Hall Ticket No: | | | | | | | | | | | **Question Paper Code : A1011**

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

MATHEMATICS-III

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

Date: 15 June, 2014 FN **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) Prove that $\int_0^4 x^{\frac{3}{2}}(4-x)^{\frac{5}{2}}dx = 12\pi$. 7M

   b) Prove that $\beta(m,n) = \frac{\Gamma(m)\Gamma(n)}{\Gamma(m+n)}$, Hence evaluate $\beta\left(\frac{5}{2},\frac{3}{2}\right)$. 8M

2. a) Prove that $J_n^1(x) = \frac{1}{2}\left[J_{n-1}(x) - J_{n+1}(x)\right]$. 7M

   b) Prove that $\int_{-1}^{1} p_m(x)\,p_n(x)dx = 0, \quad m \neq n$. 8M

Unit - II

3. a) Determine p such that the function $f(z) = \frac{1}{2}\log\left(x^2+y^2\right) + i\tan^{-1}\left(\frac{px}{y}\right)$ be an analytic function. 7M

   b) Show that the function $f(z) = \sqrt{|xy|}$ is not analytic at the origin, although Cauchy – Riemann equations are satisfied at that point. 8M

4. a) If $f(z) = u + iv$ is analytic find f(z) if $u - v = (x-y)\left(x^2+4xy+y^2\right)$. 8M

   b) Find all the roots of $\tanh z + 2 = 0$. 7M

Unit - III

5. a) Evaluate $\int_{(0,0)}^{(1,2)} 3x^2y\,dx + \left(x^3 - 3y^2\right)dy$ along the curve $y = 3x$. 7M

   b) Evaluate $\int_c z^{-2}\,dz$ along (i) C is $|z| = 1$, (ii) C is $|z-1| = 1$. 8M

6. a) Expand $f(z) = \frac{z}{(z+1)(z+2)}$ in Laurent's series about the point $z = -2$. 7M

   b) If $\phi(a) = \int_C \frac{2z^2 - z - 2}{z-a}dz$ where C is the circle $|z| = \frac{5}{2}$, evaluate $\phi(0), \phi(2)$ and $\phi(3)$. 8M

Cont...2

Unit - IV

7. a) State the Residue theorem and hence evaluate $\int_C \frac{\sin \pi z^2 + \cos \pi z^2}{(z-1)^2(z-2)} dz$ where C is the circle $|z| = 3$. 7M

   b) Determine the pole and find the residue at each pole of the function $\frac{z^2}{(z-1)(z-2)^2}$ 8M

8. a) Show that $\int_0^\infty \frac{dx}{1+x^4} = \frac{\pi}{2\sqrt{2}}$. 7M

   b) Show that $\int_0^{2\pi} \frac{d\theta}{\sqrt{2} - \cos\theta} = 2\pi$. 8M

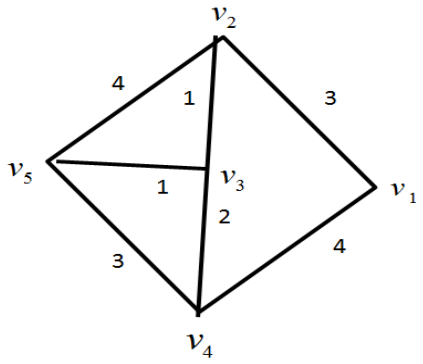
Unit - V

9. a) Find the bilinear transformation that maps the points $(1, i, -1)$ onto the points $(i, 0, -i)$ respectively. 8M

   b) Shown that the relation $w = \frac{5-4z}{4z-2}$ transform the circle $|z| = 1$ into a circle of radius unity in the w-plane. 7M

10. a) Define Multiple, Complete and Planar Graphs with examples and neat diagrams. 7M

    b) Find the minimal spanning tree of the graph G given below, using Krushkal's Algorithm. 8M



Hall Ticket No: | | | | | | | | | | | **Question Paper Code : A1012**

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

MATHEMATICS FOR AEROSPACE ENGINEERING

(Aeronautical Engineering)

Date: 15 June, 2014 FN **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) Express $\int_0^1 x^m(1-x^n)^p\,dx$ in terms of the beta functions. 7M

   b) Prove that $\beta(m,n)=\frac{\Gamma(m)\Gamma(n)}{\Gamma(m+n)}$, Hence evaluate $\beta\left(\frac{5}{2},\frac{3}{2}\right)$ 8M

2. a) Prove that $(n+1)P_{n+1}(x)=(2n+1)xP_n(x)-nP_{n-1}(x).$ 7M

   b) Starting from Roudrigues formula compute $P_0(x)$, $P_1(x)$, $P_2(x)$,$P_3(x)$ and hence express $x^3 + 2x^2 - 4x + 5$in terms of legendres polynomials. 8M

Unit - II

3. a) Define an analytic function. Show that an analytic function with constant modulus is constant. 7M

   b) If $f(z)=u+iv$ is an analytic function of z and if $u-v=e^x(\cos x-\sin y)$, then find $f(z)$ in terms of z. 8M

4. a) If $f(z)$is a regular function of z, prove that $\left(\frac{\partial^2}{\partial x^2}+\frac{\partial^2}{\partial y^2}\right)|f(z)|^2=4|f'(z)|^2$. 7M

   b) Show that the function $u(x,y)=e^x\cos y$ is harmonic. 8M

Unit - III

5. a) Evaluate $\int_0^{2+i} z^2dz$ along the line $y=x^2$. 7M

   b) Evaluate using Cauchy's integral formula $\int_C \frac{\sin\pi z^2+\cos\pi z^2}{(z-1)^2(z-2)}dz$ where C is the circle $|z|=3$ 8M

6. a) State and prove Cauchy's theorem. 7M

   b) Find the Laurent's expansion of $f(z)=\frac{7z-2}{z(z+1)(z-2)}$ in the region $1<|z+1|<3$ 8M

Cont...2

Unit - IV

7. a) Find the poles and residues at each pole for $f(z)=\frac{2z+1}{z^2-z-2}$ 7M

   b) Determine the pole and find the residue at each pole of the function $\frac{z^2}{(z-1)(z-2)^2}$ 8M

8. a) Show that $\int_0^{\infty}\frac{dx}{1+x^4}=\frac{\pi}{2\sqrt{2}}$. 8M

   b) Prove that $\int_0^{\infty}\frac{\cos mx}{x^2+1}dx=\frac{\pi}{2}e^{-m}, m>0.$ 7M

Unit - V

9. a) Discuss the transformation $w=e^z$. 7M

   b) Find the bilinear transformation which maps the points z = 1, i, -1 onto the points w = i, 0, -i. Also find the invariant points of this transformation. 8M

10. a) Determine the image of the region bounded by the circle $|z-2|=2$, under the transformation $w=z^2$. 8M

    b) Find the image of the infinite strip $0<y<\frac{1}{2}$ under the transformation $w=\frac{1}{z}$ 7M

Hall Ticket No: | | | | | | | | | | | Question Paper Code : A1013

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

(Common to Computer Science and Engineering, Information technology, Electrical and Electronics Engineering, Aeronautical Engineering & Civil Engineering)

Date: 20 June, 2014 FN **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) Briefly discuss the three fundamental concepts of Managerial Economics with relevant examples. 8M
   b) What are the important uses and limitation of microeconomics? 7M
2. Define elasticity of demand and explain different types of elasticity of demand with suitable examples. 15M

Unit - II

3. a) What are isoquants and isocost in production analysis? 8M
   b) Discuss the Least Cost Combination of input factors with a suitable diagram. 7M
4. What is breakeven point? Explain with a suitable diagram? 15M

Unit - III

5. What is monopoly market? Discuss its features and conditions of equilibrium? 15M
6. How does an individual firm behave under perfect competition? Also explain the firm and industry equilibrium under perfect competition? 15M

Unit - IV

7. XYZ Company is considering an investment proposal which requires an initial outlay of Rs.1,00,000 and has a life of five years with no salvage value. The company's tax rate is 50%. The firm uses straight line depreciation method. The estimated cash flow after tax are as follows: 15M

Years cash flows	1	2	3	4	5
After Tax	10,000	11,000	14,000	15,000	25,000

   You are required to calculate:
   i. Pay-back period
   ii. Net present value. The company's required rate of return is 10%
8. a) Explain the different methods of capital budgeting? 8M
   b) What are the steps in capital budgeting? 7M

Cont...2

Unit – V

9. Journalize the following transaction in the books of Krishna Mohan & Co. 15M

Date	Particulars	Rs.
March 1, 2012	Bought goods from Raj	50,000
March 2 2012	Sold goods for cash	15,000
March 5, 2012	Sold goods to Murthy	30,000
March 12, 2012	Bought goods for cash	75,000
March 18, 2012	Bought furniture for cash	20,000
March 20, 2012	Discount allowed	25,000
March 24, 2012	Received from Murthy on account	17,500
March 28, 2012	Paid raj on account	22,500
March 30, 2012	Paid salaries	15,000
March 31, 2012	Paid landlord rent	4,500

10. With the following financial data, compute: 15M
    i. Current ratio
    ii. Stock – Turnover ratio
    iii. Gross profit ratio

Particulars	Rs.	Particulars	Rs.
Opening stock	1,00,000	Cash in hand	3,00,000
Closing stock	2,00,000	Debtors	4,00,000
Purchases	5,45,000	Sundry creditors	3,00,000
Wages	15,000	Bills payable	2,50,000
Administrative expenses	40,000	Bank credit	25,000
Selling & Distribution expenses	2,40,000	sales	10,00,000

Hall Ticket No: | | | | | | | | | | | Question Paper Code : A1101

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

BUILDING MATERIALS AND CONSTRUCTION

(Civil Engineering)

Date: 13 June, 2014 FN **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 process of blasting rocks. State the precautions to be exercised.	7M
	b)	Write the properties and uses of the following stone: i. Granite ii. Sandstone iii. Marble iv. Slate	8M
2.	a)	Describe the manufacturing method of tiles and list different types of tiles.	8M
	b)	Enumerate the qualities of good brick.	7M

Unit - II

3.	a)	What are the physical properties of Portland cement? Explain.	8M
	b)	Describe various defects in timber.	7M
4.	a)	What are the factors affecting workability of concrete? Briefly Explain.	8M
	b)	What are the uses of chemical admixtures in concrete?	7M

Unit - III

5.	a)	What do you understand by strap footing? When do you provide this? Draw typical sketch showing common arrangements of strap footing.	8M
	b)	Name different types of rubble masonry and Ashlar masonry. Explain Ashlar chamfered masonry work in detail.	7M
6.	a)	Define cavity wall. What are its advantages? Explain with the help of sketch general features of cavity wall.	9M
	b)	Explain with neat sketches: i. Flint rubble masonry ii. Ashlar facing	6M

Unit - IV

7.	a)	Draw neat sketch of king post truss indicating all the parts.	6M
	b)	Explain briefly with sketches: i. Framed and paneled door ii. Paneled and glazed door iii. Fixed window	9M
8.	a)	What are the functions of ventilators? Explain with neat sketch fixed ventilators?	7M
	b)	What are the requirements of a good staircase?	8M

Cont...2

Unit - V

9.	a)	What is scaffolding? Briefly explain different types of scaffolding.	8M
	b)	List the different methods of damp proofing. Explain any two.	7M
10.	a)	Briefly explain the defects that may arise in a plaster work?	7M
	b)	Explain the various ingredients of a paint?	8M

Hall Ticket No: | | | | | | | | | | | **Question Paper Code : A1102**

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

SURVEYING-I

(Civil Engineering)

Date: 15 June, 2014 FN **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) Define Surveying. Also explain in detail what are the uses of Surveying? 8 M
   b) Explain : 7M
      i. Plane Surveying
      ii. Geodetic Surveying
2. a) List the advantages and disadvantages of plane table survey over the other surveys. 8M
   b) The distance between two stations was 1200 meter when measured with a 20 meter Chain. The same distance when measured with a 30 meter Chain was 1195 meter. If the 20 meter Chain was 50 mm too long compute the error of the 30 meter Chain. 7M

Unit - II

3. a) Define: 6M
      i. True Meridian
      ii. Magnetic Meridian
      iii. Arbitrary Meridian
   b) The following bearings were observed with a compass. Calculate the interior angles. 9M

Line	Fore bearing
AB	74°
BC	115°
CD	235°
DE	315°
EA	4° 30’

4. a) What are the temporary adjustments of a Prismatic Compass? 9M
   b) The magnetic bearing of a line is S30˚15′W. Find its true bearing if the declination is S10˚15′E. 6M

Unit - III

5. a) Define: 5M
      i. line of collimation
      ii. Back sight
      iii. Fore sight,
      iv. Bench mark
      v. Reduced level
   b) Two points A and B are 1530 meter apart. The following Reciprocal levels were taken with one level. 10M

Level at	Readings on A	Readings on B
A	2.165	3.810
B	0.910	2.355

Calculate the true level difference between A and B.

Cont...2

6. a) Define Contour? 3M
   b) What are the characteristics of Contours? 12M

Unit - IV

7. A railway embankment 10 meter wide with side slopes 1.5H: 1V is to be laid on a fairly level ground. Calculate the volume contained in a length of 120 meter with the center heights at each 20 meter interval being 2.20, 3.70, 3.80, 4.00, 3.80, 2.80 and 2.50 meter respectively. 15M

8. The areas within the contour line at the site and the Reservoir face of a proposed Dam face are as follows: 15M

Contour (RL)	101	102	103	104	105	106
Area (Sq.m)	100	1280	9520	14760	87250	135000

Assuming the Contour interval to be 1 meter, estimate the Reservoir Capacity.

Unit - V

9. a) Explain the measurement of horizontal angle by repetition method using theodolite 7M
   b) Explain the Temporary adjustments of theodolite. 8M

10. a) Define the terms: 9M
       i. Face left and face right observations
       ii. Swinging the telescope
       iii. Transiting the telescope
    b) How will you measure the vertical angle using the theodolite? 6M

Hall Ticket No: | | | | | | | | | | | Question Paper Code : A1103

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

STRENGTH OF MATERIALS-I

(Civil Engineering)

Date: 18 June, 2014 FN **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) Define: 6M
   i. Bulk modulus
   ii. Poisson 's ratio
   iii. Strain energy
   b) A steel bar is 2m in length & is subjected to an axial pull of 1100kN. The bar is 40mm in diameter for a length of 1m, 30mm in diameter for a length of 0.6m & 20mm in diameter for remaining length. Find the total extension of the bar. Take E=200GN/m^2. 9M
2. a) Draw stress strain curve for mild steel explain salient features. 5M
   b) The bar of a circular section as shown in Fig.1 elongates by 0.45mm when subjected to an axial pull of 100kN. Calculate the value of modulus of elasticity. 10M

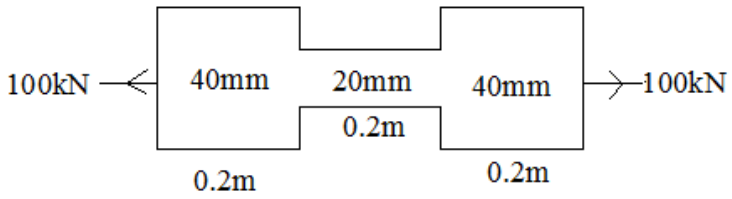


Fig.1

Unit - II

3. a) Define: 6M
   i. Bending moment
   ii. Shear force
   iii. Point of contraflexure
   b) Draw the typical SFD and BMD for a simply supported beam with a gradually Varying load from zero at one end to w/m at the other end. 9M
4. a) Derive an expression for maximum moment for a simply supported beam of span L carrying an UDL of w/unit length over its entire length. 5M
   b) Draw the SF and BM diagrams for the overhanging beam carrying UDL of 2KN/m over the entire length and a point load of 2 KN as shown in Fig.2. Locate the Point of Contraflexure. 10M

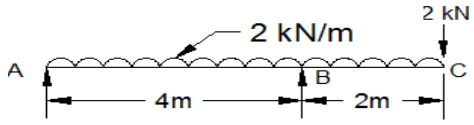


Fig.2

Cont...2

Unit - III

5. a) Derive an expression for Hoop stress for a thin cylindrical shell. 5M
   b) A cylindrical shell is 3m long and is having 1m internal diameter and 15 mm thickness. Calculate the maximum intensity of shear stress induced also the changes in the dimensions of the shell. If it is subjected to an internal fluid pressure of 1.5 N/mm^2. 10M
6. a) Write the difference between Thin and Thick cylinders. What are assumptions made in the theory of thick cylinders? 7M
   b) A thick cylinder of internal diameter 160 mm is subjected to an internal fluid pressure of 40 N/mm^2. If the allowable stress in the material is 120 N/mm^2 find the thickness required. 8M

Unit - IV

7. a) State the assumptions made in the pure bending. 5M
   b) A 2 m long cantilever with rectangular section 60 mm x 90 mm is subjected to an UDL of 4 KN /m throughout its length .determine maximum bending stress and its location. 10M
8. a) Explain simple bending theory. What are the assumptions in simple bending theory? 6M
   b) A T-section has a flange of 100 x 12mm and a web of 12 x 88 mm. It is subjected to a shear force of 20 KN. Draw the shear stress distribution across the depth marking the salient values. 9M

Unit - V

9. a) A simply supported beam of span 5 m is subjected to point loads of magnitude 20 KN and 30 KN at distances of 2 m and 3 m respectively from the left support. Determine the maximum slope and deflection under any one load. 8M
   b) A uniform load of 10kN/m acts on the entire span of a simply supported beam 3m long. $E=200GN/mm^2$, $I=28X10^{-6}m^4$. Compute maximum deflection and slope angle at each support. 7M
10. a) A simply supported beam of span 6 m is subjected to a concentrated load of 18 KN at 4 m from the left end. Calculate: 7M
      i. The position and value of maximum deflection
      ii. Slope at mid span
   b) A simply supported beam of span of 9 m carries two point loads of magnitude 50 KN and 100 KN at a distance of 3m and 6m respectively from the left end. Find the deflection under the 50 KN load. 8M

Hall Ticket No: | | | | | | | | | | |

Question Paper Code : A1104

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

CONCRETE TECHNOLOGY

(Civil Engineering)

Date: 11 June, 2014 FN **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 the chemical reactions that take place when water is added to cement? How do these reactions affect the strength of the concrete?	7M
	b)	What is fineness modulus? Explain the method of determining fineness modulus along with its significance in making good concrete?	8M
2.	a)	Explain Transition Zone, heat of hydration and water requirement of concrete?	9M
	b)	What are the different tests conducted on wet cement? Explain any one of them?	6M

Unit - II

3.	a)	What is workability? What is the effect of time and temperature on workability?	7M
	b)	Explain segregation, bleeding, gel space ratio and water cement ratio?	8M
4.	a)	Explain any two tests conducted to find the workability of fresh concrete.	8M
	b)	Why is curing required for concrete? What are the different ways of curing concrete?	7M

Unit - III

5.	a)	Explain the procedure to conduct the split tensile strength of concrete?	8M
	b)	What are the applications of non-destructive testing of concrete?	7M
6.	a)	Why compressive strength is regarded as very significant in concrete?	8M
	b)	What are the factors affecting the strength of concrete?	7M

Unit - IV

7.	a)	What are the factors influencing the choice of mix proportions? Explain.	8M
	b)	What are the different methods available to proportion the concrete mix? Explain merits and demerits of each.	7M
8.	a)	Design a concrete mix with following data M20 mix 43 grade OPC cement 7 days strength=33N/mm2 Workability-low Size of aggregate-20 mm Specific gravity for course aggregate-2.8 Specific gravity for fine aggregate-2.7	15M

Unit - V

9.	a)	What are the properties of light weight concrete?	7M
	b)	What are the applications of fibre reinforced concrete?	8M
10.	a)	What are the tests conducted on self consolidating concrete?	7M
	b)	Where do you recommend high density concrete and why?	8M

Hall Ticket No: | | | | | | | | | | | Question Paper Code : A1203

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

NETWORK ANALYSIS

(Electrical and Electronics Engineering)

Date: 18 June, 2014 FN **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 prove Tellegen's theorem. 7M
   b) Using superposition theorem, calculate the current through (2+j3) Ω impedance of the circuit shown in Fig.1. 8M

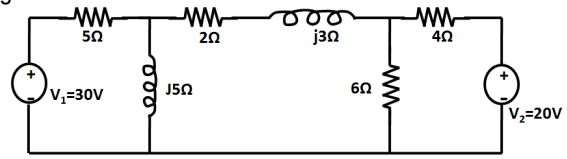


Fig.1

2. a) State and prove Reciprocity theorem. 7M
   b) State and explain maximum power transfer theorem for D.C excited circuit. 8M

Unit - II

3. a) A 400 V, 3-Φ supply is connected to a balanced network of three impedances. Each consists of a 20Ω resistance and a 15Ω inductive reactance. Determine: 8M
      i. The line current,
      ii. The power factor
      iii. The total power in kW

      When the three impedances are star connected and delta connected?
   b) Obtain the equivalent resistance R_{ab} for the circuit shown in Fig.2 7M

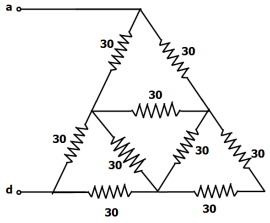


Fig.2

4. a) A balanced 3 phase, star connected load is fed from a 3phase, 400 V, 50 Hz supply. The current per phase is 25A (lagging), and the total active power absorbed by the lad is 13.856 kW. Determine: 7M
      i. The resistance and inductance of the load per phase,
      ii. The total reactive power and
      iii. The total apparent power
   b) In a three-phase, three-wire circuit, find the phasor line currents to a balanced Y load in which each phase impedance is $Z_Y = 20\angle 30^o\ \Omega$. Also, $V_{AN} = 120\angle 20^o$ V, and the phase sequence is *ABC*. 8M

Cont...2

Unit - III

5. a) Using Laplace Transform, Determine the current $i_L(t)$ for t> 0 for the circuit shown in Fig.3 — 8M

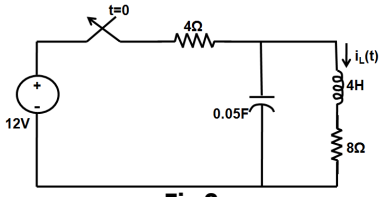


Fig.3

b) In the network shown in Fig.4 the switch 'k' is closed at t=0, with the capacitor unchanged. Find the value for I, di/dt, d^2i/dt^2 at $t=0^+$, for element values as follows, V=100 V, R=1000Ω, and C= 1 μF. — 7M

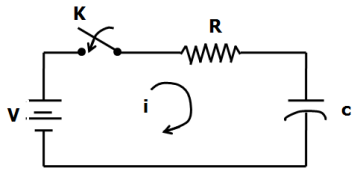


Fig.4

6. a) What is the inductance of a coil for which a changing current increasing uniformly from 30 mA to 80 mA in 100 μs induces 50 mV in the coil? — 8M

b) Convert the circuit in Fig.5 to an appropriate S-domain representation: — 7M

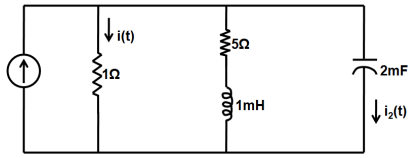


Fig.5

Unit - IV

7. a) Design a low pass filter (T-network) having a cut off frequency of 2kHz and nominal characteristic impedance of 500Ω. — 7M

b) Design m-derived T and π sections low pass filters for nominal characteristic impedance R_0=600Ω, cutoff frequency= 1800 Hz and infinite attenuation frequency f_∞=2kHz. — 8M

8. a) Design a constant k high pass filter (π-network) having a cut off frequency of 1kHz and nominal characteristic impedance of 500Ω. — 7M

b) Design a constant k band pass filter with cut off frequencies of 2kHz and 5 kHz and nominal characteristic impedance of 600Ω. — 8M

Unit - V

9. a) Draw the locus of I_2 and I_1 for the parallel circuit shown in Fig.6. — 7M

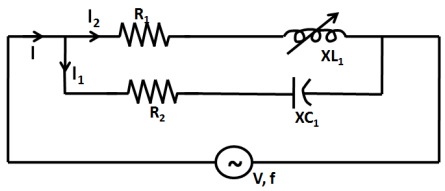


Fig.6

b) In a R-L series circuit with X-L fixed and R variable, draw the locus of the current and explain it in detail. — 8M

10. a) An R-L series circuit with R=40Ω and variable inductance is in parallel with R-C series with R=10Ω and Xc=20Ω draw the current locus for an applied voltage of 220V. — 7M

b) An R-C series circuit with R=20Ω and variable capacitance is in parallel with R-L series with R=5Ω and X_L=20Ω draw the current locus for an applied voltage of 220V. — 8M

Hall Ticket No: | | | | | | | | | | |

Question Paper Code : A1204

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

DC MACHINES

(Electrical and Electronics Engineering)

Date: 11 June, 2014 FN **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)	For a singly excited magnetic system, establish relationship between magnetic field energy and co-energy.	8M
	b)	For an electromagnetic system, the λ- I relationship is given by $\lambda = (i^{0.5}/g)$ where g = air gap length. Determine the mechanical force on the moving part of the system using: i. Energy of the system ii. Co-energy of the system for i= 4A, and g = 5cm	7M
2.	a)	What is meant by energy balance equation?	3M
	b)	A doubly- excited magnetic field system has self and mutual inductances of $L_{11} = L_{22} = 2$, $M_{12} = M_{21} = \cos\theta$ where θ is the angle between the axes of the coils. The coils are connected in parallel to a voltage source $V= V_m \cos(\omega t)$. Derive an expression for the instantaneous torque as a function of the angular position θ. Find there from the time-average torque. Evaluate for $\theta = 30^o$, v= 100 sin (314t).	12M

Unit - II

3.	a)	Name the stator parts of a d.c machine.	4M
	b)	Derive the expressions for ATd/pole and ATc/pole in case of a d.c generator undergoing armature reaction.	11M
4.	a)	Develop from first principle, EMF equations for a d.c machine.	8M
	b)	The terminal voltage of a 8 pole d.c. shunt generator with 780 wave connected armature conductors and running at 500 rpm is 240 V. The armature resistance is 0.24Ω and the field resistance is 240 Ω. Find the armature current, the induced emf and the flux per pole if load resistance is 12 Ω.	7M

Unit – III

5.	a)	Describe the experimental procedure involved in obtaining open circuit characteristics of separately excited generator.	8M
	b)	Explain the necessary reasons for operating generators in parallel?	7M
6.	a)	Explain the external (V/I) characteristics for a shunt, series generator and compare them?	8M
	b)	A 6-pole wave connected d.c machine has 300 armature conductors and each conductor is capable of carrying 80A without excessive temperature rise. The flux per pole is 0.015 Wb and the machine is driven at 1800 rpm. Calculate the total current, emf, power developed in the armature.	7M

Cont...2

Unit - IV

7.	a)	Explain why a starter is required for starting a d.c. motor. Describe a 3-point starter, having no volt and over-load protections, for starting a d.c. shunt motor?	8M
	b)	A 250 V, 4 pole, shunt motor has two circuit armature winding with 500 conductors. The armature circuit resistance is 0.25 ohm, field resistance is 125 ohms and the flux per pole is 0.02 Wb. Armature reaction is neglected. If the motor draws 14 A from the mains, then compute speed and the internal torque developed.	7M
8.	a)	Explain ward Leonard speed control method with the help of suitable diagram?	7M
	b)	Derive the torque equation of d.c motor.	8M

Unit - V

9.	a)	Derive the condition for maximum efficiency for a d.c machine when it is working as a motor.	7M
	b)	When running on a load, a 400V shunt motor takes 5A. Armature resistance is 0.5Ω and field resistance is 200Ω. Find the output of motor and efficiency when running on full load and taking a current of 50A?	8M
10.	a)	Explain the various losses in dc machine?	7M
	b)	Write short notes on Hopkinson's test?	8M

Hall Ticket No: | | | | | | | | | | |

Question Paper Code : A1205

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

ELEMENTS OF ELECTRICAL ENGINEERING

(Common to Computer Science and Engineering & Information Technology)

Date: 11 June, 2014 FN **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) A balanced 3 phase star connected load of (8+j6) ohm per phase is connected to a 3-phase 230V line to line supply. Find the line current, power factor and active power. 8M
   b) Obtain the relationship between line and phase quantities of voltage and current in case of a three phase balanced star connected system. 7M
2. a) State and explain the maximum power transfer theorem. 7M
   b) A balanced delta connected load consisting of three coils draws $10\sqrt{3}A$ at 0.5 power factor from 100V, three phase supply. If the coils are reconnected to star across the same supply. Find the line current and total power consumed. 8M

Unit – II

3. a) Derive the expression for EMF equation of a dc generator. 7M
   b) A 500V shunt motor runs at its normal speed of 250rpm when the armature current is 200A. The resistance of armature is 0.12Ω. Calculate the speed when a resistance is inserted in the field reducing the shunt field to 80% of normal value and the armature current is 100A. 8M
4. a) With the help of a schematic explain the Swinburne's test. Mention any two advantages of the best. 8M
   b) A 4 pole generator, having wave wound armature winding has 51 slots, each slot containing 20 conductors. What will be the voltage generated in the machine when drives at 1500rpm assuming the flux per pole to be 7m Wb. 7M

Unit - II

5. a) Derive an expression for the EMF induced in a primary winding of a 1-phase transformer, when fed from 1-phase AC source. 8M
   b) i. A 2,200/200 V transformer draws a no-load primary current of 0.6 A and absorbs 400 Watts. Find the magnetizing and iron-loss currents 7M
      ii. A 2,200/250 V transformer takes 0.5 A at a power factor of 0.3 on open circuit. Find magnetizing and working components of no-load primary current
6. a) What is the necessity of conducting short circuit (SC) test on transformer? Explain the procedure to conduct the SC test on 1-phase transformer? 8M
   b) Discuss about the various losses that occur in the 1-phase transformer. 7M

Unit - IV

7. a) With a neat sketch, explain the principle of operation of 3-phase induction motor. 7M
   b) Draw and explain the Speed/Torque characteristics of a 3-phase induction motor 8M
8. a) A 6-pole, 3-phase induction motor runs at a speed of 960 RPM and the shaft torque is 135.7 N-Mt. Calculate the rotor copper loss if the friction and windage losses amount to 150 Watts. The frequency of supply is 50 Hz. 8M
   b) With neat sketch, explain the operation of capacitor start 1-phase induction motor? 7M

Cont...2

Unit - V

9.	a)	Discuss in brief about the Principle of operation of 3-phase alternator?	8M
	b)	Explain in detail how do you achieve, self starting of synchronous motor?	7M
10.	a)	Derive the expression for induced EMF of a synchronous generator.	8M
	b)	A 3 phase, 16 pole alternator has a star connected winding with 144 slots and 10 conduction per slot. The flux per pole is 0.03Wb sinusoidally distributed and the speed is 375rpm. Find the frequency, phase and line emfs. Assume a winding factor of 0.96.	7M

Hall Ticket No: | | | | | | | | | | | Question Paper Code : A1206

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

PRINCIPLES OF ELECTRICAL ENGINEERING

(Electronics and Communication Engineering)

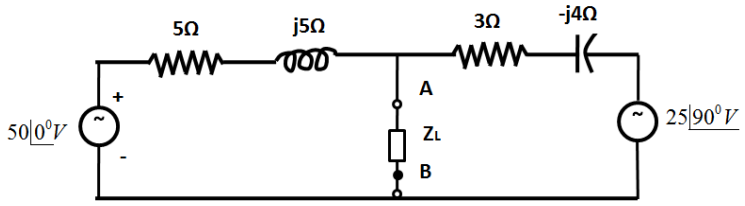
Date: 11 June, 2014 FN **Time: 3 hours** **Max Marks: 75**

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

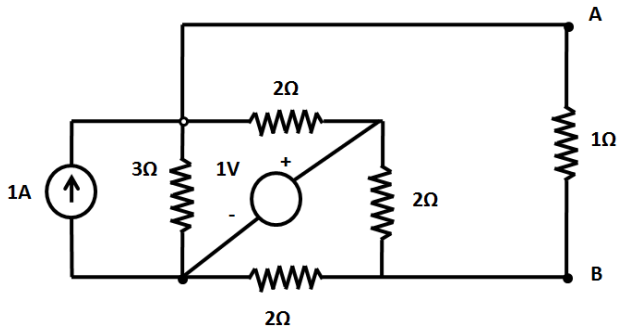
1. a) State and explain Thevenin's theorem. Compare Thevenin's equivalent with Norton's equivalent. 6M

   b) In the network shown below, if the load is variable both in resistance and reactance, for what value the load Z_L will receive maximum power? What is the value of maximum power? 9M



2. a) State and Explain Superposition theorem. 6M

   b) Using superposition theorem, find the current through 1Ω resistor across AB of the network shown below. 9M



Unit - II

3. a) Derive an expression for the current response in a R – L series circuit excited with constant voltage source. 6M

   b) A series RLC circuit with R=200Ω, L=0.1 H and C=100μF has a constant voltage of 200 V applied at t=0. Find the current transient assuming zero initial charge across capacitor. 9M

Cont...2

4. a) For the circuit shown in Fig. 1, find the current equation when the switch is changed from position 1 to position 2 at t=0. 8M

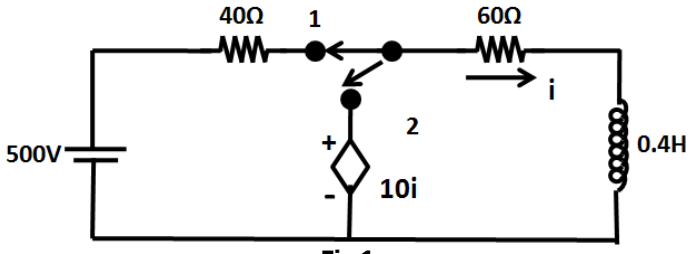


Fig.1

b) Determine the voltage at the terminals of a coil having R=10 Ω and L=15 H at the instant when the current is 10 A and increasing at 5 A/sec. Also find the stored energy in the inductor. Compute the same exercise for the case when the current decreases at 5A/sec. 7M

Unit - III

5. a) Mention various parts of DC machine and mention their function and the materials used 8M
   b) A 500 V shunt motor has 4 poles and 492 wave connected conductors. The flux per pole is 50mwb. The full load current is 20A. Its armature resistance is 0.1Ω and shunt field resistance is 250Ω. Find the speed at full load. 7M
6. a) What is the principle of operation of DC generator? Why commutator and brushes are necessary? 6M
   b) A DC shunt motor is connected to 250 V supply has armature resistance of 0.1Ω and of field winding as 100 Ω. Find the ratio of speed as a generator to the speed of as a motor when line current in each case is 80 A. 9M

Unit - IV

7. a) With neat sketch, explain the principle of operation of 1-phase transformer. 7M
   b) A 200/400 V, 10 kVA, 50 Hz, single-phase transformer has, at full-load, a copper loss of 120 W. If it has an efficiency of 98% at full load unity power factor, determine the iron losses. 8M
   What would be the efficiency of the transformer at half load 0.8 power factor lagging?
8. a) What is the necessity of conduction open circuit (OC) test on 1-phase transformer? Describe how this test is conducted experimentally. 7M
   b) In a 25-kVA, 1-phase transformer, the iron and full-load copper losses are respectively 350 and 400 W. Calculate: 8M
      i. The efficiency at half load 0.8 power factor
      ii. The load at which the efficiency is maximum

Unit - V

9. a) With neat sketch, explain the direct-on-line (DOL) starting method of 3-phase induction motor. 8M
   b) Why starter is used in starting process of induction motor? With neat sketch, describe the starting method of induction motor by Star-Delta Starter. 7M
10. a) Give the constructional details of squirrel cage and slip ring induction motors with the help of neat diagrams. 8M
    b) With neat sketch explain the operation of Shaded-pole motor. 7M

Hall Ticket No: | | | | | | | | | | | Question Paper Code : A1306

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

MECHANICS OF SOLIDS

(Common to Mechanical Engineering & Aeronautical Engineering)

Date: 13 June, 2014 FN **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) With usual notations, obtain an expression for the elongation of a uniformly tapering rod of circular cross section subjected to load P. 10M

   b) A round compound rod is made of uniform rod of diameter 30 mm attached with a 200 mm long tapering rod with big end diameter 30 mm & small end diameter 20 mm as shown in Fig.1. The compound rod is subjected to an axial tensile force of 40 KN. Determine the length L1 of the uniform rod if the total deformation is limited to 0.2 mm 5M

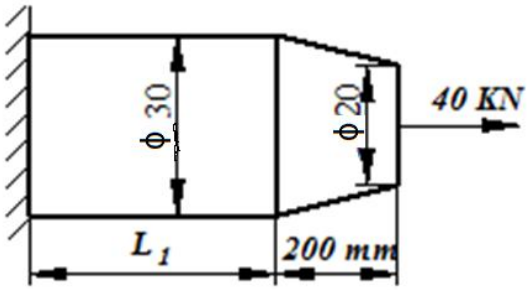


Fig.1

2. a) A 70 mm long block has cross section of 50mmx10 mm. The block is subjected to forces 60 KN (tensile) on (50 mmx10 mm) mm face and 110 KN (compressive) on the 70 mm x10 mm face. Determine the force to be applied on 70 mm x 50 mm face such that there is no change in volume of the block. Take E=200 Gpa & Poisson's ratio as 0.3. 9M

   b) Explain the terms: 6M
   i. Resilience
   ii. Poisson's ratio
   iii. Factor of safety

Unit - II

3. a) Classify types of beams and type of loads and explain any two of them with neat sketch. 6M

   b) A simply supported beam AB of 6m span is loaded as shown in Fig.2. Draw the shear force and bending moment diagrams. 9M

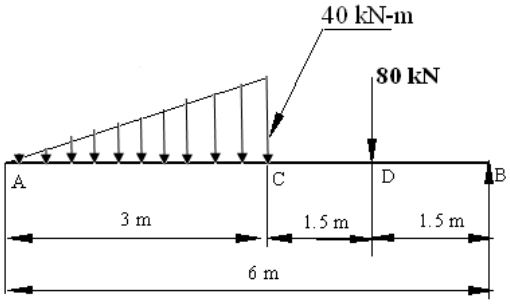


Fig.2

Cont...2

4. a) Write general procedure for drawing shear force diagram and bending moment diagram. 7M
   b) Draw the SFD and BMD for the cantilever beam shown in Fig.3 8M

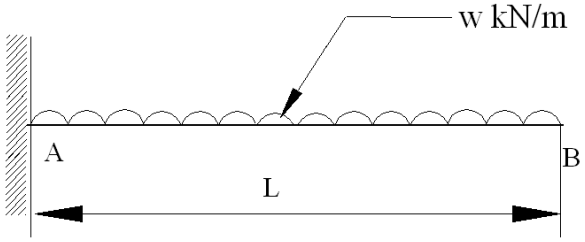


Fig.3

Unit - III

5. a) What are the assumptions made in the simple theory of Bending. 5M
   b) A beam of T sections has a length of 2.5 m and is subjected to a point load as shown in Fig.4. Calculate the compressive bending stress and plot the stress distribution across the section of the beam. The maximum tensile stress is limited to 300 MPa. Calculate the value of W. 10M

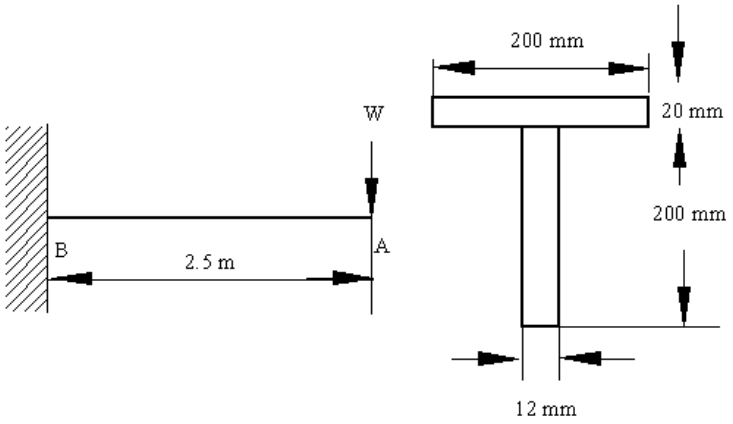


Fig.4

6. a) A high strength steel band saw, 20 mm wide by 0.8mm thick runs over a pulley 600mm in diameter. What maximum flexural stresses is developed? What minimum diameter pulley can be used without exceeding a flexural stresses of 400 MPa? Take E = 200GPa 6M
   b) A rolled I section of size 50mm x 75mm is used as a beam, with an effective span of 3m. The flanges are 5mm thick and web is 3.75mm thick. Calculate the uniformly distributed load the beam can carry if the maximum intensity of shear stress induced is limited to $40N/mm^2$. 9M

Unit - IV

7. a) Derive an expression $EI\, d^2y/dx^2 = M$ with usual notation. 7M
   b) Name the three important methods of finding slope in deflection of beams and explain one method. 8M
8. a) Derive the moment-curvature relationship from the fundamentals. 10M
   b) A 3.5 m long simply supported beam carries a point load of 25 KN at its mid span. Determine the magnitude of UDL the beam can carry with the maximum deflection to be the same as that in case of point load, which is 2.5 mm. Take E=200 Gpa. 5M

Cont...3

Unit – V

9.	a)	With usual notations, obtain an expression for change in volume of a thin cylindrical shell subjected to internal pressure P.	7M
	b)	A thin cylindrical pressure vessel of 1 m inner diameter and 1.5 m long is subjected to an internal pressure P. Thickness of the cylinder wall is 15 mm. Taking allowable stress for the material of the cylinder as 90 MPa, determine (i) Magnitude of maximum internal pressure P that the vessel can withstand (ii) Change in dimensions & volume. Take E=200 GPa & v = 0.3.	8M
10.	a)	Derive Lame's equations for thick cylinders.	8M
	b)	A thick cylindrical vessel of 500 mm inner diameter is subjected to an internal pressure of 9 MPa. Taking allowable stress for the material of the cylinder as 40 MPa, determine (i) Wall thickness of the cylinder (ii) Circumferential stress at the outer radius and (iii) % error involved if thickness is calculated based on thin vessel theory.	7M

Hall Ticket No: | | | | | | | | | | | **Question Paper Code : A1307**

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

MECHANICS OF FLUIDS

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

Date: 16 June, 2014 FN **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) Define the following terms: 7M
   i. Mass density
   ii. Specific weight
   iii. Specific gravity
   b) Calculate the specific weight, density and specific gravity of one litre of a liquid which weighs 7N. 8M
2. a) Explain about types of fluids? 7M
   b) Determine the specific gravity of a fluid having viscosity 0.05 poise and kinematic viscosity 0.035 stokes. 8M

Unit - II

3. a) Define the following: 9M
   i. Steady and Unsteady flows
   ii. Uniform and non- Uniform flows
   iii. Laminar and turbulent flows
   b) The diameters of a pipe at sections 1 and 2 are 10 cm and 15 cm respectively. Find the discharge through the pipe if the velocity of water flowing through the pipe at section 1 is 5m/sec. Determine the velocity at section 2. 6M
4. a) State and derive Bernoulli's theorem, with assumptions. 7M
   b) A Venturimeter is to be fitted in a pipe 0.25m diameter where the pressure head is 7.6m of flowing liquid and the maximum flow is 8.1m^3 per minute. Find the least diameter of the throat to ensure that the pressure head does not become negative. Take K= 0.96. 8M

Unit - III

5. a) Derive an expression for the loss of head due to sudden enlargement. 7M
   b) Find the loss of head when a pipe diameter of 200 mm is suddenly enlarged to a diameter of 400 mm .the rate of flow of water through the pipe is 250 litres/sec. 8M
6. a) Define: 7M
   i. Hydraulic gradient line
   ii. Total energy line
   b) The rate of flow of water through a horizontal pipe is 0.25 m^3 /s. The diameter of the pipe which is 200 mm is suddenly enlarged to 400 mm The pressure intensity in the smaller pipe is 11.772 N/cm^2 . 8M
   Determine:
   i. loss of head due to sudden enlargement
   ii. Pressure intensity in large pipe

Cont...2

Unit - IV

7.	a)	With neat sketch explain laminar and turbulent boundary layer.	8M
	b)	What are the methods of controlling boundary layer?	7M
8.	a)	Derive an expression for drag and lift of submerged bodies in the liquid.	10M
	b)	Find the difference in drag force exerted on a flat plate of size 2mX2m when the plate is moving at a speed of 4 m/sec normal to its plane in (i) water (ii) air of density 1.24 kg/m^3. Coefficient of dragis given as 1.15.	5M

Unit - V

9.	a)	Obtain an expression for velocity of sound for adiabatic process.	7M
	b)	Derive the continuity equation for one-dimensional compressible flow in a differential form.	8M
10.	a)	Obtain an expression for the velocity of sound in terms of bulk modulus.	7M
	b)	Derive the Bernoulli's equation for isothermal process in a compressible flow.	8M

Hall Ticket No: | | | | | | | | | | | Question Paper Code : A1308

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

THERMODYNAMICS

(Common to Mechanical Engineering & Aeronautical Engineering)

Date: 11 June, 2014 FN **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 the Zeroth law of thermodynamics and explain with the neat diagram the working of constant volume gas thermometer for measurement of temperature. 7M
   b) A new scale N of the temperature is devised in which the Ice point is assigned 100°N and the steam point is assigned 400°N. Establish the relationship between the N-scale and the Celsius scale. At what temperatures will both the Celsius and the new thermometer readings would be identical numerically. 8M
2. a) Write the steady flow energy equation and explain all terms involved. 7M
   b) A system contains 0.15 m^3 of air at a pressure of 3.8 bar and 150^{0}C. It is expanded adiabatically till the pressure falls to 1 bar. The gas is then heated at constant pressure till its enthalpy increases by 70 kJ. Determine the total work done. 8M

Unit - II

3. a) State Clausius and Kelvin Plank statements of second law of thermodynamics and show how these statements are violating second law of thermodynamics? 7M
   b) It is proposed to design a refrigeration plant for a food store which is to be maintained at – 5^{0}C. The ambient temperature is 25^{0}C and the estimated heat transfer from the store is at the rate of 5 kW. If the system operates on reversed Carnot heat engine cycle, determine the performance index and the minimum power required to operate the refrigeration plant. 8M
4. a) Sketch the Carnot cycle on the T-S diagram, and derive an expression for its efficiency 7M
   b) 0.04 m^3 of nitrogen contained in a cylinder behind a piston is initially at 1.05 bar and 15^{0}C. The gas is compressed isothermally and reversibly until the pressure is 4.8 bar, calculate 8M
      i. The change of entropy
      ii. Heat flow and
      iii. The work done. Sketch the process on a P-V and T-S diagram. Assume nitrogen to act as a perfect gas molecular weight of nitrogen= 28.

Unit - III

5. a) Define the following with respect to a pure substance 3M
      i. Critical point
      ii. Triple point
      iii. Saturation point
   b) i. What is quality of steam? What are the different methods of measurement of quality? Explain any one with a neat sketch 12M
      ii. Steam at 0.3 Mpa, 250^{0}C is cooled at constant volume.
      At what temperature will the steam become saturated vapour? What is the quality at 80^{0}C?

Cont...2

6. a) i. Prove that for an ideal gas C_P-C_V=R 7M
   ii. Write the Vander waal's equation of state and explain the different terms
   b) A certain gas has C_P=1.968 and C_V=1.507 KJ/Kg K. find its molecular weight and gas constant. A constant volume chamber of 0.3m^3 capacity contains 2 Kg of this gas at 5^0C. heat is transferred to the gas until the temperature is 100^0C. find the work done, heat transferred and changes in internal energy, entropy and enthalpy. 8M

Unit - IV

7. a) State the Dalton's law of partial pressures. On what assumption this law is based? 7M
   b) Determine the gas constant, density and partial pressures of the components of a gas mixture consisting of 10 mass fractions of air and 1 mass fraction of lighting gas. Take the density of lighting gas 0.5 kg/m^3 at 101325 N/m^2 pressure and 273K temperature. 8M
8. a) i) What do you mean by Gravimetric and volumetric analysis in the case of a gas mixture? 7M
   ii) Derive the relation between partial pressure, mole fraction and volume fraction.
   b) A closed vessel of 0.4 m^3 capacity contained air at 80 KN/m^2 and 300 K. Hydrogen was added and the pressure in the vessel raised to 82 KN/m^2 at the same temperature. Find final masses of O_2, N_2, H_2 in the vessel and their respective partial pressures. Air contains 77% of N_2 on mass basis. Take gas constant R=287 J/kg K for air and 4124 J/kg K for H_2 8M

Unit - V

9. a) Derive with usual notations an expression for the air standard efficiency of a Otto cycle. Represent the cycle on T-S and P-V diagram. 7M
   b) An engine of 250 mm bore and 275 mm stroke on constant volume (Otto) cycle. The clearance volume is 0.00263m^3. The initial pressure and temperature are 1 bar and 50^0C. If maximum pressure is 25 bar, find: 8M
      i. Air standard efficiency of cycle
      ii. Mean effective pressure
10. a) Represent Otto, diesel and duel cycle on same T-S diagram when heat supplied on each cycle is same. Compare them. 7M
   b) The compression ratio of a diesel engine is 14 and cutoff ratio is 2.2, at the beginning of the cycle air at 0.98 bar and 100^0C, find i) Temperature and pressure at salient point, ii) Air std. efficiency. 8M

Hall Ticket No: | | | | | | | | | | |

Question Paper Code : A1309

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

METALLURGY & MATERIAL SCIENCE
(Mechanical Engineering)

Date: 20 June, 2014 FN **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) Explain the term unit cell. List all the Bravais lattices in decreasing order of symmetry. 7M
   b) Give a test method for determining grain size of metals. Write the Hall-Petch relation and sketch a typical plot of yield strength Vs grain size. 8M
2. a) Enumerate on the need for alloying. State Hume Rothery rules for substitutional solid solution. 7M
   b) Enumerate on electron compounds with examples. 8M

Unit - II

3. a) Explain with example the construction of Eutectic Equilibrium phase diagrams? 8M
   b) Explain how phase diagrams help to asses the properties of the materials and establish the relationship between them? 7M
4. a) Explain the following: 6M
      i. Pearlite
      ii. Austenite
      iii. Ledeburite
   b) Draw a neat Iron-carbon equilibrium diagram and Write the invariant reactions of Iron carbon diagram. 9M

Unit - III

5. a) Enumerate on different types of Cast Iron-highlight the general characteristics and applications. 7M
   b) Explain the term Hardenability, describe the test that is carried out to assess the Hardenability of steels? 8M
6. a) With a neat sketch explain Time – Temperature – Transformation diagram for a steel with eutectoid composition. Explain the term critical cooling rate. 7M
   b) Enumerate on surface hardening methods highlighting the process principle, process parameters and merits of each of the process. 8M

Unit - IV

7. a) Explain composition, microstructure, properties and application of Aluminium–silicon alloy and Aluminium-Zinc alloys? 7M
   b) Explain the properties and applications for the following: 8M
      i. Ceramics
      ii. Nano materials

Cont...2

8.	a)	Explain different types of ceramic materials. Highlight the general characteristics and applications?	7M
	b)	Explain different crystal structures of crystalline ceramics?	8M

Unit - V

9.	a)	Explain the classification of composite materials?	7M
	b)	Write a brief note on different reinforcement materials used in Metal Matrix Composites.	8M
10.	a)	What issues are encountered in the manufacture of Metal Matrix composites?	7M
	b)	Explain a manufacturing method for producing Glass Fiber Reinforced Plastics?	8M

Hall Ticket No: | | | | | | | | | | | **Question Paper Code : A1401**

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

ELECTRONIC DEVICES

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

Date: 16 June, 2014 FN **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)	Draw the block diagram of a CRO and explain briefly the function of each block?	9M
	b)	What are the important applications of CRO? Explain them in detail?	6M
2.	a)	What is Hall Effect in semiconductor? Deduce an expression for hall coefficient.	8M
	b)	Discuss the charge densities in an extrinsic semiconductor.	7M

Unit - II

3.	a)	Explain the static and dynamic forward resistances of a diode?	6M
	b)	Write the diode current equation; explain the impact of each component on the behavior of the diode?	9M
4.	a)	Explain the transition capacitance and state the expression for it?	8M
	b)	Explain the working of Zener diode and sketch its V-I characteristics?	7M

Unit - III

5.	a)	Can an UJT be used as an oscillator? If yes, what kind of signals are generated by the circuit? Obtain an expression for frequency of oscillations.	8M
	b)	With a neat diagram, explain the construction and working of SCR?	7M
6.	a)	Draw the circuit diagram of half-wave rectifier and explain its operation with the help of waveforms.	8M
	b)	Derive an expression for ripple factor, rectifier efficiency and DC load current for a full-wave rectifier.	7M

Unit - IV

7.	a)	Discuss the input and output characteristics of a common base configuration?	10M
	b)	Obtain a relationship between α and β of a BJT.	5M
8.	a)	An NPN transistor has a dc base bias voltage, V_B=10V and an input base resistor, R_B=10KΩ, what will be the value of the base current into the transistor?	8M
	b)	Determine the resistance offered by a FET whose drain current changes by 7mA for a change of 5V in gate-source voltage, given its amplification factor is 10.	7M

Unit - V

9.	a)	Derive the expression for the stability factor(S_{VBE}) for self-bias configuration.	8M
	b)	Compare performance of the three configurations of a BJT circuit.	7M
10.	a)	Discuss the diode compensation technique for leakage current (I_{CO}).	7M
	b)	Explain with the help of the load line the effect of variation of Vcc, I_B on Q-point of a transistor?	8M

Hall Ticket No: | | | | | | | | | | | Question Paper Code : A1402

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

SIGNALS AND SYSTEMS

(Electronics and Communication Engineering)

Date: 18 June, 2014 FN **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) Calculate the Energy and Power for the signal: x(t) = 3 [u(t) - u(t – 5)]. 5M
   b) Find the Fourier Series representation for the continuous time periodic signal, x(t) shown in the Fig.1 Sketch the amplitude and phase spectrum. 10M

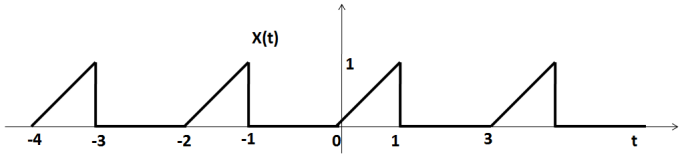


Fig.1

2. a) For the signal shown in Fig.2, sketch the following: 8M
   (i) g(2t) (ii) g(2t – 2) (iii) even part of g(t) (iv) odd part of g(t).

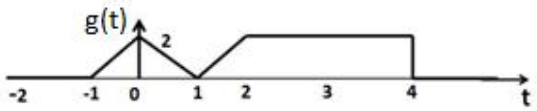


Fig.2

   b) Define the trigonometric and exponential Fourier series. Derive the relationship between the trigonometric and exponential Fourier series coefficients. 7M

Unit - II

3. a) Define the Hilbert transform and state its properties. 5M
   b) Find the Fourier transform of the signals x(t) and y(t) shown in Fig.3 and Fig.4. 10M

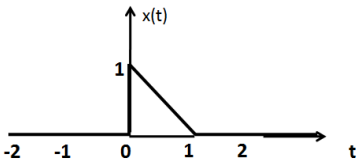


Fig.3

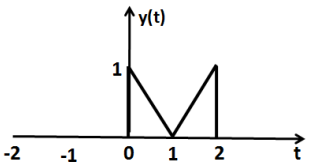


Fig.4

4. a) State and prove the Differentiation in time property and Parseval's theorem for Fourier transform. 7M
   b) The output of a continuous-time system is $y(t) = 2e^{-3t}u(t)$ for the input signal $x(t) = e^{-2t}u(t)$. Find the frequency response and impulse response of the system. Find the input energy E_x and output energy E_y. 8M

Cont...2

Unit - III

5. a) A continuous – time system is described by the following input – output relationship Y (t) = sin(6t) X (t). Determine whether this system is: 6M
   i. Memoryless
   ii. Time – invariant
   iii. Linear
   iv. Causal
   v. Stable

   b) Determine the convolution between signals x(t) and h(t) shown in Fig.5 & Fig.6. 9M

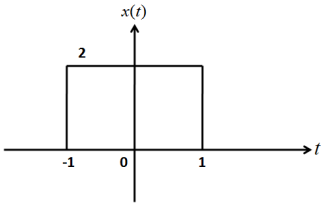


Fig.5

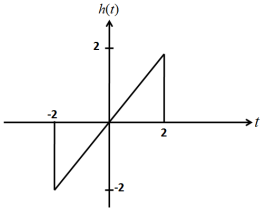


Fig.6

6. a) Compute the convolution of two sequences $x_1(n)h(t)$ and $x_2(n)$ given below 6M

   $x_1(n) = \left\{1, \underset{\uparrow}{2}, 3\right\}$ and $x_2(n) = \left\{\underset{\uparrow}{2}, 1, 4\right\}$

   b) Consider a continuous time signal x(t). Let δ(t) and u(t) represent continuous time unit impulse and unit step function respectively. Show that 9M

   $x(t) * \delta(t) = x(t)$

   $x(t) * \delta(t - t_o) = x(t - t_o)$

   $x(t) * u(t) = \int_{-\infty}^{t} x(\tau) d\tau$

Unit - IV

7. a) Find the Laplace transform of the signal 8M

   $x(t) = e^{-at}u(t) + e^{-bt}u(-t)$

   b) State and prove time convolution property for Laplace transform. 7M

8. a) For the following transform pair $L\{x(t)\} = \frac{2s}{x^2 - 2}$, determine the Laplace transform of x(2t). 7M

   b) Find the inverse unilateral Laplace transform of 8M

   $X(s) = \frac{3s^2 + 8s + 6}{(s+2)(s^2 + 2s + 1)}$

Unit - V

9. a) Define Sampling theorem for low pass signals. Specify the Nyquist frequency and Nyquist interval for the following signals: 8M
   i. x(t) = 2cos(250π t)
   ii. y(t) = 3sin(450π t) + 5cos(680π t + 0.45π)
   iii. $Sinc^2(200t)$

   b) State and prove the following properties for z-transform: 7M
   i. Linearity
   ii. Differentiation in z-domain

10. a) Find the Z transform of the sequence $x[n] = -b^n u[-n-1]$. Find the poles and draw the region of convergence. 7M

    b) Find the inverse Z-transform of the following: 10M

    $X(z) = \frac{4 + 2z^{-1}}{(4 - z^{-1})(2 - z^{-1})(1 - z^{-1})}$

    for ROC $(i)\ |z| > 1 \quad (ii)\ |z| < 0.25 \quad (iii)\ 0.5 < |z| < 1$

Hall Ticket No: | | | | | | | | | | |

Question Paper Code : A1403

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

PROBABILITY THEORY AND STOCHASTIC PROCESSES

(Electronics and Communication Engineering)

Date: 20 June, 2014 FN **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) A pair of fair dice are thrown in gambling problem. Person A wins if the sum of numbers showing up is six or less and one of the dice shows a four. Person B wins if the sum is five or more and one of the dice shows a four. Find — 9M
   i. The probability that A wins
   ii. The probability of B winning
   iii. The probability that both A and B wins

   b) Find a value of constant A such that is a valid probability density function. — 6M

$$f_x(x)=\begin{cases}0 & x<-1\\ A\left(1-x^2\right)\cos\left(\frac{\pi x}{2}\right) & -1\le x\le 1\\ 0 & 1<x\end{cases}$$

2. a) Obtain the moment generating function of normal distribution. — 8M
   b) Show that the mean value and variance of the uniform density function are — 7M

$$\bar{x}=\frac{(a+b)}{2} \text{ and } \sigma_x{}^2=\frac{(b-a)^2}{12}$$

Unit – II

3. a) List the properties of the joint distribution function for two random variables X and Y? — 6M

   b) Two random variables X and Y have the density function — 9M

$$f_{x,y}(x,y)=\begin{cases}\frac{2}{43}(x+0.5y)^2 & ,0<x<2 \text{ and } 0<y<3\\ 0 & ,\text{elsewhere}\end{cases}$$

   i. Find all the first and second order moments
   ii. Find the covariance
   iii. Are X and Y un correlated

Cont...2

4. a) Given the joint function 8M

$$f_{x,y}(x,y)=\begin{cases}\dfrac{\left(x^2+y^2\right)}{8\pi}; x^2+y^2<b\\ 0 \quad ; \text{elsewhere}\end{cases}$$

i. Find a constant so that this is a valid joint density function

ii. Find $P\left\{0.5b<x^2+y^2\le 0.8b\right\}$

b) Two random variables X and Y have means E[X] = 1 and E[Y] = 2 and variances Var[X] = 4 and Var[Y] =1 and a correlation coefficient is 0.4. New random variables W and V are defined by: V=-X + 2Y, W = X+3Y. Find: 7M

i. Means

ii. Variances

iii. Correlations coefficient ρ_{VW} of V and W

Unit - III

5. a) Explain cross correlation function and list its properties 9M

b) Consider the random process, X (t) given by $x(t)=A\cos\left(2\pi fct+\theta\right)$, where A and f_c are constants and θ is a random variable that is uniformly distributed over the interval (-π, π). Determine the auto correlation function of X(t). 6M

6. a) If X(t) is WSS process given by $X(t)=10\cos(100t+\theta)$, where θ is uniformly distributed in (-π, π), then prove that X(t) is correlated ergodic. 8M

b) Suppose we are given a cross power spectrum defined by 7M

$$S_{XY}(\omega)=\begin{cases}a+jbw/\omega, & -\omega<w<\omega\\ 0, & otherwise\end{cases}$$

Where a and b are real constants, ω >0, find cross correlation function.

Unit - IV

7. a) Derive a relation between power spectrum and auto correlation of a random process 10M

b) Consider a random process that has the auto correlation function 5M

$R_{XX}(\tau)=\left(A_0{}^2\right)\cos\left(\omega_0\tau\right)$. Find its power spectrum.

8. a) If X(t) and Y(t) are uncorrelated random processes, then find the power spectral density of Z if Z(t)=X(t)+Y(t). Also find the cross-spectral density $S_{XX}(\omega)$. 8M

b) State any four properties of cross power density spectrum. If the cross-correlation of two process X(t) and Y(t) is $\frac{AB}{2}\left[\sin\omega_0\tau+\cos(\omega_0(2t+\tau))\right]$ where A, B and ω_0 are constants. Find the cross power spectrum. 7M

Unit - V

9. a) Define in-phase component and quadrature-phase component. Show that a narrow-band noise process can be expressed as in-phase and quadrature components of it. 8M

b) Define average noise figure and average noise temperature. Derive mathematical expressions for both. 7M

10. Obtain an expression to find the noise figure and noise temperature of a multistage amplifier with a neat figure. 15M

Hall Ticket No: | | | | | | | | | | | **Question Paper Code : A1404**

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

DIGITAL LOGIC DESIGN

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

Date: 13 June, 2014 FN **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) Perform the following operations indicating the complete procedure: 8M
   i. $(110101.1011)_2 = (?)_{10}$
   ii. $(255.65)_{10} = (?)_2$
   iii. $(10110101.0111011)_2 = (?)_8$
   iv. $(265.354)_8 = (?)_2$

   b) Draw the logic circuit to implement the SOP expression below and then show how much of hardware may be reduced if the Boolean expression is simplified 7M
   $Y = \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}C + \bar{A}BC$

2. a) Perform the following arithmetic using 1's complement method. 6M
   i. + 6 ii. - 6 iii. + 6
   + 9 + 9 - 9

   b) Write the canonical form of the following SOP expressions and express the same in m-notation: 9M
   i. $f(a, b, c) = \bar{b} + abc + \bar{a}\,\bar{c}$
   ii. $f(x, y, z) = x\bar{y} + \bar{x}yz + xz$
   iii. $f(a, b, c, d) = abc + \bar{a}(\bar{c} + d)$

Unit - II

3. a) Explain the following terms with suitable examples: 10M
   i. Prime implicants
   ii. Essential prime implicants
   iii. Redundant groups
   iv. Quad
   v. Octet

   b) Draw the 2-level NAND circuit for the following Boolean expression 5M
   $F = (a\bar{b}+c\bar{d})e + bc(a+b)$. Also obtain the minimal SOP expression using 5-variable K-map and draw the circuit using NAND gates.

4. a) Realize the function: $f(w, x, y, z) = \sum m(0, 1, 5, 6, 7, 9, 12, 15)$ using a 4:1 MUX and external gates, considering w and z as select lines. 8M

   b) Using QM method, obtain the prime implicants for the function 7M
   $F(x_1, x_2, x_3, x_4) = \sum m(0, 5, 7, 8, 9, 10, 11, 14, 15)$

Cont...2

Unit - III

5. a) With a neat logic diagram and function table, explain the working of a JK flip-flop. The arrangement should include preset and clear facilities. 8M

   b) Obtain the governing equations and the state table for the sequential circuit given in Fig.1. 7M

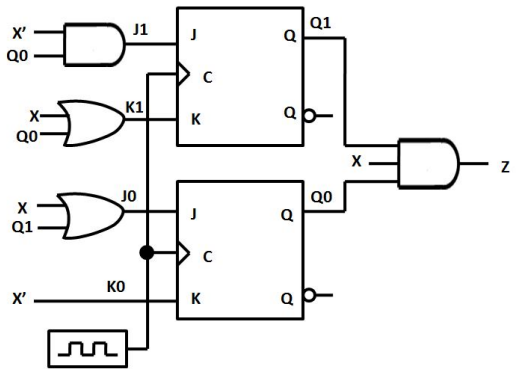


Fig.1

6. a) Write the timing waveforms and the characteristic equation of a clocked SR Flip-flop. 7M

   b) Write the circuit diagram along with their truth tables for different types of flip-flops. Also explain the 'race around' condition in a flip-flop. 8M

Unit - IV

7. a) Implement the following functions using 3x4x3 PLA, with both true and complemented outputs: 10M

$$f_1(a, b, c) = \sum m(3, 6, 7)$$

$$f_2(a, b, c) = \sum m(0, 1, 2, 6, 7)$$

$$f_3(a, b, c) = \sum m(0, 1, 3, 4, 5)$$

   b) Implement the following functions using a PROM: 5M

$$f_1(a, b, c) = \sum m(2, 3, 4, 6)$$

$$f_2(a, b, c) = \sum m(0, 1, 5, 7)$$

$$f_3(a, b, c) = \sum m(4, 5)$$

8. a) Draw the logic diagram of a RAM memory cell and explain it in detail. 8M

   b) Using the 4-input, 3-output PAL, implement the functions: 7M

$$f_1(a, b, c) = \sum m(0, 3, 5, 6, 7)$$

$$f_2(a, b, c) = \sum m(1, 2, 3, 5, 7)$$

Cont...3

Unit - V

9. a) Explain the state box and decision box of ASM chart in detail. 6M
   b) For the state diagram given in Fig.2, obtain the state table 9M

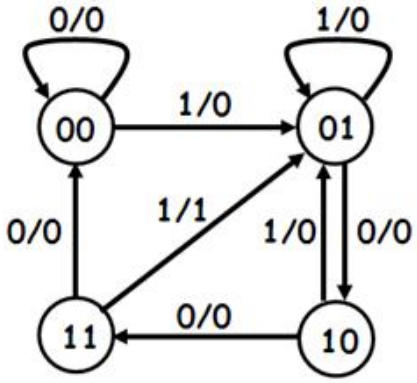


Fig.2

10. a) How ASM charts are different from SM charts and conventional flow charts? 5M
    b) Draw the ASM chart for a binary multiplier and briefly explain. 10M

Hall Ticket No: | | | | | | | | | | | Question Paper Code : A1405

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

ELECTRONIC DEVICES AND CIRCUITS

(Common to Computer Science and Engineering & Information Technology)

Date: 16 June, 2014 FN **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) Explain PN diode characteristics in forward and reverse bias conditions? 10M
   b) The voltage across a germanium diode at room temperature is 0.7V and 2mA current flows through it, if the voltage across diode increases to 0.75V. Calculate diode current. Assume V_T = 26mV. 5M
2. a) With necessary circuit and waveforms, explain a full wave rectifier circuit. Derive an expression for the ripple factor. 10M
   b) Briefly explain zener and avalanche breakdown . 5M

Unit – II

3. a) Draw and explain the input and output characteristics of a transistor in CE configuration. Indicate the cutoff, saturation and active regions. 8M
   b) Compare all the three transistor configuration with respect voltage gain, current gain, input resistance and output resistance.
4. a) Define DC load line and Q point. 6M
   b) Define α, β & γ of a transistor. A transistor has α=-0.9. if I_E=10mA, find the values of β, γ, I_B & I_C. 9M

Unit - III

5. a) Discuss briefly the advantages of h parameters. 5M
   b) Derive an expression for CE h parameters in terms of CC h parameters. 10M
6. a) Derive an expression for current gain and input impedance of a transistor amplifier in terms of h-parameters. 15M
   b) A transistor is connected as a common – emitter amplifier is driving a load of 10KΩ. It is supplied by a source of 1KΩ internal resistance. The hybrid parameters of the transistor used are h_{ie} = 1100Ω, h_{fe} = 50Ω, h_{re} = 2.5*10^{-4}, h_{oe} = 1/40K. Find:
      i. Current gain
      ii. Voltage gain
      iii. Input impedance
      iv. Output impedance

Cont...2

Unit - IV

7. a) For an n channel silicon FET with $a = 3 \times 10^{-4}$ cm and $N_D = 10^{15}$ electrons/cm^3, find: 5M
   i. The pinch off voltage
   ii. The channel half width for $V_{GS} = 0.5\ V_P$ & $I_D = 0$
   (Take $\varepsilon = 12\varepsilon_o$ and $\varepsilon_o = 8.849 \times 10^{-12}$ F/m)
   b) How do the constructional features of a MOSFET differ from that of a JFET. With the help of suitable diagram explain different types of MOSFET. 10M
8. a) When the reverse gate voltage of JFET changes from 4.0 to 3.9V, the drain current changes from 1.3 to 1.6 mA. Find the value of transconductance. 5M
   b) With neat diagrams, explain the construction and characteristics of an n channel depletion MOSFET. 10M

Unit - V

9. a) Explain the effect of negative feedback on gain? 7M
   b) With the help of a neat circuit diagram explain transistor Colpitts oscillator. 8M
10. a) With the help of a neat circuit diagram, explain the working of Hartley oscillator. 8M
   b) A quartz crystal is characterized by L=2.5H, R=1KΩ, Cs= 0.01PF and Cm=10PF. Determine the series and parallel resonant frequencies of crystal. 7M

Hall Ticket No: | | | | | | | | | | |

Question Paper Code : A1503

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

DATA STRUCTURES THROUGH C

(Mechanical Engineering)

Date: 18 June, 2014 FN **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)	Differentiate between iterative and recursive technique.	7M
	b)	Write a C program to search for an item using linear search technique.	8M
2.	a)	Write a recursive C program to find the factorial of N numbers.	8M
	b)	What is recursion? Discuss the properties of recursive algorithms.	7M

Unit - II

3.	a)	Explain the working of bubble sort with an example? Mention the time complexity to sort using bubble sort.	7M
	b)	Analyze the worst case performance of quick sort and also discuss the advantages and disadvantages of quick sort.	8M
4.	a)	Write the merge sort algorithm for sorting of numbers. Illustrate the working of merge sort with an example.	10M
	b)	Show the various passes of bubble sort on an unsorted list 11, 15, 2, 13, 6.	5M

Unit - III

5.	a)	What is a stack? Illustrate the working of push and pop operations in the stack with an example.	8M
	b)	Write a C program to implement an ordinary queue.	7M
6.	a)	Convert the following infix expression into its corresponding post fix expression: ((A+(B-C)*D)^E+F)	5M
	b)	Write a C program to implement circular queue which should perform the following operations; function to check overflow, function to under overflow, insert an item at rare end and function to delete an item from the front end.	10M

Unit - IV

7.		Explain Insert/Delete a node at the rear, front end from circular singly linked list?	15 M
8.	a)	Write the 'C' function for Sorting elements in descending order using single linked list.	7 M
	b)	Write the 'C' function to return the Nth node from the end of the linked list in one pass.	8 M

Unit - V

9.		What is a Binary Search Tree? Explain the different operations of Binary search tree. Construct a Binary Search Tree for the following sequence of numbers. Traverse the Binary Search Tree created above in Preorder, Inorder and Postorder? 45, 32, 90, 21, 78, 65, 87, 132, 90, 96, 41, 74, 92.	15 M
10.	a)	Illustrate the threaded binary tree with an example.	7 M
	b)	Explain BFS and DFS graph traversal techniques with an example?	8 M

Hall Ticket No: | | | | | | | | | | | **Question Paper Code : A1505**

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

DISCRETE MATHEMATICAL STRUCTURES

(Common to Computer Science and Engineering & Information Technology)

Date: 15 June, 2014 FN **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) Prove that $q \wedge \neg (p \rightarrow q)$ is a contradiction without using truth table. 6M
   b) Define tautology? Show that $q \wedge (p \Rightarrow \neg q) \Rightarrow \neg p$ is tautology without using Truth table? 9M
2. a) Establish the validity of the following arguments using the rules of inference: 9M

   $p \rightarrow (q \rightarrow r)$
   $p \vee s$
   $t \rightarrow q$
   $\neg s$

   $\therefore \neg r \rightarrow \neg t$

   b) Negate the following: $[\forall x \exists y[(p(x, y) \wedge q(x, y)) \rightarrow r(x, y)]]$. 6M

Unit - II

3. a) Let $A = \{1, 2, 3, 4, 12\}$, consider the partial order of divisibility on A. That is, if a and $b \in A$, $a < b$ if and only if $a \mid b$. Draw the Hasse diagram of the Poset (A, ≤) 7M
   b) Assume *R* and *S* are relations from *A* to *A*. If *A* = {1, 2, 3, 4}, *R* = {(1,2), (2,3), (3,4), (4,2)}, and *S* = {(1,3), (2,4), (4,2), (4,3)}, then compute *R* o *S*, *S* o *R* and *R* o *R*. 8M
4. a) Define Unary relation? What are the properties of unary relations on set A? 7M
   b) Consider the directed graph as shown in below Fig.1. Determine all the paths of length 1 and 2. 8M

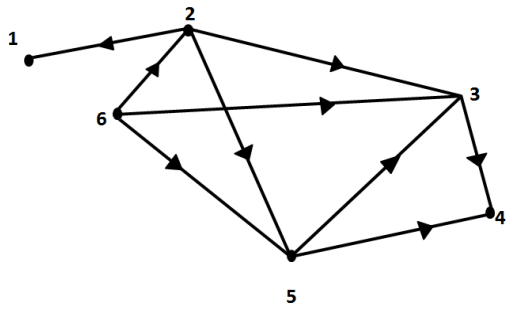


Fig.1

Cont...2

Unit - III

5. a) For any group G, prove that G is abelian if and only if $(ab)^2=a^2b^2$ $\forall$ a, b $\in$ G. 6M
   b) Define and give an example for each: 9M
      i. Complete lattice
      ii. Bounded lattice
      iii. Complemented lattice
      iv. Distributive lattice
6. a) Define lattice. List out the properties of lattice 5M
   b) Define and give an example for each: 10M
      i. Lattice homomorphism
      ii. Direct Product of Lattices

Unit - IV

7. a) How many arrangements are there of all the letters in SOCIOLOGICAL (i)? 6M
      i. In how many of the arrangements in are A and G adjacent
      ii. In how many of arrangements in are all vowels adjacent
   b) In how many ways can 10 (identical) dimes be distributed among five children if: 9M
      i. There are no restrictions
      ii. Each child gets at least one dime
      iii. The oldest child gets at least two dimes
8. a) Determine the coefficient of: 6M
      i. xyz^2 in $(x+y+z)^4$
      ii. xyz^2 in $(2x-y-z)^4$
      iii. xyz^{-2} in $(x-2y-3z^{-1})^4$
   b) A bag contains 6 white marbles and 5 red marbles. Find the number of ways in which four marbles can be drawn from the bag if: 9M
      i. They can be any colour
      ii. Two white and 2 red
      iii. They are of same colour

Unit - V

9. a) Determine the generating function for the number of ways to distribute 35 pennis (from unlimited supply) among five children. 8M
   b) If a_n, $n\geq 0$, is a solution of the recurrence relation $a_{n+1} - d\,a_n=0$ and $a_3=153/49$, $a_n = 1377/2401$, what is d? 7M
10. a) Find the coefficient of x^{32} in $(1+x^5+x^9)^{10}$ 8M
   b) Determine the constant in $(3x^2 - (2/x))^{15}$. 7M

Hall Ticket No: | | | | | | | | | | | Question Paper Code : A1506

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

(Regulations: VCE-R11)

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

(Common to Computer Science and Engineering & Information technology)

Date: 18 June, 2014 FN **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)	Write a program to arrange the numbers in ascending order.	8M
	b)	What is Java Virtual Machine? List the properties of JAVA programming language.	7M
2.	a)	Write a java program to check whether the given string is palindrome or not?	7M
	b)	Write a program give example for command line arguments: i. To find the sum of command line arguments and count the invalid integers entered ii. To get the name using command line	8M

Unit - II

3.	a)	Illustrate the concept of dynamic dispatch with a suitable example.	7M
	b)	Design a class called person with attributes name and age. Extend the person class to a new class called faculty with attributes qualification and salary. Further derive a class called guest faculty having ppl (pay per lecture) attribute. Define appropriate methods to accept and display information. Finally, design a test program to validate the inheritance chain.	8M
4.	a)	Write a Program to read a file and check whether the file exists, readable, writable and also print the length.	8M
	b)	Illustrate with an example how interfaces can be extended.	7M

Unit - III

5.	a)	What is a thread? Briefly discuss different stages in the life cycle of a thread.	7M
	b)	Explain different unchecked and checked exceptions defined in Java.lang?	8M
6.	a)	Write a program to demonstrate two threads at different priorities, which do not run on a preemptive platform in the same way as they run on a non-preemptive platform.	8M
	b)	What is the use of finally keyword? Write a program to illustrate the use of finally clause?	7M

Unit - IV

7.	a)	Explain briefly checkbox AWT control of Java with its constructors and methods?	8M
	b)	List any seven event listeners along with a line description for each.	7M
8.	a)	Write short notes on Flow Layout and Border Layout.	7M
	b)	Explain briefly the following AWT Controls: i. Labels ii. Buttons	8M

Unit - V

9.	a)	"Swing Supports a Pluggable Look and Feel"- Comment.	7M
	b)	Write a program to demonstrate parameter passing to applets?	8M
10.	a)	Explain the following swing components with their constructors / methods: i. JTextField ii. JTree	8M
	b)	Write a program to create a Applet life cycle.	7M

Hall Ticket No: | | | | | | | | | | |

Question Paper Code : A1310

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

(Regulations: VCE-R11)

MACHINE DRAWING

(Mechanical Engineering)

Date: 15 June, 2014 FN **Time: 3 hours** **Max Marks: 75**

Answer Two questions from Unit-1
Unit-2 is Compulsory
All parts of the question must be answered in one place only

Unit – I

1. Draw the three views of hexagonal bolt of 100 mm length, 25 mm nominal diameter and a thread length of 50 mm, with a washer and a hexagonal nut. Dimension the views. 15M

2. Draw the sectional front view and top view of a single riveted butt joint with two equal cover plates to connect two plates of 9 mm thickness. 15M

3. Draw the top half sectional front view and side view of knuckle joint. Indicate the required dimensions. 15M

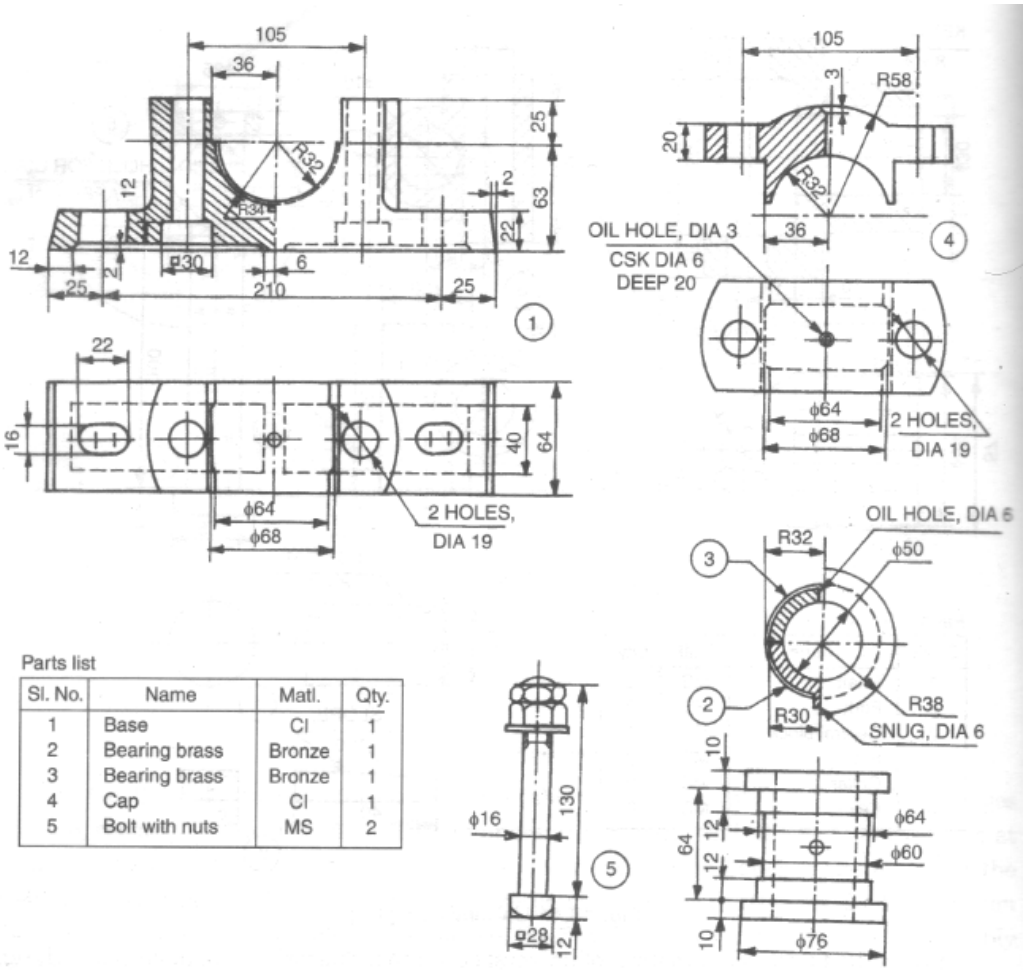
Cont...2

Unit – II

4. The details of PLUMMER BLOCK are shown in Fig.1. Draw the following views of the assembled PLUMMER BLOCK. 45M

i. Left of Sectional front view

ii. Top View



Parts list

Sl. No.	Name	Matl.	Qty.
1	Base	CI	1
2	Bearing brass	Bronze	1
3	Bearing brass	Bronze	1
4	Cap	CI	1
5	Bolt with nuts	MS	2

Fig.1: Parts of PLUMMER BLOCK