to HP and parallel to VP. It is cut by a horizontal section plane passing through the highest corner of the base. Draw the sectional top view. 15M
8. A cone base 50mm diameter and axis 65mm long, rests with its base on HP. It is cut by a section plane perpendicular to VP, inclined at 45° to HP and passing through a point on the axis 35mm above the base. Draw the sectional top view and the true shape of section. 15M

Unit - V

9. Draw the development of the truncated portion of a square pyramid of 30 mm side of the base and height 50 mm rests with its base on HP with one of the edges of the base parallel to VP. The truncated surface is inclined at 45° to the axis and bisecting it. 15M
10. A cone of base diameter 40mm and axis 60mm long is resting on its base on HP. It is cut by a section plane perpendicular to VP and parallel to an extreme generator and passing through a point on the axis at a distance of 20mm from the apex. Draw the development of the retained solid. 15M

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VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

Four Year B. Tech I Semester Supplementary Examinations June - 2014
(Regulations: VCE-R11)

MATHEMATICS-I

(Common for All Branches)

Date: 11 June, 2014 AN

Time: 3 hours

Max Marks: 75

Answer ONE question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

Unit - I

1. a) Find the orthogonal trajectories of the family of coaxial circles $x^2 + y^2 + 2\lambda y + c = 0$ where λ is a parameter. 8M
- b) Form the differential equation by eliminating arbitrary constant a from $\log y = ax$ 7M
2. a) Solve $x(2x^2 + 3y^2 - 7)dx + y(3x^2 + 2y^2 - 8)dy = 0$ 8M
- b) If a substance cools from 370°C to 330°C in 10 mins, when the temperature of the surrounding air is 290°C , find the temperature of the substance after 40 mins. 7M

Unit - II

3. a) Solve $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = \sin x$. 7M
- b) Solve $(D^2 - 1)y = 1 + e^{-x}$ 8M
4. a) Solve $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = e^{3x} + \sin 2x$. 7M
- b) Solve by method of variation of parameter $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 2y = \tan x$. 8M

Unit - III

5. a) Prove that if $0 < a < b < 1$, $\frac{b-a}{1+b^2} < \tan^{-1} b - \tan^{-1} a < \frac{b-a}{1+a^2}$. 7M
- b) If $x = r \cos \theta$, $y = r \sin \theta$ find $J = \frac{\partial(x, y)}{\partial(r, \theta)}$ and $J' = \frac{\partial(r, \theta)}{\partial(x, y)}$ and verify that $JJ' = 1$. 8M
6. a) Evaluate $\int_0^1 \int_{\sqrt{y}}^{2-y} xy \, dx \, dy$ by changing the order of integration. 7M
- b) Verify Cauchy's Mean value theorem for the function $f(x) = e^x$; $g(x) = e^{-x}$ in $[a, b]$ 8M

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Unit - IV

7. a) Obtain Laplace transform of $f(t) = \frac{\cos at - \cos bt}{t}$ 7M
b) Find the Laplace transforms of $f(t) = \begin{cases} \sin t, & 0 < t < \pi \\ \cos t, & t > \pi \end{cases}$ 8M
8. Solve by using Laplace transforms $y''' + 2y'' - y' - 2y = 0$ 15M
 $y(0) = y'(0) = 0$ and $y''(0) = 6$

Unit - V

9. a) Find $\text{div}F$ and $\text{curl}F$ if $F = \nabla(x^3 + y^3 + z^3 - 3xyz)$ 8M
b) Show that $F = (y^2 \cos x + z^3)\vec{i} + (2y \sin x - 4z)\vec{j} + (3xz^2 + 2x)\vec{k}$ is irrotational. 7M
10. Verify Green's theorem for $\int_C [(xy + y^2)dx + x^2 dy]$ where C is bounded by $y = x$ & $y = x^2$ 15M

Hall Ticket No:

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Question Paper Code : A1002



VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

Four Year B. Tech II Semester Supplementary Examinations June - 2014

(Regulations: VCE-R11)

ENGINEERING PHYSICS

(Common to Computer Science Engineering, Information Technology &
Electronics and Communication Engineering)

Date: 14 June, 2014 AN

Time: 3 hours

Max Marks: 75

Answer ONE question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

Unit - I

1. a) In a diatomic molecule, explain the importance of equilibrium spacing and hence obtain an expression for the cohesive energy of the atoms. 9M
- b) Discuss the prominent bonding processes according to their bond characteristics. 6M
2. a) Describe the 7 crystal systems with the lattice parameters $a = b = c$ and draw the Bravais lattices for the systems. 8M
- b) Find the APF of body centered cubic system with appropriate sketch. 7M

Unit - II

3. a) Derive an expression for inter planar spacing of an orthogonal crystal system. 8M
- b) Explain chemical vapor deposition method for nano fabrication? 7M
4. a) Derive an expression for Bragg's law for X-ray diffraction. 7M
- b) What is the importance of S/V ratio and explain any four applications of nano materials? 8M

Unit - III

5. a) Set up the Schrödinger's one dimensional time independent wave equation. 10M
- b) An electron is accelerated to a potential of 100V. Calculate its wave length. 5M
6. a) Distinguish between Conductors, Semi conductors and insulators. 10M
- b) Define Bloch function. What are the salient features of Kronig-Penny model. 5M

Unit - IV

7. a) Define electric polarization, dielectric constant and susceptibility of dielectrics. 6M
- b) What is ferro electricity and mention its properties? 9M
8. a) Explain ferromagnetism on basis of the domain theory? 8M
- b) Discuss the phenomenon of superconductivity in metals and explain Meissner effect. 7M

Unit - V

9. a) Describe the spontaneous emission and stimulated emission in lasers. 5M
- b) Describe the construction and working of a Ruby Laser. Give one application of semiconductor Laser. 10M
10. a) Elaborate Step index and Graded index optical fibers used in optical communication systems. 10M
- b) Calculate numerical aperture and fractional difference in Refractive indices of Optical fibers where Refractive index of Core and Clad are 1.568 and 1.498. 5M

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VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

Four Year B. Tech I Semester Supplementary Examinations June - 2014

(Regulations: VCE-R11)

ENGINEERING CHEMISTRY

(Common to Electrical and Electronics Engineering, Mechanical Engineering, Aeronautical Engineering & Civil Engineering)

Date: 16 June, 2014 AN

Time: 3 hours

Max Marks: 75

Answer ONE question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

Unit - I

1. a) What are primary cells? Describe the construction and working of Lechlanche cell with electrode reactions. 8M
- b) Calculate electrode potential of Zinc electrode containing 0.01 M ZnSO₄ solution (E^oZn²⁺/Zn = -0.76 V) in contact with zinc metal. 7M
2. a) Describe a fuel cell. What are its advantages? How does it differ from a battery? 7M
- b) How Kohlrausch law is used in determining λ^{∞} of weak electrolyte and solubility of sparingly soluble salts? 8M

Unit - II

3. a) What is temporary hardness of water? Discuss a method for estimating the hardness. 7M
- b) Discuss the lime-soda process for softening of water? State one advantage and one disadvantage of this process. 8M
4. a) A water sample on analysis gave the following data: CaCl₂=30 mg/L, MgCl₂=24 mg/L, CO₂ = 20 mg/L, HCl = 50 mg/L. Calculate the quantities of lime and soda required to soften one thousand litres of water sample. 8M
- b) With the help of a neat diagram, explain the process of electro dialysis. 7M

Unit - III

5. a) Explain the following: 8M
 - i. Tyndal effect
 - ii. Applications of colloids
- b) Explain Vulcanization of Rubber? Give the merits of Vulcanized Rubber. 7M
6. a) Differentiate between addition and condensation polymerization with examples. 6M
- b) Write the synthesis, properties and one engineering application of the following polymers: 9M
 - i. Teflon
 - ii. Buna-s
 - iii. Polyester

Unit - IV

7. a) Describe the characteristics of a good fuel. 5M
- b) Describe Ultimate analysis of coal along with its significance. 10M
8. a) The percentage of coal sample is C = 85 %, H = 5 %, O = 6%, N = 4 %, S = 2 %, ash = 5 % and moisture = 3%. Calculate the minimum amount of air required for the combustion of 1 Kg of fuel. 7M
- b) Describe fractional distillation of petroleum, mentioning the components, composition, boiling point ranges and applications. 8M

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Unit - V

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|-----|----|--|-----|
| 9. | a) | Explain the phase diagram of one component system and calculate the degree of freedom at the curves and regions. | 8M |
| | b) | What are refractory materials? Explain any three characteristics of Good refractory material. | 7M |
| 10. | a) | What is a lubricant? Explain the criteria of a good lubricant. | 5M |
| | b) | Write a note on the manufacturing of Portland cement with the help of a neat diagram. | 10M |

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Question Paper Code : A1004



VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

Four Year B. Tech I Semester Supplementary Examinations June - 2014

(Regulations: VCE-R11)

ENVIRONMENTAL SCIENCE

(Common to Computer Science and Engineering, Information Technology &
Electronics and Communication Engineering)

Date: 16 June, 2014 AN

Time: 3 hours

Max Marks: 75

Answer ONE question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

Unit - I

1. a) List out various renewable and non renewable energy resources and explain about any one resource in detail. 8M
- b) What are the impacts of deforestation on environment? 7M
2. a) Describe in brief the importance and sources of water resources. 7M
- b) Explain the problems related to usage of chemical pesticides and fertilizers in the modern Agriculture. 8M

Unit - II

3. a) Briefly enumerate the status of India as mega diversity nation of biodiversity. Give a brief description of in-situ and ex-situ conservation of biodiversity. 8M
- b) Define the term biodiversity. Classify the levels of biodiversity and explain in detail with examples. 7M
4. a) Explain the structure of an ecosystem. With a neat sketch explain the energy flow in the ecosystem. 10M
- b) What is meant by ecological succession? Mention how initiation of succession happens and about the types of succession. 5M

Unit-III

5. a) i. Solid Waste requires proper management of disposal. Write any three methods of solid waste disposal. 9M
- ii. Explain the process of preparing vermi compost.
- b) Air is a vital and essential natural resource for all living organisms that is getting polluted. Analyze the causes, effects and controlling measures of Air Pollution. 6M
6. a) What is the role of an individual in controlling various pollutions in the day to day life? 7M
- b) Explain the chemical reactions taking place in the stratosphere that is leading to the Ozone layer depletion? 8M

Unit - IV

7. a) What is the role of information technology in protecting the environment and human health? 8M
- b) Write short note on carbon credits and carbon foot print? 7M
8. a) Discuss the scope and benefits of ISO 14000 environment quality management? 8M
- b) Write about Carbon Sequestration and explain various techniques involved in carbon storing? 7M

Unit - V

9. a) Give an account of legislation framed to protect Air from Pollution, in the year 1981 by our Indian Government? 10M
- b) Write briefly about environmental management plan? 7M
10. a) Write the summary of Water (Prevention and Control of Pollution) Act, 1974? 7M
- b) Write the objectives, principles, key elements and importance of environmental impact Assessment? 8M

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Question Paper Code : A1005



VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

Four Year B. Tech I Semester Supplementary Examinations June - 2014
(Regulations: VCE-R11)

PROBABILITY STATISTICS AND COMPUTATIONAL TECHNIQUES
(Common to Computer Science and Engineering, Information Technology,
Aeronautical Engineering & Civil Engineering)

Date: 20 June, 2014 AN

Time: 3 hours

Max Marks: 75

Answer ONE question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

Unit - I

1. a) The students in a class are selected at random, one after the other, for an examination. Find the probability p that boys and girls in the class alternate if: 8M
 - i. The class has 4 boys and 3 girls
 - ii. The class consists of 3 boys and 3 girls
- b) State the axioms of probability and define the following terms: 7M
 - i. Random experiment
 - ii. Sample space
 - iii. Event
2. a) Enumerate the applications of binomial and normal probability distribution. 8M
- b) In a normal distribution 31% of the items are under 45 and 8% are over 64. Find the mean and the standard deviation of the distribution. 7M

Unit - II

3. a) In a sample of 500 men drawn from a population it was found that 60% of them had over weight. What can we infer about the proportion of men having over weight in the population at 99% level of confidence? 7M
- b) A die was thrown 9000 times and a throw of 5 or 6 was obtained 3240 times, on the assumption of random throwing, does the data indicate an unbiased die at 0.01 LOS? 8M
4. a) Two independent samples of 8 and 7 items respectively had the following values 8M

Sample I	9	11	13	11	15	9	12	14
Sample II	10	12	10	14	9	8	10	-

Do the two estimates of population variance differ significant by at 5% LOS?

- b) The following data gives the number of aircraft accidents that occurred during the various days of a week. 7M

Day	Mon	Tue	Wed	Thu	Fri	Sat
No. of accidents	15	19	13	12	16	15

Test whether the accidents are uniformly distributed over the week at 5% LOS.

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Unit - III

5. a) Find a real root of the equation $\tan x = x$ by Regula Falsi method, correct to 3 decimals. 8M
b) Using Lagrange's interpolation formula, find a polynomial which passes through (0, -12), (1, 0), (3, 6), (4, 12). 7M
6. a) Using Newton-Raphson method, find a real root of the equation, $x \sin x + \cos x = 0$ near $x = \pi$ carryout iterations upto four decimal places where x is in radians. 7M
b) Find $\frac{dy}{dx}, \frac{d^2x}{dx^2}$ at $x = 1.1$ for the table below: 8M

x	1	1.2	1.4	1.6	1.8	2
y	0	0.128	0.544	1.296	2.432	4

Unit - IV

7. a) Fit a least squares quadratic curve of the form $y = a + bx + cx^2$ to the following data 7M

x	1	2	3	4
y	1.7	1.8	2.3	3.2

- b) The following table gives the values of $f(x)$ for given values of x 8M

x	0.2	0.3	0.4	0.5	0.6	0.7	0.8
$f(x)$	0.03	2.87	3.14	3.65	3.01	2.71	2.15

Determine the area bounded by the curve between $x = 0.2$ to $x = 0.8$ and X-axis using Trapezoidal rule and Simpson's 1/3 rule.

8. a) Fit a curve of the form $y = ae^{bx}$ by the method of least squares for the data 7M

x	0	5	8	12	20
y	3	1.5	1.0	0.55	0.18

- b) Evaluate $\int_0^1 \frac{x}{1+x^2} dx$ by using Simpson's 3/8th rule taking six equal strips. 8M

Unit - V

9. Using Euler's modified method, find an approximate value of y when $x = 0.3$ given that $\frac{dy}{dx} = x + y$ and $y=1$ when $x = 0$ in steps of 0.1. 15M
10. Solve $y' = x + y^2, y(0) = 1$ to find $y(0.4)$ by Adam's predictor corrector method. Starting solutions required are $y(0.1), y(0.2), y(0.3)$ to be obtained by Runge-Kutta 4th order method. 15M

Hall Ticket No:

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Question Paper Code : A1006



VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

Four Year B. Tech I Semester Supplementary Examinations June - 2014

(Regulations: VCE-R11)

COMPUTATIONAL TECHNIQUES

(Mechanical Engineering)

Date: 20 June, 2014 AN

Time: 3 hours

Max Marks: 75

Answer ONE question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

Unit – I

- 1 a) Using Newton Raphson method derive the iterative formula to find $\frac{1}{\sqrt{N}}$ and hence 7M
find $\frac{1}{\sqrt{15}}$ correct to four decimal places.
- b) Apply Gauss – Seidel iteration method to solve the equations, carry out 3 iterations. 8M
 $10x_1 + x_2 + x_3 = 12, 2x_1 + 10x_2 + x_3 = 13, 2x_1 + 2x_2 + 10x_3 = 14.$
- 2 a) Show that a real root of the equation $\tan x + \tanh x = 0$ lies between 2 and 3. Apply 7M
Regula-falsi method to find third approximation.
- b) Solve by Jacobi's method. Perform 3 iterations. 8M
 $4x + y + 3z = 17, x + 5y + z = 14, 2x - y + 8z = 12.$

Unit – II

- 3 a) Show that $\Delta = \frac{1}{2} \delta^2 + \delta \left[\sqrt{1 + \frac{1}{4} \delta^2} \right]$ 7M
- b) Using Newton's divided difference formula, calculate the value of $f(4)$ from the 8M
following data:

x	1.5	3.	6
$f(x)$	-0.25	2	20

- 4 a) Using Newton's forward interpolation, find y at $x = 8$ from the following table: 8M

x	0	5	10	15	20	25
y	7	11	14	18	24	32

- b) Using Lagrange's interpolation formula, find the value of y when $x = 10$ from the 7M
following table:

x	5	6	9	11
y	12	13	14	16

Unit – III

5 a) Evaluate $\int_0^{\pi/4} \cos x dx$ using 2, 4 and 6 sub intervals by the trapezoidal rule. 10M

b) Evaluate $\int_1^7 \frac{1}{x} dx$ using Simpson's 1/3rd rule. 5M

6 a) Find a least squares straight line for the following data: 7M

X :	1	2	3	4	5	6
Y :	6	4	3	5	4	2

b) Fit a least squares quadratic curve to the following data: 8M

X	1	2	3	4
Y	1.7	1.8	2.3	3.2

Also estimate $Y(2.4)$

Unit – IV

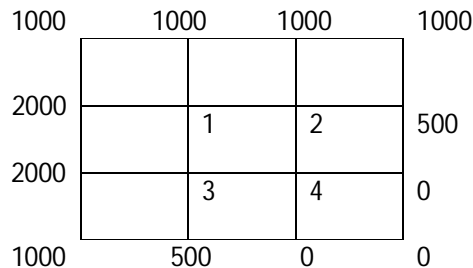
7 Using Euler's modified method, obtain a solution of the equation $\frac{dy}{dx} = x + \sqrt{y} = f(x, y)$ 15M
with initial condition $y = 1$ at $x = 0$ for the range $0 \leq x \leq 0.6$ in steps of 0.2

8 a) Given $\frac{dy}{dx} = xy + 1$ with the initial condition that $y = 1, x = 0$, compute $y(0.1)$ correct 10M
to four places of decimal by using Taylor series method.

b) Using Picard method, find the first approximation from $y' = x + y; y(1) = 0$ 5M

Unit – V

9 Given the values of $u(x, y)$ on the boundary of the square given in the figure, evaluate the 15M
function $u(x, y)$ satisfying Laplace equation $\Delta^2 u = 0$ at the pivotal points of this figure.



10 Solve the equation $\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}$ subject to the conditions $u(x, 0) = \sin(\pi x), 0 \leq x \leq 1;$ 15M
 $u(0, t) = u(1, t) = 0$. Carry out computations for two levels taking $h=1/3, k = 1/36$

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VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

Four Year B. Tech II Semester Supplementary Examinations June - 2014

(Regulations: VCE-R11)

TECHNICAL ENGLISH

(Common to Electrical and Electronics Engineering, Mechanical Engineering,
Aeronautical Engineering & Civil Engineering)

Date: 14 June, 2014 AN

Time: 3 hours

Max Marks: 75

Answer ONE question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

Unit - I

1. a) Outline sketch in simple English brief biographical sketch highlighting the mile-stone achievements of Sir Chandrasekhar Venkata Raman. 10M
- b) Do as directed: 5M
 - i. Write the antonym for the word : Abundant
 - ii. Write the synonym for the word : Hardworking
 - iii. Choose appropriate article: I have the accommodation.
 - iv. Underline the nouns in the sentence: Mary told the gardener about the flowers.
 - v. Underline the adjective in the sentence: The green corn sways.
2. a) Charity is selflessness. How Mother Teresa was synonymous with charity? Narrate her vision and mission.
- b) Do as directed:
 - i. Write the antonym for the word : Garbage
 - ii. Write the synonym for the word : Amenable
 - iii. Identify the gerund in the sentence : They enjoyed working on the boat.
 - iv. Identify the infinitive in the sentence : Murthy heard the alarm clock buzz
 - v. Underline the noun phrases in the sentence: The election year politics are annoying for many people.

Unit - II

3. a) Miss Krishna was an irritating guest. How? 10M
- b) Do as directed: 5M
 - i. Write the antonym for the word : Garbage
 - ii. Write the synonym for the word : Amenable
 - iii. Identify the gerund in the sentence : They enjoyed working on the boat.
 - iv. Identify the infinitive phrase in the sentence : To ride a bike
 - v. Underline the noun phrases in the sentence: Life as a couch potato is more deadly than smoking
4. a) Mentioning about the early life of Sam Pitroda write comprehensively about the early career positions and achievements in the field of telecommunications. 10M
- b) Do as directed: 5M
 - i. Write the antonym for the word : Abandon
 - ii. Write the synonym for the word : Abbreviate
 - iii. Identify the demonstrative in the sentence: These are bad times.
 - iv. Identify the infinitive in the sentence : "To be or not to be, that is the question".
 - v. Underline the noun phrases in the sentence: The wells and water table had been Polluted.

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Unit - III

5. a) Rudyard Kipling makes a secret promise to himself of setting the patch alight before he leaves the village elaborate the statement. 10M
- b) Do as directed 5M
- i. Rewrite the sentence in right order : frequently he visited us
 - ii. Pick the modal verb : Should I do this work for you?
 - iii. Use the idiom in your sentence : a burning issue
 - iv. Give on e word substitute : doubting the goodness of people
 - v. Derive the verb form for the word : activity
6. a) What was king Martin Luther King's vision? What does he express in his historic speech? 10M
- b) Do as directed 5M
- i. Choose an appropriate modal verb of permission : may / should I help you in this matter?
 - ii. Write one word substitute : looking at positive side
 - iii. Use this idiom in your sentence : a lion's share
 - iv. Correct the error : they doesn't have enough informations
 - v. Write the adjective form for the word : compare

Unit - IV

7. a) Imagine you need to open an account in Vijaya Bank. Draft a letter to the Bank Manager for the same. 8M
- b) Draft a memo asking your colleagues to participate in the health camp organized at your institute. 7M
8. a) You are the purchase officer of your factory. Place order with a dealer for the supply of ten scientific calculators. Draft a letter for the same. 8M
- b) Write an application for the post of Assistant Engineer in Hindustan Engineering Works, 103, Nehru Road, Delhi-1. Address to the HR Manager of the company. 7M

Unit - V

9. Prepare a report on a recent industrial visit that your department had organized. 15M
10. Imagine you are the General Manager in a car manufacturing factory. Prepare a report on the recent fire accident with your recommendations for averting a similar accident in future. 15M

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VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

Four Year B. Tech I Semester Supplementary Examinations June - 2014

(Regulations: VCE-R11)

BASIC ELECTRICAL ENGINEERING

(Common to Electronics and Communication Engineering & Electrical and Electronics Engineering)

Date: 20 June, 2014 AN

Time: 3 hours

Max Marks: 75

Answer ONE question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

Unit - I

1. a) What is an electrical circuit? Differentiate between: 8M
 i. Active and passive elements
 ii. Independent and dependent sources
- b) Use Kirchoff's laws to determine the currents flowing in each branch of the network shown in Fig.1 7M

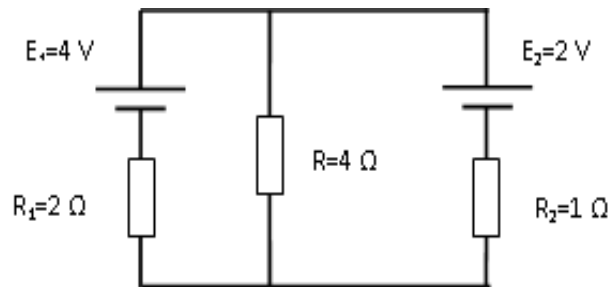


Fig.1

2. a) For the circuit shown in Fig.2 find the current in the 2Ω resistors in branches BD and DC by network reduction. 10M

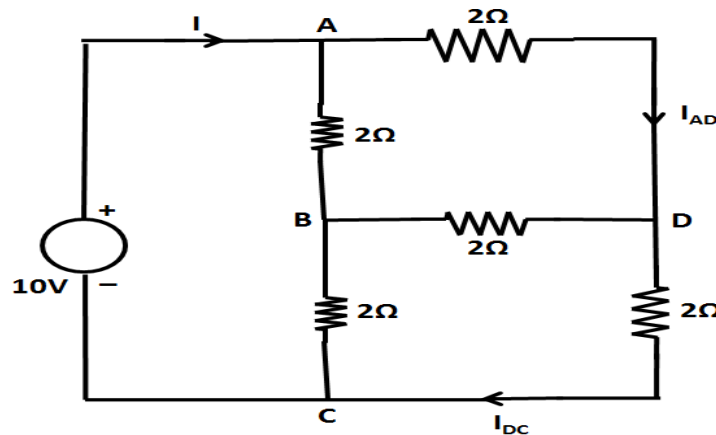


Fig.2

- b) State and explain Kirchoff's voltage Law. 5M

::2::

Unit - II

3. a) Using mesh analysis, find I_x in the circuit shown in Fig.3.

10M

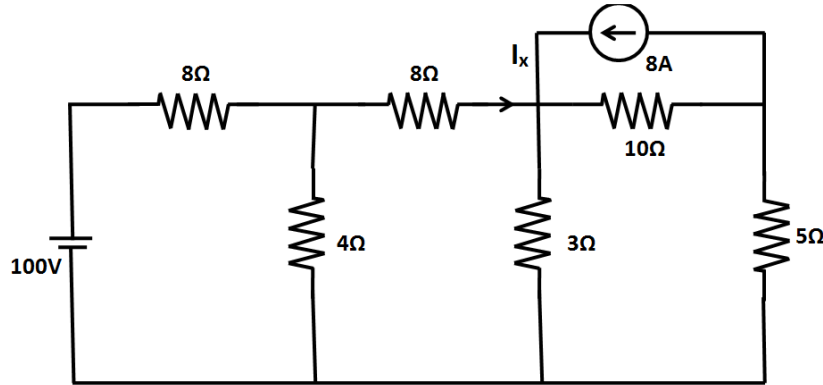


Fig.3

- b) Using Nodal analysis find the current in the 3Ω resistance for the network shown in Fig.4

5M

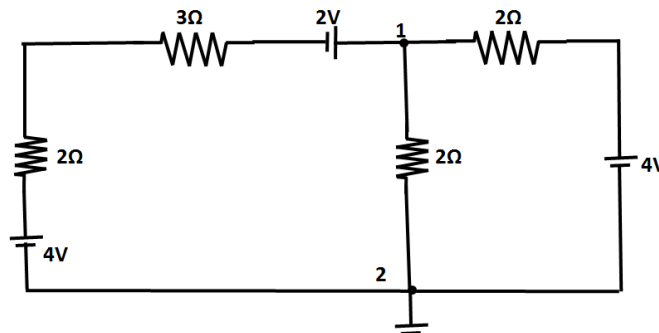


Fig.4

4. a) Derive the relationship between delta & star networks.
 b) Find the branch currents in the circuit of Fig.5 by using mesh analysis.

5M

10M

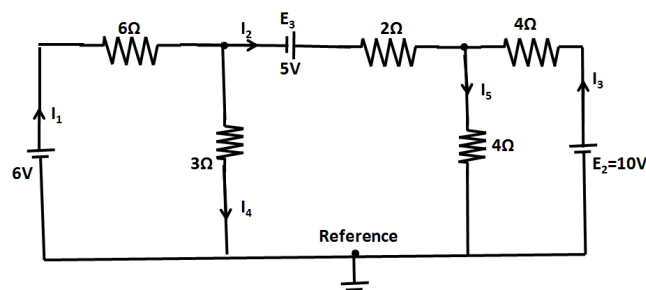


Fig.5

Unit - III

5. a) A current $i(t) = \sin \omega t$ passes through an Inductor whose inductance is given by $L(t) = (1 + te^{-t})H$. Find $V_L(t)$.

7M

- b) Define the following terms: power factor, real power, reactive power and Q-factor. The voltages across two series connected circuit elements are $v_1 = 100 \sin \omega t$ V and $v_2 = 50 \sin(\omega t - 30^\circ)$ V. If the circuit current is $(4 + j2)$ A, find the complex power of the circuit.

8M

6. a) A coil of resistance 5Ω and inductance 120 mH in series with a $100\ \mu\text{F}$ capacitor is connected to a 300 V , 50 Hz supply. Calculate: 8M
- i. The current flowing
 - ii. The phase difference between the supply voltage and current
 - iii. The voltage across the coil and
 - iv. The voltage across the capacitor
- b) A coil having a resistance of $10\ \Omega$ and an inductance of 125 mH is connected in series with a $60\ \mu\text{F}$ capacitor across 120 V supply. At what frequency does resonance occur? Find the current flowing at the resonant frequency. 7M

Unit - IV

7. a) Show that the form factor of the half wave rectified sinusoidal alternating current is 1.57 . 10M
- b) A $4\ \Omega$ resistor is connected to a 10mH inductor across a 100V , 50Hz voltage source. Find input current, voltage drops across resistor and inductor, power factor of the circuit and the real power consumed in the circuit. 5M
8. a) A resistance of $24\ \Omega$, a capacitor of $150\ \mu\text{F}$ and an inductor of 0.16H are connected in series with each other. A supply of 240V , 50Hz is applied to the ends. Calculate 10M
- i. The current in the circuit
 - ii. The potential difference across each element
 - iii. The frequency to which the supply would need to be changed so that the current would be at unity power factor and find the current at this frequency
- b) Define real power, reactive power and power factor of an ac circuit. Also define Q factor of resonant circuit. 5M

Unit - V

9. a) Define Tie-set and cut –set schedule. 6M
- b) Write the mesh equations for the network shown in Fig.6 and obtain their dual set of equations and construct the dual network. 9M

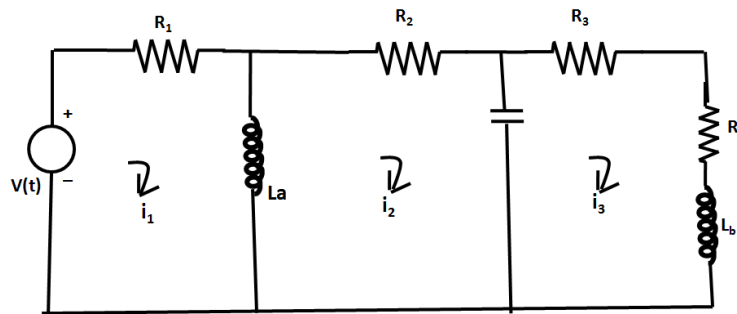


Fig.6

10. a) Derive the relation of h parameters in terms of Z parameters. 6M
- b) Find the h parameters for the network shown in Fig.7. 9M

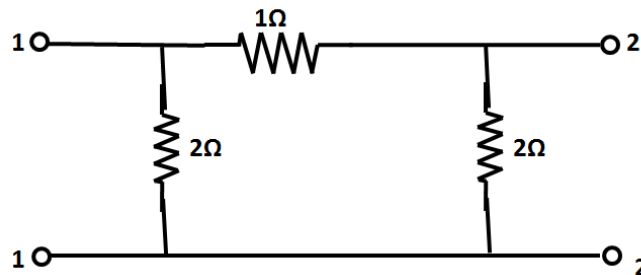


Fig.7

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VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

Four Year B. Tech I Semester Supplementary Examinations June - 2014
(Regulations: VCE-R11)

ENGINEERING MECHANICS

(Common to Mechanical Engineering, Aeronautical Engineering & Civil Engineering)

Date: 18 June, 2014 AN

Time: 3 hours

Max Marks: 75

Answer ONE question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

Unit - I

1. a) State and Explain 'parallelogram law of forces' with neat sketches. 8M
b) An electric light fixture weighing 50N hangs from point C by two strings AC and BC as shown in Fig.1 using Lami's theorem or otherwise determine the forces in the strings AC and BC. 7M

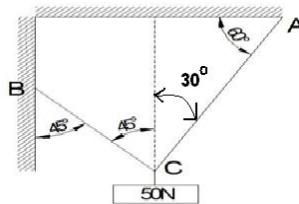


Fig.1

2. a) Explain: 5M
i. Free body diagram
ii. Equations of equilibrium
b) Two identical rollers, each of weight 500N are supported by an inclined plane making 30° with the horizontal and a vertical wall as shown in Fig.2. Find the reactions at the points of contact of the rollers with the inclined plane and the wall. All surfaces are smooth. 10M

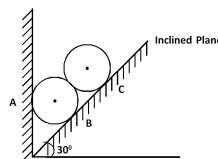


Fig.2

Unit - II

3. a) Define the following: 6M
i. Coefficient of friction
ii. Angle of friction
iii. Angle of repose
b) A pull of 180N applied upward at 30° to a rough horizontal plane was required to just move a body resting on the plane while a push of 220N applied down wards along the same line of action was required to just move the same body as shown in Fig.3. Determine the weight of the body and the coefficient of friction 9M



Fig.3

::2::

4. A uniform ladder of 7m long rest against a smooth vertical wall with which it makes an angle of 45° , μ the coefficient of friction between ladder and the floor is 0.50. If a man, whose weight is 1.5 times that of a ladder, ascends it, how high will he be when the ladder slips? 15M

Unit-III

5. a) Differentiate between centre of gravity and centroid. Under what conditions these will coincide? 8M
b) A right circular cone of 20cm height weighs 1000N. A cone of 8cm height and 64N weight is removed from the top. Determine the distance of CG of the frustrum from the base. 7M
6. Determine the centroid of the area as shown in Fig.4 with respect to the axis given. 15M

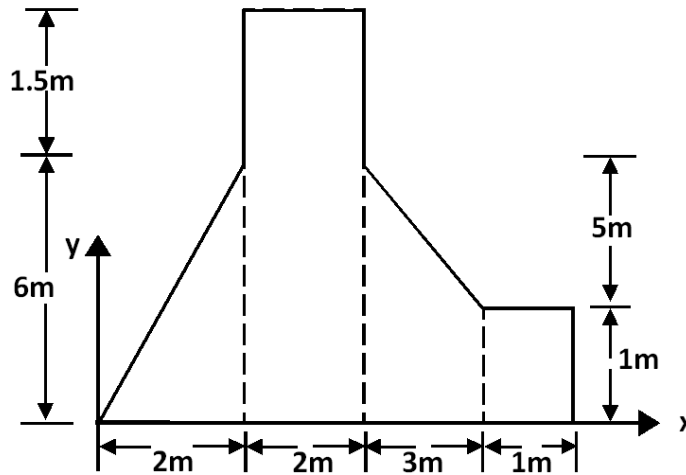


Fig.4

Unit-IV

7. a) Define Area Moment of Inertia and derive an expression in terms of rectangular moment of inertia. 5M
b) 10M

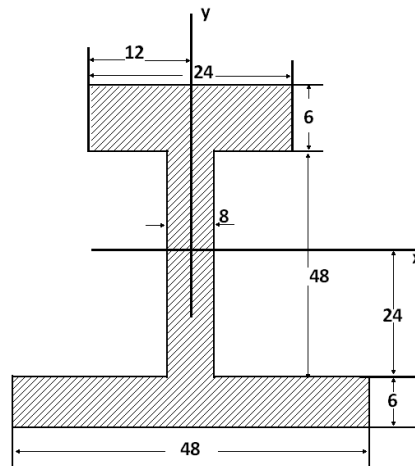


Fig.5

Determine the moment of inertia for the component shown in the above Fig.5 with respect to given axis.

8. a) Determine the moment of inertia for a rectangular area of width 'b' and height 'h' about its centroidal axis x_0, y_0 . 8M
b) Determine the mass moment of Inertia of a right circular cone with respect to its longitudinal axis. 7M

Unit-V

9. A beam AB of span 10m carries two point loads of 15kN and 20 kN at 4m and 6m from the end A respectively as shown in Fig.6. Determine the beam reactions by the principle of virtual work 15M

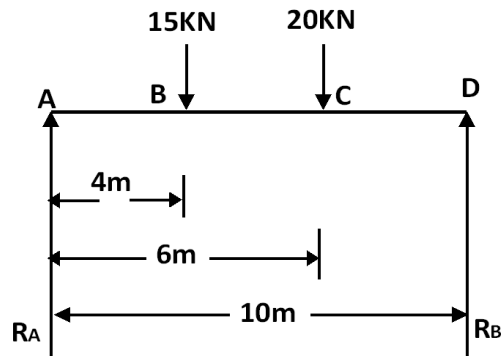


Fig.6

10. a) Define "principle of virtual work". 5M
 b) A block of weight 2000N rests on a smooth inclined plane that makes an angle of 30° with the horizontal. This block is supported by a load 'P' lying on another smooth plane of inclination 60° as shown in Fig.7. The block and the load have been connected by an inelastic string. Determine the value of load 'P' by the method of virtual work. 10M

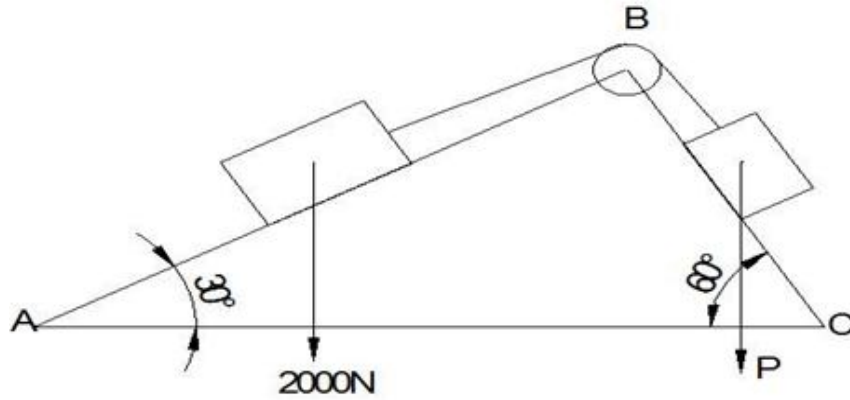


Fig.7

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VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

Four Year B. Tech I Semester Supplementary Examinations June - 2014

(Regulations: VCE-R11)

COMPUTER PROGRAMMING

(Common to Computer Science and Engineering, Information Technology,
Electronics and Communication Engineering & Electrical and Electronics Engineering)

Date: 18 June, 2014 AN

Time: 3 hours

Max Marks: 75

Answer ONE question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

Unit - I

1. a) Describe the basic structure of a C program. 5M
 - b) What is a flow chart? Draw a flow chart to display the factorial of a given number. 10M
 2. a) What is an identifier? Write the identifier rules to be followed while writing a C program? 8M
 - b) What is the output of the following C program? 7M
- ```

void main()
{
 int a=5, b=4, c=2;
 printf("%d", a&&b | c);
 printf("%d", a & b);
 printf("%d", a << c);
 printf("%d", a >> 2);
 printf("%d", a*b/c);
}

```

**Unit - II**

3. a) Differentiate while and do-while loop giving suitable examples. 5M
- b) Explain how one dimension and two dimension arrays are declared and initialized? 10M
- Write a C program to find the largest and smallest element in an array of n elements.
4. a) What are the different parameter passing mechanisms available in functions? Write a C program to swap the values of a=10 and b=20 using both the parameter passing mechanisms. 10M
- b) Write a C program to print the addition of two matrices A and B. 5M

**Unit - III**

5. a) What is pointer variable? Explain how they are declared and accessed? 5M
- b) Write a C program to read a string and display its reverse. Check whether the string is palindrome or not. 10M
6. a) Explain the following functions used in dynamic memory allocation: 5M
- i. malloc()
- ii. calloc()
- b) Write a C program to read an array of n elements and find the sum of elements using pointers. 10M

**Unit - IV**

7. a) What is the output of the following program? Justify your answer. 6M
- ```
#include <stdio.h>
struct Point {
    int x;
    int y;
};
int main()
{
    struct Point p1 = {10, 20};
    struct Point p2 = p1;
    if (p1 == p2)
    {
        printf("p1 and p2 are same ");
    }
    return 0;
}
```
- b) Write the difference between structure and union with example? 9M
8. a) Write a c program to create student structure having field roll_no, stud_name, class. Pass this entire structure to function and display the structure element? 9M
- b) Explain self-referential structure with an example? 6M

Unit - V

9. a) What are the various file opening modes? Explain each of them? 5M
- b) Write a C program to copy the contents of one file to another. 10M
10. a) Write a C program to read and then append the data of the file? 10M
- b) Compare fscanf() and fread() functions with appropriate examples. 5M