Hall Ticket Number:

Code No. : 11016BEM S

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (CBCS) I-Semester (New) Supplementary Examinations, May/June-2018

Basic Engineering Mechanics

(Civil, EEE & Mech. Engg.)

Time: **3** hours Max. Marks: **60**

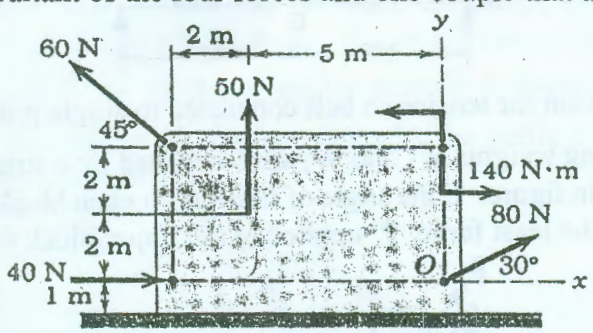
*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2=20 Marks)

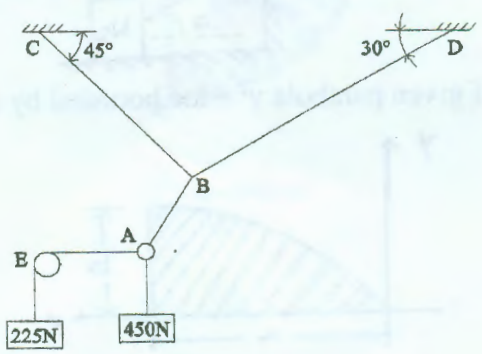
1. Explain various types of forces.
2. Determine magnitude and direction of the resultant of two forces 100N and 150N at an angle of 45°
3. Explain the free body diagram with suitable examples.
4. Write the equilibrium equations for a concurrent force system in space.
5 Distinguish between perfect frame and redundant frame.
6. What are the steps involved in the analysis of a truss?
7. Enumerate the applications of belt friction.
8. Explain the terms i) limiting friction ii) Friction Angle.
9. State and prove parallel axis theorem.
10. Differentiate between centroid and centre of gravity.

Part-B (5 × 8 = 40 Marks)
(All sub-questions carry* equal *marks)

11. a) Determine the resultant of the four forces and one couple that act on the plate shown.



b) Find the tensions in the three cables connected to B. The entire system of cables is coplanar. The roller at E is free to turn without resistance.



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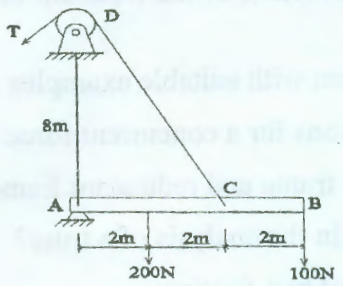
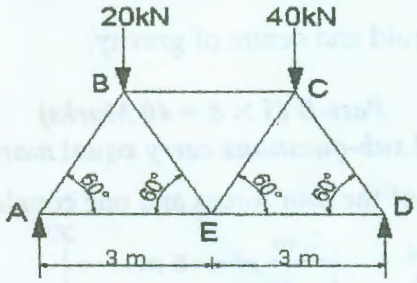
12. a) A system of forces consists of:
Force $P_1 = 3i + 5j - 6k$ acting through point (2,1,-3)
Force $P_2 = 5i - 4j + 3k$ acting through point (1,4,2) and a moment $M = 20i - 35j + 60k$.
The forces are in Newton (N) units, distance in 'm' units and the moment in 'N-m' units.
Calculate
i) The component of the resultant forces and its magnitude
ii) The total moment of the system about the origin 'O'

b) A boom AB is supported in a horizontal position by a hinge A and a cable which runs from 'C' over a small pulley at 'D'. Compute the tension in the cable and the horizontal and vertical components of the reaction at A. Neglect the weight of the boom and size of the pulley at D.



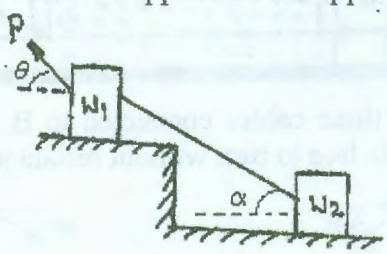
13 a) Explain the terms: Perfect frame, imperfect frame and deficient frame.

b) Determine the support reactions and members forces in a structure shown below:

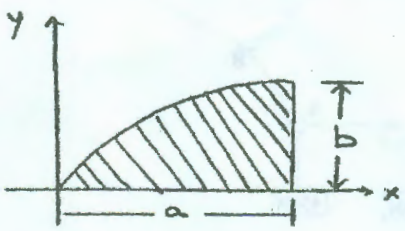


14. a) Write the expression for tension in belt connected to single pully.

b) Two blocks having weights W_1 and W_2 are connected by a string and rest on horizontal planes as shown in figure. If the angle of friction for each block is ϕ, find the magnitude and direction of the least force 'P' applied to the upper block that will induce sliding.



15. a) Locate the centroid of given parabola $y^2 = kx$ bounded by x- axis the line $x = a$.



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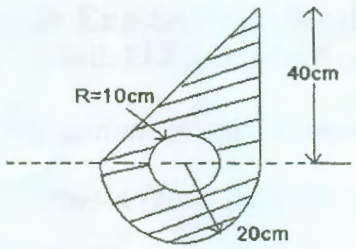
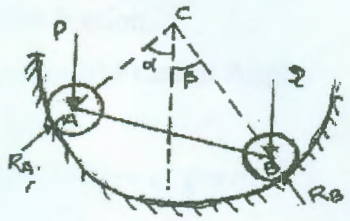
b) Find the moment of inertia of the shaded area about the horizontal centroidal axis as shown in fig



16. a) Define Force and explain its characteristics & types with suitable diagrams.

b) A Ringed bar AB with rollers of weights P = 50 N and Q = 100N at its ends is supported inside a circular ring in a vertical plane as shown in figure. The radius of the ring and length AB are such that the radii AC and BC form a right angle at 'C' that is, $\alpha + \beta = 90^{\circ}$. Neglecting friction and weight of the bar AB, find the configuration of equilibrium as defined by the angle $\frac{(\alpha-\beta)}{2}$ that makes with horizontal. Find also the reactions R_A and R_B and the compressive force 'S' in the bar AB.

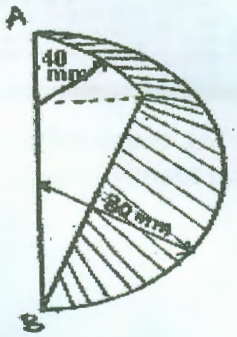


17. Answer any **two** of the following:

a) What are the steps involved in the analysis of redundant frames.

b) Two equal bodies P and Q of weight 'W' each are placed on a rough inclined plane. The bodies are connected by a light string. If $\mu_p = 1/2$ and $\mu_q = 1/3$, show that the bodies will be both on the point of motion when the plane is inclined at $\tan^{-1}$ (5/12)

c) Determine the angle that the line AB makes with the vertical when the shaded stem is suspended at A as shown in fig.



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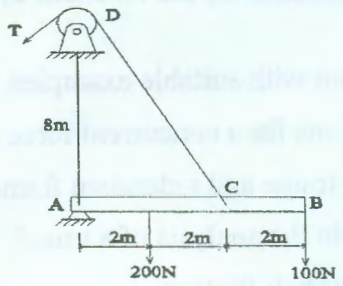

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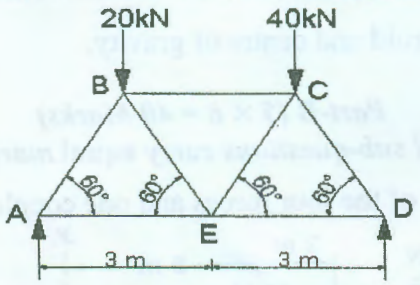

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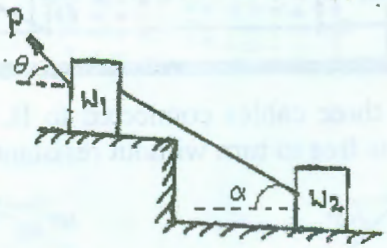

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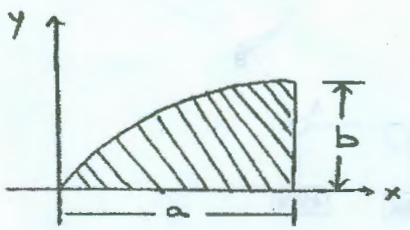

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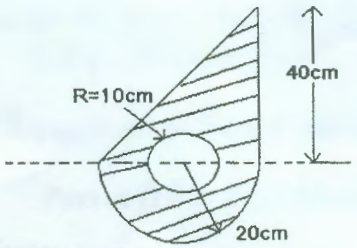

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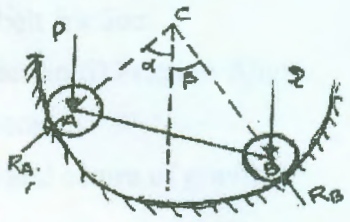

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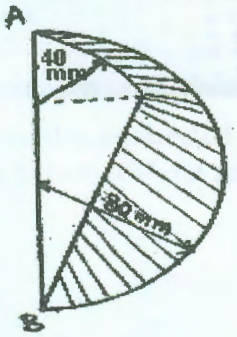

Hall Ticket Number:

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VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (CBCS) I-Semester (New) Supplementary Examinations, May/June-2018

Engineering Drawing–I

(CSE, ECE & IT)

Time: **3** hours Max. Marks: **60**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2=20 Marks)

1. What are the two different systems of dimensioning? Explain with the help of a neat sketch.
2. What is the advantage of diagonal scale over plain scale?
3. How is a hyperbola obtained in Conic sections? Give at least two engineering applications for the same.
4. Construct a heptagon of side 30 mm.
5. Mention at least two different methods of orthographic projection? How are they different from each other?
6. Define trace of a line.
7. Draw the projections of a pentagon of 35 mm sides when its surface is vertical while its one edge is inclined at 30^0 to the *HP*.
8. The surface of a square of 30 mm sides is parallel to *HP* with one of the edges 30^0 inclined to *VP*. Draw the projections when its centre is 40 mm in front of *VP* and 20 mm above *HP*.
9. What is polyhedra? Give examples.
10. A cylinder of 50 mm diameter and 60 mm long axis rests on one of its generators on the *HP*. Draw the projections of the cylinder if the generator on which it rests is perpendicular to the *VP*.

Part-B (5 × 8 = 40 Marks)

11. a) Construct a diagonal scale of *RF* = 1/5000, capable of reading 1 km and showing meters. Show on it the length of 726 m. [5]

    b) Give two standard examples each of enlarging and reducing scales. [3]

12. a) Line *AB* is a fixed vertical line. F is a point 45 mm from *AB*. Trace the path of a point P moving in such a way that the ratio of its distance from point F to its distance from the fixed vertical line is 2:3. Name the curve and draw a normal and tangent at a convenient point on the curve. [6]

    b) Sketch a double hyperbola showing the asymptotes. [2]

13. a) A line *AB* is in the first quadrant. Its ends *A* and *B* are 20 mm and 60 mm in front of the *VP* respectively. The distance between the end projectors is 75 mm. The line is inclined at 30^0 to the *HP* and its *HT* is 10 mm above *xy*. Draw the projections of *AB* and determine its true length and the *VT*. [6]

    b) Differentiate between the first and third angle methods of orthographic projection. [2]

14. a) The longest side 100 mm, of a $30^0 - 60^0$ set square is in *VP*. Its surface is 45^0 inclined to *VP*. The ends of the longest side are 35 mm and 10 mm above *HP* respectively. Draw its projections. [5]

    b) Show the traces of a square plate when its surface is (i) parallel to HP (ii) Parallel to VP (iii) Perpendicular to both HP and VP. [3]

Contd...2

15. A cone of base diameter 50 mm and axis 65 mm has one of its generators in the *VP* and inclined at 30^0 to the *HP*. Draw the projections of the cone so that the base is visible in the *TV*. [8]

16. a) What is the range of size of letters used for (i) Dimensioning (ii) Sub-titles (iii) Main titles. [4]

    b) Construct an ellipse when the distance of the focus from the directrix is equal to 60 mm and the eccentricity is 3/5. Draw a tangent and normal at any point on the curve. [4]

17. Answer any ***two*** of the following:

    a) A line *CD* of length 65 mm has its end C 25 mm above *HP* and 20 mm in front of *VP*. The other end D is 45 mm above *HP* and 55 mm in front of *VP*. Draw the projections of the line and find its inclinations with respect to the principal planes. [4]

    b) Classify planes based on their orientation in the first quadrant. [4]

    c) A hexagonal prism of base 30 mm and axis 60 mm long is resting on one of its rectangular faces on the *HP* so that the axis is also parallel to *VP*. Draw its projections. [4]

Hall Ticket Number:

Code No. : 13605 S

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (IT: CBCS) III-Semester Supplementary Examinations, May/June-2018

Basic Electronics

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. Justify why the cut-in voltage of Si diode more than Ge diode?
2. Compare the different performance parameters of a HWR, FWR and Bridge rectifier.
3. Define the term thermal run away in Bipolar junction transistor?
4. Explain how a transistor acts as an amplifier.
5. Define the terms (i) Noise margin (ii) Propagation delay.
6. List the various Digital IC technologies.
7. Why RC oscillators are not used at high frequencies?
8. Show that gain reduces with negative feedback.
9. List the ideal characteristics of Op-Amp.
10. Draw the logarithmic amplifier circuit using Op-Amp.

Part-B (5 × 10 = 50 Marks)

11. a) Explain the operation of Half wave Rectifier and derive the expressions of Efficiency, Ripple factor and percentage regulation. [6]

    b) A sinusoidal voltage of amplitude 20V, 50Hz is applied to a half wave rectifier. If RL = 1000Ω, Rf = 10Ω , Rr = ∞, Find the values of [4]
    i) Conversion Efficiency *ii)* Ripple factor *iii)* Percent Regulation

12. a) Draw the exact h parameter model of a Transistor suitable for any configuration. Derive expressions for voltage gain, input impedance of an amplifier using exact h parameter model. [6]

    b) Explain the necessity of biasing a Transistor. Derive the Q-point of a self-bias (Potential Divider) circuit in Common Emitter Configuration. [4]

13. a) Explain the physical structure of MOSFET. [5]

    b) Implement NOR gate using CMOS circuit and verify its operation using a Truth table indicating the transistor conditions. [5]

14. a) Briefly explain the different topologies of Negative feedback amplifiers with neat block diagrams and explain the effect of feedback on input and output impedances for each case. [5]

    b) What is an oscillator? What is the necessary condition for the oscillator to produce oscillations? List out the different types of Oscillators. [5]

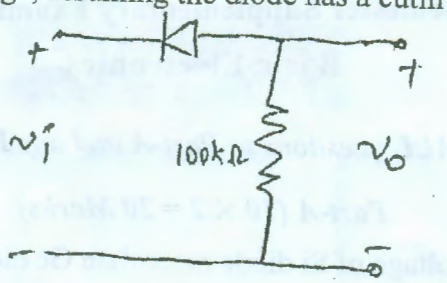
15. a) Explain operation of Astable multivibrator using Operational Amplifier. [5]

    b) Draw the circuit diagram for op-amp as integrator and derive an expression for its output. [5]

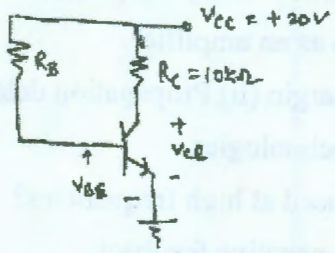
Contd... 2

Code No. : 13605 S

16. a) Determine the output for the circuit shown below where the input is a sinusoidal signal with 40V peak-to-peak votage, assuming the diode has a cutin voltage of 0.7V. [5]



b) Draw the DC load line and determine the operating point for the BJT circuit shown below. Assume V_{BE}=0.7V. [5]



17. Answer any *two* of the following:

a) MOSFET as an amplifier [5]

b) Effect of negative feedback on Band width and sensitivity [5]

c) Generation of triangular waveform using op-amp [5]

Hall Ticket Number:

Code No. : 13405 S

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (ECE: CBCS) III-Semester Supplementary Examinations, May/June-2018

Electromagnetic Theory

Time: 3 hours Max. Marks: 70

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. Determine Laplacian of scalar field $A = x^2y + xyz$.
2. State Gauss law and give its applications.
3. Prove that electrostatic field is conservative.
4. Write the statement of uniqueness theorem.
5. Write Poisson's equation for steady Electric field.
6. Prove that magneto static fields have no sources or sinks and field lines are always continuous.
7. Convert the Maxwell's equations for mmf and emf from integral form to differential form related to the time varying fields.
8. Define is skin depth.
9. Differentiate Critical angle and Brewster angle with an example.
10. State Poynting theorem.

Part-B (5 × 10 = 50 Marks)

11. a) A sphere is defined with volume charge density $\rho_v\ c/m^3$ and has radius 'r'. Obtain the expressions for the electric field strength and electric displacement density inside and outside the sphere using Gauss law. [6]

    b) Determine the charge densities corresponding to the given displacement densities [4]

    $D = 4x^2ya_x + 3xy^2a_y\ C/m^2$

    $D = 2\rho\cos\phi\ a_\rho + 3\rho\sin\phi\ a_\phi + 5za_z\ C/m^2$.

12. a) Determine the capacitance between two parallel plates each one them having Area 'A'. (the distance of separation between the parallel plates is 'd'). [6]

    b) The potential distribution is given as $V = 10y^3 + 2x^2$. Find the volume charge density at the point (2, 0). [4]

13. a) State and explain Ampere's circuital law for steady currents. Mention its applications and limitations. [6]

    b) Find the magnetic field strength H on the z-axis at a point P(0,0,4) due to a current carrying conductor loop, $x^2 + y^2 = 4$ in z = 0 plane. [4]

14. a) For free space propagation, derive the wave equations from Maxwell's equations. [6]

    b) In a non-magnetic medium, the wave has an electric field vector given by $\vec{E} = 50\cos(10^9t - 8x)a_y + 40\sin(10^9t - 8x)a_z$. Find the dielectric constant ϵ_r and the corresponding magnetic field vector H. [4]

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Code No. : 13405 S

15. a) Find the reflection coefficients of a plane wave when the reflection is from a plane surface of a perfect dielectric due to normal incidence of wave. [6]

    b) Determine the reflection coefficient for an EM wave incident normally on a sheet of iron. The corresponding parameters are: frequency (f) = 1 MHz, $\sigma = 1 \times 10^6\ mho/m$ and $\mu = 1000\mu_o$. [4]

16. a) Discuss the uniform and non uniform charge distributions. [5]

    b) Derive continuity equation. [5]

17. Answer any ***two*** of the following:

    a) Mutual inductance [5]

    b) Wave polarization [5]

    c) Oblique incidence. [5]

Hall Ticket Number:

Code No. : 13305 S

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (EEE: CBCS) III-Semester Supplementary Examinations, May/June-2018

Electrical Circuits-I

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** questions from **Part-B***

Part-A (10 × 2=20 Marks)

1. Determine R_{AB} for the circuit shown in the fig 1.

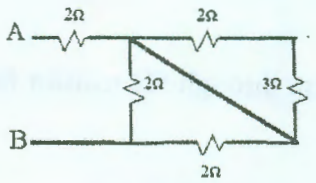


fig 1.

2. Determine 'i' for the circuit shown in the fig 2.

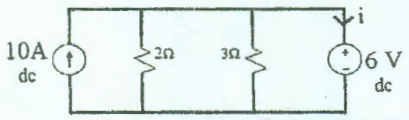


fig 2.

3. Derive RMS value of a full wave rectifier output clipped at half of its maximum value.
4. A 220 W, 110V lamp is to be connected across a 230 V, 50 Hz ac supply by connecting a capacitor in series so that the voltage across the lamp is 110V. What should be the value of the capacitor?
5. State and explain Reciprocity theorem.
6. Explain the procedure to obtain Thevenin's equivalent for the circuits containing dependent sources.
7. What are half power frequencies?
8. Draw the graph of X_L vs. frequency with respect to a series RLC circuit.
9. Prove that the power in a 3Φ system is $\sqrt{3}V_L I_L cos\emptyset$ irrespective of star or delta.
10. Distinguish between self & mutual inductances.

Part-B (5 × 10 = 50 Marks)

11. a) Prove that power in Electrical Systems is given by the product of voltage and current [4]

    b) Determine effective resistance between nodes A & B in circuit as shown in fig.3 [6]

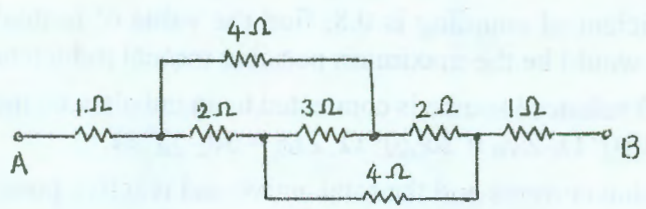


fig 3.

Contd...2

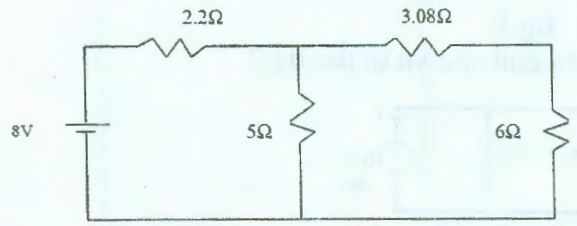
12. a) Explain the concept of phase and phase difference using suitable example. [4]

b) A parallel circuit having two branches, first branch consisting of 3Ω resistor in series with 12.7mH inductor and second branch consists of 1Ω resistor in series with 3.18mH inductor. The whole combination is connected to a 200V, 1Φ, 50Hz supply. Calculate [6]

1) Conductance & susceptance of each branch
2) The equivalent admittance
3) The current in each branch
4) The total current.

13. a) State and explain Millman's theorem. [5]

b) Applying Thevenin's theorem, determine the current through 5Ω resistor for the circuit shown in Fig.4. [5]



14. a) A series RLC circuit is connected to a variable frequency supply. State what happens when [2]

a) $f < f_r$
b) $f = f_r$
c) $f > f_r$

b) A coil has a resistance of 400Ω and inductance of 318μH. Find the capacitance of the capacitor which when connected in parallel with the coil will produce resonance with a supply frequency of 1MHz. If a second capacitor of 23.5pF is connected in parallel with the first capacitor, find the frequency at which resonance will occur. [8]

15. a) What is "Dot Convention". Explain with the help of an example. [5]

b) A 3Φ, 3 wire, 400V, RYB system supplies a delta connection of three equal impedances of 5 /45° Ohms. Determine the line currents I_R, I_Y & I_B and draw the phasor diagram [5]

16. a) Write a note on Source transformation. [4]

b) A coil takes a current of 1A at 0.6 lagging power factor from a 220V, 60Hz, single phase, 60Hz supply. If the coil is modelled by a series RL circuit find [6]

i. Complex power in the coil
ii. Values of R & L.

17. Answer any ***two*** of the following:

a) Explain Maximum Power Transfer theorem with respect to DC circuits. [5]

b) Two magnetically coupled coils have self-inductance L_1=100mH and L_2=400mH.

If the coefficient of coupling is 0.8, find the value of mutual inductance between the coils. What would be the maximum possible mutual inductance? [5]

c) A 400V, 3-Ø balanced source is connected to an unbalanced mesh connected impedances of $Z_{RY} = 10/10^\circ\ \Omega$; $Z_{YB} = 20/20^\circ\ \Omega$; $Z_{BR} = 30/-53^\circ\ \Omega$. [5]

Determine line currents and the total active and reactive power.

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Hall Ticket Number:

Code No. : 13205 S

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (CSE: CBCS) III-Semester Supplementary Examinations, May/June-2018

Logic & Switching Theory

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. Simplify the function Y = AB+A(B+C)+B(B+C) using Boolean theorems.
2. Show that (B+D)(A+D)(B+C)(A+C)=AB+CD.
3. Implement NOR gate using 2:1 Multiplexer.
4. Simplify each of the following function and implement with NAND gates.

   $F = AC^1 + ACE + ACE^1 + ACD + ADE$
5. Design a single bit comparator.
6. Implement full subtractor using De Multiplexer.
7. What is 'race around'(unstable) condition of a flip flop and how can it be eliminated?
8. Compare sequential and combinational circuits.
9. Implement the following Boolean function using ROM $F_1(A_1,A_0) = \sum(1,2)$, $F_2(A_1,A_0) = \sum(0,1,3)$.
10. Classify programmable logic Devices.

Part-B (5 × 10 = 50 Marks)

11. a) Simplify the following Boolean function using Karnaugh map method. [5]
    $F(A,B,C,D)=\sum(0,1,2,4,5,6,8,9,12,13,14)$.

    b) Obtain the prime implicants for the following Boolean function [5]
    $F(X,Y,Z)=\sum(01,3,5,7)$.

12. a) Use tabulation method to simplify the given function [6]
    $F(w,x,y,z))=\sum m(0,1,2,5,7,8,9,10,13,15)$.

    b) Implement the following Boolean function with NAND-NAND logic. [4]
    $Y=AC+ABC+A^1BC+AB+D$

13. a) Design 8×1 multiplexer using 2×1 multiplexer. [5]

    b) Implement Half Adder using 4 NAND gates. [5]

14. a) Design a counter circuit using JK flip flops which counts 0,1,2,4,5,6,0. [6]

    b) Explain SR Flip-Flop with help of NAND gates also obtain its excitation table. [4]

15. a) Implement the following two Boolean functions using PLA having three inputs, four product terms and two outputs. [6]
    $F_1(A,B,C)=\sum(0,1,2,4)$
    $F_2(A,B,C)=\sum(0,5,6,7)$.

    b) What is the architectural difference between PROM, PLA and PAL? [4]

Contd... 2

16. a) Simplify the function F(A,B,C,D) = (0,2,6,11,12,13,14) using k-maps and implement the circuit using NAND gate only. [6]

    b) Implement EX-OR gate using NAND gates and NOR gates. [4]

17. Answer any ***two*** of the following:

    a) Design a circuit with four inputs and one output where the output is 1 if the input is divisible by 3 or 7. [5]

    b) Design a Modulo-7 binary counter using J K Flip-Flop. Draw its state diagram. [5]

    c) Explain AND-OR structure of PLA & PAL. [5]

Hall Ticket Number:

Code No. : 13105 S

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (Civil Engg.: CBCS) III-Semester Supplementary Examinations, May/June-2018

Surveying-I

Time: 3 hours Max. Marks: 70

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 ×2 = 20 Marks)

1. What are the basic principles of Surveying?
2. Differentiate the terms Magnetic Declination and Dip?
3. State any two Lehmann's rules used for solving three point problem of resection?
4. Write the intersection method of plane table surveying?
5. Define sensitivity of bubble tube and state how it is calculated?
6. Write the uses of contours?
7. What are the general methods of calculating areas?
8. How do you determine volume from spot levels?
9. What are the ranges of wave lengths applicable for EDM instruments?
10. State the checks applicable for closed traverse and open traverse?

Part-B (5 × 10=50 Marks)

11. a) Write the methods of direct and indirect ranging methods of chain surveying? [5]

    b) A closed compass traverse survey was conducted round a compound wall and the WCB were observed. Determine which of the stations are affected by local attraction and calculate their corrected bearings if the magnetic declination at the place is $3^0\ 01'$ 01"W. [5]

LINE	FORE BEARING	BACK BEARING
PQ	$32^0\ 30'$	$214^0\ 31'$
QR	$124^0\ 30'$	$303^0\ 25'$
RS	$181^0\ 00'$	$1^0\ 00'$
SP	$289^0\ 30'$	$108^0\ 44'$

12. a) Explain the two point problem of plane table surveying? [4]

    b) Write the Bessel's method of resection used for solving three point problem? Draw sketches to show the salient details. [6]

13. a) Derive expressions to determine curvature and refraction effects? [4]

    b) The following readings were obtained from a reciprocal observations: The horizontal distance between P and Q is 1210 m and the RL of P = 130.015m. Determine (i) True RL of Q (ii) Angular error in the collimation adjustment of the instrument? [6]

Instrument at	P	Q
Staff readings on P	1.804	0.929
Staff readings on Q	2.748	1.616

14. a) The following are the notes of a multi-level cross section for a road. The width of the road Bed is 10m and side slopes are 1:1.5. Calculate the cross-sectional area? [6]

1.8	2.9	3.7	5.9	6.0
7.8	5.0	0.0	10.2	10.4

b) At every 100 ft along a piece of ground, level were taken. They were as follows: [4]

Feet	G.L
0	210.00
100	220.22
200	231.49
300	237.90
400	240.53
500	235.00

A cutting is to be made for a line of uniform gradient passing through the first and last points. What is the gradient? Calculate the volume of cutting on the assumption that the ground at right angles to centre line is levelled. Given: Breadth of formation 30 feet; slope of the cutting in each side 1 ½ to 1. Use prismoidal formula.

15. a) Explain the measurement of transit times and phase comparison applicable to total station measurement? [5]

b) Determine the omitted measurements of the following closed traverse? [5]

Line	Length (m)	Bearing
AB	204	$87^0\ 30^0$
BC	226	$20^0\ 30^0$
CD	187	$280^0\ 03^0$
DE	192	$210^0\ 45^0$
EA	?	?

16. a) What are the errors in Plane Table surveying and write their remedial measures? [5]

b) What are the types of chains used and write the details of lengths of their each link and total length? [5]

17. Answer any ***two*** of the following:

a) Measurement of volumes for various cross sections [5]

b) Characteristics of contours [5]

c) Methods of balancing the traverse [5]

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Hall Ticket Number:

Code No. : 13405 O3

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (ECE) II Year I-Semester Old Examinations, May/June-2018

Electromagnetic Theory

Time: 3 hours Max. Marks: 70

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. State Coulomb's law.
2. Describe about Azimuthal symmetry.
3. Write about importance of uniqueness theorem.
4. Compare homogeneous and isotropic mediums.
5. What is the inconsistency in Ampere's circuital law?
6. Describe the sources for steady magnetic fields.
7. List Maxwell's equations in dielectric medium for static fields.
8. Write important characteristics of Uniform Plane Wave.
9. Relate reflection coefficient with transmission coefficient of an electromagnetic wave.
10. Differentiate Elliptical and circular wave polarizations.

Part-B (5 × 10 = 50 Marks)
(All bits carry equal marks)

11. a) Write various charge distributions in electrostatics. Write down integral expressions for finding total charge of these distributions.

    b) The surface of a spherical conducting shell carries a uniform charge density $\rho\ c/m^3$. Find the field intensity due to a spherical shell both inside and outside.

12. a) Derive Poisson's equation.

    b) The surface at x = 0 separates two perfect dielectrics.
    For $x > 0$ $\epsilon_{r1} = 3$ and $x < 0$ $\epsilon_{r2} = 5$. If $\vec{E}_1 = 80\hat{a}_x - 60\hat{a}_y - 30\hat{a}_z$ V/m.
    Find $\vec{D}_1$, $\vec{E}_2$ and $\vec{D}_2$ if the boundary is charge free.

13. a) Explain about magnetic potentials.

    b) A current sheet $\vec{K} = 8\hat{a}_x$ A/m flows in the region -2 < y < 2 in the plane Z = 0. Show that $\vec{H}$ at P(0,0,3) is $-8\hat{a}_y$.

14. a) Formulate wave equation for magnetic field in dielectric medium.

    b) The magnetic field intensity associated with a uniform plane wave propagating in free space is given by $\vec{H} = H_0[cos(9\pi \times 10^8 t + 3\pi y)\hat{a}_x + sin(9\pi \times 10^8 t + 3\pi y)\hat{a}_y]$ A/m. Find the frequency, the direction of propagation and the associated electric field intensity.

Contd...2

15. a) Differentiate the average Poynting vector from the instantaneous Poynting vector. Give a proof of the Poynting theorem.

    b) A plane wave travelling in free space has an electric field intensity of 61.39 v/m. Find Poynting vector.

16. a) An infinite sheets with charge density of $10\eta c/m^2$ is located at y = 4 m. Find electric field at i) origin ii) y = 5m.

    b) State and derive Continuity of current equation.

17. Answer any ***two*** of the following:

    a) Applications of Biot-Savarts law.

    b) Write short note on Phasor Maxwell's equations.

    c) Reflection of plane waves by a perfect dielectric.

Hall Ticket Number:

Code No. : 13605 O3

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (IT) II Year I-Semester Old Examinations, May/June-2018

Micro Electronics

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. Briefly discuss about Semiconductors.
2. Draw the circuit symbols of a Schottky Diode and Varactor Diode.
3. Sketch a simplified structure of an npn transistor.
4. Define the term propagation delay in CMOS circuits.
5. Distinguish between Class A, B and C Power Amplifiers.
6. Define the term Noise Margin.
7. Write the expression for frequency of oscillation in a tuned LC Oscillator.
8. List the ideal characteristics of an Operational Amplifier.
9. State four application circuits of Operational Amplifiers.
10. Draw the circuit of Voltage controlled Current source using an Op Amp.

Part-B (5 × 10 = 50 Marks)

11. a) Draw i-v characteristic of a silicon junction diode to reveal relevant details in forward-bias, reverse-bias and breakdown regions. Interpret the equations: $v = n V_T \ln(i/I_S)$ and $V_T = kT/q$. [6]

    b) A silicon junction diode with $n = 1$ has $v = 0.7$ V at $i = 1$ mA. Find the voltage drop at $i = 0.1$ mA and $i = 10$ mA. [4]

12. a) Explain how a BJT acts as an Amplifier. [6]

    b) Given for a BJT $\beta = 50$ and $I_B = 10\mu A$, compute its collector current, also compute the value of α. [4]

13. a) Sketch the physical structure of MOSFET and plot its i_D-v_{DS} characteristics. [5]

    b) Implement an Ex-OR gate using CMOS transistors. [5]

14. a) Draw the general structure of a feedback amplifier as a signal-flow diagram and explain the concept of 'Loop Gain'. [5]

    b) Explain the operation of the Hartley Oscillator circuit and give an expression for its frequency of Oscillation. [5]

15. a) State and explain the characteristics of an ideal Operational Amplifier. [4]

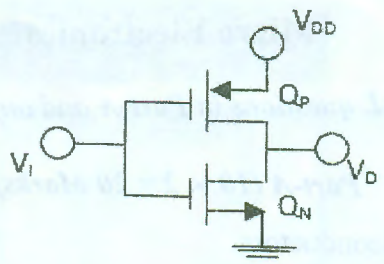
    b) Explain the instrumentation Amplifier circuit using an Operation Amplifier. [6]

Contd... 2

 Code No. : 13605 O3

16. a) Explain the input and output characteristics of a BJT in common Emitter configuration. [6]

    b) Explain the operation of the circuit given below. [4]



17. Write short notes on any ***two*** of the following:

    a) BJT and MOSFET Amplifiers. [5]

    b) Small Signal Model for Transistor Amplifier. [5]

    c) Integrator and Differentiator using Op-Amp. [5]

Hall Ticket Number:

Code No. : 13305 O3

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (EEE) II Year I-Semester Old Examinations, May/June-2018

Principles of Mechanical Engineering

Time: 3 hours Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

1. Define critical radius of insulation.
2. Define the coefficient of performance of a refrigerating machine.
3. State the significance of clearance volume in reciprocating air compressors.
4. Give the classification of gas turbines.
5. Mention the applications of belt drives.
6. List the merits and demerits of gear drive.
7. Mention any four applications of Bernoulli equation.
8. Define specific speed of hydraulic turbine.
9. List the preventive measures against cavitation.
10. Define suction head, delivery head and static head of a centrifugal pump.

Part-B (5 × 10 = 50 Marks)

11. a) Discuss the classification of heat exchangers. [5]

    b) A hollow cylinder of 5 cm inner diameter and 10 cm outer diameter has an inner surface temperature of 200^0C and an outer surface temperature of 100^0C. Determine the temperature at a point halfway between the inner and outer surfaces. If the thermal conductivity of the cylinder material is 70 W/m K, determine the heat flux through the cylinder per meter length. [5]

12. a) Explain the working of a two stroke petrol engine with a neat sketch and draw the P-v diagram. [5]

    b) Explain the classification of steam boilers. [5]

13. a) Describe the working of reverted gear train with the help of neat sketch. Also mention any two applications of the same. [5]

    b) Find the power transmitted by a belt running over a pulley of 600 mm diameter at 200 rpm. The coefficient of friction between the belt and pulley is 0.25, Angle of lap 160^0 and maximum tension in the belt is 2500 N. [5]

14. a) Explain various parameters of Darcy's formula along with their units. Also mention its applications. [4]

    b) A turbine develops 9000 kW of power running at 100 rpm. The head on turbine is 30 m. If the head on turbine is reduced to 18 m, determine the speed and power developed by the turbine. [6]

Contd....2

15. a) Explain the working principle and constructional details of a centrifugal pump with a neat sketch. [5]

    b) A double acting reciprocating pump running at 40 rpm is discharging 1 m^3 of water per minute. The pump has a stroke of 400 mm. The diameter of the piston is 200 mm. The delivery and suction heads are 20 m and 5 m respectively. Find the slip of the pump and power required to drive the pump. [5]

16. a) Explain the working of air refrigeration system working on Bell-Coleman cycle. [5]

    b) The torque produced by an IC engine is 140 N-m. Engine consumes 4.2 kg/h of fuel at a rated speed of 1000 rpm. The calorific value of the fuel is 43900 kJ/kg. Calculate: (i) Brake specific fuel consumption and (ii) Brake thermal efficiency. [5]

17. Answer any ***two*** of the following:

    a) Derive the condition for maximum power transmission in the case of belt drive. [5]

    b) Explain the working principle of Orifice meter with the help of neat sketch. [5]

    c) Sketch single acting and double acting reciprocating pump and label the parts. [5]

Hall Ticket Number:

Code No. : 13505 O3

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (Mech. Engg.) II Year I-Semester Old Examinations, May/June-2018

Mechanics of Materials

Time: 3 hours Max. Marks: 70

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. State and explain Hooke's law.
2. Explain what happens if Poisson's ratio of a material is zero.
3. Define bending moment and shear force.
4. Draw the bending stress diagram of a rectangular section at support section of cantilever beam, which is subjected to a point load at the free end. Indicate tension and compression zones.
5. A rectangular beam of 200 mm×350 mm subjected to a shear force 30 kN. Find average shear stress and maximum shear stress.
6. An element is subjected to 20 N/mm^2 (compression) and 30 N/mm^2 (compression) in perpendicular directions. Determine maximum and minimum principal stresses.
7. What are the limitations of double integration method?
8. Give the boundary conditions used to determine slope and deflection in a cantilever beam of length 'L' subjected to a point load at free end.
9. Define middle third rule and explain its importance.
10. Classify the columns based on their failure.

Part-B (5 × 10 = 50 Marks)

11. a) Briefly explain thermal stress and thermal strain. [3]

    b) A short steel tube of external diameter 75 mm and internal diameter 50 mm is surrounded by a brass tube of same length and having external diameter 100 mm and internal diameter 75mm. The tubes are rigidly fixed and an axial load of 20 kN is placed on the tubes, Find the load carried by each and also shortening of each tube, if it is 250 mm long. Take $E_s = 2\times10^5$ N/mm^2 and $E_b = 1\times10^5$ N/mm^2. [7]

12. a) Define Modulus of section, Moment of resistance and Flexural rigidity. [3]

    b) A simply supported beam of length 4 m carries an U.D.L of 3kN/m over central 2 m length and two point loads 2 kN and 3 kN at a distances 0.5 m and 3.5 m from the left support. Draw Shear force and Bending moment diagrams. [7]

13. a) A rectangular element in a strained material is subjected to tensile stresses of 120 N/mm^2 and 60 N/mm^2 on two mutually perpendicular planes together with a shear stress of 70 N/mm^2. Fine the principal stresses, principal planes and maximum shear stress in the block. [4]

    b) A beam of I section top and bottom flanges 200 mm×20 mm and web 20mm×360 mm. Calculate the maximum intensity of shear stress across the section and sketch the shear stress distribution across the section of the beam, if it carries a shearing force of 300 kN at a section. [6]

Contd... 2

14. a) Find the torque which a shaft of 100 mm diameter can transmit safely, if the shear stress is not exceeding 120 N/mm^2. [3]

    b) A simply supported beam of span 4 m and circular cross section is having a diameter of 200 mm is loaded with UDL 10kN/m over a 2 m length from left support. Determine maximum deflection of the beam. Take $E=2\times10^5 N/mm^2$. [7]

15. a) Briefly explain the difference in analysis of thin and thick cylinders. [4]

    b) A hollow cylindrical cast iron column of 150mm external diameter and 15mm thickness, 3 m long and is hinged at one end and fixed at the other. Find (a) the Euler's crippling load (b) for what length, the critical load by Euler's formula will be equal, if both ends of the column are hinged. [6]

16. a) Draw stress stain curve for mild steel. Indicate and explain the salient points. [5]

    b) A simply supported beam of length 10 m carries two UDL each of magnitude 2kN/m over a length of 3 m from both supports. Draw S.F. and B.M. diagrams. [5]

17. Answer any ***two*** of the following:

    a) Briefly explain graphical method of finding principal stresses, when a rectangular element subjected to normal stresses and shear stress. [5]

    b) What are the different assumptions made in torsion of circular shafts? [5]

    c) What do you mean the term limit of eccentricity? Find out the limit of eccentricity for i) a solid circular section for diameter 'D' and (ii) for a rectangular section (b×d). [5]

Hall Ticket Number:

Code No. : 13506 S

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (Mech. Engg.-: CBCS) III-Semester Supplementary Examinations, May/June-2018

Thermodynamics

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. Distinguish between intensive and extensive properties of thermodynamics.
2. Can we do ideal gas thermometer experiment at high pressures? Why?
3. Define specific heats at constant volume and at constant pressure.
4. What are the limitations of the First law of Thermodynamics?
5. What is the principle of increase of entropy?
6. State second law of Thermodynamics.
7. Draw the vapour dome of water on T-s and h-s coordinates.
8. Write Clapeyron Equation and its importance.
9. State Amagat's law.
10. Write expressions for Thermal efficiency of Otto and Diesel cycles.

Part-B (5 × 10 = 50 Marks)

11. a) Consider an electric refrigerator located in a room. Determine the direction of the work and heat interactions (in or out) when the following are taken as the system: [3]
    i) the contents of the refrigerator
    ii) all parts of the refrigerator including the contents
    *iii)*everything contained within the room during a chilling winter day.

    b) Explain the working of constant volume gas thermometer with neat sketch. [7]

12. a) 0.2 m^3 of air at 4 bar and 130^{0}C is contained in a system. A reversible adiabatic expansion takes place till the pressure falls to 1.02 bar. The gas is then heated at constant pressure till enthalpy increases by 72.5 kJ. Determine [5]
    i) the work done
    ii) the index of expansion, if the above processes are replaced by a single reversible polytropic process giving some work between the same initial state and final states. take c_p=1 kJ/kgK and c_v=0.714 kJ/kgK.

    b) Develop an expression for the work done in an adiabatic process. [5]

13. a) Two reversible heat engines A and B are arranged in series, A rejecting heat directly to B. Engine A receives 200 kJ at a temperature of 421°C from a hot source, while engine B is in communication with a cold sink at a temperature of 4.4°C. If the work output of A is twice that of B, find [5]
    i) The intermediate temperature between A and B
    ii) The efficiency of each engine
    *iii)*The heat rejected to the cold sink

    b) An inventor claims to have developed an engine that takes in 105 MJ at a temperature of 400 K, rejects 42 MJ at a temperature of 200 K, and delivers 15 kWh of mechanical work. Evaluate the claim of inventor. [5]

Contd... 2

Code No. : 13506 S

14. a) A piston/cylinder contains 1 kg water at 20^0C with volume 0.1 m^3. By mistake someone locks the piston preventing it from moving while we heat the water to saturated vapor. Find the final temperature and the amount of heat transfer in the process. [4]

    b) One-tenth percent of 1 m^3 capacity closed vessel is occupied by water and remaining by steam in thermal equilibrium with water at 10 bar pressure. This vessel is heated by external means. The pressure at the end of heating is 12 bar. After heating, 25% mass is blown-off from the vessel. Determine: (i) quality of steam at the beginning (ii) Degree of super heat at the end of heating process (iii) Heat supplied by external means (iv) Final specific volume of steam in the vessel. [6]

15. a) An engine working on Otto cycle with the following data : [5]
    Maximum temperature = 1227°c.
    Exhaust temperature = 427°c,
    ambient conditions = 1bar and 27°c.
    Determine the compression ratio, maximum pressure and efficiency.

    b) Represent Otto cycle, Diesel cycle, Dual cycle on P-v and T-s Co-ordinates and compare them. [5]

16. a) Along with the definitions of reversible and irreversible process, explain the following cases (cycle) are reversible or not. Support your answer. [5]
    i) a steel bar is heated from 20^0C to 100^0C by means of heater and cooled down to initial temperature by means of water.
    ii) Human is inhaling and exhaling air.

    b) What is the property derived from the first law of Thermodynamics? Prove that characteristic of the system is a property? [5]

17. Answer any ***two*** of the following:
    a) State and prove Clausius inequality. [5]
    b) You want a pot of water to boil at 105°C. How heavy a lid should you put on the 15cm diameter pot when Patm = 101 kPa? [5]
    c) Draw the Rankine cycle on P-v and T-s coordinates. Explain/represent different possible cases of steam entry into the turbine. [5]

Hall Ticket Number:

Code No. : 13306 S

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (EEE: CBCS) III-Semester Supplementary Examinations, May/June-2018

Electrical Machinery-I

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2=20 Marks)

1. Why magnetic field only used as coupling medium in energy conversion devices?
2. Draw a schematic diagram for mechanical to electrical energy conversion.
3. Write different types DC machines based on their excitation process.
4. Distinguish between lap and wave winding connections.
5. Justify the statement that a DC series motor could not be started at no-load.
6. Mention the reason for DC shunt motor not to be used for cranes and hoists.
7. What is the effect of leakage flux in a transformer?
8. How Sumpner's test is called back to back test?
9. Where and why tertiary winding is used?
10. Why the wave shape of magnetizing current of a transformer is non sinusoidal?

Part-B (5 × 10 = 50 Marks)

11. a) Derive expression of field energy, co-energy and magnetic force in a singly excited electromechanical system. [5]

    b) A doubly excited rotary machine has the inductance coefficients for stator as L_{11} = 1.1+0.4 Cos 2θ and for rotor as L_{22} = 0.03+0.005 Cos 2θ. The mutual inductance coefficient between stator and rotor as L_{12} = 0.2 Cos θ. Exciting currents for stator and rotor are 8A & 50A respectively. Determine the torque relation for this system. [5]

12. a) Explain the construction of a DC machine with a neat schematic. [5]

    b) An 8 pole generator has 480 conductors connected in wave winding. The armature current is 200A. Find the armature reaction demagnetizing and cross magnetizing ampere turns if (a) Brushes are in geometrical neutral axis (GNA), (b) when brushes are shifted 6^0 from GNA. [5]

13. a) Derive the torque equation for a DC motor. [5]

    b) A DC shunt motor has the following observations during Swinburne's test: Voltage = 600 V, current = 8 A. Its armature resistance is 0.1 Ω and shunt field resistance is 300Ω. Find the efficiency of the machine as motor and generator for 100 A load as generator and 100 A line current for motor. Assume stray losses are 1% of output. [5]

14. a) Distinguish between two winding transformer and auto transformer. [5]

    b) An 800 kVA transformer has core loss of 7.5 kW and full load copper loss of 14.2 kW Find the all day efficiency of the transformer for its duty cycle as 500 kW at 0.8 power factor for 6 hours, 700 kW at 0.9 power factor for 4 hours, 300 kW at 0.95 power factor for 4 hours and no load for 10 hours. [5]

Contd... 2

Hall Ticket Number:

Code No. : 13506 O3

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (Mech. Engg.) II Year I-Semester Old Examinations, May/June-2018

Thermodynamics

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. State *Zeroth law of thermodynamics*. What is its *importance*?
2. Define the *standard fixed point* of thermometry.
3. Define *enthalpy* and compare it with *internal energy*.
4. List out the *limitations* of the *first law of thermodynamics*?
5. What is *perpetual motion machine* of *second kind* (*PMM-II*)?
6. Explain the *principle of entropy increase*.
7. Explain the terms *latent heat* and *sensible heat* as applied to a pure substance.
8. Differentiate between *water* and *other pure substances* with the help of a *p-T* diagram.
9. Illustrate *Brayton cycle* on *p-v* and *T-S* planes.
10. State the *law of partial volumes*.

Part-B (5 × 10 = 50 Marks)

11. a) Define *specific heat*. Why do gases have two specific heats? [3]

    b) With the help of a neat sketch, explain the *working principle* of a *constant volume ideal gas thermometer*. [7]

12. a) With the help of first law of thermodynamics, prove that *internal energy* is a property. [3]

    b) *One kg* of air at *1 bar* and *300 K* is compressed *adiabatically* till its pressure becomes *five times* the original pressure. Subsequently it is expanded at *constant pressure* and finally cooled at *constant volume* to return to its original state. Calculate the *heat* and *work* interactions, and *change in internal energy* for each process and for the entire cycle. [7]

13. a) What is an *isentropic process*? Explain the difference between an *isentropic process* and an *adiabatic process*. [3]

    b) Define *entropy* and show that for an irreversible process [7]

$$\int ds > \int \frac{\delta Q}{T}$$

14. a) With the help of a p-v diagram, illustrate and explain an *isothermal process of compression* for water (pure substance) starting from an initial thermodynamic state of superheated vapour. [3]

    b) A rigid tank of *1 m^3* volume contains dry saturated steam at *0.2 MPa*. Due to poor insulation, there is heat transfer to the surroundings and the pressure drops to *0.1 MPa* after some time. Estimate the *final dryness fraction* and the amount of *heat* transferred. [7]

Contd... 2

15. a) State and prove *Dalton's law of partial pressures*. List out the *assumption* on which this law is based. [3]

    b) A gas mixture consists of *0.5 kg* of *carbon monoxide*, *1 kg* of *carbon dioxide* and *1.5 kg* of *nitrogen*. Determine: (i) *mass fraction* of each component, (ii) *mole fraction* of each component, (iii) *equivalent molecular weight* of the mixture, (iv) *equivalent Gas constant* of the mixture. (Molecular weights:: $CO = 28$ *kg/kg-mol*, $CO_2 = 44$ *kg/kg-mol* and $N_2 = 28$ *kg/kg-mol*). [7]

16. a) Explain the terms *closed system* and *open system*. Give *practical examples* of each. [5]

    b) Using the *steady flow energy equation*, develop the *governing equations* for i) *turbine*, ii) *nozzle*, and iii) boiler. [5]

17. Answer any ***two*** of the following:

    a) Prove that the "efficiency of an engine working on reversible cycle depends only on the temperature of source and sink and is independent of the working fluid." [5]

    b) *0.8 kg* of steam at a pressure of *15 bar* and *250°C* expands to *1.5 bar*. Assuming that steam expands according to the law $pV^{1.25} = constant$, estimate the *final dryness fraction*, *work done*, *heat* transferred and *change of entropy* during the expansion. [5]

    c) An air-standard *Otto cycle* has a compression ratio of *8*. At the start of the compression process, the temperature is *26°C* and the pressure is *1 bar*. If the maximum temperature of the cycle is *1080°C*. Determine (i) the *heat supplied* per kg of air, (ii) the *net work done* per kg of air, and (iii) the *air-standard efficiency* of the cycle [5]

Hall Ticket Number:

Code No. : 13206 S

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (CSE: CBCS) III-Semester Supplementary Examinations, May/June-2018

Introduction to Electronics Engineering

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. Describe the formation of a depletion region in PN junction.
2. Define a rectifier. Compare different types of it.
3. What is Early effect? How does it affect the V-I characteristics?
4. Briefly discuss how Zener diode acts as a voltage regulator.
5. Name the types of feedback used in amplifier circuits.
6. What is an oscillator? Give its classification.
7. Make a comparison between an ideal op-amp and practical op-amp.
8. Show that the dual of the Exclusive-OR is also its compliment.
9. What is LVDT? With the help of a graph, show the relation between the output voltage and the displacement of a core.
10. List the applications of CRO.

Part-B (5 × 10 = 50 Marks)
(All bits carry equal marks)

11. a) Differentiate between Static and Dynamic resistances of a PN junction diode with the help of its VI characteristic curves.
    b) What is the ripple factor, if a power supply of 220V, 50 Hz is to be full wave rectified and filtered with a 220 micro farad capacitor before delivering to a resistive load of 120 ohms?
12. a) Define the four hybrid parameters of a BJT in CE configuration. Also draw its equivalent circuit.
    b) Explain in detail about the Avalanche and Zener breakdown mechanisms.
13. a) Draw drain and transfer characteristics of JFET.
    b) With a neat sketch, explain the working principle of Hartley oscillator.
14. a) Op-amp acts as a differentiator and an integrator as well. Justify.
    b) Design Half adder and Half subtractor using logic gates along with Boolean expressions and truth tables.
15. a) With the necessary sketches, discuss the working principle of a thermocouple.
    b) Explain the construction and working principle of SCR.
16. a) Discuss the conductivity and mobility aspects of semiconductors.
    b) Write the differences between BJT and FET. Also list the applications of JFET.
17. Answer any ***two*** of the following:
    a) An amplifier has voltage gain with feedback of 100. If the gain without feedback changes by 20 % and gain with feedback should not vary more than 2%, determine the value of open loop gain A and feedback ratio β.
    b) Realize the basic logic gates OR, AND and NOT gates using universal logic gates only.
    c) Explain the constructional details and working of UJT.

Hall Ticket Number:

Code No. : 13106 S

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (Civil Engg.: CBCS) III-Semester Supplementary Examinations, May/June-2018

Geology

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. Define the hardness and cleavage of a mineral.
2. Write about the cross bedding and graded bedding in sedimentary rocks.
3. Differentiate the angular unconformity and disconformity.
4. What is spheroidal weathering in basalt.
5. What is a spring.
6. Draw a neat sketch of hydrological cycle and label the various components.
7. Analyse a dam failure that you know.
8. Write about the reservoir induced seismicity.
9. What is a standup time.
10. What are seismic waves.

Part-B (5 × 10 = 50 Marks)

11. Give geological description and engineering properties of the following rocks: [10]
    a) Granite b) Basalt c) Laterite d) Slate
12. a) Explain the various classifications of faults. [6]
    b) Describe the main processes of chemical weathering. [4]
13. a) Explain the suitability of groundwater occurrences in various lithological formations [5]
    b) Describe the different types of aquifers. [5]
14. a) Explain the geology of any one major dam site of India. [6]
    b) Suggest the solutions for the problems associated with the silting of reservoirs. [4]
15. a) Discuss the role of various geological considerations for selection of tunnels. [7]
    b) Describe the intensity of earthquakes. [3]
16. a) Write in detail the various structures exhibited by metamorphic rocks. [4]
    b) Explain in brief the classifications of folds. [6]
17. Answer any ***two*** of the following:
    a) Groundwater exploration [5]
    b) Describe the various geological considerations for selection of a dam site. [5]
    c) What are the causes and remedial measures for prevention of land slides. [5]

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Hall Ticket Number:

Code No. : 13606 S

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (IT: CBCS) III-Semester Supplementary Examinations, May/June-2018

Digital Electronics & Logic Design

Time: 3 hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. Implement the function $F = (x_1 + x_2).x_3$ using logic gates.
2. Define SOP & POS. Write the equivalent SOP expression for F $(x, y, z) = x'y+xz+y'z$.
3. Define Multiplexer. Construct 4x1 multiplexer using 2x1 multiplexer.
4. Construct combinational circuit for a 2 bit multiplier.
5. Construct the circuit diagram of Gated D latch. Write the truth table and excitation table.
6. Define Counters and draw Johnson counter logic diagram.
7. List out the differences between asynchronous and synchronous sequential circuit.
8. Define propagation delay, setup time and Hold Time of Flip Flop.
9. Illustrate the primitive flow table with example.
10. Discuss the significance of hazard?

Part-B (5 × 10 = 50 Marks)
(All bits carry equal marks)

11. a) Implement the function $f = (x_1 + x_2)(x_2 + \overline{x_3})$ using NOR gates.
    b) Demonstrate by means of truth table the validity of the following identity
    $x + yz = (x + y)(x + z)$

12. a) Implement the following functions using PLA.
    $f_1(a, b, c) = \sum(0, 1, 2, 4)$ $f_2(a, b, c) = \sum(0, 5, 6, 7)$
    b) Design logic circuit of 2-to-4 decoder and write the VHDL code for the same.

13. a) Design 3-bit up counter. Explain its operation with timing diagrams.
    b) Discuss about decoding problems in asynchronous sequential circuit.

14. a) List out the differences between Mealy and Moore models.
    b) Design a synchronous counter with the repeated binary sequence $0 \rightarrow 2 \rightarrow 4 \rightarrow 6 \rightarrow 8 \rightarrow 0$ using D flip flop.

15. a) Explain in detail steps for digital hardware modelling using CAD tools
    b) Write notes on following terms:
    i) Transition table ii) Flow table

16. a) Simplify the following Boolean function using Karnaugh map.
    $f(a, b, c, d, e) = \sum(0, 2, 4, 6, 9, 13, 21, 23, 25, 29, 31)$
    b) Design Carry look ahead adder.

17. Answer any ***two*** of the following:
    a) Compare Flip flops Vs Latches
    b) Draw the logic diagram of ring counter. Explain its operation with timing diagram.
    c) Draw the ASM chart for multiplying two 4 bit numbers. Explain its multiplication operation with numerical example.

Hall Ticket Number:

Code No. : 13606 O3

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (IT) II Year I-Semester Old Examinations, May/June-2018

Digital Electronics and Logic Design

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. Implement the Boolean function F=A(CD+B)+BC' using NAND gates.
2. Write VHDL Program for implementing XOR operation.
3. Give any two differences between PLAs and PALs.
4. Implement an Half adder circuit.
5. Convert D flip-flop to T flip-flop using excitation tables.
6. Give the truth tables and excitation tables of SR and JK flip flops.
7. Differentiate between Mealy and Moore state models.
8. List two differences between synchronous sequential circuits and asynchronous sequential circuits.
9. Differentiate between static and dynamic hazards.
10. Define set up and hold time of a flip-flop.

Part-B (5 × 10 = 50 Marks)

11. a) Minimize and implement $f(x_1, x_2, x_3) = \sum m(1,3,4,7)$ using only NOR gates. [8]
    b) Write short notes on TTL 74 series gates. [2]

12. a) Design a 4 input priority encoder. [5]
    b) Explain Arithmetic comparison circuits. [5]

13. a) Design a 3 bit binary counter using T Flip flop. [5]
    b) Explain JK flip-flop with neat circuit diagram and timing diagram. [5]

14. a) Design a sequential circuit with two D flip flops A and B and one input x. When x = 0, the state of the circuit remains the same. When x=1, the circuit goes through the state transitions from 00 to 01 to 11 to 10 and back to 00 and repeats. [8]
    b) Write short notes on CAD tools. [2]

15. a) Explain digital hardware design flow. [5]
    b) Explain the different types of hazards in combinational circuits. [5]

16. a) Implement $f(x_1, x_2, x_3) = \sum m(1, 2, 4, 7)$ (i) using 2:1 multiplexers only and (ii) using 4:1 multiplexers only. [7]
    b) Explain the significance of number system. [3]

17. Answer any ***two*** of the following:
    a) Master-slave edge triggered flip-flops. [5]
    b) FSM as an arbiter circuit. [5]
    c) ASM charts. [5]

Hall Ticket Number:

Code No. : 11011 S

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (CBCS) I-Semester (New) Supplementary Examinations, May/June-2018

English-I

Time: **3** hours Max. Marks: **60**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***
Answer all of Part-A in one place before attempting Part-B

Part-A (20 Marks)

1. **Rewrite the following sentences by making necessary corrections.** [4]
   a) The bell rang by the time we reached the playground.
   b) Unless you do not give up bad habits, you will repent.
   c) I have read that book yesterday.
   d) One lakh rupees are what he won in the lottery.

2. **Fill in the blanks with the appropriate word given in bracket.** [2]
   a) He _____over his examination paper as he studied all night long. (doused, dozed)
   b) My boss met with a terrible accident as the car _____failed. (breaks, brakes)

3. **Fill in the blanks with an appropriate preposition or article.** [2]
   a) Ravi Shankar is _____ music maestro.
   b) Do you like listening ___ music?

4. **Identify the parts of speech in the following sentences.** [2]
   a) The road is slippery after the rain.
   b) They nearly succeeded.

5. **Fill in the blanks with appropriate cohesive devices.** [2]
   a) Essays must be handed in by the deadline, _____they will not be marked. (obviously, otherwise , as a result)
   b) The two main Channel Islands, ___Jersey and Guemcey, are much closer to France than to England. (for example, namely, in particular)

6. **Read the passage and answer the questions that follow:** [4x1=4]

The world is now warmer than at almost any time since the end of the last ice age and, on present trends, will continue to reach a record high for the entire period since the dawn of civilisation, a study has found. The study published in the journal Science, aims to give a global overview of Earth's temperatures over the past 11,300 years - a relatively balmy period known as the Holocene that began after the last major ice age ended and encompasses all of recorded human civilization.

Their data (compiled by studying such things as ice cores, fossils and ocean sentiment) looked back over a much longer era than previous research, which went back 1,500 years. Scientists say it is further evidence that modern-day global warming isn't natural, but the result of rising carbon dioxide emissions that have rapidly grown since the Industrial Revolution began roughly 250 years ago. Scientists say that if natural factors were still governing the climate, the Northern Hemisphere would probably be destined to freeze over again in several thousand years. Instead, scientists believe the enormous increase in greenhouse gases caused by industrialization will almost certainly prevent that.

Shaun Marcott, a geologist at Oregon State University, says "global temperatures are warmer than about 75 percent of anything we've seen over the last 11,000 years or so." The other way to look at that is, 25 percent of the time since the last ice age, it's been warmer than now. It has taken just 100 years for the average temperature to change by 1.3 degrees, when it took 5,000 years to do that before. By the end of the century, climate warming models predict an additional increase of 2 to 11.5 degrees, due largely to carbon emissions, the study noted.

Contd...2

Code No. : 11011 S

i. - 'Dawn' in this text means:
a) Earth b) Sunrise c) Heat d) Beginning

ii. 'Balmy' means:
a) Cold b) Hot c) Cool d) Warm

iii. The Earth's temperature has increased quickly since:
a) The Northern Hemisphere b) The Holocene c) The Industrial Revolution
d) 1,500 years ago

iv. 'Prevent' means
a) Slow b) Encourage c) Stop d) Complete

7. **Choose the appropriate synonym from the options given below:** [2x1=2]
a) She was skeptical about the newly introduced medicine ( )
i. certain ii. doubtful iii. hopeful iv. sure
b) Let us not aggravate the problem ( )
i. appreciate ii. Advocate iii. Alleviate iv. worsen

8. **Punctuate the following:** [2x1=2]
a) delhi capital of indian union is on the banks of river jamuna.
b) some men eat that they may live however others live that they may eat.

Part-B (5 ×8 = 40 Marks)

(All sub-questions carry equal marks)

9. a) Mention the four channels of communication and explain the importance of each in an organisation.
b) Construct a dialogue between two friends on the ***importance of learning English today***.

10. a) "Response or feedback is the most important component of communication". Justify this statement with examples.
b) How does the poet compare the main theme with the dilemma one faces in real life? Explain it with reference in the poem 'The Road not Taken'.

11. a) Mention about five barriers to listening? Suggest a few measures to overcome them.
b) Why does Ruskin Bond in "The Eyes are not here" feel that people with good eye sight fail to see what is right in front of them?

12. a) What are some of the speaking strategies you would adopt to become a successful professional?
b) Explain the nonverbal forms of communication that are necessary to make a speech effective.

13. a) What is formal and informal communication? Explain by giving two examples for each.
b) Write a paragraph on "technology is not a boon to society anymore" Use connectives and punctuations appropriately

14. a) Active listening can improve ones performance. Discuss.
b) What is skimming and scanning in reading. Give examples for each after defining them?

15. Write any *two* of the following
a) Draw the processes of communication and explain each in brief.
b) Which road does the poet in the poem "The Road not taken", choose? Is he happy with his decision?
c) Briefly describe the conversation between the girl and the narrator in the story "The eyes are no there".

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Hall Ticket Number:

Code No. : 11012 EG O3

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD
B.E. (CBCS) I-Semester Old Examinations, May/June-2018
Engineering Graphics-I
(Civil, EEE & Mech. Engg.)

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. What is the difference between plane scale and diagonal scale?
2. Distinguish between aligned and unidirectional system of dimensioning with the help of sketches.
3. The locus of a point that moves so that its distance from a fixed point called the _____ bears a constant ratio, always less than 1, to its perpendicular distance from a straight line called the _____.
4. Sketch an appropriate ellipse of major axis 12 cm and minor axis 8 cm.
5. The top view of a 75mm long line measures 55mm. The line is in VP, its one end being 25mm above the HP. Draw its projections.
6. A point D is situated 40 mm below HP and 20 mm in front of VP. Draw the projections.
7. Show a plane parallel to VP and 40 mm in front of it lying in the first quadrant by means of their traces.
8. What is the major difference(s) between Orthographic and Isometric projection?
9. What are the various positions which a solid can take with respect to the reference planes?
10. A cylinder is resting on HP with its axis parallel to VP and 30 mm in front of VP. Draw the front and top views if the diameter of the cylinder is 50 mm and height is 70 mm.

Part-B (5 × 10 = 50 Marks)

11. a) What is the scale factor? [4]

    b) A rectangular plot of land measuring 1.28 hectare is represented on a map by a simple rectangle of 8 sq.cm. Calculate RF of the scale. Draw diagonal scale to read single meter. Show a distance of 438 m on it. (Hint: 1 hectare = 10,000 sq. meters). [6]

12. a) What are different types of cycloidal curves, explain them in brief? [4]

    b) A circle of 50mm diameter rolls on another circle of 175mm diameter. Draw the locus of a point on the circumference of the rolling circle for its one complete revolution. Draw a tangent and normal to the curve at a point 100mm from the centre of the directing circle. [6]

13. a) The shortest distance of the point E to intersection line of HP and VP is 36 mm and point is 20 mm above HP. Draw the front and top views, if the point is in second quadrant. [4]

    b) The top view of a 75mm long live AB measures 65mm while length of its front view is 50mm. Its one end A is in HP and 12mm in front of VP. Draw the projections of AB and determine its inclinations with the HP and VP. [6]

Contd... 2

14. a) Write the classifications of the planes with respect to reference planes. [4]

    b) A circular plane, 50mm diameter appears as an ellipse in the front view, having its major axis 50mm long and minor axis 30mm long. Draw its top view when the major axis of ellipse is horizontal. [6]

15. a) Draw the projection of a triangle prism of side 20 mm and axis 35 mm, if it is resting on HP with its axis parallel to both HP and VP and in front of VP. [5]

    b) Draw the projections of the cube of side 50 mm when it rests on the ground on one of its corner and a face containing that corner is inclined at 30° to the ground and perpendicular to VP. [5]

16. a) Explain the elements of dimensioning with the help of sketches. [5]

    b) Draw a parabola with its base equal to 180 mm and axis equal to 70 mm and mark focus and directrix on it. [5]

17. Answer any ***two*** of the following:

    a) The end projectors of a line PQ are 50 mm apart, while those drawn for its H.T. and V.T. are 90 mm apart. The H.T. is 40 mm in front of the V.P. and V.T. is 80 mm above the H.P. Draw projections of PQ if its end P is 10 mm above the H.P. Also determine its true length and inclinations with the reference planes. [5]

    b) A square lamina of 40 mm side rests on one of its sides on HP. The lamina makes 30^0 to HP and the side on which it rests makes 45^0 to VP. Draw its projections. [5]

    c) A Cone having 50 mm diameter and 70 mm long axis has a point of its base circle in the VP, such that the axis is inclined at 45^0 to the VP and parallel to the HP. Draw its projections. [5]

Hall Ticket Number:

Code No. : 11012 BEE O3

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (CBCS) I-Semester Old Examinations, May/June-2018

Basic Electrical Engineering

(CSE, ECE & IT)

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

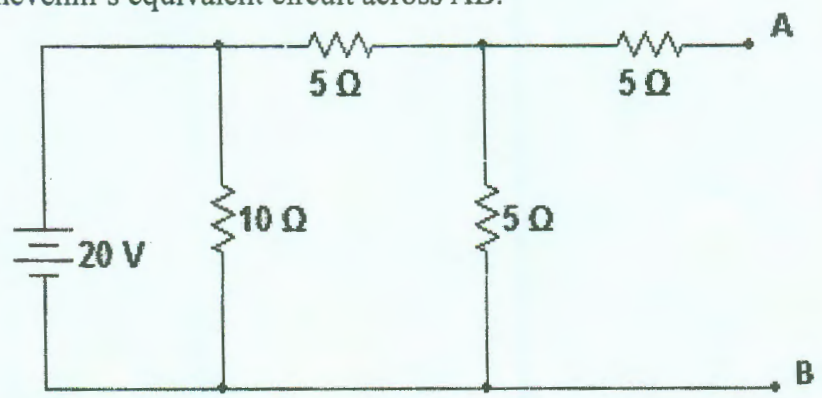
Part-A (10 × 2 = 20 Marks)

1. Distinguish between series and parallel circuits.
2. Define Ohm's Law.
3. Define a) Form factor b) Peak factor of an alternating quantity.
4. An alternating current is represented by $i = 141.4 \sin 628t$. Find its maximum value RMS Value, frequency and time period.
5. What is the function of commutator in a d.c generator?
6. Which d.c motor is preferred for traction applications and why?
7. What are the various losses in a transformer?
8. What are the two types of rotors used in 3 phase alternators?
9. Write the function of super heater in thermal power plant.
10. What are the various applications of stepper motors?

Part-B (5 × 10 = 50 Marks)

11. a) Define i) Power in DC circuits ii) Superposition theorem. [4]

    b) Obtain the Thevenin's equivalent circuit across AB. [6]



12. a) Derive the Average and RMS values of a sinusoidal alternating quantity. [5]

    b) A series circuit consists of resistance of 50 Ω and capacitance of 10 μF. If the applied voltage across the circuit is 100 V at 50 Hz, find i) impedance ii) current iii) power factor iv) power consumed. [5]

13. a) Derive the torque equation of a d.c motor. [5]

    b) A 4 pole lap wound, long shunt d.c compound generator supplies a 20 kW load at 500 V. The armature, series and shunt field resistances are 0.02 Ω, 0.04 Ω and 250 Ω respectively. Determine the emf generated. [5]

Contd...2

14. a) Explain the construction of a 3-phase alternator. [5]

    b) A 100 kVA single phase transformer has iron loss of 1000 W and full load copper loss of 1200 W. Find its efficiency at full load, 0.8 power factor. [5]

15. a) What are the various types of collectors used in solar power stations? [5]

    b) Explain the construction and principle of operation of 1-phase motor used in ceiling fans. [5]

16. a) Classify different types of network elements and explain with examples. [5]

    b) Derive the relation between line and phase quantities in a 3-phase star connection. [5]

17. Write short notes on any ***two*** of the following:

    a) Classification of d.c generators according to excitation. [5]

    b) Principle of rotating magnetic field. [5]

    c) Wind power station. [5]