Code No. 427/CBCS/S

FACULTY OF ENGINEERING

B.E. (Civil) III - Semester (CBCS) (Suppl.) Examination, May/June 2018

Subject : Strength of Materials – I

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

Note: Answer all questions from Part-A & any five questions from Part-B.

PART – A (20 Marks)

1 Differentiate between brittle and ductile materials.
2 The Young's modulus(E) of a material is 100 KN/mm^2 and its shear modulus(C) is 40 KN/mm^2. Calculate its Poisson's ratio.
3 Draw the bending moment diagram for a cantilever beam of span 3m subjected to a clockwise couple of 20 kN-m at its free end.
4 Calculate the section modulus of a square section of side 90mm.
5 Sketch the core of a solid circular section of diameter 'd' and find the area of core section.
6 What is the relation between average shear stress and maximum shear stress in rectangular and circular sections?
7 A point in a strained material is subjected to a direct stress of 80MPa. Calculate the resultant stress on a plane making 30^o with the axis of given stress.
8 Derive an expression for circumferential stress in a thin cylinder due to internal pressure.
9 Define shear flow and sketch the shear flow of T-section.
10 Explain unsymmetrical bending.

PART-B (50 Marks)

11 A steel rod of 20mm diameter is enclosed in a copper tube of 22mm internal and 24mm external diameter. The ends are rigidly fastened by nuts and washers. The nuts are tightened until there is a tension of 12 kN in the rod. Calculate the stresses in rod and tube if the temperature of the assembly is raised by 60^{o}C. E_s=200 GN/m^2, E_c=100 GN/m^2, α_s=12x10^{-6} /^{o}C & α_c=18x10^{-6} /^{o}C.

12 Draw Shear force and Bending moment diagrams for the simply supported beam shown in fig.1

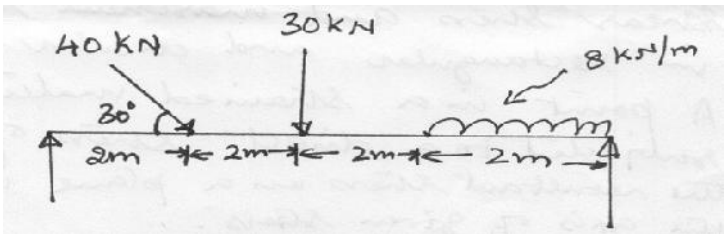


Fig-1

13 The cross section of a beam is a T- section having flange 120mm x 10mm and web 10mm x 150mm. Calculate the shearing stresses induced in the beam section due to a shear force of 90kN. Also, sketch the shear stress distribution across the section of beam.

..2

14 A point in a strained material is subjected to direct stresses of 140 N/mm^2 (tensile) and 80 N/mm^2 (compressive) in two mutually perpendicular directions. It is also accompanied by a shear stress of 30 N/mm^2. Calculate Principal stresses, position of Principal planes and maximum shear stress.

15 A column of rectangular section 3m x 2m is subjected to a load of 240 kN acting at a point P as shown in fig 2. Determine the stresses at all four corners.

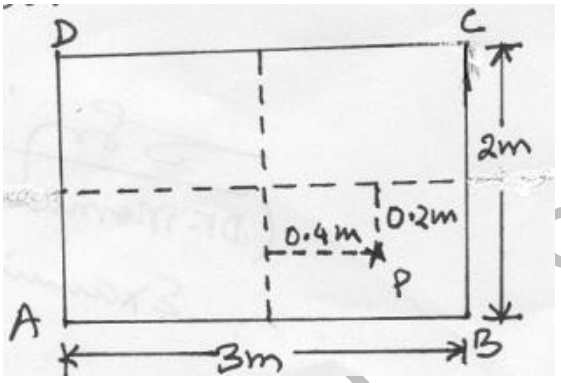


Fig-2

16 A thick cylinder of internal diameter 200 mm is required to withstand a pressure of 30 N/mm^2. if the permissible hoop stress is 120 N/mm^2, Calculate the external diameter and minimum value of hoop stress in the cylinder . Sketch the radial pressure and hoop stress distribution across the section.

17 A simply supported beam 4m long is subjected to central point load of 600N at 30^o with vertical in the transverse section as shown in fig-3.Calculate bending stress at corner A.

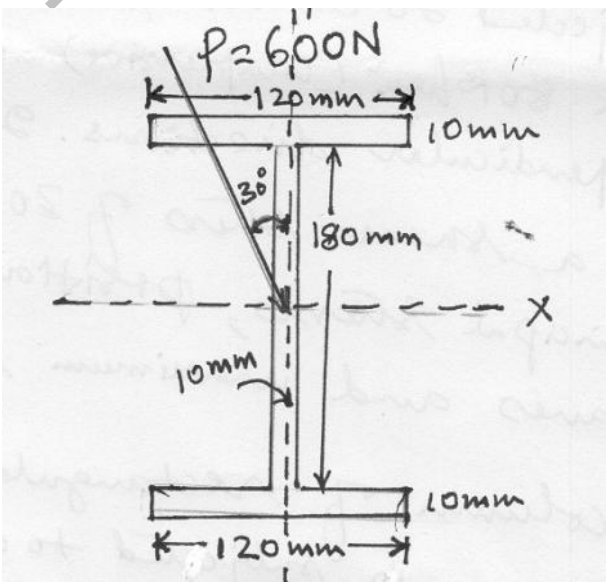


Fig-3

*****

Code No. 437/CBCS/S

FACULTY OF ENGINEERING

B.E. (CBCS) (Inst.) III-Semester (Suppl.) Examination, May/June 2018

Subject: Network Theory

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

Note: Answer all questions from Part - A & any five questions from Part - B.

PART-A (20 Marks)

1. What is a passive element? 2
2. State Kirchhoff's current law 2
3. State Maximum power transfer theorem 2
4. Define and draw a unit impulse signal 2
5. Explain steady – state response 2
6. Define average value of an ac waveform 2
7. Explain reactive power 2
8. What is meant by Q – factor of a series – resonant circuit 2
9. What do you understand by a balanced load circuit 2
10. Define a "port" when referring to a two – port network 2

PART-B (50 Marks)

11. a) Derive the expression for energy stored in an inductance 5
    b) Find the current supplied by the 10-V battery of fig-1 using Star/delta transformation 5

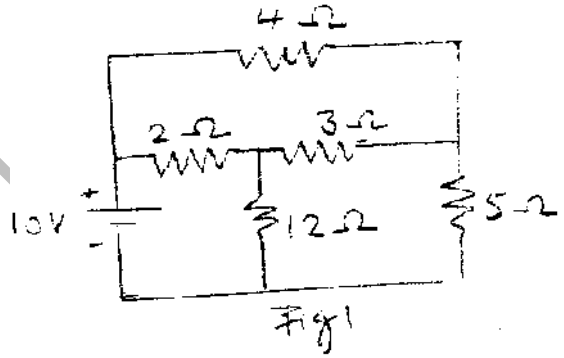


Fig 1

12. Using superposition, find the current through resister R_1 in the network shown in the figure – 2

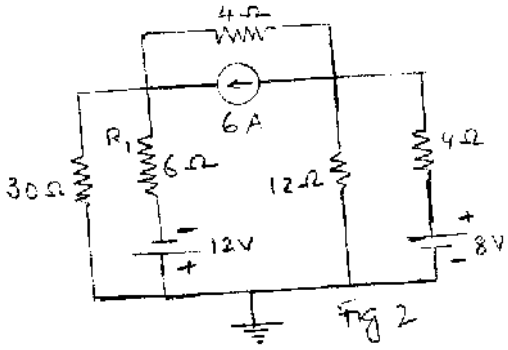


Fig 2

…2

13. Calculate the voltage V_c (t) and current i_R(t) for t ≥ o for the circuit shown in fig-3 below. Assume that switch "S" was closed for a long time before being opened a t = o 10

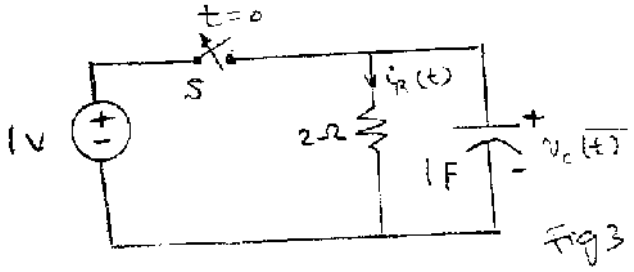


Fig 3

14. In the circuit shown in Fig-4 find the total number of watts, volt- amperes, Volt. Amperes reactive and the power factor. Sketch the power triangle. 10

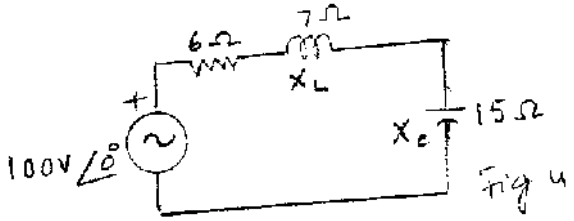


Fig 4

15. A resistor and capacitor are connected in series across a 150 V ac supply. When the frequency is 40 HZ the circuit draws 5A. When the frequency is increased to 50Hz, it draws 6A. Find the values of resistance and capacitance. Also find the power drawn in the second case. 10

16. The phase sequence of the star – connected generator is RYBL of Fig- 5 10
    a) Find the phase angles θ_2 and θ_3.
    b) Find the magnitude of the line voltages.
    c) Find the line currents
    d) Verify that, since the load is balanced I_N=O

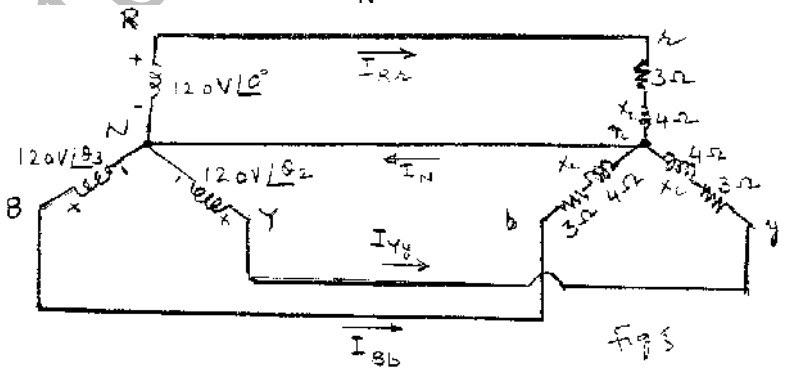


Fig 5

17. Determine the Y – Parameters for the network shown below in Fig = 6 10

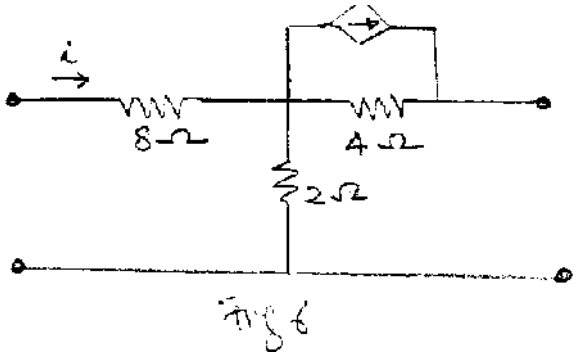


Fig 6

****

Code No: 433/CBCS/S

FACULTY OF ENGINEERING

B.E III-Semester (CBCS) (Suppl.) Examination, May / June 2018

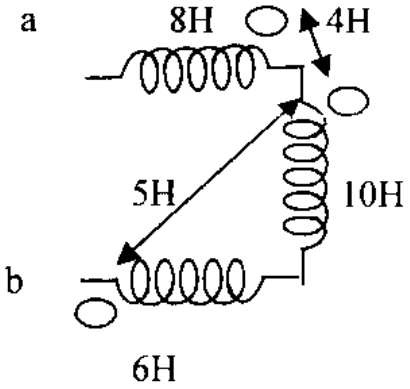
Subject: Electrical Circuits-I

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

Note: Answer All Questions From Part-A, & Any Five Questions From Part-B.

Part-A(20 Marks)

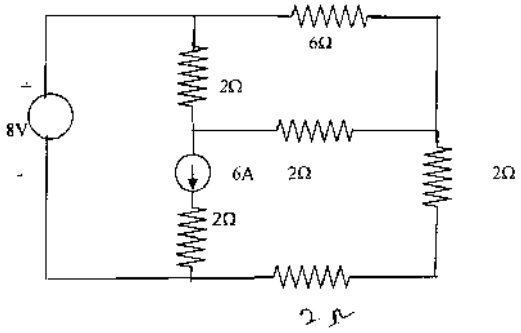
1. A resistor with a current of 2A through it converts 1000J of electrical energy to heat energy in 15s. What is the voltage across the resistor ?
2. A 100Ωresistor ,20μF & a 2H inductor are connected in series .At what frequency the phase angle is 45º
3. Three equal resistances are connected in star across a three phase balanced supply consume 1000W .If the same three resistances were reconnected in delta across the same supply determine the power consumed
4. State Maximum Power Theorem & list its applications
5. The full rectified sine wave has a delay angle of 60º.Calculate average & RMS value of voltage
6. In two wattmeter method of power measurement, the power shown by one wattmeter is 3500W while the other reads down scale .After reversing the later ,it reads 300W .Determine the total power & p.f
7. Calculate the total inductance of the circuit shown across a & b



8. Define coefficient of coupling?
9. Draw the Power triangle of RC circuit & explain it in detail
10. Explain in brief the source transformation technique

PART-B (50 Marks)

11. a) Solve the given network & find all the mesh currents [6M]

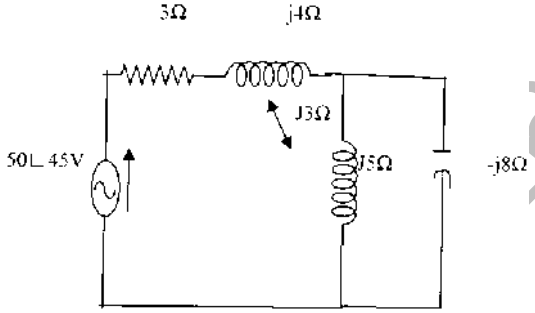


b) When a D.C voltage is applied to a capacitor the voltage across its terminals is found to build up in accordance with Vc =50 $(1-e^{-100t})$ .After a lapse of 0.01sec the current flow is 2mA .a) Find the value of capacitor in micro farad b) How much energy is stored in electric field at this time [4M]

12 a) A reactor has a resistance of 5Ω & an inductance of 0.04H .Find a suitable shunt circuit such that the current taken by the combination will be 20A at 100V at all frequencies [5M]

b) Two impedances Z1=20+j10 & Z2=10-j30 are connected in parallel & this combination in series with Z3 =30+jX Find the X which will produce resonance. [5M]

13 a) For the circuit shown in fig find the voltage across j5 Ω reactance [5M]

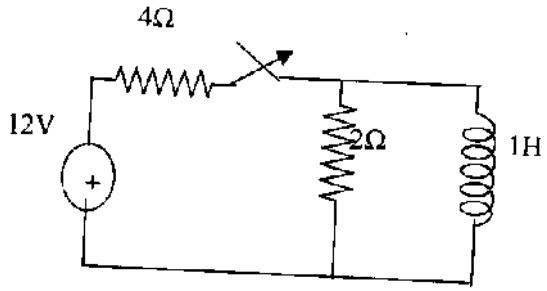


b) Three identical impedances are connected in delta to a 3 phase of 400V supply. The line current is 34.65A.& the total power taken from the supply is 14.4KW .Calculate the resistance & reactance of each impedance. [5M]

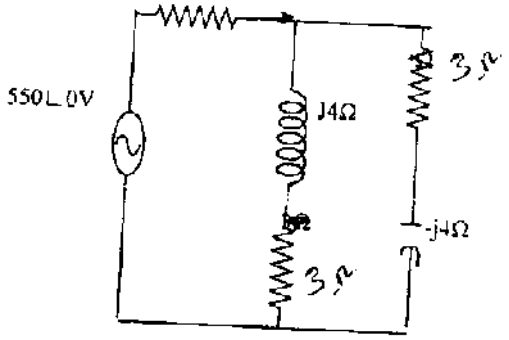
14 a) Obtain the expression for current i(t) from the differential equation [4M]

$\frac{d^2i(t)}{dt^2} + 10\frac{di(t)}{dt} + 25i(t) = 0$ with $i(0^+) = 2$ & $di(0^-)/dt = 0$

b)

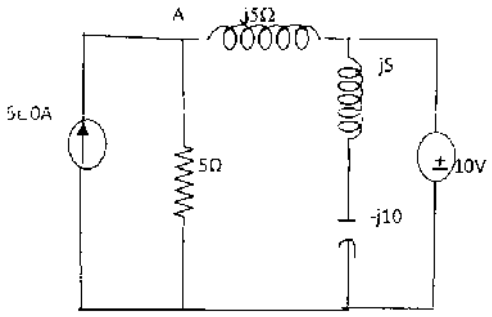


15 a) Verify reciprocity theorem for the circuit shown .Find the current in (3-j4) Ω impedance [5M]

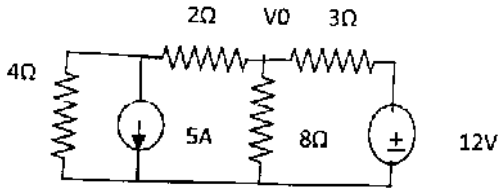


b) A load of (20 - j Xc) is supplied from a source of 10V rms & internal impedance of (10+j20) .Determine the value of Xc fo which maximum power supplied to load & determine the power [5M]

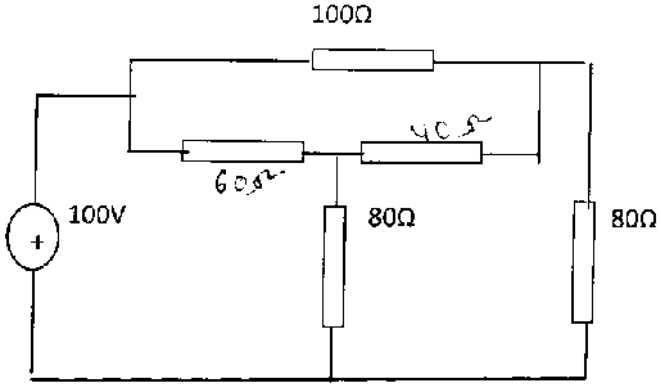
16a) Determine the current through branch AB of the network using superposition theorem [6M]



b) Calculate V0 using source transformation technique [4M]



17 a) Determine the current through the voltage source [5M]



b) Explain Power Measurement by two wattmeter in star connected load with relevant phasors [5m]

****

Code No.441/CBCS/S

FACULTY OF ENGINEERING

B.E. III Semester (CBCS) (ECE) (Suppl.) Examination, May/June 2018

Subject: Signal Analysis and Transform Techniques

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

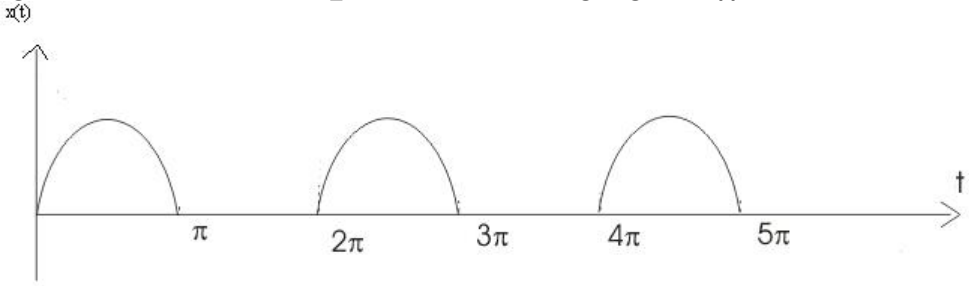
Note: Answer all questions from Part A & any five questions from Part B.

PART-A (20 Marks)

1. Show that whether the unit step signal is a power or energy signal. 2
2. Write the relation between exponential and trigonometric Fourier series coefficients. 2
3. Find the Fourier Transform of the signal $x(t)=e^{-4|t|}\,u(t)$. 2
4. Define ROC and determine ROC for a right sided signal. 2
5. Show clearly the S-plane and Z-plane correspondence. 2
6. Explain shifting property of Z-transform. 2
7. Write the properties of convolution. 2
8. Perform the convolution between two signals x(n)={1,2,1,2} and h(n)={2,0,2,0}. 2
9. State whether the following system is time invariant or not. y(t)=2 t x(t) 2
10. What is sampling? 2

PART-B (5X10=50 Marks)

11. Find the trigonometric Fourier series of the following signal x(t) 10



12. a) Determine the even and odd part of the following signal 5
x(t)= sin(3t)+cos(2t)+sin(t)cos(2t).

b) Determine the energy of the signal $x(t)=e^{-5t}\,u(t)$. 5

13. a) Write any five properties of Fourier transform. 5

b) Using Laplace transform determine the complete response of the system represented by following equations. Assume initial conditions are zero.

$\frac{d^2y(t)}{dt^2}+11\frac{dy(t)}{dt}+24\,y(t)=3x(t)$; where x(t)=4 u(t) 5

…2

14. a) Find inverse Z-transform of X(Z)= $\frac{1+z^{-1}}{1-(\frac{1}{3})z^{-1}}$ if ROC |Z| > 1/3 . 5

b) Consider a causal discrete-time system whose output y(n) and input x(n) are related by 5

$$y(n) - \frac{5}{6}\ y(n-1) + \frac{1}{6}y(n-2) = x(n)$$

i)Find its transfer function H(z).

ii) Find its impulse response h(n).

15. a) Perform the convolution of the continuous signals using graphical method. 5
$x_1(t)=e^{-2t}\ u(t)$ and $x_2(t)=t\ u(t)$

b) Write short notes on scaling of discrete time signals. 5

16. a) Determine whether the following signal is energy or power signal 5
$x(n)= (1/4)^n\ u(n)$

b) Test the following systems is linear or not. 5

$$y(n)=3x(n)+\frac{1}{x(n-1)}$$

17. Write short notes on **any two** of the following. 10
a) Addition and multiplication of discrete time sequences.
b) Auto correlation and its properties.
c) Fourier transform of periodic signals.

****

Code No. 455/CBCS/S

FACULTY OF INFORMATICS

B.E. (IT) (CBCS) III-Semester (Suppl.) Examination, May/June 2018

Subject: Discrete Mathematics

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

Note: Answer all questions from Part A & any five questions from Part B.

PART-A (20 Marks)

1. Show that (p^q)→(pvq) is a tautology using a series of logical equivalences?
2. Show that n^2 is not O(n).
3. What is the power set of the set {0,1,2}?
4. Define a partial ordering.
5. Suppose that f is defined recursively by f(0)=3 and f(n+1)=2f(n)+3. Find f(1), f(2), f(3) and f(4).
6. Show that the divides relation on the set of positive integers is not an equivalence relation.
7. Define a) Pendant vertex b)Hamilton Cycle
8. How many edges are there in a graph with 10 vertices of degree six?
9. Define chromatic number of a graph.
10. Represent the expression ((x+2)↑3)*(y-(3+x))-5 using a binary tree.

PART-B (50 MARKS)

11. a) Show that pv(q^r) and (pvq)^(pvr) are logically equivalent without using truth table method. (5)

    b) Construct truth table for the proposition $p \rightarrow (q \vee r)$. (5)

12. a) Translate the statement $\exists x \forall y \forall z$ ((F(x,y)^F(x,z)^(y!=z))→ ~F(y,z)) into English where F(a,b) means a and b are friends and the domain for x,y and z consists of all students in your school. (5)

    b) Show that the premises "A student in this class has not read the book" and Everyone in this class passed the first exam" imply the conclusion "Someone who passed the first exam has not read the book". (5)

13. a) Prove that √2 is irrational by giving a proof by contradiction. (5)

    b) Write the procedure for insertion sort and arrange the elements 3, 2, 1, 4, 5 in increasing order using insertion sort. (5)

14. a) Find the solution to the recurrence relation $a_n=-3a_{n-1}-3a_{n-2}-a_{n-3}$ with initial conditions $a_0=1, a_1=-2$ and $a_2=-1$. (5)

    b) Find all the solutions of the recurrence relation $a_n=5a_{n-1}-6a_{n-2}+7^n$. (5)

15. a) How are paths used in determining the isomorphism of graphs? Explain with an example. (5)

    b) Explain the procedure for constructing Euler Circuits. (5)

16. a) Show that a relation R on a set A is reflexive if and only if A^{-1} is reflexive. (5)

    b) Draw the Hasse diagram representing the partial ordering {(a,b)|a divides b}on {1,2,3,4,6,8,12}. (5)

17. a) Construct circuits that produce the following outputs. a) $(x+y).\overline{x}$ b)$(x+y+z).(\overline{x}\,\overline{y}\,\overline{z})$ (5)

    b) Use the Quine-McCluskey method to simplify the sum-of-products expansion $wxy\overline{z} + w\overline{x}yz + \overline{w}xyz + \overline{w}x\overline{y}z + \overline{w}\overline{x}yz + \overline{w}\overline{x}\overline{y}z$. (5)

****

Code No. 453/CBCS/S

FACULTY OF ENGINEERING

B.E. 3/4 (CSE)(CBCS) II –Semester (Suppl.) Examination, May/June 2018

Subject: Discrete Mathematics

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

Note: Answer all questions from Part A & any five questions from Part B.

PART-A (20 Marks)

1. What is difference between identical and equivalent set?
2. Define division algorithm
3. What is pigeon-hole principle
4. Define equivalence relation
5. What is recurrence relation?
6. How to represent divide and conquer relation?
7. Define group oid
8. Write about homomorphism
9. What is chromatic number?
10. Define a spanning tree

PART-B (50 Marks)

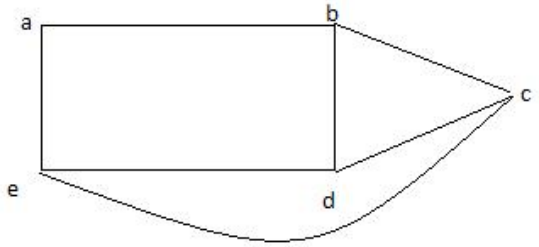
11. a) Construct truth table for (p <-> q) <-> (r <-> s) (5M)
    b) Prove that $(A \cap B)' = A' \cup B'$ (5M)

12. a) If f(x)=x+2 g(x)=x-2 h(x)=3x find fog, gof, fof, gog, hog, hof, fog oh (5M)
    b) How many bit strings of length 8 either start with 1 bit or end with two bits 00? (5M)

13. a) In how many different ways can 8 identical cookies can be distributed among 3 children if each child recieves atlest 2 cookies and no more that 4 cookies? (5M)
    b) Solve recurrence relation $a_n=2a_{n-1}+n.3^n$ with $a_0=1$ (5M)

14. a) Explain concept of prim's algorithm with an example (5M)
    b) Prove that we can't have an odd number of vertices for a graph with odd degree (5M)

15. Determine all 6 possible spanning trees of the graph (10M)



16. Discuss DFS and BFS with examples (5+5M)

17. Write short notes on
    a) Group codes and their applications (5M)
    b) Semi-groups (5M)

****

Code No: 448/CBCS/S

FACULTY OF ENGINEERING

B.E. III Semester (AE)(CBCS) (Supple.) Examination, May / June 2018

Subject: Thermal Engineering

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

Note: Answer all questions from Part A & any five questions from Part B.

PART – A (10x2=20Marks)

1. Define PMM-I
2. Define thermodynamic cycle.
3. What is Carnot theorem?
4. Define Clasius Inequality.
5. Classify Gas Turbines.
6. Compare open and closed cycle Gas Turbines.
7. Define pure substance.
8. What is COP of refrigerator?
9. What are the advantages of Multistage compression?
10. What is working principle of a Fuel Cell.

PART – B (5x10=50 Marks)

11. (a) Derive the steady flow energy equation for one inlet and one outlet.
    (b) Air at 100kPa and 290K flows steadily through a compressor at a rate of $5m^3/s$. During the compression process the pressure and temperature of air are respectively raised to 250 kPa and 400K. There is also a heat loss of 15kJ/s to the cooling waer. Determine the power required to derive the compressor. Presume that air behaves as a perfect gas and neglect changes in kinetic energy and potential energy.

12. (a) Explain the equivalence of Clausius and Kelvin plank statement of second law of thermodynamics.
    (b) One kg of air is compressed according to the law $PV^{1.25}=C$ from 1.03 bar and 15^{oC} to 16.45 bar. Calculate the change in entropy.

13. (a) Explain the methods of improving the efficiency of Gas Turbines.
    (b) A gas turbine unit receives air at 1 bar and 300k and compresses it adiabatically to 6.2 bar. The compressor efficiency is 88%. The fuel has a heating value of 44,186kJ/kg and the fuel air ratio is 0.017kJ/kg of air. The turbine internal efficiency is 90% calculate the work of turbine and compressor per kg of air compressed and thermal efficiency.
    For products of combustion C_p =1.147 kK/kg K and ¥ =1.333.

14. (a) Explain the working of vapour absorption system with the help of layout diagram and graphs.
    (b) A simple Rankine cycle works between pressures 28bar and 0.06bar, the initial condition of steam being dry saturated. Calculate the cycle efficiency.

15. (a) What is the potential of Fuel Cell and what are the challenges?
    (b) A single cylinder double acting air compressor has indicated power of 40kW. Compression follows the law $PV^{1.25}$. The air is drawn into the cylinder at 1 bar and compressed at 8 bar. The speed of compression is 220rpm and average piston speed is 176m/min. Find the dimensions of the cylinder.

..2

16. (a) What are the desirable properties of refrigerants?
    (b) What are the future developments and prospects of Hybrid Vehicles?

17. (a) Explain Carnot Cycle.
    (b) 0.44kg of air at 180^{o}C expands adiabatically to three times its original volume and during the process, there is a fall I temperature to 15^{o}C. the work done during the process is 52.5kJ. Calculate C_p and C_v.

****

Code No. 445 / CBCS / S

FACULTY OF ENGINEERING

B.E (M / P) III Semester (CBCS) (Supple.) Examination May / June 2018

Subject: Metallurgy and Material Science

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

Note: Answer all questions from Part A & any five questions from Part B

PART – A (20 Marks)

1. Distinguish between edge and screw dislocation.
2. Explain Bauchinger's Effect.
3. Draw the structure of a fatigue fracture surface and explain the fracture zones
4. State and explain FICK'S Ist LAW of diffusion
5. Draw the cooling curve for pure iron and show the different allotropic forms of iron on it.
6. How plain carbon steels are classified?
7. What is full annealing?
8. Differentiate between austempering and martempering.
9. Draw a neat sketch of Blast furnace.
10. Write the properties and applications of maraging steel.

PART – B (5 x10 = 50 Marks)

11. (a) Distinguish between cold working and hot working. What are the advantages of cold Working compare to hot working.
    (b) Explain the Griffith theory of Brittle fracture.

12. (a) Explain the experimental determination of fatigue strength with the help of the neat sketch.
    (b) Differentiate between creep curve and stress rupture curve.

13. (a) Draw Iron – Iron carbide equilibrium diagram and label all points, lines and areas of significance.
    (b) Discuss the invariant reactions in Fe-C system.

14. (a) Explain the need of tempering hardened steel. Describe the process of tempering.
    (b) What is surface hardening? Explain flame hardening process.

15. (a) Explain the method of production of steel by Electric Arc Process.
    (b) Explain in brief the method of production of Aluminium.

16. (a) What is critical resolved shear stress? Explain.
    (b) Write the applications of diffusion theory in mechanical engineering

17. Write short notes on:
    (a) Age Hardening
    (b) Grey cast Iron
    (c) Stainless steels

****

Code No. 422

FACULTY OF ENGINEERING & TECHNOLOGY

B.E. / B.Tech. (Bridge Course) II – Semester (Backlog) Examination,
May / June 2018

Subject : Mathematics

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part-A & any five questions from Part-B.

PART – A (25 Marks)

1 Find the median for the following frequency distribution.

x	1	2	3	4	5	6	7	8	9
f	8	10	11	16	20	25	15	9	6

2 Two coins are tossed simultaneously. Find the sample space.

3 Find the value of c of the Lagrange's mean value theory for the function f(x) = x^2 in [1, 4].

4 Find the radius of curvature of the curve $y^2 = x^2$ at (1, 1).

5 Find area of the region bounded by $x = 0$, y = 0 and x + y = 1.

6 Evaluate $\int_0^1 \int_0^1 \int_0^1 dz\, dy\, dx$

7 Show that $\vec{F} = 12xi - 15y^2 j + k$ is irrotational.

8 State Gauss's divergence theorem.

9 Define Beta and Gamma functions.

10 Evaluate $\int_0^{\pi/2} \sin^3 \theta \cos^3 \theta\, d\theta$

PART – B (50 Marks)

11 (a) Define mode for continuous frequency distribution. Find the mode for the following distribution. (5)

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
frequency	5	8	7	12	28	20	10	10

(b) State and prove addition theorem of probability. (5)

12 (a) State and prove Cauchy's mean value theorem. (5)

(b) Find the envelope of the family of curve $x\cos\alpha$ + ysinα = 5. (5)

13 (a) Evaluate $\int (\sin x \cos^6 x + xe^x) dx$. (5)

(b) Evaluate $\int\int_R xy\, dxdy$ where R is the first quadrant of the circle $x^2 + y^2 = 1$. (5)

14 (a) Find the directional derivative of $f(x, y, z) = x^2 + y^2 + z^2$ at (2, 1, 1) in the direction of the vector 2i + 2j + k. (5)

(b) Apply Green's theorem to evaluate $\oint_C (x^2 + xy)dx + (x^2 + y^2)dy,$ where C is the square formed by the lines $x = \pm 1, y = \pm 1$. (5)

15 (a) Prove that $\Gamma(1/2) = \sqrt{®}$ and hence find $\Gamma\left(7/2\right)$. (5)

(b) Show that $\int_0^\infty e^{-mx}(1-e^{-x})^m dx =$ $(m, n+1)$ where m and n are positive numbers. (5)

16 (a) If P(A) = $\frac{1}{2}$, P(B) = $\frac{1}{3}$ and P(A∩B) = $\frac{1}{5}$ find (i) P(A∪B) (ii) $P(\overline{A} \cap \overline{B})$ (iii) P($\overline{A}$) (iv) P($\overline{B}$) and (v) P($\overline{A} \cap B$). (5)

(b) Verify Rolle's theorem for f(x) =e^x sinx in [0, 4π]. (5)

17 (a) Find the angle between the surface $x^2 + y^2 = 4$, $x^2 + y^2 + z^2 = 12$ at (2, 2, -2). (5)

(b) Prove that $(m, n) = \int_0^\infty \frac{x^{m-1}}{(1+x)^{m+n}} dx$ (5)

*****

Code No. 04

FACULTY OF ENGINEERING

B.E I-Year (Backlog) Examination, May/June 2018

Subject : Engineering Physics

Time : 3 Hours **Max Marks : 75**

Note: Answer all questions from Part – A & Any five questions from Part – B.

Part – A (25 MARKS)

1. A light of wavelength $600nm$ is incident on a slit of width $1\mu m$. Find the angle of separation between the first order minima on side of central maxima. [2]
2. Write a note on optical activity [2]
3. Distinguish between SIN and GRIN fibres [2]
4. Find first two energy levels of election in $1A^{o}$ box [3]
5. What are different types of point defects [2]
6. Distinguish between conductors, semiconductors and Insulators [3]
7. Distinguish between ferro, antiferro and ferri magnetic materials [3]
8. How Meissner effect contradicts Maxwell's theory? Explain [3]
9. What are carbon nano tubes? Mention few applications [3]
10. Define specific Rotation [2]

PART – B

11. a) Derive the expression for wavelength of incident light by forming Newton's rings taking diameters of rings into account [5]
    b) Discuss Fraunhofer's diffraction at a double slit and explain intensity distribution [5]

12. a) Explain the classification of ensembles in statistical mechanics [4]
    b) Obtain Schrödinger's time dependent and time independent wave equation. [6]

13. a) Describe the powder diffraction experimental method for determination of inter planner spacing of a crystal [5]
    b) Find the carrier concentration of electrons in intrinsic semiconductor [5]

14. a) Explain Weiss domain theory of ferromagnetism and hysteresis variation [5]
    b) Distinguish between TYPE – I and TYPE – II superconductors [5]

15. a) Describe construction and working of solar cell [5]
    b) Explain top – to – bottom approach in preparing Nano particles [5]

16. a) Define equation for numerical Aperture and acceptance angle [5]
    b) Explain construction and working of Ruby laser [5]

17. Write a note on
    a) High Tc Super conductors [5]
    b) Explain about hall effect [5]

****